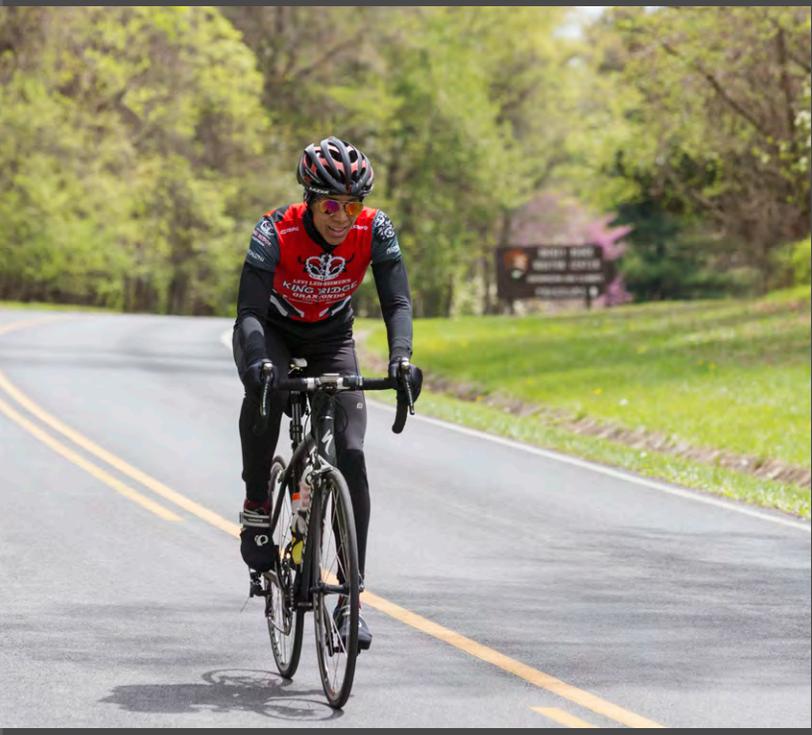




National Park Service
U.S. Department of Interior



National Park Service Active Transportation Guidebook

*A Resource on Supporting Walking and Bicycling for
National Parks and their Partners*

July 2018





Cover

Cover images are sourced as follows:

- Top, Left Photo: Shenandoah National Park, Virginia (Source: NPS)
- Bottom, Left Photo: Grand Canyon National Park, Arizona (Source: NPS)
- Top, Right Photo: Golden Gate National Recreation Area, California (Source: NPS)
- Bottom, Right Photo: Grand Teton National Park, Wyoming (Source: Matt Wild)



Notice

This document is disseminated under the sponsorship of the National Park Service in the interest of information exchange. The U.S. Government assumes no liability for the use of information contained in this document.

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of this document.

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official policy of the National Park Service or other federal agencies involved in the development of this report. This report does not constitute a standard, specification, or regulation.



Foreword



United States Department of the Interior National Park Service

1849 C Street, N.W.
Washington, DC 20240

National parks are places of wonder and inspiration that deepen our understanding of our Nation’s natural and cultural heritage. With over 84 million acres of extraordinary landscapes, national parks are popular destinations for outdoor recreation opportunities, emphasizing the importance of access for all Americans.

Since its creation in 1916, the National Park Service has balanced public access to use and enjoy our parks with its responsibility to protect and preserve these important resources for future generations. This includes designing roads so as to “lie lightly” on our most breathtaking and formidable of landscapes. From the time the first automobiles entered Mount Rainier National Park in 1908, cars have been a primary medium through which visitors have experienced their parks.

Yet, as more visitors discover and connect with these special places, parks and nearby communities are struggling to accommodate the resulting increase in the number of cars and resulting impacts, including an increase in vehicle collisions with wildlife, persistent congestion, noise and air pollution, and visitor experiences of traffic jams they wouldn’t expect to find in a park. Active transportation, including cycling, walking and other forms of human-powered transportation, not only offers a unique experience for the visitor, but it can also help mitigate some of these impacts.

The National Park Service, in partnership with the U.S. Department of Transportation, is pleased to present the *National Park Service Active Transportation Guidebook: A Resource on Supporting Walking and Bicycling for National Parks and their Partners*. This tool supports National Park Service staff, local governments, community partners, and others to promote, encourage and implement responsible bicycle and pedestrian-friendly travel to and within national park sites.



Active transportation efforts across the country are providing a multitude of benefits to national park sites and nearby communities by helping to accommodate an increase in park visitors, alleviating vehicle congestion, promoting the protection of park resources, encouraging environmentally sustainable travel options, promoting healthy outdoor recreation and providing new ways to enhance the visitor experience.

Opportunities outlined in this guidebook include implementing bike sharing systems, coordinating with local communities to develop multiuse trails and other bicycle and pedestrian infrastructure, hosting car-free events, and something as simple as conducting bicycle safety trainings. Many of these efforts can be accomplished through National Park Service staff, volunteers and friends groups, and with support and resources from local, state, and national partnerships.

As with many of the active transportation projects that are highlighted herein, the guidebook itself is the result of a partnership across a variety of disciplines, programs, agencies, and organizations, including the involvement by many who share a common desire to create a more bicycle- and pedestrian-friendly national park system.

We hope this guidebook will inform and inspire National Park Service staff, communities, and partners to work together to improve bicycle and pedestrian access between national parks, surrounding communities, and beyond.

A handwritten signature in black ink, appearing to read "P. Daniel Smith".

P. Daniel Smith
Deputy Director
Exercising the Authority of the Director
for the National Park Service



Foreword



United States Department of Transportation Federal Highway Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

The Federal Highway Administration (FHWA) is pleased to partner with the National Park Service (NPS) to present the National Park Service Active Transportation Guidebook: A Resource on Supporting Walking and Bicycling for National Parks and their Partners. Working with the NPS to develop this Guidebook is another example of FHWA's Office of Federal Lands Highway's long standing commitment to supporting the NPS in meeting their context-sensitive transportation goals to: "preserve and protect resources, while providing safe and enjoyable access to and within the national parks, using sustainable, appropriate, and integrated transportation solutions."

The U.S. Department of Transportation (USDOT) has a long history of supporting pedestrian and bicycle transportation. Our 2018 - 2020 Strategic Plan reinforces transportation safety as our highest priority and the importance of "collaborating with stakeholders to foster behavior and infrastructure changes that improve safety" and save lives. Success in improving pedestrian safety and mobility for people of all ages and abilities in our national parks depends on partnerships such as this one with the NPS.

The National Park Service Active Transportation Guidebook serves as a resource for national park units and their partners to both identify and prioritize bicycle and pedestrian transportation needs, in addition to helping gain an understanding of design considerations and resource opportunities to implement projects that meet these needs. Similarly, the Guidebook shares information and examples of how national parks and their communities can develop and provide active transportation programs to further promote opportunities for visitors to bike and walk to and within parks. While focused on the NPS, the information in this Guidebook will be beneficial to all Federal Land Management Agencies looking to support non-motorized transportation to and within federal lands.



This Guidebook was developed by drawing on guidance and expertise from numerous disciplines within the NPS and USDOT. It serves as an example of both agencies collaborating to develop resources that will educate and expand the capabilities of federal staff to develop bicycling and walking options to and within some of the most iconic places of natural wonder and cultural heritage the nation has to offer.

A handwritten signature in blue ink that reads "Tim Hess".

Timothy G. Hess, P.E.
Associate Administrator for Office of Federal Lands Highway Federal Highway Administration
U.S. Department of Transportation



Acknowledgements

The National Park Service (NPS) developed this Guidebook with support from the U.S. Department of Transportation John A. Volpe National Transportation Systems Center (Volpe Center), and the U.S. Department of Transportation Federal Highway Administration (FHWA). The following individuals were instrumental in this effort:

- Krista Sherwood, National Park Service, Conservation & Outdoor Recreation Programs
- Jessica Baas, U.S. DOT Volpe Center
- Amy Plovnick, U.S. DOT Volpe Center
- Alexandra McNally, U.S. DOT Volpe Center
- David Daddio, U.S. DOT Volpe Center
- Amalia Holub, U.S. DOT Volpe Center
- Laurie Miskimins, Central Federal Lands Highway Division

The NPS convened a Technical Advisory Committee (TAC) to support the development of the Guidebook. TAC members helped to develop content, review drafts, provide ideas and varying perspectives, and subject matter expertise. Their contributions and dedication to the effort were critical to the completion of the Guidebook. Members included:

- Tegan Boehmer, Centers for Disease Control and Prevention
- Nola Chavez, National Park Service, Denver Service Center
- Linda Ginenthal, City of Portland, Oregon Active Transportation and Safety Division
- Morgan Lommele, People for Bikes
- Saara Snow, Adventure Cycling Association

Development of this Guidebook was a collaborative effort, gathering input from multiple agencies, organizations, and disciplines. The authors would like to acknowledge the following individuals for their contributions of time and subject matter expertise to this Guidebook:

National Park Service

- Craig Ackerman, Crater Lake National Park
- Nick Bartolomeo, Rock Creek Park
- Randy Biddle, Rocky Mountain National Park
- Jeremy Buzzell, Park Facility Management Division
- Michael Byrd, Colonial National Historical Park
- Jennifer Evans, Crater Lake National Park
- Ina Hysi, Public Risk Management Program
- John Kelly, Acadia National Park
- Randy King, Mount Rainier National Park
- Steve Kloster, Great Smoky Mountain National Park
- Molly McKinley, Denali National Park
- Jennifer Proctor, Public Risk Management Program



- Estee Rivera, NPS Centennial Office
- Brian Sikes, Shenandoah National Park
- Elizabeth Stern, NPS Centennial Office
- Tammy Stidham, National Capital Region
- Virginia Sullivan, Adventure Cycling Association
- Alan Turnbull, Rivers, Trails & Conservation Assistance Program
- Eliza Voigt, National Mall and Memorial Parks
- Phil Wilson, Glacier National Park

Federal Highway Administration

- Scott Allen
- David Cohen
- Christopher B. Douwes
- Dan Goodman
- Gary Jensen
- Todd Johnson
- Anthony M. Jones
- Dave Kirschner
- Susan Law
- Tamara Redmon
- Gabe Rousseau
- Shari Schaftlein

Additional Stakeholders

- Dee Merriam, Centers for Disease Control and Prevention
- Marissa Rodriguez-McGill, ofo
- Andy Williamson, International Mountain Bicycling Association

Additional Volpe Center Support

- Caitlin Connelly
- Rachel Galton
- Emily Navarrete
- Miranda Richard
- Amber Shackelford
- Erica Simmons
- Jaime Young



REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE July 2018		3. REPORT TYPE AND DATES COVERED Final Report
4. TITLE AND SUBTITLE National Park Service Active Transportation Guidebook			5a. FUNDING NUMBERS VU15/RC221	
6. AUTHOR(S) Jessica Baas, Alexandra McNally, Amy Plovnick, David Daddio, Amalia Holub (Volpe Center), Krista Sherwood (National Park Service), Laurie Miskimins (Central Federal Lands Highway)			5b. CONTRACT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Department of Transportation John A. Volpe National Transportation Systems Center Transportation Planning Division 55 Broadway Cambridge, MA 02142-1093			8. PERFORMING ORGANIZATION REPORT DOT-VNTSC-NPS-18-04	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Krista Sherwood National Park Service 1849 C Street NW Washington, DC 20005			10. SPONSORING/MONITORING AGENCY REPORT NUMBER 999/146604	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Public distribution/availability			12b. DISTRIBUTION CODE	
13. ABSTRACT The NPS Active Transportation Guidebook is intended to serve as a resource to parks and their partners, and inspire them to pursue enhancements to active transportation to and within parks. This Guidebook contains 10 chapters that cover policy, infrastructure design, and programs that parks and partners can pursue to improve walking and bicycling opportunities for visitors and surrounding communities.				
14. SUBJECT TERMS			15. NUMBER OF PAGES 167	
16. PRICE CODE				
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18

298-102



Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ABA	Architectural Barriers Act
ART	Anacostia Riverwalk Trail
BAB	Bright Angel Bicycles
C2A	A Call to Action
CDC	Centers for Disease Control and Prevention
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CSS	Context Sensitive Solutions
CUA	Commercial Use Authorization
CVTS	Collaborative Visitor Transportation Survey
DDOT	District of Columbia Department of Transportation
DNR	Department of Natural Resources
DOI	Department of Interior
DOT	Department of Transportation
DSC	Denver Service Center
EA	Environmental Assessment
EIS	Environmental Impact Statement
eMTB	Electric mountain bike
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FLH	Federal Lands Highway
FLMA	Federal Land Management Agency
FLTP	Federal Lands Transportation Program
FLAP	Federal Lands Access Program
FMSS	Facility Management Software System
FTA	Federal Transit Administration
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information Systems
GMP	General Management Plan
GPP	Green Parks Plan
GTSR	Going-to-the-Sun Road
HAV	Highly Automated Vehicle
IMARS	Incident Management, Analysis, and Reporting System
LRIP	Long Range Interpretive Plan
L RTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NLRTP	National Long Range Transportation Plan
NPS	National Park Service
ODOT	Oregon Department of Transportation
PBIC	Pedestrian and Bicycle Information Center
RSA	Road Safety Audit
RTCA	Rivers Trails and Conservation Assistance Program
TIP	Transportation Improvement Program
USBRS	U.S. Bicycle Route System
UPS	United Parcel Service
U.S.C.	United States Code
U.S. DOT	United States Department of Transportation



Executive Summary

This Guidebook is intended to assist and inspire parks and their partners to identify and pursue opportunities that enhance active transportation to and within national parks. It introduces a variety of policies, programs, and types of infrastructure that support and promote the use of active transportation within and around national parks. The resources referenced throughout this Guidebook may help those who want to learn more, do more, and implement programs and projects that support walking and bicycling. The Guidebook highlights many park-related examples and best practices in addition to innovative examples from other contexts, with the goal of presenting ideas for improving bicycling and walking opportunities for national parks and their surrounding communities.

The Guidebook covers a number of topics and strategies to support walking and biking in national parks and surrounding communities, including:

- Providing context and background information on **policies and planning activities** related to active transportation, at both local and national levels.
 - Planning and deploying active transportation **infrastructure**, such as pedestrian pathways, multiuse trails, bike lanes, signs/wayfinding, pavement markings, and bicycle racks.
 - Evaluating and improving **safety** for active transportation modes through strategies such as infrastructure improvements, safety education, enforcement, and emergency response.
 - Offering **activities and programs** that provide park visitors the opportunity to bicycle or walk while learning about or experiencing the park in new ways.
 - Holding **open streets or “car-free” events** that enable visitors to enjoy walking and bicycling on park roads without automobile traffic.
 - Implementing **bicycle sharing or rental systems** in coordination with nearby communities or other partners.
- Encouraging **employees** to incorporate active transportation into their workplace routines through offering employee bicycle fleets, active transportation incentives, and employee wellness programs.
 - Becoming aware of and planning for **innovative trends and technologies** related to bicycling and walking, such as bicycle and pedestrian count data, mobile applications and crowdsourced data, electric bicycles and fat tire bicycles, and the emergence of automated vehicles.

These types of efforts to enhance active transportation can benefit parks and surrounding communities in many ways. Many parks are experiencing an increase in visitation combined with aging infrastructure and roads that struggle to handle additional cars. Active transportation can help parks accommodate growing visitation while also offering a unique experience for the visitor. It can also help reduce vehicle congestion and mitigate some of the negative impacts to resources that vehicles cause, such as air, light, and noise pollution and wildlife-vehicle collisions. Investments in infrastructure and programs for walking and bicycling can also provide visitors with more options for getting to and around parks, improve visitor access, and provide visitors and staff opportunities for increasing physical activity and experiencing natural settings.

Partnership efforts between parks, surrounding communities, and other partners aimed at improving active transportation help to facilitate better connections for walking and bicycling between the park and community, as well as form lasting working relationships between park staff and local governments or other local organizations. Active transportation improvements and related opportunities can also promote local economies in gateway communities by attracting visitors and supporting local businesses such as bicycle shops, sports stores, and restaurants.



Figure ES-1: An Everglades National Park Bike Patrol volunteer on the Shark Valley Scenic Loop. (Source: NPS)

In addition to describing policies, programs, and infrastructure that parks can implement to promote active transportation, the Guidebook also provides practical information on recommended steps to help parks, partners, and surrounding communities to begin their active transportation efforts. These steps are:

Consider how active transportation can help support park goals.

Review the park’s Foundation Document and other planning documents to determine if expanding active transportation could help the park meet its mission or address identified transportation challenges. Developing an understanding of how active transportation helps to meet park goals can build internal support and justify investments in active transportation.

Inventory existing conditions and needs.

Evaluate the existing infrastructure, programs, or policies within and surrounding the park that support or could be improved to enhance active transportation. Working with residents and stakeholders, particularly those who walk and bicycle in the park, determine whether there are certain locations that are particularly unsafe for walking and bicycling, and whether or not a visitor could enter the park from a nearby community safely on foot or by bicycle. In addition to identifying problem spots, look at what is working well, and how that could be expanded.



Develop proposals.

Based on the existing conditions analysis and stakeholder input, develop project ideas for how active transportation in and around the park could be improved or enhanced. This may be through developing new infrastructure, but it could also be through educational programs or organized tours, changes in policies (such as a lower entrance fee for visitors arriving by bicycle rather than by car), initiating a bicycle rental or sharing program, or one or more of the numerous other strategies highlighted within this Guidebook.

Consider incorporating active transportation into ongoing transportation initiatives.

Often, active transportation improvements can be incorporated into existing transportation projects at a relatively low cost. For example, if a planning study (such as a transportation plan or visitor use management plan) is conducted, ensure that walking and bicycling are also considered. If a road is being repaved, consider adding a bike lane or crosswalk into the roadway design.

Identify potential partners.

Partners can play an integral role in successfully pursuing, planning, and implementing active transportation projects that benefit parks and the surrounding communities. Potential partners are as wide-ranging and diverse as the parks themselves and can bring a variety of skills and resources to a project. Potential partners could include gateway communities, regional planning organizations, state and local transportation departments, friends of the park groups, national walking and bicycling organizations, and many others.

Think creatively about funding sources.

Funding for active transportation projects and programs can come from a variety of sources, including those beyond traditional NPS transportation and operational funding. For example, funding may be leveraged through partnerships, formal agreements, and external federal funding sources administered through state and local governments or through regional or metropolitan planning organizations.¹ Funding could also come through grants from nonprofits or corporations, or through concessions agreements or donations, and other philanthropic partnerships.²

Monitor and evaluate improvements.

After implementing active transportation projects and programs, consider how these have changed park and surrounding conditions, visitation trends, and the visitor experience. Continually evaluating performance will help to identify what is working well, where modifications might be needed, and what strategies could be expanded.



Figure ES-2: Valley Forge National Historical Park, Pennsylvania. (Source: U.S. DOT Volpe Center)

End Notes

¹ NPS External Transportation Funding Opportunities for National Parks.
<https://www.nps.gov/subjects/transportation/funding.htm>

² NPS Director's Order #21: Donations and Philanthropic Partnerships (2016).
https://www.nps.gov/policy/DOrders/DO_21.htm



Table of Contents

Introduction

Introduction	IN-1
Guidebook Organization	IN-1
What is Active Transportation?	IN-3
Benefits of Active Transportation and Support for NPS Goals and Strategic Initiatives	IN-3
Building Partnerships Beyond Park Boundaries	IN-4

Chapter 1: Policy Context

Introduction	1-1
National Park Service Policies Relevant for Active Transportation	1-1
Additional Federal Provisions Relevant in National Park Settings	1-3
U.S. Department of Transportation Pedestrian and Bicycle Funding and Priorities	1-4
Coordination at the State and Local Levels	1-5
Appendix	1-6
Additional Resources	1-7

Chapter 2: Planning and Elements of Project Development

Introduction	2-1
What is Transportation Planning?	2-1
Transportation Planning within the National Park Service	2-1
Linking to State and Regional Transportation Planning	2-4
Transportation Funding Opportunities	2-6
Steps in Park Level Planning and Project Scoping	2-6
Additional Resources	2-11

Chapter 3: Infrastructure and Multimodal Connectivity

Introduction	3-1
Infrastructure Policy and Design Guidelines	3-1
Types of Pedestrian Infrastructure	3-2
Types of Bicycle Infrastructure	3-4
Bicycle Parking Design	3-8
Types of Multiuse Infrastructure	3-8
Designing Safe Intersections and Crossings	3-10
Wayfinding and Signs for Bicyclists and Pedestrians	3-13
Strategies to Enhance Multimodal Connectivity	3-16
Additional Resources	3-17

Chapter 4: Bicyclist and Pedestrian Safety

Introduction	4-1
Improving Safety with Engineering (Infrastructure)	4-1
Improving Safety with Education and Information	4-7
Improving Safety with Enforcement Strategies and Emergency Response	4-9
Additional Resources	4-11



Chapter 5: Partnerships and Funding

Introduction	5-1
Promoting Active Transportation through Partnerships	5-1
Potential Partners	5-2
Strategies for Building Connections between Parks and Communities	5-6
Funding and Partnerships	5-9
Formalizing Partnerships through Agreements	5-11
Additional Resources	5-13

Chapter 6: Visitor Activities and Programs

Introduction	6-1
Bicycle and Walking Tours and Classes	6-2
Special Events that Promote Walking and Bicycling	6-3
Long-Distance Active Travel	6-5
Policies Promoting Active Travel	6-6
Communication and Visitor Outreach	6-7
Considerations for Implementing Active Transportation Programs	6-10
Additional Resources	6-11

Chapter 7: Open Streets Opportunities in National Parks

Introduction	7-1
Existing NPS Car-Free Opportunities and Programs	7-2
Open Streets Best Practices and Key Considerations for National Parks	7-5
Getting Started Guide for Car-Free Opportunities	7-8
Additional Resources	7-10

Chapter 8: Bicycle Rental and Sharing Systems

Introduction	8-1
Overview of Bicycle Rentals	8-2
Overview and Types of Bike Share Systems	8-5
Additional Resources	8-12

Chapter 9: Employee Programs and Park Operational Uses

Introduction	9-1
Benefits of Workplace Active Transportation	9-1
Use of Employee Bicycle Fleets	9-2
Employee Active Transportation Programs and Incentives	9-6
Additional Resources	9-8

Chapter 10: Innovative Technologies and Emerging Trends

Introduction	10-1
The Value of Active Transportation Data	10-1
Collecting Bicycle and Pedestrian Count Data	10-2
Crowdsourced Nonmotorized Travel Data	10-5
Utilizing Mobile Apps for NPS Visitor Experience	10-6
Use, Regulation, and Considerations for Electric Bikes and National Parks	10-7
Use, Regulation, and Considerations for Fat Bikes and National Parks	10-10
Automated Vehicles and Active Transportation	10-13
Additional Resources	10-14

Introduction

This chapter introduces the content and organization of the Guidebook. It outlines the benefits of active transportation for parks and surrounding communities, and details NPS initiatives that active transportation supports.



Introduction

Traveling to or exploring national parks by foot, bicycle, or other nonmotorized means provides visitors with opportunities to experience natural, cultural, and historical places in new ways. Active transportation infrastructure and programs offer a broad range of benefits to parks and surrounding communities, and help parks and communities better manage vehicle congestion, promote resource preservation, and accommodate current and increased visitation by providing alternatives to driving.

With many national parks historically designed for motorized vehicle access, new approaches are needed to offer alternative ways to access parks and to support visitors of all backgrounds and abilities in safely walking and bicycling in and around parks. These changes can take the form of installing new infrastructure, but can also involve implementing programs or educational activities to promote walking and bicycling.

This Guidebook was developed through a collaboration of bicycle and pedestrian professionals, transportation experts, National Park Service (NPS) staff, and partners. It is intended as a resource for parks, partners, and gateway communities interested in encouraging and promoting nonmotorized access, particularly walking and bicycling, to and within national parks. The goal of this document is to inspire NPS staff as well as community, tribal, and local government partners to consider potential areas of improvement for multimodal access and connectivity. The Guidebook also highlights a variety of resources, both within the NPS and external to the agency that may be helpful in developing ideas and implementing projects and programs.

Opportunities for improving walking and bicycling to and within a national park can be diverse and reflect the unique environment of the park and surrounding community. Information in this Guidebook is applicable to a wide range of contexts and settings, from small, urban historic sites, to large, remote parks with extensive road networks. The importance of collaboration with partners in the surrounding community is also emphasized throughout the

Guidebook, as partnerships can help advance the development of active transportation infrastructure and programs for parks of all sizes, whether parks may own transportation infrastructure or not.

The Guidebook focuses on several topic areas, highlighted below, and incorporates case studies and best practices as examples for success and for challenges that may arise.



Figure IN-1: Pedestrians and bicyclists enjoy views at Acadia National Park in Maine. (Source: U.S. DOT Volpe Center)

Guidebook Organization

The Guidebook contains visual cues to highlight examples, key takeaways, and important points for the reader:



This symbol indicates an in-text NPS example.

Blue boxes indicate important facts or information relevant to the section's content.

Green boxes indicate important case studies relevant to the section's content.



The following provides a brief overview of the topic areas included within the subsequent chapters that make up the NPS Active Transportation Guidebook:

- **Chapter 1. Policy Context:** Provides an overview of NPS specific policies, as well as federal, state, and local laws that can support parks and partners in pursuing bicycling and walking projects.
- **Chapter 2. Planning and Project Scoping:** Provides an overview of transportation planning at the NPS and at state and regional agencies; NPS management authorities and park goals; and an overview of project development and inventorying active transportation infrastructure, programs, opportunities, and needs.
- **Chapter 3. Infrastructure and Multimodal Connectivity:** Introduces types of infrastructure (e.g., pedestrian pathways, multiuse trails, bike lanes, signs/wayfinding, pavement markings, bicycle racks, etc.) and strategies for improving connectivity between modes.
- **Chapter 4. Bicycle and Pedestrian Safety:** Provides information and resources to evaluate and improve safety for active transportation modes. Strategies include infrastructure improvements, safety education, enforcement, and emergency response.
- **Chapter 5. Partnerships and Funding:** Explains the benefits of and purposes for partnerships and physical connections with surrounding communities, partner funding opportunities, and case studies of successful active transportation partnerships.
- **Chapter 6. Visitor Activities and Programs:** Discusses visitor programming related to guided tours, special events, bicycle travel policies and touring routes, as well as policy considerations.
- **Chapter 7. Open Streets Opportunities:** Explores the potential benefits of open streets, or “car-free” opportunities in national parks and provides best practices based on existing case studies.

- **Chapter 8. Bicycle Sharing and Rental Systems:** Discusses types of bicycle sharing and rental systems, opportunities and constraints, and case studies.
- **Chapter 9. Employee and Operational Opportunities:** Explores opportunities to support and promote active transportation for employees such as incentive programs and bicycle fleets used for operations activities.
- **Chapter 10. Innovative Technologies and Emerging Trends:** Discusses other emerging topics, such as bicycle and pedestrian counts, electric bicycles (e-bikes), fat tire bicycles, and automated vehicles.

NPS Mission

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.¹

What is Active Transportation?

The NPS does not formally define active transportation in policy; however, this Guidebook uses the following definition:

Active Transportation: Any form of human-powered transportation that uses physical activity to travel from one destination to another.



Although this Guidebook primarily focuses on pedestrians (including people using mobility aids such as wheelchairs) and bicyclists, active transportation can encompass a variety of nonmotorized transportation modes, such as hiking, in-line skating, roller skating, skateboarding, ice skating, snowshoeing, cross-country skiing, dog mushing, backpacking, canoeing, or kayaking.

Many bicycling and hiking trips to and within national parks have both a transportation and recreational purpose and often use the same infrastructure, such as multiuse trails or bicycle racks. While this Guidebook has a greater focus on transportation, many topics support both active transportation and recreation.



Figure IN-2: A bicyclist at Chamizal National Memorial in Texas. (Source: NPS)

Benefits of Active Transportation and Support for NPS Goals and Strategic Initiatives

Providing active transportation opportunities offers a broad range of benefits to parks and surrounding communities, which also support the NPS mission. These benefits include:

- **Resource Protection:** Helping to avoid and mitigate the negative impacts of automobiles on air quality, wildlife, and other natural resources within national parks.
- **Visitor Experience:** Enabling visitors to experience parks in a more natural setting, without the noise or disturbance of vehicles.
- **Equitable Access:** Providing access opportunities for people who do not own a vehicle or who do not drive, including those with disabilities.
- **Public Health:** Providing meaningful and fun ways to exercise, and opportunities to experience natural settings.
- **Congestion Relief:** Helping to relieve vehicle congestion and accommodate increasing visitation by providing alternatives to driving.
- **Economic and Social Benefits:** Promoting economic growth by attracting visitors who will then support local businesses (e.g., bike shops, sports stores, restaurants), providing jobs and contributing to the quality of life for surrounding communities. In some cases, active transportation opportunities may also increase visitation outside of a park's typical peak season.



In addition to the benefits described above, providing increased opportunities for active transportation supports several current and past NPS strategic initiatives, including:

- [Congestion Management Program](#):²
The NPS Congestion Management Program promotes multiple strategies to reduce vehicle congestion to and within parks, including the provision of motorized and nonmotorized alternatives to the private vehicle and the incorporation of bicycle and pedestrian facilities and infrastructure.
- [Green Parks Plan \(GPP\)](#):³
This plan promotes sustainable park operations and management, the reduction of greenhouse gas emissions, and environmental stewardship. The GPP “Green our Rides” goal is to reduce transportation-related greenhouse gas emissions, which account for 40 percent of NPS emissions according to the GPP.
- [Accessibility Strategic Plan](#):⁴
This five year strategic plan discusses approaches for ensuring that national parks can be enjoyed by individuals with disabilities.
- [Climate Friendly Parks Program](#):⁵
This program is a partnership between the U.S. Environmental Protection Agency (EPA) and the NPS that protects parks’ natural and cultural resources and ensures their preservation for future generations. Reducing fuel use and greenhouse gas emissions from park facilities and operations is one goal of this program.
- [A Call to Action \(C2A\)](#):⁶
This effort sets a vision for the second century of the NPS. C2A promotes safe and enjoyable physical connections from parks to sustainable transportation options and the connection of densely populated, diverse communities to parks, greenways, trails, and waterways.
- [Urban Agenda](#):⁷
This initiative focuses on national parks and programs in metropolitan areas, with the

aim of ensuring that all national parks, both urban and rural, are accessible, relevant, and meaningful to urban audiences. One element of this agenda is improving access to nearby parks in urban areas, by nonmotorized transportation if possible.

- [Healthy Parks Healthy People US](#):⁸
This program recognizes and promotes the health benefits of parks and public lands to build upon the contributions that parks play in creating healthy communities.

Building Partnerships Beyond Park Boundaries

This Guidebook encourages park staff and their partners to focus on active transportation infrastructure and programs both within and outside of park boundaries to create meaningful connections. Partnerships between parks and local communities and regional planning agencies (i.e., rural and metropolitan planning organizations, economic development agencies, and local transportation departments) can improve physical connections, provide joint programming support, develop projects of mutual benefit, share maintenance of facilities, and leverage funding. The [Partnerships and Funding](#) chapter of this Guidebook provides more information and best practices for local partnerships.



Figure IN-3: A bicyclist in Fort Ord National Monument in New Mexico on Juan Bautista de Anza Trail. (Source: NPS)



End Notes

¹ NPS Mission Statement. <https://www.nps.gov/aboutus/index.htm>

² NPS Congestion Management Toolkit (2014).
<https://www.nps.gov/subjects/transportation/congestion-management.htm>

³ NPS Green Parks Plan (2016). <https://www.nps.gov/greenparksplan/>

⁴ All In! Accessibility in the National Park Service 2015-2020.
https://www.nps.gov/aboutus/upload/All_In_Accessibility_in_the_NPS_2015-2020_FINAL.pdf

⁵ NPS Climate Friendly Parks Program. <https://www.nps.gov/subjects/climatechange/cfpprogram.htm>

⁶ NPS A Call to Action (2015). https://www.nps.gov/calltoaction/PDF/C2A_2015.pdf

⁷ NPS Urban Agenda (2015). https://www.nps.gov/subjects/urban/upload/UrbanAgenda_web.pdf

⁸ NPS Healthy Parks Healthy People U.S. (2011). https://www.nps.gov/public_health/hp/hphp.htm

Chapter 1: Policy Context

This chapter outlines relevant NPS policies, as well as federal, state, and local laws, that can support parks and partners in pursuing active transportation projects. It covers key topics such as accessibility and environmental compliance, describes relevant initiatives from the U.S Department of Transportation, and discusses how to coordinate with transportation partners at the state and local levels.





Introduction

Familiarity with laws, policies, guidance, and initiatives relevant to active transportation provides an important foundation to successfully pursue and advance projects and programs that support walking and bicycling. This chapter provides an overview of NPS specific policies, as well as federal, state, and local laws that can help support parks and their partners in pursuing projects that encourage walking and bicycling.

NPS-wide policies, including the NPS Management Policies and the NPS Bike Rule, guide decision-making for how certain active transportation projects can be implemented on NPS managed roads and property. Unit-level policies, many of which are laid out in a park's Superintendent's Compendium, have specific requirements relating to the particular park. In addition to where the project is implemented, the funding source for the project often dictates what regulations apply. Federal policies, including accessibility guidelines and the National Environmental Policy Act (NEPA), apply to any project that receives federal funding. Since a majority of funding for transportation-related projects is acquired through

federal transportation funding programs, the U.S. Department of Transportation (U.S. DOT) often plays a major role in ensuring federally mandated policies and regulations are followed. Finally, state, regional, and local governments may also have policies related to walking and bicycling that could affect projects in parks and gateway communities.

National Park Service Policies Relevant for Active Transportation

Today, the NPS manages over 400 park units within the national park system. Site management decisions take place primarily at the park level, as each park unit is designated for its own unique and significant qualities and values representing our natural or cultural heritage.

However, regional- and national-level NPS policies or other federal mandates also guide park staff in their decision-making processes. The following provides an overview of laws and policies that are specific to NPS units; however, they may also influence some partnership projects.

NPS Site Designation and Enabling Legislation

Sites administered by the NPS are designated either by an act of Congress through enabling legislation, or by presidential proclamation through an executive order. The enabling legislation typically details the purpose of the designated site, defines the boundaries, dictates operating conditions that may apply, and specifies certain uses and activities that are allowed and uses that are prohibited. The enabling legislation becomes law and guides park management decisions.

The NPS must manage each site in accordance with that site's enabling legislation. These statutes also provide the NPS with certain regulating and authorizing abilities. For instance, the enabling legislation may allow or prohibit certain recreational uses, or it might include a directive to manage an area based on certain values or priorities that were identified in the enabling legislation. There may also be authorities included which allow the NPS to enter into agreements in order to fulfill the designated purpose, intent, and mandates that were established by Congress.



NPS Management Policies: The [NPS Management Policies](#) (2006)¹ serves as the highest and most comprehensive policy guidance for the NPS system-wide. This document provides management and staff with detailed information on laws, regulations, and policies requiring adherence. It also provides an overview of the foundation of the agency, the authorities and laws that generally govern park management, and guidance on various management topic areas such as natural and cultural resources, interpretation, commercial visitor services, and more.

Several elements in the NPS Management Policies document align with the goal of promoting active transportation. In particular, these policies are:

- Parks, when appropriate and feasible, should emphasize and encourage alternative transportation systems, including buses, trains, ferries, trams, and—preferably—nonmotorized modes of access to and moving within parks (Chapter 9.2).
- Park roads are intended to enhance the quality of a visit while providing for safe and efficient travel with minimal or no impacts on natural and cultural resources; the primary purpose of a park’s road system is generally not to provide fast and convenient transportation (Chapter 9.2.1.1).
- When a park’s road system needs to be updated, parks may consider supplementing the road with other means of travel (Chapter 9.2.1.1).
- Bicycle travel may be integrated with park roads when determined to be safe and feasible (Chapter 9.2.2.4).
- Construction or modification of facilities, including transportation systems and their components, should be done in a manner that ensures they are accessible by persons with disabilities (Chapter 9.1.2).
- The NPS has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. Protecting and improving air quality in the parks will help to preserve natural resources and systems, preserve cultural resources, and sustain visitor enjoyment, human health, and scenic vistas (Chapter 4.7.1).

Unit-Specific Superintendent’s Compendium: A Superintendent’s Compendium outlines the specific policies applicable in a given park. It may include policies relating to active transportation, such as roads and trails on which bicycles are allowed or prohibited, or specific instances in which vehicles are restricted from a particular road.

For example, the [Superintendent’s Compendium for Great Smoky Mountains National Park](#)² in Tennessee lists routes that are designated for nonmotorized bicycle use, including year round bicycle use on certain roads that are closed seasonally. In addition, the Compendium describes how motorized vehicles are restricted from the Cades Cove Loop Road on Wednesday and Saturday mornings in the summer. The document explains how this restricted access is in response to a large number of requests from the public to have an opportunity to enjoy the area’s wildlife, the historic and cultural resources, and natural beauty without the intrusion of motor vehicles.

NPS Bike Rule: The NPS developed the [Bike Rule](#)³ in 2012 to set standards for designating bicycle routes and managing bicycle use within park units throughout the National Park System ([36 CFR 4.30](#)).⁴ This rule emphasizes the individual park planning process to decide whether or not bicycle use is appropriate on a trail in a national park. The rule states that within NPS units, the use of a bicycle is prohibited except on park roads, in parking areas, and on routes designated for bicycle use. However, the park superintendent may close any park road or parking area to bicycle use pursuant to certain criteria and procedures. A superintendent may also open existing hiking or equestrian trails to bicycles if the park:

- Completes a park planning document that addresses bicycle use on the specific trail;
- Completes either an environmental assessment or an environmental impact statement evaluating the effects of bicycle use in the park and on the specific trail; and
- Completes a written determination stating that the addition of bicycle use on the existing hiking or horse trail is consistent with the protection of the park area’s natural, scenic and aesthetic values, safety considerations, and management objectives, and will not disturb wildlife or park resources.

For example, in 2014, Bryce Canyon National Park in Utah designated a 6.2 mile multiuse trail open to bicycles in accordance with the NPS Bike Rule. This process resulted in a briefing statement, environmental compliance documents, cost-benefit and regulatory flexibility analyses, a written determination, and other documents necessary for compliance with the rule.⁵ In addition, the park's superintendent gave authority to designate sections of the park's multiuse trail for use by bicycles.⁶

Additional Federal Provisions Relevant in National Park Settings

Beyond the NPS policies discussed above, there are other federal provisions that need to be considered when advancing active transportation in national parks. The sections below discuss the Wilderness Act, accessibility guidelines and requirements, and environmental compliance (NEPA).

Wilderness Act: The [Wilderness Act of 1964](#)⁷ bans “mechanical transport” in any designated wilderness area (Section 4(c)). Bicycles are considered a form of mechanical transport and therefore are not allowed in wilderness areas. Many national parks have either proposed or congressionally designated Wilderness Areas within management boundaries, where the NPS must prohibit bicycles. Parks can consider the impacts of the Wilderness Act on bicycling, and exclude areas from wilderness designations that may later be slated for multiuse trails.

For example, in 2008, Sleeping Bear Dunes National Lakeshore in Michigan conducted a [Wilderness Study](#)⁸ that evaluated lands within Sleeping Bear Dunes National Lakeshore for possible recommendation to Congress for inclusion in the national wilderness preservation system. While the study identified a large area for consideration as a wilderness area, it specifically excluded a corridor along the main roadway through the Lakeshore to allow for the eventual construction of a multiuse trail. Since 2008, the Lakeshore has successfully leveraged funding for construction of several portions of the trail. If this corridor had not been excluded from the Wilderness Study area, the construction of the multiuse trail would not have been possible. In 2014, over 32,000 acres of Sleeping Bear Dunes National Lakeshore became designated a Wilderness Area.

Accessibility Guidelines: The NPS is committed to providing access to its facilities, services, and programs, for all people including those with disabilities. The [NPS General Management Guidelines](#)⁹ and the [NPS Director's Order #42](#)¹⁰ outline the accessibility guidelines for its facilities, which include the Architectural Barriers Act of 1968 and the Rehabilitation Act of 1973, and section 507 of the Americans with Disabilities Act (ADA). In 2013, the U.S. Access Board issued a [final rule](#)¹¹ for outdoor areas developed by the federal government, which became part of the [Architectural Barriers Act Accessibility Standards](#).¹² The final rule provides detailed specifications for accessible trails, picnic and camping areas, viewing areas, beach access routes, and other components of outdoor developed areas when either newly built or altered. The rule also outlines exceptions for situations where terrain and other factors make compliance impracticable. The rule applies to federal agencies that develop outdoor areas for recreational purposes, including the NPS, U.S. Forest Service, U.S. Fish and Wildlife Service, Army Corps of Engineers, Bureau of Land Management, and Bureau of Reclamation. More resources on accessibility specific to the NPS can be found on the [Denver Service Center's Accessibility and Universal Design Standards webpage](#).¹³



Figure 1-1: Bicyclists on a multiuse trail at Sleeping Bear Dunes National Lakeshore in Michigan. (Source: NPS)



National Environmental Policy Act: The NPS is subject to the [National Environmental Policy Act \(NEPA\)](#),¹⁴ passed by Congress in 1969, which requires federal agencies to assess the environmental impact of their proposed actions prior to decision-making. For the NPS, NEPA is a tool for evaluating the environmental impacts of its actions, while also involving the public in the decision-making process. In 2011, the NPS issued [Director's Order #12](#),¹⁵ which sets forth policies and procedures to help NPS units meet NEPA requirements. The NPS also released an updated [NEPA Handbook](#)¹⁶ in 2015. The NEPA Handbook outlines the pathways of the NEPA process that a park may need to complete, depending on the size and scale of a project. The [Planning and Elements of Project Development](#) chapter contains more information on NEPA pathways, which include Categorical Exclusions (CE), Environmental Assessments (EA), and Environmental Impact Statements (EIS).

U.S. Department of Transportation Pedestrian and Bicycle Funding and Priorities

The majority of funding available to the NPS for transportation planning and projects comes from the U.S. DOT through the Federal Lands Transportation Program (FLTP) or in partnership with states, counties, or local entities through the Federal Lands Access Program (FLAP). Similarly, much of the funding for local transportation projects, including projects in communities in proximity to national parks, originates from federal-aid funding sources.

The U.S. DOT administers federal transportation funds according to laws set forth by Congress. The statutory provisions affecting bicycling and walking are codified in Titles 23 and 49 of the United States Code (U.S.C.).¹⁷ These codes outline the funding mechanisms, planning requirements, and policy tools necessary to create more walkable and bicycle-friendly communities. Titles 23 and 49 of the U.S.C. and supporting U.S. DOT guidance facilitate the implementation of the two codes. These provisions enable communities and national parks to invest federal funding in projects that improve the safety,

convenience, and comfort of walking and bicycling for everyday travel. Provisions in 23 U.S.C. relating to active transportation can be found in the Appendix at the end of this chapter.

Active transportation is a priority for the U.S. DOT. The [2010 Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations](#)¹⁸ states that the U.S. DOT's policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Bicycle and pedestrian needs must be given "due consideration" under federal surface transportation law.¹⁹ Transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.



Figure 1-2: Visitors on a multiuse trail at Sleeping Bear Dunes National Lakeshore. (Source: NPS)

In recent years, the U.S. DOT has taken further action to improve pedestrian and bicycle safety and infrastructure. In 2016, the Federal Highway Administration (FHWA) released the [2016 Strategic Agenda for Pedestrian and Bicycle Transportation](#),²⁰ a framework to guide pedestrian and bicycle planning, design, and research efforts in the next five years. This agenda establishes a strategic, collaborative



approach for making walking and bicycling viable transportation options for people of all ages and abilities in communities throughout the U.S. It also provides a framework for issues such as data collection and management, pedestrian and bicycle network implementation and documentation, research, training, initiatives, and national design guidance. Additionally, the FHWA released a guide on [Small Town and Rural Multimodal Networks](#),²¹ which is of particular relevance to many parks and gateway communities located in rural areas. For these and other relevant U.S. DOT bicycle and pedestrian resources, see the Resources section at the end of this chapter.

In accordance with the [Americans with Disabilities Act \(ADA\) of 1990](#)²² and [Section 504 of the Rehabilitation Act](#),²³ ensuring that pedestrians with disabilities can safely use the transportation system is also a priority for the U.S. DOT. The FHWA's [ADA program](#)²⁴ works to ensure that recipients of federal aid and state and local entities that are responsible for roadways and pedestrian facilities do not discriminate on the basis of disability in any highway transportation program, activity, service or benefit they provide to the general public; and to ensure that people with disabilities have equitable opportunities to use the public right-of-way system. A Department of Justice and Department of Transportation Joint Technical Assistance legislative interpretation [document](#) states that whenever streets, roadways, or highways are altered, state and local governments must provide curb ramps where street level pedestrian walkways cross curbs in order to ensure the accessibility and usability of the pedestrian walkway for persons with disabilities.²⁵

Coordination at the State and Local Levels

Most states have laws stating that bicyclists have the same rights and responsibilities as operators of automobiles. The [League of American Bicyclists' State Bike Laws website](#)²⁶ is one source for information on each state's laws relating to bicycles. For example, the website includes information on safe passing laws requiring vehicles to leave a certain distance (e.g., three feet) when passing bicycles, laws requiring bicyclists to wear helmets, and laws specifying where bicyclists can and cannot ride on sidewalks.

As required in federal transportation legislation (23 U.S.C. 217(d)), each state department of transportation (DOT) is directed to fund a Bicycle and Pedestrian position with the purpose of promoting bicycle and pedestrian facilities and programs throughout the state.²⁷ The coordinator typically serves as a liaison within the agency for bicycle and pedestrian issues, a vital technical resource, and an important point of contact for regional and local agencies and user groups seeking to improve conditions for bicycling and walking. The FHWA also designates a bicycle and pedestrian point of contact in each of its 52 Division Offices (one in each state, the District of Columbia, and Puerto Rico).²⁸ Parks, communities, or partners are encouraged to reach out to these individuals to understand state-specific law or policy that could impact proposed projects or programming. FHWA's Office of Federal Lands Highway (FLH) also has staff in each of its three Division Offices (Central, Western, and Eastern) who can provide information on active transportation policy and funding sources in the federal lands context. Each of these Division Offices can help to identify technical resources and opportunities for planning or project collaboration.

At the state and regional level, state and metropolitan transportation planning processes involve evaluating and coordinating regional and statewide transportation needs in order to identify short and long term project and funding priorities. Parks and their partners can work with the relevant state DOT and regional planning agency such as a metropolitan planning organization (MPO)²⁹ or rural transportation planning organization to ensure that active transportation enhancements in their area are considered in this process.

State, regional, and local governments may have additional plans and policies relating to active transportation. These may include a statewide bicycle and pedestrian plan listing planned active transportation infrastructure within the area of focus, or a [Complete Streets policy](#)³⁰ that requires balancing the needs of various users regardless of age or ability (including children, people with disabilities, and older adults) with multimodal transportation needs for motorists, transit users, bicyclists, and pedestrians in



Health and Active Transportation

The Centers for Disease Control and Prevention (CDC) acknowledges that the current transportation infrastructure in the U.S. focuses on motor vehicle travel, while walking and bicycling, and activity levels generally, have declined compared to previous generations. These trends contribute to obesity, diabetes, heart disease, and other chronic health conditions. The CDC provides several transportation policy recommendations³¹ that promote active transportation, which can be considered for federal lands as well as their surrounding communities. Other recommendations aim to improve active transportation facilities through the lighting of sidewalks, multiuse trails, and recreational trails; creating safe roadway crossings; reducing motor vehicle traffic speed with street design that consider all roadway users; and improving pedestrian and bicycling connections to public transportation. In addition, the CDC suggests that communities, parks, and others making decisions about transportation infrastructure create guidelines for the inclusion of active transportation in planning, development, and building of transportation infrastructure. These recommended measures can have numerous benefits, including the improvement of respiratory and cardiovascular health, reduction of air pollutants, and creation of better planned and designed communities.

Appendix

Provisions of the Title 23 and the U.S. Code Relating to Active Transportation

The FHWA provides guidance on the bicycle and pedestrian legislation in Title 23 of the United States Code,³² which outlines the funding mechanisms, planning requirements, and policy tools necessary to create more walkable and bicycle-friendly communities. Provisions relating to active transportation include:

- State DOTs and MPOs must develop long-range transportation plans that consider bicycle and pedestrian facilities and safety (23 U.S.C. 217). Federal land management agencies (FLMAs), including the NPS, must develop transportation planning procedures consistent with metropolitan and statewide planning processes (23 U.S.C. 204).
- Each state is required to use a portion of its federal surface transportation funding to fund a bicycle and pedestrian coordinator position in its state DOT to promote and facilitate increased walking and bicycling by developing pedestrian and bicycle facilities, promoting these facilities, and conducting public education and safety programs (23 U.S.C. 217(d)).
- Title 23 also describes situations in which bicycles may not be allowed to use park roads. A provision included in the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012 and continued in subsequent transportation funding legislation requires federal land management agencies (FLMAs) to prohibit bicycles on park roads with a speed limit of 30 miles per hour or greater when there is an adjacent paved bicycle path within 100 yards of the road unless the Secretary of the FLMA determines that the bicycle level of service on that roadway is rated B or higher (23 U.S.C. 203(d)).³³
- Bicycle transportation facilities and pedestrian walkways are eligible for funding under all major federal aid programs and the Federal Lands Transportation Program. The FHWA develops guidance for eligibility for pedestrian and bicycle funding opportunities.³⁴



Additional Resources

FHWA Bike Network Mapping Idea Book (2016).

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/bikemap_book/

FHWA Metropolitan Pedestrian and Bicycle Planning Handbook (2017).

https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/mpo_handbook/index.cfm

FHWA Pedestrian and Bicycle Safety Guide and Countermeasure Selection System (PedSafe and BikeSafe).

<http://www.pedbikesafe.org/index.cfm>

FHWA Statewide Pedestrian and Bicycle Planning Handbook (2014).

https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/pedestrian_bicycle_handbook/

FLH Guide to Promoting Bicycling on Federal Lands (2008).

http://www.pedbikeinfo.org/cms/downloads/01_promoting_bicycling_entire_document.pdf

League of American Bicyclists: Bicycle Friendly America Program.

<http://www.bikeleague.org/bfa>

NPS Transportation Program.

<https://www.nps.gov/subjects/transportation/index.htm>

NPS Denver Service Center: Resources on Sustainable Trails.

<https://www.nps.gov/articles/dsc-trails.htm>

Paul S. Sarbanes Transit in Parks Technical Assistance Center: Good Practices to Encourage Bicycling & Pedestrians on Federal Lands (2011). http://www.fedlandsinstitute.org/Documents/RepositoryDocuments/BikePedPlan_Web.pdf

U.S. DOT Safer People, Safer Streets Initiative (2015).

<https://www.transportation.gov/safer-people-safer-streets>



End Notes

- ¹ NPS Management Policy (2006). <https://www.nps.gov/policy/MP2006.pdf>
- ² Superintendent's Compendium for Great Smoky Mountains National Park (2014). <https://www.nps.gov/grsm/learn/management/upload/2014-Compendium-all.pdf>
- ³ NPS Bike Rule (2012). https://www.nps.gov/orgs/1804/upload/NPS-BikeUse-36CFR4-30-FlowChart_July2017_AF.pdf
- ⁴ NPS Bicycles 36 CFR 4.30. <https://www.gpo.gov/fdsys/pkg/CFR-2012-title36-vol1/pdf/CFR-2012-title36-vol1-sec4-30.pdf>
- ⁵ Bryce Canyon National Park Multi-Use Path Document List. <https://parkplanning.nps.gov/documentsList.cfm?parkID=34&projectID=46606>
- ⁶ NPS Special Regulations, Areas of the National Park System, Bryce Canyon National Park, Bicycling, 36 CFR Part 7. <https://www.gpo.gov/fdsys/pkg/FR-2015-04-30/pdf/2015-10170.pdf>
- ⁷ The Wilderness Act (1964). <https://www.nps.gov/subjects/wilderness/law-and-policy.htm>
- ⁸ NPS Sleeping Bear Dunes National Lakeshore, Wilderness Study (2008). <https://parkplanning.nps.gov/document.cfm?parkID=165&projectId=14651&documentID=25026>
- ⁹ NPS General Management Policies 8.2.4 Accessibility for Persons with Disabilities. https://www.nps.gov/policy/mp/policies.html#_Toc157232632
- ¹⁰ NPS Director's Order #42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services (2000). <https://www.nps.gov/policy/DOrders/DOrder42.html>
- ¹¹ U.S. Access Board Final Guidelines for Outdoor Developed Areas (2013). <https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas>
- ¹² U.S. Access Board Architectural Barriers Act Accessibility Standards. <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards>
- ¹³ NPS Accessibility Standards. <https://www.nps.gov/dscw/ds-accessibility-universal-design.htm>
- ¹⁴ NPS NEPA page. <https://www.nps.gov/subjects/nepa/policy.htm>
- ¹⁵ NPS NEPA Director's Order #12 (2011). https://www.nps.gov/policy/DOrders/DO_12.pdf
- ¹⁶ NPS NEPA Handbook. https://www.nps.gov/subjects/nepa/upload/NPS_NEPAHandbook_Final_508.pdf
- ¹⁷ FHWA Guidance on Bicycle and Pedestrian Legislation in Title 23 U.S. Code. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/legislation/sec217.cfm
- ¹⁸ U.S. DOT Policy Statement Bicycle and Pedestrian Accommodation Regulations (2010). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/policy_accom.cfm
- ¹⁹ FHWA Guidance on Bicycle and Pedestrian Legislation (2015). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/guidance_2015.cfm
- ²⁰ FHWA Strategic Agenda for Pedestrian and Bicycle Transportation (2016). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/strategic_agenda/fhwahep16086.pdf



- ²¹ FHWA Small Town and Rural Networks (2016). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf
- ²² Americans with Disability Act (1990). <https://www.ada.gov/pubs/adastatute08.pdf>
- ²³ Section 504, Rehabilitation Act (1973). <https://www.dol.gov/oasam/regs/statutes/sec504.htm>
- ²⁴ FHWA's Americans with Disabilities Act (ADA) program (1973). <https://www.fhwa.dot.gov/civilrights/programs/ada.cfm>
- ²⁵ Department of Justice/Department of Transportation Joint Technical Assistance document (2013). <https://www.ada.gov/doj-fhwa-ta.htm>
- ²⁶ State Bike Laws. <http://bikeleague.org/StateBikeLaws>
- ²⁷ State Bicycle and Pedestrian Coordinators. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/state_contacts.cfm
- ²⁸ FHWA Division Office Bicycle and Pedestrian Coordinators. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/state_fhwa_contacts.cfm
- ²⁹ FHWA MPO Database. <https://www.planning.dot.gov/mpo.asp>
- ³⁰ Complete Streets. <https://smartgrowthamerica.org/program/national-complete-streets-coalition/what-are-complete-streets/>
- ³¹ CDC Transportation Recommendations. <https://www.cdc.gov/transportation/>
- ³² FHWA Guidance: Bicycle and Pedestrian Provisions of Federal Transportation Legislation (2015). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/guidance_2015.cfm
- ³³ Moving Ahead for Progress in the 21st Century (MAP-21) Act. <https://www.fhwa.dot.gov/map21/factsheets/fltp.cfm>
- ³⁴ FHWA Pedestrian and Bicycle Funding Opportunities. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

Chapter 2: Planning and Elements of Project Development

This chapter describes the basics of transportation planning as it applies within the NPS, as well as at the state and regional levels. It also covers related topics that can help parks and partners succeed in their active transportation projects, including acquiring transportation funding, resources for obtaining planning support, and project development at the park and the local levels.





Introduction

The previous chapter covered relevant policies that may influence or guide decision-making in active transportation efforts. This chapter builds upon the policy discussion by providing information on the basics of transportation planning as it applies within the NPS, as well as regionally and locally. The transportation system in each national park connects parks with their surrounding communities, and these often separate but connected systems require coordinated planning. By getting involved in the surrounding local transportation planning process, national park staff can build relationships with other transportation stakeholders, align park transportation needs and activities with state and regional priorities, and ensure important projects are included in transportation plans to become eligible for additional federal funding.

In addition to planning, project scoping and development are critical components to getting transportation infrastructure projects built. This chapter also provides an overview of project scoping at the park and the local levels. Capital projects can be developed in a number of ways depending on the type of need and project identified, stakeholders involved, and funding available. The project development process generally includes site-level planning and design, which encompasses planning studies, preliminary engineering, and environmental review. After site-level planning and design, projects typically move onto final design and construction. This chapter gives an overview of project scoping and environmental review requirements for the NPS, which is meant to serve as a preliminary resource for the development of capital projects.

What is Transportation Planning?

Transportation planning is a comprehensive process for evaluating transportation needs in a collaborative and meaningful way. Planning happens at various levels, including the federal, state, regional, tribal, and the local levels, and allows for public involvement in setting long term transportation visions and goals

to prioritize projects for transportation funding. Planning is a critical step for envisioning and implementing transportation projects. As it relates to active transportation, planning can ensure pedestrian and bicycling considerations are systematically and integrally considered alongside developing future transportation enhancement projects.

The planning process typically considers existing conditions, system performance, current and future multimodal connections, potential opportunities and challenges, as well as natural, cultural, historical, and environmental resource considerations, societal influences, and equity needs. It should engage stakeholders, identify future demand, analyze alternative solutions, consider all modal options, demonstrate how the preferred solution will meet goals and needs, and identify an implementation strategy. As a result, the most successful projects are those that are analyzed comprehensively and developed through an integrated and collaborative planning process.

Transportation Planning within the NPS

The NPS employs transportation planning support in a variety of ways. Some national parks (typically those managing an extensive transportation system) include transportation planning professionals on staff. The NPS can also receive transportation planning support through interagency or cooperative agreements, project contracting, or through other NPS programs like the [Rivers, Trails, and Conservation Assistance \(RTCA\)](#)¹ program or the [Denver Service Center \(DSC\)](#),² for example. The U.S. Department of Transportation (U.S. DOT) Federal Lands Highway (FLH) Division and the U.S. DOT Volpe National Transportation Systems Center (Volpe Center) also provide transportation planning support to the NPS. At the state and regional level, state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) employ planning staff that can assist parks and gateway communities. State DOT and MPO staff can often assist with understanding the local and regional planning processes, schedules for plan updates, and provide guidance integrating active transportation needs into these efforts.



Relevant NPS Planning Documents

The NPS conducts transportation planning, with resulting planning documents, at both the park and program levels. These planning processes are completed in order to guide park management decisions.

As an important aspect of any multimodal transportation network, active transportation goals and priorities should always be considered in the planning process and incorporated into the resulting planning documents. These plans may also require periodic updating, providing an opportunity to update or add active transportation goals and priorities, as needed. When active transportation needs and goals are identified and then included in these plans, it can lay the foundation for a park manager to prioritize and pursue project funding for bicycle and pedestrian efforts.

The section below provides an overview of relevant NPS transportation-related planning documents, and how active transportation may be incorporated within each. Being familiar with these plans and how active transportation contributes to the identified goals, objectives, and strategies can help park staff and partners make the case for implementing active transportation projects and programs. Additional information on these and other active transportation-related NPS planning products can be found in the [Partnerships and Funding](#) chapter. This chapter contains a table with a description and example of several additional planning documents, including Bicycle and Pedestrian Plans, Five-Year Active Transportation Plans, and Accessibility Conceptual Site Plans, among others.

National Long Range Transportation Plan

(NLRTP): The [NPS NLRTP](#)³ outlines a 20 year vision for the NPS transportation system on a national level. While active transportation supports many of the higher-level goals of the NLRTP, it is specifically identified as supporting resource protection and visitor experience goals. The NLRTP was completed in 2017, and is scheduled to be updated every five years.

NPS Region-Specific Plans: The seven NPS regions also develop regional [Long Range Transportation Plans \(L RTPs\)](#),⁴ which support the goals of the National Plan, and provides a planning framework for regional support to parks in achieving transportation goals and coordinating transportation investments over a 20-plus year horizon. For example, the [Midwest Region's 2016 Long Range Transportation Plan](#)⁵ emphasizes multimodal access and developing best practices "to safely turn walking and/or biking into viable transportation options." The regional L RTPs are scheduled to be updated every five years.

Collaborative Visitor Transportation Survey

(CVTS): [CVTS](#)⁶ is an effort among the Federal Land Management Agencies (FLMAs) to develop a common set of tools and measures for collecting visitor experience data on federal public lands. This effort established a streamlined process for visitor data collection with pre-approved survey questions by the Office of Management and Budget. The NPS can collect data about park visitors, including demographic information, and visitor usage patterns with the CVTS. CVTS is often used as part of larger planning initiatives at a regional level (e.g. long range transportation plans) or at a park level (e.g. as part of visitor use management plans), and can provide data on visitor experiences and preferences relating to active transportation and access at NPS sites.

Park-Specific Foundation Documents: A

[Foundation Document](#)⁷ provides guidance for park planning and management decisions, and discusses the park's congressionally-designated purpose, significance, fundamental resources and values, legal and policy requirements, and key planning and related data needs. Although active transportation is not specifically addressed in every Foundation Document, a park may use this document to identify ways in which active transportation could support a park's purpose, values, and transportation or resource needs. A Foundation Document may identify existing transportation-related challenges, including vehicle congestion, air quality impacts, or other identified resource, visitor experience, and connectivity issues.

For example, the Foundation Document for Cedar Breaks National Monument in Utah identifies transportation planning as a key planning need.



Planning is needed to coordinate with surrounding communities on a proposed visitor shuttle and trail between the nearby community of Brian Head and the monument. The trail would be used by bicyclists and pedestrians in the summer and by cross-country skiers in the winter. The Foundation Document recommends the development of a transportation plan in coordination with local partners, which would examine the feasibility, impacts, and implementation of this trail.

Park-Specific General Management Plans:

A park’s [General Management Plan \(GMP\)](#)⁸ is a strategic planning document that outlines the future management direction of an NPS site for the next 15 to 20 years. GMPs vary in their level of detail, but typically set the basic philosophy and broad guidance for management decisions that affect the park’s resources and the visitors’ experience, and lay out a vision for desired future conditions at the park. GMPs may include information about a park’s existing transportation system and planned improvements.

With the development of Foundation Documents (see above), no future GMPs are scheduled for development or updating. However, existing GMPs are still referenced, providing valuable information for the management of a park.

Other Park Management Plans: Some parks have topic-specific transportation plans or trail management plans to guide the management of transportation or trail-related issues. These plans are typically combined with an environmental assessment (EA) or environmental impact statement (EIS) describing various alternatives for how a proposed project might impact a park’s transportation system, the environmental impacts of each alternative, and the park’s preferred alternative. Transportation plans should address all modes of transportation, including walking and bicycling. When walking and bicycling are included in a transportation or trail plan, parks typically discuss how they relate to reducing congestion, enhancing safety, or creating additional options for visitors.

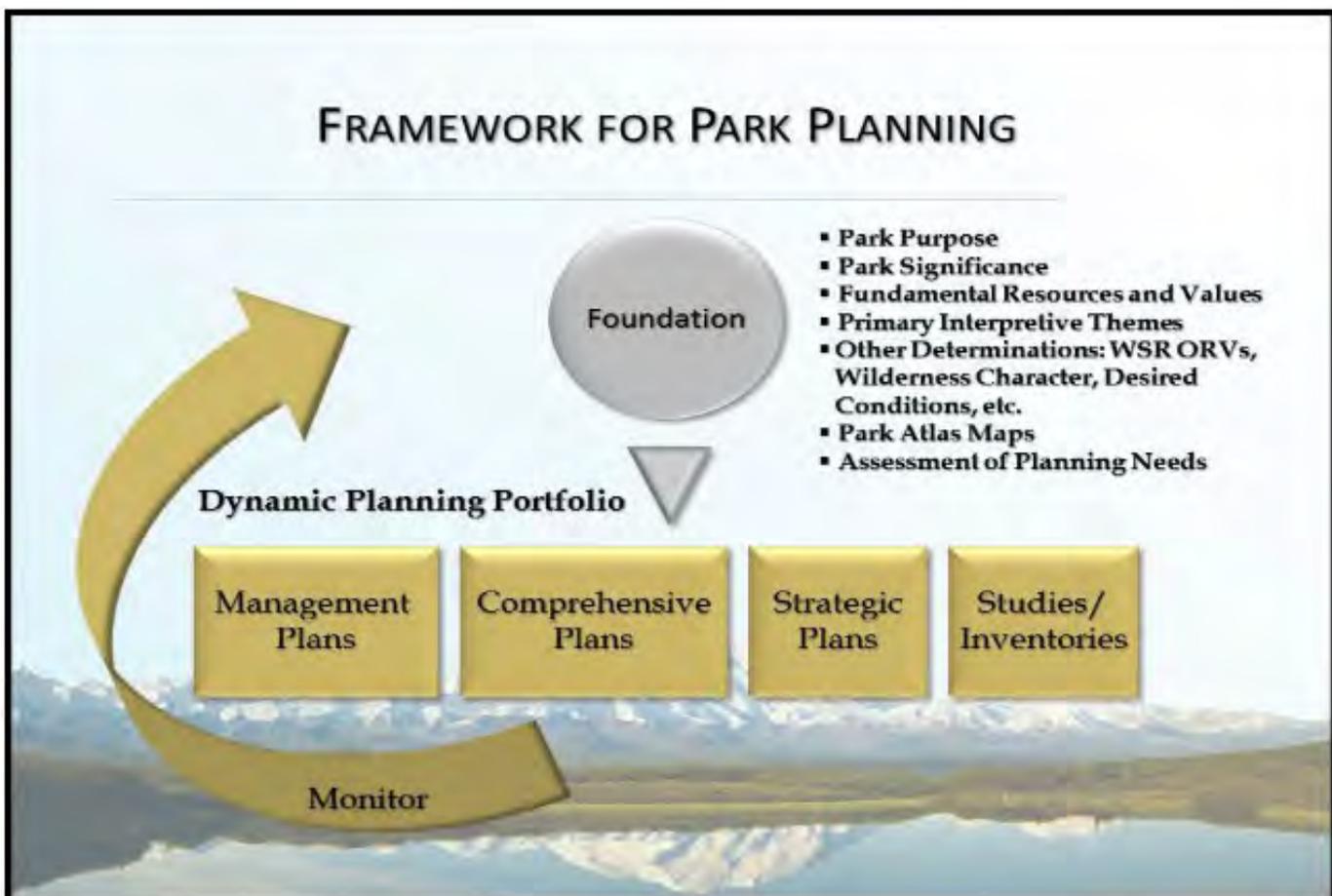


Figure 2-1: Framework for Park Planning Diagram. (Source: NPS)



Linking to State and Regional Transportation Planning

The NPS does not necessarily have jurisdiction and authority over all roadways and transportation facilities within or connecting to a park. For example, a state highway running through a national park would be under the jurisdiction of the state. Even when a transportation facility is located within park boundaries, partners sometimes own or maintain the facilities through maintenance agreements, right-of-way agreements, and other similar types of arrangements (see the [Partnerships and Funding](#)

chapter for more information). Outside of park boundaries, land ownership and legal or regulatory authority can be even more complicated, as transportation facilities may be owned and managed by a mix of state, local, tribal, or private entities.

Depending on where a project is proposed or implemented, and who has regulatory authority over it, additional planning, coordination, and consultation with state, county, MPO, and other local entities, or tribal governments may be needed. Each of these entities have [planning processes](#)¹¹ with which a prospective project (even an NPS owned or managed project) may need to comply.



General Management Plan: Hawaii Volcanoes National Park

The General Management Plan for Hawaii Volcanoes National Park⁹ finalized and approved in 2016, describes existing transportation access to and within the park, and how future access will be managed under the strategies laid out in the plan. The plan addresses future transportation access within each of the park’s four identified management zones; the selected alternative has several actions pertaining to active transportation, including:

- Encourage safe bicycle use around Crater Rim Drive by improving or adding signage along the road, providing adjacent bicycle trails when feasible, and considering restricting vehicular traffic during specific times of day or days of the week to encourage bicycle use.
- Continue to maintain the historic Escape Road as an emergency egress route, but also improve the trail surface on the Escape Road to accommodate increased bicycle, equestrian, and pedestrian use, and improve connections from the park to the nearby community.
- Explore new or improved trail connections for pedestrians and bicycles from locations in the park, such as trails linking Thurston to Pu’u Pua’i and Devastation Trail parking lots in order to create more pedestrian access to Thurston.

The actions above would complement the Earthquake Trail, which is adjacent to Crater Rim Drive. The trail is part of the old Crater Rim Drive alignment, much of which was destroyed in an earthquake. The park kept the safe part of the old road open as a trail, which bicyclists can use to avoid riding with traffic on the new Crater Rim Drive.¹⁰



Figure 2-2: Earthquake Trail is adjacent to Crater Rim Drive in Hawaii Volcanoes National Park. (Source: NPS)



Multiuse Trail Plan: Rocky Mountain National Park

The Multiuse Trail Plan for Rocky Mountain National Park in Colorado, finalized in 2014, describes options for providing a multiuse trail system along the developed corridor of roads on the east side of the park. The purpose of this proposed trail system is to connect with proposed multiuse trail systems in the Estes Valley, enhance multimodal connections to existing visitor use areas in the park, and provide connections to the seasonal shuttle system within and outside of the park. The plan describes three alternatives, including a no-action alternative and two options for a trail system. Objectives of this trail system include:

- Explore potential multiuse trail connections to other recreational opportunities;
- Expand recreational opportunities for self-propelled transportation;
- Provide connections to the park’s shuttle bus system;
- Provide for spatial dispersal of visitors;
- Provide for new visitor experiences within the park;
- Minimize conflicts among visitors;
- Provide a safe multiuse trail system;
- Promote health and well-being in support of national initiatives.



Figure 2-3: Rocky Mountain National Park, Colorado (Source: NPS)

Coordination of planning between entities ensures that projects and efforts provide for an integrated transportation network for a region. Integrating proposed transportation projects into partner planning documents demonstrates higher levels of coordination. These planning documents may include: metropolitan transportation plans, long range statewide transportation plans, bicycle and pedestrian plans, statewide transportation improvement programs, or transportation improvement programs.

For example, between 2014 and 2015, the San Antonio Missions National Historical Park in Texas worked with the Alamo Area MPO to assess the local transportation network connecting with national park sites in order to identify opportunities for enhancing bicycling and walking access.

The boundary of the park is non-contiguous, encompassing four individual Spanish colonial mission

sites and the related resources located in the middle of south San Antonio neighborhoods. The urban park has little ownership of transportation facilities with many of the existing transportation facilities crossing a variety of jurisdictions. In order to address the growing transportation concerns of negative impacts caused by vehicles and to provide safe, multimodal options for park visitors and community members alike, the park worked in coordination with the MPO to develop a regional [Bicycle and Pedestrian Planning Study](#). This study identified opportunities for developing a safe, accessible, and comprehensive bicycle and pedestrian network that would improve connections between the national park and surrounding community.

For more information on the local, regional, and state transportation planning process, see the NPS factsheet [Introduction to the Transportation Planning Process](#).¹²



Transportation Funding Opportunities

As stated in the **Policy Context** chapter of this Guidebook, the majority of funding available to the NPS and its partners for transportation planning and project development is provided through U.S. DOT funding programs. These programs are authorized and funded by Congress through the latest federal surface transportation authorization Act. These laws establish specific programs with intended goals and project eligibility requirements for funding priorities. The surface transportation Act also authorizes program administration and funding formulation to agencies, states, and regions. For more information on the current transportation funding authorization, visit the NPS Transportation website at <https://www.nps.gov/subjects/transportation/index.htm>. Park staff can reach out to the NPS Transportation Program and the NPS Federal Lands Transportation Program Coordinators for further information about the most current funding opportunities and their eligibility requirements for active transportation projects near and within NPS units. Another way to learn about transportation funding opportunities available to the NPS and its partners is to get involved in the state or regional transportation planning process.¹³ The **Partnerships and Funding** chapter contains more information on select funding opportunities.

Prioritizing Transportation Needs

Transportation needs often exceed funding availability. As such, state, regional, local governments and national parks must prioritize these needs during the planning process to determine which projects are funded, and when, for further development or implementation. Project prioritization of active transportation projects should consider how these projects rank against each other and all transportation needs. Active transportation projects that have been prioritized alongside other transportation needs have a better chance of successfully competing for funding. Each entity is continually balancing budget and management priorities, which will affect the feasibility of any proposed active transportation

project. Understanding that priorities are dynamic will help determine the right time to propose a project, the level of enthusiasm for a project, who the most effective advocates will be, when a project will compete best for funding, and most importantly, the likelihood of success. Projects that effectively address park and surrounding community goals, while creating multimodal connections and involving greater stakeholder support, have a better chance at receiving higher priority in the funding prioritization process, either federally or locally.

Steps in Park Level Planning and Project Scoping

At the park level, staff and park partners can take several approaches to improve or expand active transportation facilities and programs, depending on the scale and scope of the project. Park staff may be aware of a need, such as filling in a gap in a multiuse trail or improving conditions for bicyclists on existing roadways, which also may have been identified broadly in the park's Foundation Document. In many cases, the goal may be to improve conditions or connections for pedestrians and bicyclists. A detailed planning or feasibility study may be required for a greater assessment of the project area and identification of potential alternatives. Depending on the skills and resources available at the park, these studies may be conducted in-house, or may require engaging a contractor or other technical resources within the NPS or DOT who have experience with pedestrian and bicycle planning. After a planning or feasibility study is completed and specific projects are identified, staff and partners continue through the project development process, which may include the following steps: preliminary engineering; preliminary design and environmental compliance with the National Environmental Policy Act (NEPA), which includes compliance with applicable historic preservation requirements (e.g., the National Historic Preservation Act, Section 106); final design and engineering; and construction. Often, to achieve success, these active transportation improvement projects require a champion, or an NPS staff person,



Planning for Infrastructure and Safety Improvements in Presidio, San Francisco

The Presidio of San Francisco is an area of exclusive federal jurisdiction, located within the boundaries of Golden Gate National Recreation Area on the northern tip of San Francisco, California. The Presidio Trails and Bikeways Master Plan and Environmental Assessment¹⁴ focuses on the safety of bicyclists and pedestrians in relation to the park's pedestrian and bicycle infrastructure network. This analysis and plan is an example of an important step in creating safer infrastructure in parks; it includes an analysis of user groups and anticipated user groups, and a proposal of project alternatives that create a safer active transportation network for visitors. Furthermore, safety is considered throughout the plan and within each alternative with specific user groups in mind.



Figure 2-4: Visitors jog on the multiuse trail in the Presidio of San Francisco, Golden Gate National Recreation Area. (Source: NPS)

- Identification of active transportation users and infrastructure:** As a preliminary step, this assessment identifies active transportation infrastructure and users in Presidio. Users include pedestrians, bicycle commuters, recreational cyclists, family or touring bicyclists, and skaters and skateboarders. The inventory of infrastructure included surface type, width, grading, buffers, and access classification.
- Typical users matched to trail types:** The plan matched different types of trails with typical users, and classified them as pedestrian trails, multiuse trails, bikeways, and accessible trails. The user and trail typologies focus on the safety of the user, taking into account characteristics such as average distance traveled, comfort level with traffic, traffic speed, and destination. For example, family or touring bicyclists were considered more likely to use scenic multiuse trails, while bicycle commuters prefer direct bike routes with bike lanes or low-volume roadways.
- Alternatives analysis:** The trail and user typology, with an overall emphasis on safety and network connectivity, led to an alternatives analysis, which considered infrastructure features, design context, and locations where users are riding bicycles or are allowed to ride. This analysis produced a plan that proposed a wide range of approaches with alternatives, which offered up to 22 miles of improved or new corridors and access for people with disabilities.

The Presidio is undertaking an LRTP in 2018 to build on the progress made since their Trails and Bikeways Master Plan and Environmental Assessment. The LRTP will further identify and prioritize active transportation improvements for the future.



park partner, or contractor who maintains the momentum of the project and also understands the connection between active transportation facilities and park resources.

In order to meet federal environmental requirements, NPS projects need to adhere to NEPA. The [NPS NEPA Handbook](#)¹⁵ contains information on the NEPA process, detailed below (the **Policy Context** chapter contains an introduction to NEPA). NEPA defines a process that public agencies must follow to evaluate the environmental impact of proposed projects, prior to decision-making. The NPS uses four levels of analysis to comply with NEPA, which range from Categorical Exclusions to Environmental Impact Statements based on potential impact of the project or action.

- **Categorical Exclusions (CE) for Which No Documentation is Required:** Applicable to actions that have no potential for significant environmental impacts under ordinary circumstances that the NEPA review does not require formal documentation. Example CE projects that do not require formal documentation may include educational activities, day-to-day resource management and research activities, and preparing and issuing publications.
- **Categorical Exclusions for Which Documentation is Required:** Applicable to actions that have been found to have no potential for individual or cumulative significant environmental impacts under ordinary circumstances, but whose potential for environmental impacts warrants some level of analysis and formal documentation. Example CE projects that do require documentation may include minor boundary changes, routine maintenance of facilities including trails, and repair, resurfacing, striping, and installation of traffic control devices on existing roads and trails.
- **Environmental Assessment (EA):** Applicable to a variety of situations. An EA is a means for documenting compliance with NEPA and assisting in the planning and decision-making process when a CE is not appropriate but an environmental impact statement is not necessary. An EA is meant

to document at the level of detail necessary to demonstrate that the proposal would not result in significant environmental impacts.

- **Environmental Impact Statement (EIS):** Applicable to proposals that could result in significant adverse environmental impacts. An EIS is a detailed written statement required by Section 102(2)(C) of NEPA (1508.11).

For active transportation projects, the necessary NEPA documentation will vary, and will be project specific. For example, the reconfiguring of striping on an existing roadway to accommodate a bicycle lane during a roadway resurfacing project might be considered a CE under NEPA. The resurfacing of a trail may also be considered a CE under NEPA, whereas the construction of a new trail or other new infrastructure projects will likely require an EA, and in rare cases an EIS. It is incumbent on the park to ensure that the proper NEPA process is undertaken prior to any federally funded project.

The [National Historic Preservation Act, Section 106](#)¹⁶ requires federal agencies to consider how their actions impact historic properties. The Section 106 process typically occurs concurrently with and is incorporated into the NEPA process. If an action taken by the NPS may impact a historic property on the National Register of Historic Places, or a property that meets the criteria for the National Register, park staff will need to contact the State Historic Preservation Officer or Tribal Historic Preservation Office for consultation during the process, and may also need to involve the public and other relevant stakeholders. Compliance with the National Historic Preservation Act is required of the NPS, and must be considered as necessary in the implementation of active transportation projects.

Developing an Inventory of Existing Conditions and Programs

Understanding existing conditions and programs is a key component for a planning or feasibility study. The following list provides some examples of the types of information or data that parks and partners may be interested in collecting to inform future active transportation opportunities:

- Number and location of existing bicycle and pedestrian infrastructure, such as bike lanes, multiuse trails, trail crossings, crosswalks, bicycle racks, and signs;
- Facility attributes (e.g., condition, width, surface type, and designated use);
- Areas with congestion or consistent conflicts between modes;
- Connectivity of bicycle and pedestrian routes or gaps in a network of connected bicycle and pedestrian facilities that allow people to get safely and conveniently where they need to go;
- Connections with other forms of transportation (e.g., transit or shuttle bus systems) and with nearby transportation systems (e.g., state highways, local roads, and gateway communities);
- Information on bicycle and pedestrian safety (e.g., annual number of crashes involving bicyclists or pedestrians, locations of crashes, road safety audits);¹⁷
- Availability and location of bicycle rentals and bicycle sharing stations;
- Programming featuring active transportation (e.g., guided bike tours or walks);
- Counts of pedestrians and bicyclists;

- Types and ability levels of the bicyclists and pedestrians using, or who might use, the facilities; and
- Crowdsourced data on bicycle and pedestrian routes and travel patterns (see the **Innovative Technologies and Emerging Trends** chapter for more information).

Before collecting data on existing conditions, consider what data is readily available within the NPS and from other data sources. The Federal Highway Administration (FHWA) *Statewide Pedestrian and Bicycle Planning Handbook*¹⁸ contains a list of potential data sources at the national and state level.



Figure 2-5: Bicyclists ride down Washington D.C.'s Rock Creek Parkway. (Source: Connor Donevan)

U.S. FWS Bicycle and Pedestrian Counting Pilot Project

The U.S. Fish and Wildlife Service (FWS) is conducting a pilot effort to test bicycle and pedestrian counters at 30 FWS stations across the country. As bicycle and pedestrian access to and within wildlife refuges is becoming more popular, data from this project will help track growth and inform FWS planning and prioritization of active transportation projects in the future. Common counters on the market have been widely tested in urban areas, though less in the types of environments in which FWS stations are located (rural areas, gravel roads, mainly recreational riders, more exposure to weather elements, etc.). The FWS will test a few brands of counters to identify those that are most accurate and work in different conditions. The results of this pilot program may inform NPS units that are considering installing counters to track bicycle and pedestrian activity on the types of counters to use in different conditions and how to track and manage the data over time. More information on bicycle and pedestrian count data can be found in the **Innovative Technologies and Emerging Trends** chapter.



For example, the National Highway Traffic Safety Administration publishes [counts of roadway fatalities by mode](#),¹⁹ and the FHWA [National Household Travel Survey](#)²⁰ collects data on trip purpose and mode. State DOTs and MPOs may have information on the location and condition of bicycle and pedestrian facilities, and local transit agencies may have data on multimodal connections.

Within the NPS, data is housed both centrally and at the park level. Centralized datasets include information such as facility condition data (which is housed within the Facility Management Software System (FMSS)), roadway Geographic Information Systems (GIS) data, and safety data (including crashes involving pedestrians and bicycles), which is housed

within the Incident Management, Analysis and Reporting System (IMARS). Other data, including information on bicycle and pedestrian facilities, signs, and key visitor destinations, is gathered and housed at the park level. Some parks also conduct nonmotorized counts, although this is less common. The [NPS Visitor Use Statistics](#)²¹ website also provides data on the number of visitors parks receive each year, and available data on traffic counts.

An assessment of existing conditions can help parks and partners recognize opportunities for pursuing active transportation projects or programs. After identifying gaps or deficiencies, parks and partners can develop projects and programs to address needs.



NPS National Capital Region Paved Trails Study

The NPS National Capital Region Paved Trails Study²² sets a vision to guide future planning and coordination for trails in the NPS National Capital Region paved trail network. The study identifies achievable goals, provides 121 infrastructure and programmatic recommendations, and prioritizes opportunities to expand multiuse trails in national parks in the Washington, D.C. area, as funding becomes available. To develop the study, the NPS region conducted a comprehensive examination of its regional trail network, including identifying bicycle count trends, gaps in the trail network, trail safety issues and opportunities, and maintenance requirements. Stakeholder outreach and local government trail plans and priorities also informed the study. The NPS prioritized projects based on seven criteria, such as projects that are in an approved or adopted plan or study, projects that may reduce user conflicts, and those located along high-volume trail segments. Since its creation, the Paved Trails Study has assisted the NPS in working with partners to secure funding for projects in the plan.



Figure 2-6: A bicyclist near the Washington Monument in the District of Columbia. (Source: M. Gersema)



Additional Resources

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2011).

https://bookstore.transportation.org/item_details.aspx?id=119

AASHTO Guide for the Development of Bicycle Facilities (2012).

https://bookstore.transportation.org/item_details.aspx?ID=1943

FHWA Bike Network Mapping Idea Book (2016).

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/bikemap_book/

FHWA Metropolitan Pedestrian and Bicycle Planning Handbook (2017).

https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/mpo_handbook/index.cfm

FHWA Small Town and Rural Multimodal Networks.

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf

FHWA Statewide Pedestrian and Bicycle Planning Handbook (2014).

https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/pedestrian_bicycle_handbook/

FLH Guide to Promoting Bicycling on Federal Lands (2008).

http://www.pedbikeinfo.org/cms/downloads/01_promoting_bicycling_entire_document.pdf

Paul S. Sarbanes Transit in Parks Technical Assistance Center: Good Practices to Encourage Bicycling & Pedestrians on Federal Lands (2011). http://www.fedlandsinstitute.org/Documents/RepositoryDocuments/BikePedPlan_Web.pdf

The NPS Planning Program. <https://parkplanning.nps.gov/planningHome.cfm>

U.S. DOT Safer People, Safer Streets Initiative. <https://www.transportation.gov/safer-people-safer-streets>



End Notes

- ¹ Rivers Trails and Conservation Assistance Program (RCTA). <https://www.nps.gov/orgs/rtca/index.htm>
- ² NPS Denver Service Center. <https://www.nps.gov/dsc/>
- ³ NPS NLRTP (2014). https://parkplanning.nps.gov/files/NLRTP_10-3.pdf
- ⁴ NPS Regional Long Range Transportation Plans. <https://www.nps.gov/orgs/1548/long-range-transportation-planning.htm>
- ⁵ NPS Midwest Region Long Range Transportation Plan (2016). https://www.nps.gov/orgs/1548/upload/Mid_West_Region_2016-Long-Range_Transportation_Plan_508-1.pdf
- ⁶ Collaborative Visitor Transportation Survey. http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma_lrtп_cvts/cvts.htm
- ⁷ NPS Foundation Documents. <https://parkplanning.nps.gov/foundationDocuments.cfm>
- ⁸ NPS Management Plans. <https://parkplanning.nps.gov/ManagementPlans.cfm>
- ⁹ GMP for Hawaii Volcanoes National Park (2016). <https://parkplanning.nps.gov/projectHome.cfm?projectID=24888>
- ¹⁰ Earthquake Trail/Waldron Ledge, Hawaii Volcanoes National Park (2013). <https://www.nps.gov/media/photo/view.htm?id=12704E05-155D-4519-3EC9546CFF154AFF>
- ¹¹ FHWA Transportation Planning Process Briefing Book (2015). https://www.fhwa.dot.gov/planning/publications/briefing_book/fhwahep18015.pdf
- ¹² NPS Introduction to the Transportation Planning Process (2017). https://www.nps.gov/subjects/transportation/upload/Intro_Planning_Fact_Sheet_Final.pdf
- ¹³ NPS Transportation Program. External Transportation Funding Opportunities for National Parks. <https://www.nps.gov/subjects/transportation/funding.htm>
- ¹⁴ NPS Presidio Trails and Bikeways Master Plan and Environmental Assessment (2003). <https://www.nps.gov/goga/learn/management/upload/PRES%20Trails%20and%20Bikeways.pdf>
- ¹⁵ NPS NEPA Handbook. https://www.nps.gov/subjects/nepa/upload/NPS_NEPAHandbook_Final_508.pdf
- ¹⁶ Advisory Council on Historic Preservation Section 106 Regulations Summary. <http://www.achp.gov/106summary.html>
- ¹⁷ FHWA Pedestrian and Bicycle Safety website. https://safety.fhwa.dot.gov/ped_bike/
- ¹⁸ FHWA Statewide Pedestrian and Bicycle Planning Handbook, Appendix B. https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/pedestrian_bicycle_handbook/page11.cfm
- ¹⁹ NHTSA Road Safety. <https://www.nhtsa.gov/road-safety>
- ²⁰ FHWA National Household Transportation Survey. <http://nhts.ornl.gov/>



²¹ NPS Visitor Use Statistics. <https://irma.nps.gov/Stats/>

²² NPS National Capital Region Paved Trails Study (2016).
<https://parkplanning.nps.gov/document.cfm?parkID=463&projectID=64643&documentID=74623>

Chapter 3: Infrastructure and Multimodal Connectivity

This chapter introduces different types of active transportation infrastructure – such as pedestrian pathways, multiuse trails, bike lanes, signs/wayfinding, pavement markings, and bicycle racks – and discusses strategies for improving connectivity between modes.





Introduction

A well-connected multimodal transportation network provides visitors with more options to access and travel between parks and surrounding communities. In addition, active transportation infrastructure that is integrated with other transportation systems, such as roadways or transit, gives visitors convenient and attractive opportunities to experience a park without needing an automobile.

While the context and types of NPS park roads and trails vary widely, this chapter provides an overview of common physical elements of an active transportation system. It describes infrastructure design guidelines that apply to active transportation, and introduces various types of bicycle, pedestrian, and multiuse infrastructure, along with examples of how parks and surrounding communities have implemented these types of infrastructure. This chapter also offers strategies for improving connections between modes, such as bicycles and shuttle buses. For more information on bicycle and pedestrian safety design elements relevant to national parks and gateway communities, see the [Bicyclist and Pedestrian Safety](#) chapter.

Infrastructure Policy and Design Guidelines

For the design of bicycle infrastructure, the American Association of State Highway and Transportation Officials (AASHTO) has a Guide for the Development of Bicycle Facilities that provides design values and

factors to accommodate bicycle travel in most riding environments. Specific state or local highway design manuals, or specific state bicycle facility design manuals, may also provide similar design guidance.

In designing pedestrian infrastructure, transportation professionals take guidance from AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities, the Federal Highway Administration (FHWA) Designing Sidewalks and Trails for Access, the U.S. Access Board's Accessibility Guidelines, the Architectural Barriers Act (ABA), and other pertinent guidelines and manuals. Similar to bicycle infrastructure, some states and local municipalities produce their own pedestrian design manuals.

The FHWA [Manual on Uniform Traffic Control Devices \(MUTCD\)](#)¹ defines the standards for signs and striping of both bicycle and pedestrian infrastructure and is used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. In general, practitioners follow the MUTCD, or state-specific MUTCD versions, whenever practicable unless there is a reason to deviate from established policy. A memorandum of understanding between the NPS and the FHWA, updated in 2006, states that on campground roadways and other similar low-speed, low-volume roadways, signs may differ from the MUTCD if the NPS submits these signs under the experimental rules set forth in the MUTCD and obtains FHWA approval prior to their initial use.² Similarly, design manuals are followed by design engineers. For cases involving design exceptions, the NPS documents and ensures proper justification for these exceptions.

Connected, Multimodal Networks

The FHWA defines a connected network as “interconnected pedestrian and bicycle transportation facilities that allow people of all ages and abilities to safely and conveniently get where they need to go.” When bicycle and pedestrian networks are complete and interconnected, meaning people can comfortably travel between national parks and destinations within a local community, safety and access are improved, along with the potential to reduce congestion through a reduction in the number of vehicles on the roadway.



Design Flexibility and Context Sensitive Solutions

Good facility design involves balancing safety, mobility, and preservation of scenic, aesthetic, historic, cultural, and environmental resources. Flexibility in design criteria is allowed for under most existing standards and guidelines. Applying flexibility requires knowledge of these standards, a recognition of the range of options available, and understanding how deviating from these may impact safety and mobility. For more information about taking a flexible approach to active transportation infrastructure design, see the [2013 FHWA Memo on Bicycle and Pedestrian Design Flexibility](#).³

Context Sensitive Solutions (CSS) is a collaborative, interdisciplinary approach that includes the viewpoints of all stakeholders in the development of project goals. CSS seeks transportation solutions that address the needs of all users and facility functions within the context of its setting, considering land use, and the environmental, cultural, and historical factors. The Institute of Transportation Engineers handbook [Implementing Context Sensitive Design](#)⁴ offers further guidance and case studies on CSS.

Design flexibility and CSS are relevant to the NPS, as they create infrastructure that meets the needs of bicyclists and pedestrians, but also balance its mission to preserve resources and provide for the enjoyment of the public.

Types of Pedestrian Infrastructure

Infrastructure such as sidewalks, pedestrian trails and bridges, and pedestrian-only lanes can help people safely and comfortably walk or use a mobility device (such as a wheelchair, scooter, walker, cane, or crutches).⁵ When expanding pedestrian facilities in and around national parks, consider how installing pedestrian infrastructure could help fill gaps in the existing pedestrian network and increase pedestrian access between parks and surrounding destinations. Evaluating the type of roadway and anticipated number of pedestrian users helps identify the most appropriate type of pedestrian infrastructure to install. Areas that do not seem to have an initial demand for pedestrian facilities are still likely to see an increase in the number of pedestrians once adequate facilities are provided.



Figure 3-1: A bicyclist on a multiuse trail at the Grand Canyon National Park in Arizona. (Source: NPS)

In areas of higher pedestrian volumes, locate sidewalks to create a dedicated, continuous network for pedestrians and wheelchair users. Consider locating sidewalks around NPS visitor centers, and linking to pedestrian trails, multiuse trails, transit stops, and park entrances. Sidewalks should be wide enough to accommodate and enable people of all ages and abilities to safely use them in groups. Americans with Disabilities Act (ADA) accessibility standards require a minimum sidewalk width of five feet, but many communities choose to make sidewalks wider in order to allow for more people to pass through, and to allow space for amenities. In areas where sidewalks are directly adjacent to fast-moving traffic, an eight-foot or wider sidewalk can provide a buffer between pedestrians and cars.



Figure 3-2: A multiuse trail in Glacier National Park, Montana. (Source: U.S. DOT Volpe Center)

Pedestrian lanes, or exclusive pedestrian walking areas designated on a roadway lacking sidewalks, provide interim or temporary pedestrian accommodation. Pedestrian lanes, however, are an emerging design requiring additional research and evaluation. These designated walking areas are not intended to be an alternative to sidewalks and often serve to fill short gaps between other higher quality facilities. Like sidewalks, pedestrian lanes should be at least five feet wide, but eight-foot lanes are preferable to allow for side-by-side walking and physical separation from traffic.⁶

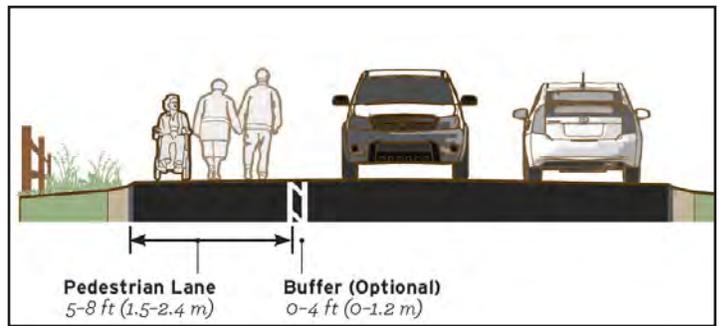


Figure 3-3: Pedestrian lanes provide an exclusive space for pedestrians to walk outside of the travel area. (Source: FHWA Small Town and Rural Multimodal Networks)



Pedestrian Connections in Sitka, Alaska

The Sitka Sea Walk is a pedestrian corridor project that will connect downtown Sitka, Alaska at Totem Square to the Sitka National Historical Park. With only one crosswalk along Harbor Drive in the project area, pedestrians making uncontrolled roadway crossings has been a long-standing safety challenge. By providing both physical and grade separation between traffic and pedestrians, the project will lead to a safer and more efficient transportation corridor than currently exists. The Sitka Sea Walk will consist of pedestrian oriented facilities with a minimum eight-foot wide concrete walking surface and guardrails. The first phase of the project was completed in 2014, and construction of the second phase is expected to begin in 2018.



Figure 3-4: Virtual rendering of Sitka Sea Walk in Alaska. (Source: City and Borough of Sitka)



Types of Bicycle Infrastructure

The selection of bicycle facility types should be informed by the characteristics of the road and the experience level of the bicyclists who will be using the facilities. On remote or rural roads with less traffic and lower speeds, a bicycle warning sign (such as “Bicycles May Use Full Lane” or “Bicycles on Road”) or marking on the road may be sufficient to notify drivers and bicyclists that bicyclists are permitted and are encouraged to use the road. On roads with higher speeds and higher traffic volumes, separated bike lanes or off-street trails may be more appropriate for ensuring that bicyclists can safely use the route. When deciding what types of bicycle facilities to provide, consider the number and characteristics of the bicyclists who will be using the facilities, as well as the characteristics of the vehicle traffic (e.g., speed, volume, etc.) and characteristics of the landscape and topology. For example, casual bicyclists or those riding with children might be hesitant to ride on roads that do not provide separation from vehicle traffic or that have challenging grades, while those engaging in long-distance bicycle touring might be more comfortable bicycling in those settings.

When deciding where to incorporate new active transportation infrastructure, it is important to evaluate how the proposed infrastructure fits into the existing or planned bicycle network within the park and surrounding community. Expanding bicycle infrastructure can be especially beneficial in places where it fills gaps in an existing bicycle network, such as by connecting two separate multiuse trails, or adding a bike lane on a bridge that carries high-speed traffic.^{7,8} Parks and their partners may also wish to prioritize installing new bicycle infrastructure in areas where safety is a concern, such as at intersections or along roadways that have seen a high number of crashes or documented safety deficiencies.

For more information about evaluating existing conditions and prioritizing new projects, see the [Planning and Elements of Project Development](#) and [Bicyclist and Pedestrian Safety](#) chapters.



Figure 3-5: A sign notifies drivers to be alert for bicyclists ahead. (Source: U.S. DOT Volpe Center)

Roadway resurfacing projects may present opportunities to install bicycle (and pedestrian) infrastructure.⁹ This can help create new active transportation facilities in an efficient, cost-effective way while road work is already being done. For example, if a roadway has wide shoulders or travel lanes, there may be an opportunity to reconfigure the pavement markings to create bike lanes, provided that safety standards are maintained for all roadway users. In addition, if the existing roadway width is maintained, the environmental review process for adding bicycle or pedestrian infrastructure as part of a resurfacing project will likely be minimal. For upcoming resurfacing projects on NPS roadways, park staff can coordinate with their NPS Federal Lands Transportation Program Coordinator and the Federal Lands Highway staff overseeing project design on integrating bicycle and pedestrian infrastructure where possible. This coordination should happen early on in

the process so that bicycle and pedestrian facilities can be incorporated into the project scope, design, and budget.

Pavement material can affect the ease of bicycling. For example, many transportation agencies apply chip seal to existing pavement to protect the surface from wearing, lower maintenance costs, and extend the lifespan of rural, low-volume roads. However, chip seal can be difficult and unpleasant for bicyclists to ride on. Microsurfacing is a bicycle-friendly alternative to chip seal.¹⁰ When deciding whether to apply chip seal or asphalt, or to use a microsurfacing treatment, parks can consider the number of bicyclists who use the road, and whether there is a possibility to provide dedicated bicycle infrastructure (e.g., a bike lane, multiuse trail, or sidepath) without chip seal. Other

trail surface types that can be considered include natural soil, gravel, asphalt, concrete, etc. Each trail surface type has tradeoffs associated with costs, durability, user groups, and visual impacts.¹¹



Figure 3-6: Bicyclists riding in Grand Canyon National Park. (Source: NPS)



Common types of bicycle facilities are listed in order from least to most separation from traffic in the following section. Bicycle facilities that are more separated from traffic tend to be safer for both bicyclists and drivers, because more separated facilities minimize the potential for a vehicle-bicycle crash.^{12,13}

Shared Lane Marking (Sharrow)



Figure 3-7: Sharrow in Austin, Texas. (Source: National Association of City Transportation Officials)

Definition: A roadway shared by vehicles and bicycles with pavement markings providing wayfinding guidance to bicyclists and alerting drivers that bicyclists are likely to be operating in mixed traffic.

Context: Sharrows are used on roadways that are a part of a bicycle route or network, but where the roadway width cannot accommodate both a vehicle lane and bike lane. Sharrows are typically displayed in a series along the roadway and are designed for roads with speed limits of 35 mph or less; they are most commonly found in more urban settings.

On-street Bike Lane



Figure 3-8: On-street bicycle lane near San Antonio Missions National Historical Park in Texas. (Source: NPS)

Definition: An on-road bicycle facility designated by striping, signing, and pavement markings. A bike lane may have a painted buffer that increases lateral separation between bicyclists and motor vehicles.

Context: On-street bike lanes are often used on roadways where there is adequate pavement width to accommodate lanes for both vehicles and bicycles. Bike lanes can be considered for roads with high traffic volumes or high truck traffic, and when funding for more protective infrastructure is unavailable.

Bicycle Boulevard



Figure 3-9: A pavement marking denoting a bicycle boulevard in Berkeley, California. (Source: National Association of City Transportation Officials)

Definition: A shared roadway bicycle facility, designed to offer priority for bicyclists operating within a roadway shared with motor vehicle traffic.

Context: Bicycle boulevards provide a bicycle-priority route designed to offer convenient, low-stress access to destinations and through neighborhoods. Access management, traffic calming, and crossing treatments are often included to improve the bicycle experience. They are typically used on local streets with existing low speeds and low traffic volumes.

Sidepath

Separated Bike Lane



Figure 3-10: A two-way separated bike lane which is part of the Connect Historic Boston project. (Source: U.S. DOT Volpe Center)

Definition: An exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element (e.g., curbs, posts, plantings, etc.). Also known as a cycle track or protected bike lane.

Context: Separated bike lanes are often used on roadways with space to accommodate bicycles and vehicles separately. They are especially valuable along roadways with high speed limits, high traffic volumes, or high truck traffic. They provide a physical barrier between the vehicle lane and the bike lane for enhanced comfort and safety.



Figure 3-11: A sidepath in Sleeping Bear Dunes National Lakeshore in Michigan. (Source: NPS)

Definition: A bidirectional multiuse trail located immediately adjacent and parallel to a roadway.

Context: Sidepaths provide full separation from traffic, but are located adjacent to the roadway. They require a wide roadside environment to provide for separation and pathway area outside of the adjacent roadway.

Multiuse Trail



Figure 3-12: A multiuse trail in Grand Teton National Park, Wyoming, has averaged more than 19,000 trips each year since it opened in May 2009. (Source: NPS)

Definition: A travel area separated from motorized traffic and intended for shared use by a variety of groups, including pedestrians, bicyclists, wheelchair users, and joggers.

Context: Multiuse trails (also referred to as multiuse paths or shared use paths) are often located within the rights-of-way of roadways, limited access highways, railroads, or utility paths. They can also be found within publicly accessible lands such as parks and open space areas, as well as along waterways. Typically, these trails have a width of 10 to 14 feet and can have a variety of materials, such as soil, gravel, asphalt, concrete, etc. Because these paths limit interaction with motorized vehicles, they improve the safety and comfort of their users.¹⁴



North Moab Recreation Areas Alternative Transportation Project

The North Moab Recreation Areas Alternative Transportation Project is an integrated transit and nonmotorized pathway system connecting the town of Moab, Utah to Arches National Park, the Colorado Riverway Recreation Area, and other Bureau of Land Management, state, and NPS recreation sites. The \$11.8 million alternative transportation system includes two transit hubs with parking spaces and drop-off areas for buses, 12 miles of multiuse trails, and 14 miles of wide shoulders that can be used by bicyclists. The project also includes a bicycle and pedestrian bridge across the Colorado River that parallels a State Highway 191 bridge that lacks shoulders and was previously a major point of conflict between bicycles and vehicles.^{15,16}



Figure 3-13: Colorado River bicycle and pedestrian bridge near Moab, Utah.¹⁷ (Source: National Trails Training Partnership)

Bicycle Parking Design

Providing secure bicycle parking and storage facilities can help encourage visitors to bicycle to and within national parks. When deciding what types of bicycle racks to use and where to locate them, consider for what purpose and for how long people will be parking their bicycles. For short term parking, such as at a visitor center or concessions facility, bicycle parking should be convenient, visible, and easy to use. For example, inverted “U”-style bicycle racks are popular because they support the bicycle frame rather than simply the wheel. They are appropriate for many types of bicycles and can be installed in different numbers and configurations depending on the need. For long term bicycle parking, such as at a trailhead or campground, users require additional security and weather protection. Examples of long term bicycle parking include bicycle lockers and sheltered, secure enclosures. The [Essentials of Bike Parking](#)¹⁸ guide by the Association of Pedestrian and Bicycle Professionals is one resource which provides details on different types of bicycle parking—including styles of bicycle racks to avoid—and other factors to consider prior to installing bicycle parking.

Types of Multiuse Infrastructure

Multiuse trails can accommodate a variety of nonmotorized users, including bicyclists, pedestrians, joggers, and people using mobility aids. In order to promote safety and reduce conflict between users, the U.S. Access Board accessibility guidelines recommend that multiuse trails be wide enough to allow for users to safely pass each other; typical multiuse trail width standards are between 10 and 14 feet.¹⁹ If high numbers of both pedestrians and bicyclists are expected to use a path, parks may want to consider creating separate zones for bicycles and other users who will be traveling more slowly (e.g., through parallel paths, lane markings, pavement variation, or landscaping). Signs, such as a “give warning when passing” sign, or trail etiquette brochures can also educate users to be aware of others on the path and encourage them to pass safely. See the [Bicyclist and Pedestrian Safety](#) chapter for more information on safety education.

Some parks are experiencing overcrowding and conflicts between users on existing multiuse trails that are narrower than what is recommended by the current accessibility guidelines. Many NPS multiuse trails are relatively narrow compared to modern trail standards. For example, the Mount Vernon Trail managed by the George Washington Memorial Parkway in northern Virginia is six to eight feet wide, while modern standards recommend that trails be a minimum of 10 feet wide with separation for bicyclists and pedestrians, particularly on trails that are heavily used as is the Mount Vernon Trail.

If space is available and impact on resources is minimal, a narrow trail could be widened in order to accommodate more users; however, this is typically a costly and time-consuming strategy, emphasizing the importance of appropriately sizing a multiuse trail in the initial planning and design. If trail widening is not an immediate solution, other options can help alleviate these trail conflict and crowding issues. First, trail etiquette signs, messaging, or training can help users safely interact with each other. Or, if available, alternate routes could be identified; for example, an on-road route with minimal traffic may be an attractive alternative to a multiuse trail for bicyclists who want to go at higher speeds.

Maintaining multiuse trails in good condition helps to create a safe place to walk and ride, and makes the paths more inviting. Where appropriate, and when the hours of the trail extend beyond dawn to dusk, trails can include lighting in order to extend the transportation use of the path for longer periods. Routine maintenance activities, such as sweeping, mowing, clearing snow, pavement repair, and trash removal, can help keep multiuse trails in a safe condition.



Figure 3-14: A multiuse trail at Chesapeake and Ohio Canal National Historical Park in Washington, D.C. includes a gravel path and a parallel paved path to provide options for pedestrians, bicyclists, runners, and others using the trail. (Source: National Trails Training Partnership)²⁰



Oregon State Parks Bicycle Amenities

Oregon State Parks have made improvements to several state managed hiker-biker campsites in recent years. Three campgrounds have gear and food storage lockers, solar-powered phone charging stations, bicycle repair stations with basic tools and a floor pump, and group shelters. Oregon State Parks have also installed “U”-style bicycle racks at campgrounds and day use areas.



Figure 3-15: A hiker-biker campsite at Cape Blanco State Park in Oregon includes lockers for food and gear storage and a bicycle pump and repair station. (Source: Oregon State Parks)



Accessibility Considerations for Bicycle and Pedestrian Infrastructure

Developing bicycle and pedestrian infrastructure in a way that meets relevant accessibility guidelines and regulations allows people of various abilities to benefit from the infrastructure. Accessibility guidelines consider the usability of trails and visitor areas for those who have mobility challenges. These considerations could include trail widths, access ramps, trail slopes, trail surface types, access to rest areas, and level landings. U.S. Access Board guidelines apply to federal agencies that develop outdoor areas for recreational purposes, and include standards for accessible trails, trail facilities, and other types of pedestrian paths, such as Outdoor Recreation Access Routes (see the [Policy Context](#) chapter for more information).²¹ These standards do not apply to multiuse trails or infrastructure that is primarily for bicycles; those planning bicycle or multiuse infrastructure should refer to the AASHTO Guide for the Development of Bicycle Facilities²² for recommendations and best practices on accessible bicycle and multiuse infrastructure.

Designing Safe Intersections and Crossings

Intersections, trails, and street crossings can be designed in ways that accommodate pedestrians and bicyclists and promote safety for all road users.

At intersections with crosswalks or where multiuse trails (or bicycle or hiking trails) cross a road, interventions can make these crossings safer. Placing tactile warning strips before a crosswalk can alert visually impaired individuals that a roadway crossing is coming up. A raised crosswalk increases the visibility of pedestrians and bicyclists, and forces vehicles to slow down before entering the crosswalk. Other techniques that make crosswalks more visible to

drivers include using reflective material to make them visible at night. Avoid using patterns or materials like brick pavers that can make crosswalks less visible to motorists. Examples of high visibility crosswalk treatment designs are shown in the image below. FHWA studies have demonstrated that continental crosswalk markings have the highest visibility to drivers at unsignalized crosswalks, and hence recommend using this treatment.²³ An example of a continental crosswalk at Bryce Canyon National Park in Utah is shown in the image on the next page.

Since many crosswalks in national parks are not signalized, they may require special consideration of signs, approach signs, lighting, and visibility enhancements, in addition to crosswalk treatments to increase safety.

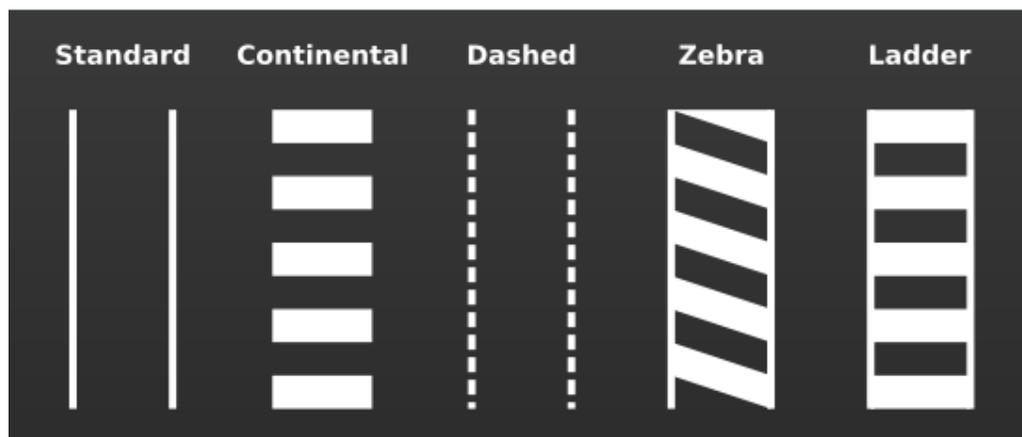


Figure 3-16: Examples of High Visibility Crosswalk Treatments. (Source: [SF Better Streets](#))



Figure 3-17: A sign warns road users to watch for pedestrians and bicyclists as a trail crosses the road in Bryce Canyon National Park, Utah. (Source: U.S. DOT Volpe Center)

Pedestrian Refuge Islands

Pedestrian refuge islands are usually used on roads wider than two lanes, and help pedestrians feel less exposed as they cross the street. Roads can also be narrowed from two lanes to one lane in each direction at a crosswalk, which encourages cars to slow down and makes it safer for pedestrians to cross. When determining where to install a crosswalk, it is best to consider pedestrian “desire lines,” or the idea that pedestrians tend to take the shortest route to their destinations regardless of whether there is a crosswalk. Installing crosswalks near popular destinations where pedestrians want to go can improve safety while respecting these desire lines.

Flashing Beacons

Flashing beacons are pedestrian or bicycle signs paired with irregular flash pattern lights that are activated by pedestrians or bicyclists manually by a push button or passively by a pedestrian or bicyclist detection system. Flashing beacons can supplement pedestrian or bicycle warning signs at unsignalized intersections or mid-block crosswalks; they are usually installed on either two-lane or multi-lane roadways. The lights alert drivers of the presence of pedestrians or bicyclists and increases yielding. Flashing beacons should only be used in conjunction with a marked crosswalk.



Figure 3-18: A flashing beacon signal at a trail crossing in the Cape Cod National Seashore in Massachusetts. (Source: NPS)



Urban Active Transportation Infrastructure

Some active transportation infrastructure types are more tailored to addressing the mobility challenges faced by bicyclists and pedestrians in urban areas, where there are typically higher traffic volumes, a greater density of intersections and traffic lights, and in some cases higher numbers of pedestrians and bicyclists. On urban sidewalks, elements such as shade trees, benches, lighting, planters, and green infrastructure such as a rain garden can help to create a sidewalk that is a safe, enjoyable place for pedestrians to pass through and to linger.²⁴

Two common strategies to enhance a bicyclist's comfort at an intersection include intersection crossing markings and bicycle boxes. Intersection crossing markings guide bicyclists on a safe and direct path through intersections. A bicycle box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible area to queue ahead of motor vehicles during a red light. Agencies must receive interim approval from the FHWA to use bicycle boxes.²⁵

Traffic signals can also be designed to prioritize bicyclists and pedestrians. A leading pedestrian phase gives pedestrians a walk signal several seconds before vehicles get a green light, allowing pedestrians to enter the intersection first and make themselves visible to turning vehicles. The pedestrian scramble, also known as a "Barnes Dance," is an exclusive phase for pedestrians at a traffic signal where vehicle traffic is stopped in all directions, giving priority to pedestrians to cross in any direction, including diagonally. Bicycle signals are traffic control devices that indicate bicycle signal phases and enable specific bicycle travel routes. Bicycle signals are often used at complex intersections, in locations with high traffic or bicycle volumes, along contraflow lanes, or where there is a need to prioritize bicycle movements.

While the majority of NPS sites would not need to use these urban infrastructure types, parks located in or near urban areas could consider working with gateway communities and local transportation agencies on implementing these types of infrastructure on partner owned facilities approaching the park.



Figure 3-19: (left) Intersection crossing marking in Denver, Colorado. (Source: Ashley Haire, Toole Design Group); (right) Bicycle Box in Portland, Oregon. (Source: NACTO Urban Bikeway Design Guide)

Wayfinding and Signs for Bicyclists and Pedestrians

Wayfinding and signs are key components of bicycle and pedestrian facilities that let users know where they are and what to expect, aid them in navigating to key destinations, and help ensure safety. The [NPS Sign Program](#)²⁶ at Harpers Ferry Center, which provides media services for NPS, maintains the NPS national sign standards and provides assistance to parks with designing and implementing signs. The NPS Sign Program categorizes signs into three different types for guidance: motorist guidance signs, visual information signs, and identity signs. Signs for bicyclists and pedestrians generally fall into the visual information signs category, while signs on roadways

related to bicyclists or pedestrians are included in the guidance for motorist signs. The Harpers Ferry Center guidelines comply with the [FHWA Manual on Uniform Traffic Control Devices](#)²⁷ for signs located on roadways. Chapter 9 of the Manual on Uniform Traffic Control Devices (MUTCD) provides examples of bicycle wayfinding signs, as does the National Association of City Transportation Officials (NACTO) [Urban Bikeway Design Guide](#).²⁸ See the [Bicyclist and Pedestrian Safety](#) chapter for more information on signs for motorists and bicyclists traveling together in mixed traffic.

Wayfinding, which fall into the Harpers Ferry Center visual information signs category, can show bicyclists and pedestrians that they are on or near a designated trail, bikeway, or walking route, and also provide guidance about distances to specific destinations,



Figure 3-20: Wayfinding near Indiana Dunes National Lakeshore in Indiana. (Source: U.S. DOT Volpe Center)



such as attractions, campgrounds, visitor centers, or nearby communities. Signs can also mark routes that are accessible to wheelchair users or others with disabilities to make it easy for users to find and follow them. Wayfinding signs, as well as paper maps, map kiosks, GPS-enabled smart phone apps, or other electronic mapping tools help users identify the safest or most direct pedestrian and bicycle routes to destinations or park attractions. These can also help familiarize users with the active transportation network. Mile markers help to orient people bicycling and walking as to how far they have traveled or need to go, but are also useful for pinpointing locations of maintenance issues or the user's location in the event of an emergency. Wayfinding signs can also indicate

to bicyclists that they are on part of an official bicycle route, such as the U.S. Bicycle Route System (USBRS). For more information about bicycle touring routes, see the [Visitor Activities and Programs](#) chapter.

Other types of signs can help communicate laws and expectations to bicyclists and pedestrians, especially when they are sharing the same facility. Signs can also tell them what to do or expect as a trail intersects a roadway. The following section contains examples of bicycle and pedestrian signs. For information about the safety benefits of these types of signs, see the [Bicyclist and Pedestrian Safety](#) chapter.

When creating new signs or improving existing signs, it is important to work with partners, particularly state DOTs, to ensure compliance with sign standards and pursue coordination with surrounding sign networks and designs. Parks may need to get approval from their state DOT for signs on the roadway, and DOTs may have state-specific guidance on interpreting the MUTCD. Signs in parks need to be sensitive to the context of the surrounding area, taking into consideration factors such as safety, visitor experience, and visibility of natural and cultural resources. For instance, the design and placement of signs in urban parks may differ significantly from those implemented in more rural, nature focused parks. In addition, signs should be simple and concise to reduce visual clutter. Signs are often added to a location when there is a problem or issue to solve, but more signs may not be the only or best solution. Table 3-1 contains examples of bicycle and pedestrian signs. For information about the safety benefits of these types of signs, see the [Bicyclist and Pedestrian Safety](#) chapter.



Figure 3-21: The National Mall and Memorial Parks partnered with the Washington D.C. Department of Transportation to install bicycle route signs throughout the park to connect bicycle routes between the park and city. In addition to pointing out the direction of the route, the signs also show the distance to the destination. (Source: NPS).

Table 3-1: Description of Signs

Sign	Definition	Context
<p>Signed Bicycle Route</p>  <p>Figure 3-22: Bicycle route sign. (Source: MUTCD)</p>	<p>A roadway designated as a preferred route for bicycles, indicated by signs along the road.</p>	<p>Signed bicycle routes are used on roads selected as appropriate for bicycle travel. The signs alert drivers to the presence of bicyclists on the road, and show bicyclists that they are on a preferred bicycle route.</p>
<p>Trail Courtesy Signs</p>  <p>Figure 3-23: Trail courtesy sign. (Source: www.americantrails.org)</p>	<p>This type of sign is used to convey etiquette for all users on a multiuse trail or path.</p>	<p>Encouraging users to share a multiuse trail is important whether the trail is in an urban area or the backcountry. Signs conveying etiquette can help reduce conflicts between different user groups.</p> <p>NOTE: This information is typically placed on informational kiosk trailhead signs and is not an MUTCD compliant sign.</p>
<p>Bikes ‘Yield to Pedestrians’ Signs</p>  <p>Figure 3-24: Bikes ‘Yield to Pedestrians’ sign. (Source: MUTCD)</p>	<p>This sign is used where bicyclists and pedestrians cross or share a facility. It conveys that a bicyclist must yield to pedestrians when operating on the facility together.</p>	<p>This type of sign can help bicyclists and pedestrians safely operate or navigate the same facility by reducing conflicts between the two modes.</p>
<p>Trail Crossing Signs for Bicyclists</p>  <p>Figure 3-25: Trail crossing signs for bicyclists. (Source: MUTCD)</p>	<p>Signs where a trail crosses a roadway that warns cyclists and pedestrians about upcoming conditions.</p>	<p>Signs on trails can alert trail users that a crossing is coming up and provide instructions on how to safely navigate it.</p>



Strategies to Enhance Multimodal Connectivity

To allow greater mobility, visitors using active transportation need to be able to connect to other modes of transportation, such as shuttle buses, trains, local transit, bikeshare systems, and ferries within and connecting to parks. Connecting a variety of modes in a transportation network helps to facilitate multimodal connectivity; for example, bike lanes or multiuse trails could connect with a train station or with public transit facilities (i.e., bus stops). The

Partnerships and Funding chapter of this Guidebook provides more information on creating partnerships between parks and nearby communities. For more information on making bicycle and pedestrian connections to transit, see the Federal Transit Administration (FTA) [Manual on Pedestrian and Bicycle Connections to Transit](#).²⁹

Other transportation modes can also support bicycle use. For example, shuttle buses operating in and around national parks can include bicycle racks or trailers so that bicyclists can transport their bicycles between locations within a park or from a nearby community. Additionally, bicycle racks on support vehicles allows staff and others to provide assistance to bicyclists in a distress situation (e.g., a flat tire or minor injury). Bicycle rental facilities may also consider providing vehicle bicycle racks to enable visitors to more easily transport bicycles. Sufficient bicycle parking, storage, and transport options can allow park visitors to switch between modes and more easily explore parks and surrounding communities.

Amtrak, the only national passenger rail system in the U.S., operates through or near several national parks, and provides a car-free opportunity for people to visit parks. Amtrak’s Bicycle Task Force works towards the goal of implementing bicycle carry-on service on all of Amtrak’s routes. Carry-on service, which allows the passenger to carry their bike on and off the train themselves at any station, is the most flexible type of bicycle service and has been implemented on a number of routes. Amtrak has also implemented train-side checked bike service, which allows passengers to check their standard-sized bicycle at stations with baggage service instead of boxing the bike for

transport. This service has been implemented on all of Amtrak’s long-distance routes. These improvements make it easier for people to visit national parks along or near Amtrak routes by rail and without a car. Parks, communities, and partners can consider providing accommodations for these visitors, such as lockers for temporary storage of personal items.

In addition to Amtrak, some local or intercity trains have cars outfitted with bicycle racks. For example, the MARC train service in Maryland tested bike cars on several trains to Harpers Ferry, West Virginia, allowing bicyclists to access Harpers Ferry National Historical Park and the Chesapeake and Ohio Canal National Historical Park by train.³⁰

Shuttle Service for Bicyclists at Glacier National Park



Glacier National Park allows bicycles to use Going-to-the-Sun Road in the spring season while the road is being plowed and is not yet open to cars (see the **Open Streets** chapter for more information about this opportunity). In 2016, the NPS and the Glacier National Park Conservancy launched a new shuttle bus service for bicycle riders on Going-to-the-Sun Road. The shuttle buses operate in May and June, until the road opens to vehicles for the season, and are equipped with bicycle trailers that can carry up to 16 bikes, including a limited number of tandem and recumbent bikes. The project is intended to prevent possible resource damage associated with vehicle congestion at Avalanche Creek, a popular area for bicyclists and hikers to drive to and gather when the Going-to-the-Sun Road is closed to vehicles during the spring. With the shuttle service, visitors can now take the shuttle bus with their bicycles to this location, rather than driving.



Figure 3-26: A bicycle trailer at Glacier National Park in Montana. (Source: Saara Snow)



Additional Resources

Association of Pedestrian and Bicycle Professionals. Essentials of Bike Parking.

http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/Bicycle_Parking/EssentialsofBikeParking_FINA.pdf

FHWA Incorporating On-Road Bicycle Networks into Resurfacing Projects (2016).

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf

FHWA Manual on Uniform Traffic Control Devices. Part 9: Traffic Control for Bicycle Facilities.

https://mutcd.fhwa.dot.gov/htm/2009/part9/part9_toc.htm

NPS Accessibility Standards. <https://www.nps.gov/dscw/ds-accessibility-universal-design.htm>

NPS Director's Order #42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services (2000). <https://www.nps.gov/policy/DOrders/DOrder42.html>

U.S. Access Board Final Guidelines for Outdoor Developed Areas (2013). <https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas>

U.S. Access Board Architectural Barriers Act Accessibility Standards. <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards>

FTA Manual on Pedestrian and Bicycle Connections to Transit (2017).

<https://www.transit.dot.gov/research-innovation/manual-pedestrian-and-bicycle-connections-transit>

NACTO Urban Street Design Guide. <http://nacto.org/publication/urban-street-design-guide/>

People for Bikes Green Lane Project. <http://www.peopleforbikes.org/green-lane-project>

Portland, Oregon Pedestrian Design Guide. <https://www.portlandoregon.gov/transportation/article/84048>



End Notes

- ¹ FHWA Manual on Uniform Traffic Control Devices. <https://mutcd.fhwa.dot.gov/>
- ² Memorandum of Understanding Between FHWA and National Park Service Regarding Traffic Control Devices on Roads in National Parks (2006). <https://mutcd.fhwa.dot.gov/resources/policy/moutcd/>
- ³ FHWA Memorandum on Bicycle and Pedestrian Facility Design Flexibility (2013). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm
- ⁴ Institute of Transportation Engineers Implementing Context Sensitive Solutions Design Handbook (2017). <http://ecommerce.ite.org/IMIS/ItemDetail?iProductCode=IR-145-E>
- ⁵ ADA Requirements: Wheelchairs, Mobility Aids, and Other Power-Driven Mobility Devices. <https://www.ada.gov/opdmd.htm>
- ⁶ FHWA Small Town and Rural Multimodal Networks. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/
- ⁷ FHWA Strategic Agenda for Pedestrian and Bicycle Transportation. http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/strategic_agenda/fhwahep16086.pdf
- ⁸ FHWA Case Studies in Delivering Safe, Comfortable, and Connected Bicycle Networks (2015). http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/network_report/network_report.pdf
- ⁹ FHWA Incorporating On-Road Bicycle Networks into Resurfacing Projects (2016). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf
- ¹⁰ Evaluation of Pavement Safety Performance (2015). <https://www.fhwa.dot.gov/publications/research/safety/14065/004.cfm>
- ¹¹ FWS Wichita Mountains Wildlife Refuge. Comprehensive Alternative Transportation Plan (2014). <https://rosap.ntl.bts.gov/view/dot/12109>
- ¹² FHWA Separated Bike Lane Planning and Design Guide (2015). http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/separatedbikelane_pdg.pdf
- ¹³ UNC Highway Safety Research Center. Costs for Pedestrian and Bicyclist Infrastructure Improvements report (2013). http://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf
- ¹⁴ Shared use paths Accessibility Guidelines (2011). http://nacto.org/docs/usdg/shared_use_path_accessibility_guidelines_federal_register.pdf
- ¹⁵ FHWA and FLH Guide to Promoting Bicycles on Federal Lands (2008). http://www.pedbikeinfo.org/cms/downloads/01_promoting_bicycling_entire_document.pdf
- ¹⁶ FHWA Small Town and Rural Multimodal Networks (2016). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/
- ¹⁷ National Trails Training Partnership. Bridges and structures for trails. <https://www.americantrails.org/resources/structures/MoabUTbridge.html>



- ¹⁸ Association of Pedestrian and Bicycle Professionals. Essentials of Bike Parking (2015).
http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/Bicycle_Parking/EssentialsofBikeParking_FINA.pdf
- ¹⁹ Shared use paths Accessibility Guidelines (2011).
http://nacto.org/docs/usdg/shared_use_path_accessibility_guidelines_federal_register.pdf
- ²⁰ National Trails Training Partnership. Dual tread trails: multiple use aided by multiple pathways.
<http://www.americantrails.org/photoGalleries/cool/4-dual-tread-trail-bike-walk.html>
- ²¹ U.S. Access Board. A Summary of Accessibility Standards for Federal Outdoor Developed Areas (2014).
<https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/a-summary-of-accessibility-standards-for-federal-outdoor-developed-areas>
- ²² AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012).
https://bookstore.transportation.org/item_details.aspx?ID=1943
- ²³ FHWA Crosswalk Marking Visibility Study (2010).
<https://www.fhwa.dot.gov/publications/research/safety/pedbike/10068/10068.pdf>
- ²⁴ NACTO Urban Street Design Guide. <http://nacto.org/publication/urban-street-design-guide/>
- ²⁵ FHWA and MUTCD Bicycle Box Memorandum (2016).
https://mutcd.fhwa.dot.gov/resources/interim_approval/ia18/index.htm
- ²⁶ NPS Sign Program at Harpers Ferry Center. <https://www.nps.gov/subjects/hfc/index.htm>
- ²⁷ FHWA-NPS MOU on the MUTCD (2006). <https://mutcd.fhwa.dot.gov/resources/policy/moutcd/>
- ²⁸ NACTO Urban Bikeway Design Guide. <http://nacto.org/publication/urban-bikeway-design-guide/>
- ²⁹ FTA Manual on Pedestrian and Bicycle Connections to Transit.
<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf>
- ³⁰ Maryland Transit Administration. MARC Bike Cars October 27 and 30 (2017).
<https://mta.maryland.gov/content/marc-bike-cars-october-27-and-30>

Chapter 4: Bicyclist and Pedestrian Safety

This chapter provides resources to help parks and their partners evaluate and improve safety for active transportation modes. It discusses safety strategies in the categories of infrastructure improvements, safety education, enforcement, and emergency response.



Introduction

As demand for walking and bicycling in national parks continues to increase, parks are encouraged to provide visitors with safe opportunities for active transportation and recreation while minimizing conflicts between transportation modes. To assist parks and partners in improving active transportation safety, this chapter provides details on the “four E’s” of transportation safety: engineering (infrastructure), education, enforcement, and emergency response.

Active transportation plans and projects vary to fit the specific needs and context of a park and surrounding community, and appropriate strategies and interventions to ensure safety for pedestrians and bicyclists may vary by park. Focused research, planning, and project development can aid in the implementation of safety strategies and interventions appropriate to the context of each area. This chapter provides specific examples and additional resource links that can assist parks and partners in the improvement of bicycle and pedestrian safety.

Improving Safety with Engineering (Infrastructure)

A variety of infrastructure including paved shoulders, on-street bike lanes, separated bike lanes, sidewalks, side paths, and multiuse trails can be used to improve bicycle and pedestrian comfort and safety. Dedicated bicycle and pedestrian infrastructure—such as multiuse trails, bike lanes, sidewalks, and pedestrian trails—promote safety by increasing physical separation between vehicles and bicycles or pedestrians, and sometimes by making bicyclists and pedestrians more visible. The [Infrastructure and Multimodal Connectivity](#) chapter provides details on the types, amount of separation, and context for these specific types of bicycle and pedestrian infrastructure.

Bicycle facilities on park roadways are generally limited, as many park roads balance motorized vehicle access needs with resource protection. As a result, many park roads are narrow and often lack shoulders. In these cases, other measures such as signs, pavement markings, rumble strips, reduced speed limits, and high-visibility crosswalks may provide cues to drivers that bicyclists and pedestrians are likely to be using the road.

Federal Highway Administration (FHWA) BIKESAFE and PEDSAFE

The FHWA Bicycle Safety Guide and Countermeasure Selection System and Pedestrian Safety Guide and Countermeasure Selection System (BIKESAFE¹ and PEDSAFE²) provide information on how to improve safety for pedestrians and bicyclists through an online selection tool. The online tool provides the user with a list of possible engineering, education, or enforcement treatments to improve bicyclist and pedestrian safety and/or mobility based on user input about a specific location. The associated websites have information on countermeasures for specific situations, including intersection treatments, shared roadway facilities, multiuse trails, and markings, signs, and signals. These online tools discuss the importance of data, including bicycle crash data, pedestrian crash data and other related data; this data can be used to identify safety issues and inform different solutions in the categories of engineering, education, enforcement, and emergency response.³ For more information about data collection and count technology, see the [Innovative Technologies and Emerging Trends](#) chapter.



Road Safety Audit (RSA)

By considering how and where bicyclists and pedestrians travel, parks can evaluate potential points of conflict between different transportation modes.^{4,5} An RSA is an examination of an intersection or stretch of roadway, undertaken to identify opportunities for improvements in safety for all road users. In some cases, an RSA can help to analyze, evaluate, and recommend safety interventions for transportation facilities. In addition, RSAs can help parks and their partners understand all roadway users' actions on the road (both intentional and unintentional). The FHWA provides guidance on how to conduct an RSA, which can result in engineering, education, enforcement, and emergency response countermeasures to improve roadway safety.⁶

Roadway Reconfigurations and Other Infrastructure Modifications

One potential strategy to improve bicycle and pedestrian safety is reconfiguring roadways to reallocate space on the road for bicyclists and pedestrians. This is often referred to as a road diet. In a park setting, this is most likely to be done through narrowing a two-lane roadway with shoulders to create space for bicyclists where the roadway shoulders are located. Road diets improve overall safety and comfort for bicyclists and pedestrians, and often enhance the efficiency of vehicle operation.

Reducing lane width encourages drivers to travel at lower speeds, resulting in traffic speeds that are closer to the posted speed limit. Lower traffic speeds enhance safety by decreasing the severity of injuries in the event of a crash.⁷ These factors combine to create a safer and more comfortable roadway for all users. Before reconfiguring a roadway, parks should consider working with transportation experts to evaluate traffic speeds, volumes, and the types of vehicles using the road.⁸

Some national parks may face challenges incorporating bicycle and pedestrian infrastructure along existing roads. In some cases, the roads are too narrow to include dedicated space for these modes, and narrowing lanes could be less safe for bicyclists. In some instances it might not be possible for a park to widen a roadway due to footprint constraints in the natural environment, or due to the historical context. In addition, many park roads do not have shoulders, so alternate and context appropriate solutions such as signs, vehicle speed reduction, changes in operational policies such as car-free opportunities at certain times of day, and other interventions can create a safe place for bicyclists and pedestrians. For more information about car-free opportunities, see the [Open Streets](#) chapter.

For example, Mount Rainier National Park in Washington faces historic constraints for a number of roads in the park that were designated as part of the Mount Rainier National Historic Landmark District. The park was established in 1899, and most of the road system was constructed between 1911 and 1940. These roads are narrow and winding with little to no shoulder, and cannot be reconstructed because of their historic status and purpose. While these roads cannot be widened, other roads in the park have been damaged by flooding or other natural events; these damaged roads have been closed to motor vehicles, but remain open for nonmotorized users, offering a car-free environment for visitors to explore.

By considering the local context of the park in relation to the surrounding environment, community, and existing transportation systems, parks and partner agencies can identify areas to incorporate safe opportunities to walk and bicycle.

Roadway Treatments to Improve Safety for Bicyclists and Pedestrians in Mixed Traffic

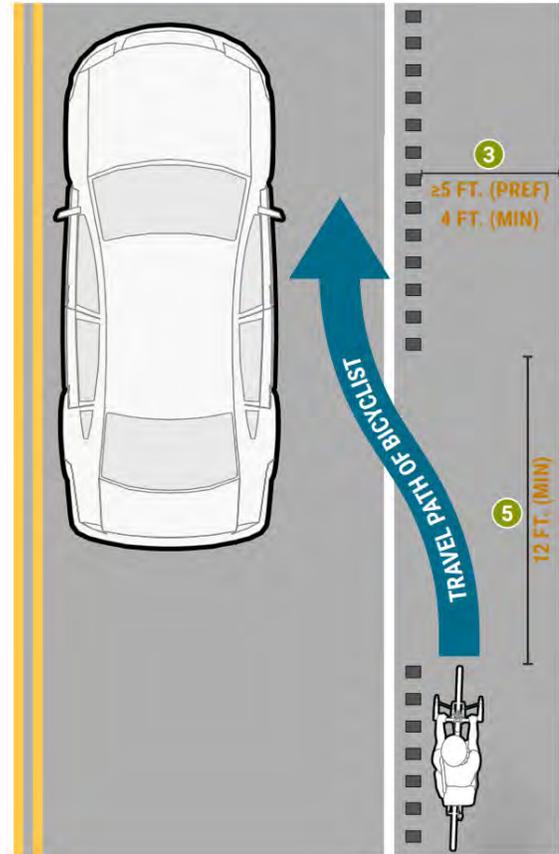
Some types of infrastructure are geared towards alerting drivers of the presence of bicyclists and pedestrians who may be using or crossing the roadway, encouraging them to drive in a way that promotes safety. The section below includes information on rumble strips, speed limits, signs, and dynamic warning systems, all of which can be added treatments along roadways to improve safety for bicyclist and pedestrians. These interventions can be considered alongside the bicycle and pedestrian, and intersection treatments in the [Infrastructure and Multimodal Connectivity](#) chapter.

Rumble Strips

Rumble strips are repeated and uniform divots in pavement, which are applied along the edgeline or centerline of the roadway. They create a tactile vibration and an audible rumbling transmitted through the wheels to the vehicle to warn motor vehicle drivers that they are drifting out of their lane.

- Context:** To accommodate bicycles and pedestrians, rumble strips should be placed adjacent to the roadway edgeline with an outside shoulder of at least four feet. Placing rumble strips on shoulders narrower than four feet can create unsafe conditions for bicycling. Bicycle-friendly rumble strips have 12-foot gaps every 60 feet to allow bicyclists to easily enter and exit the shoulder without having to ride over the rumble strip.
- Safety implications:** Rumble strips alert drivers that they are leaving their travel lane. On roads where bicyclists tend to ride in the shoulder, this alert mechanism may reduce collisions between vehicles and active transportation modes.
- National park resource and landscape considerations:** Because of the noise that rumble strips generate when vehicles depart from their lane, rumble strips should only be used in locations that are not part of a sensitive soundscape. When considering the use of rumble strips, parks can gather input from the cyclist community and

DESIRABLE (FOR BICYCLISTS) CROSS SECTION



UNDESIRABLE (FOR BICYCLISTS) CROSS SECTION



ADEQUATE CROSS SECTION



CONSTRAINED CROSS SECTION



Figure 4-1: Diagram of rumble strips with undesirable, adequate, and constrained cross sections. (Source: FHWA)



surrounding community on the design. Learn more about rumble strips from the National Cooperative Highway Research Program's [Synthesis 490: Practice of Rumble Strips and Rumble Stripes](#),⁹ [NPS Rumble Strips: National Park Service Review](#),¹⁰ and Adventure Cycling Association's [Rumble Strips Best Practices](#).¹¹

Speed Limits and Signs

A posted speed limit sign is used to inform road or multiuse trail users of the legal requirement of a speed limit. Compliance to speed limit signs is successful when paired with context-specific roadway design and enforcement.

- **Context:** Lower roadway speed limits are often posted along winding roads, through hilly areas, in densely populated or visited areas, or in areas where there is a safety concern. Speed limit signs are also posted along some multiuse trails to reduce conflicts between bicyclists and other trail users. To change roadway or multiuse trail users' speeding behavior, speed limit signs are often paired with speed management, enforcement,

and engineering design techniques, such as road reconfigurations.

- **Safety Impact:** Lower speed limits reduce vehicle speeds and extend the reaction time of drivers, bicyclists, and pedestrians to unexpected events; they also correlate with decreases in crash and injury severity. For both bicyclists and pedestrians, higher speed limits—and thus higher vehicle speeds—correspond with higher probability of a bicyclist or pedestrian fatality in the case of a collision.¹²

Learn more about speed limit signage used on an NPS parkway from the [NPS Natchez Trace Parkway Bicycle Planning Study](#).¹³



Figure 4-2: A bicyclist on Rock Creek Parkway in Washington D.C. (Source: Connor Donevan)

Warning Signs

Table 4-1 includes a definition, context, and image of bicycle warning signs, ‘Bicycle May Use Full Lanes’ signs, and pedestrian crossing signs. Additionally, the use of dynamic warning signals for safety purposes is also discussed below. Wayfinding and other signs are further explored in the [Infrastructure and Multimodal Connectivity](#) chapter.

Table 4-1: Description of Bicyclist and Pedestrian Warning Signs

Sign Type	Definition	Context
<p>‘Bicycle May Use Full Lane’ sign and bicycle warning sign</p>  <p>Figure 4-3: ‘Bicycle May Use Full Lane’ and Bicycle warning signs (Source: adapted from the MUTCD)</p>	<p>Signs along the road that designate the roadway as a preferred route for bicycles.</p>	<p>Combinations of bicycle signs can be used at locations where roadway travel lanes are too narrow for bicyclists and motor vehicles to operate side-by-side or other locations where there is a higher risk for collision. The sign can call attention to all roadway users, communicate safe behaviors to avoid conflicts, and increase visibility.</p> <p>NOTE: Bicycle warning signs are sometimes installed with other signs to give direction to roadway users. Some states, such as Oregon and Delaware, have phased out ‘Share the Road’ signs because the phrase was determined to be too ambiguous in meaning. It is being replaced with ‘Bicycle May Use Full Lane’ signs.</p>
<p>Pedestrian crossing sign</p>  <p>Figure 4-4: Pedestrian crossing sign with arrow (Source: MUTCD)</p>	<p>Signs on the road or trail alerting drivers or bicyclists that a pedestrian crossing is coming up and that pedestrians are likely to be crossing.</p>	<p>Signs on roads or trails can alert trail users that a crossing is coming up and provide instructions on its safe navigation. For example, some crossings have signs asking bicyclists to dismount before they cross a road, ensuring they slow down and make themselves visible to cars. Other trails bypass road crossings by using an overpass or underpass. This is particularly helpful when a trail passes a major road with high traffic volumes and high speed traffic.</p>



Dynamic Warning Signals for Bicycles

Dynamic warning signals are bicyclist-activated lights paired with warning signs to increase driver awareness of bicyclists on the roadway. This is a supplemental measure, which can be added to already installed signs or co-installed with signs and pavement markings. Consider the following:

- **Context:** Dynamic warning signals are often used on roadways with narrow lanes or areas where vehicles encroach on bicycle space, potentially exposing bicyclists to collisions with drivers; these locations can include rural roadways and narrow bridges, or tunnels. These signals are considered when there are no other safe routes for bicycle travel.
- **Safety Implications:** Dynamic warning signals alert motorists with flashing lights to the real-time

presence of bicyclists on roadways. Drivers will be alerted that they will need to share the roadway with bicyclists.

- **Potential Impact on National Park Resources and Landscapes:** These signals can be installed with solar panels to reduce roadside hardware and power connection needs. Since these warning signals produce light at a fixed point, parks and locations with expansive vistas, night sky programs, etc. should take this into consideration.

Learn more about the use of dynamic warning signals in mixed traffic from Oregon Department of Transportation's 2009 [Traffic Manual](#).¹⁴ Learn more about pedestrians and bicyclists crossing traffic in the [Infrastructure and Multimodal Connectivity](#) chapter.



Figure 4-5: Bicyclist-activated dynamic warning signals indicate to vehicles that bicyclists are present on the road. (Source: Google Streetview)



Improving Safety with Education and Information

The development and implementation of successful safety campaigns, and the effective dissemination of visitor safety information can support safe environments for pedestrians and bicyclists. Components may include building staff support, creating a safety culture, building law enforcement support, partnering, sharing safety information and materials, and wayfinding and signs.

Building Staff Support

The involvement of NPS staff and partnering agencies in the development and deployment of a safety campaign is important, as this involvement can lead to a more effective safety program for visitors. Internal staff members or volunteers who are opposed to bicycling on park roads may inhibit public outreach success; therefore it is important to understand the reasons behind opposition, as well as to communicate the benefits of bicycling and walking. An organized all-staff workshop or bike ride are both useful and enjoyable activities to encourage support and understanding for bicycling and walking in the park.

Creating a Culture of Safety

In addition to fostering staff support, educational tools can be used to target a variety of age levels and settings in order to promote awareness of active transportation safety issues. Parks and partners can use educational techniques from the [National Highway Traffic Safety Administration \(NHTSA\) Highway Safety Countermeasure Guide](#),¹⁵ which outlines several educational techniques as part of school programs. These techniques may apply, for instance, to school groups visiting parks. Park staff or safety ambassadors, who are often volunteers that patrol trails and roadways on bicycles to provide assistance to visitors, can distribute safety pamphlets or conduct safety discussions with youth safety clubs, safe routes to school programs, or at active transportation events. Park staff are integral in creating a culture of safety and can encourage all staff to participate in safe practices and risk management processes in the [NPS Operational Leadership](#) program.¹⁶ Adults can learn

about bicycle and pedestrian safety through safety ambassadors, who can provide information along the multiuse trail or roadway. Safety ambassadors can provide this information at active transportation events, or through formal safety training programs. They can also work in coordination with law enforcement officers to reinforce safe behaviors. Understanding the risks of bicycling and walking will reinforce the need for safety on transportation facilities, which are often highlighted in RSAs.

Building Law Enforcement Support

Law enforcement officials are responsible for enforcing traffic regulations related to bicycle and pedestrian safety (see the “Improving Safety Enforcement Strategies and Emergency Response” section below). Law enforcement can be NPS law enforcement or local/state law enforcement, where there is concurrent jurisdiction. Involving law enforcement in planning infrastructure, RSAs, or educational campaigns can help them understand where safety issues exist and what the needs of bicyclists and pedestrians are, which may help them to effectively target their enforcement efforts. Similarly, law enforcement personnel may know where crashes or other conflicts tend to occur, and can help parks and local partners target safety campaigns to these areas.

Partnering

Partnering with a local, state, tribal, or national active transportation advocacy group is one way to leverage their expertise and connections in gateway communities and beyond. Bicycling and walking advocacy groups can provide resources and information on safety, guidance on bicycling/walking best practices, and connections to the cycling community, media, tourism, local government, and other important outreach contacts. In addition, parks could require concessionaires that lead bicycle groups or rent bicycles to visitors to provide safety training to their customers.

Sharing Safety Education Information and Messaging

Safety information can be distributed through printed materials, websites, in-person communication, or



social media to educate and encourage safe driving, walking, and bicycling behavior. Communications can include different messages for different roadway users. For example, parks and partners could communicate to drivers that they should expect and yield to bicyclists and pedestrians, while informing bicyclists of proper hand signals and areas for safe bicycling. Often, safety campaigns are more effective if they are targeted to a particular audience or a specific issue. Understanding visitor behaviors can allow park staff and partners to identify critical audiences and develop targeted messaging.

Messaging could include information on:

- Relevant rules and regulations for the park and local jurisdiction (e.g., organized group size restrictions and permitting requirements, local helmet laws, sharing the road, and safe passing distance requirements between bicycles and vehicles);
- Where to walk and bike, and where walking and biking may NOT be allowed or safe;

- When to walk and bike to avoid high volumes of vehicle traffic;
- Proper bicycle safety equipment (e.g., recommendations for wearing helmets, reflective clothing, and bicycle lighting);
- Where to find route maps and park information;
- Promotion of active transportation-related events; and
- Camping information for accommodating bicycles.

Digital mapping can offer valuable trip planning information to improve the safety and experience of visitors, park staff, and partners. Digital mapping uses online mapping tools to communicate park-specific and real-time information for all users. NPS park websites¹⁷ and other third party websites sometimes offer interactive digital maps that improve trip planning through sharing information of transit schedules, bicycle and pedestrian routes, and live data related to congestion, weather, etc. For example, the [San Antonio Missions Trip Planner](#)¹⁸ offers interactive



Education Best Practice: Blue Ridge Parkway and Shenandoah National Park

Blue Ridge Parkway and Skyline Drive in Shenandoah National Park in Virginia partnered with Adventure Cycling Association to develop a bicycle safety campaign work plan.²⁰ The campaign will focus on educational strategies to improve safety for bicyclists and all road users on both facilities.

- The main educational strategies include the creation and dissemination of printed and online materials that inform bicyclists and drivers about sharing the road practices and bicyclist visibility.²¹ Shenandoah National Park is partnering with the Shenandoah Valley Bicycle Coalition to promote these safety practices in gateway communities.
- Data collection is another central part of this bicycle safety campaign. Both parks would like to find ways to implement bicycle count technology which will be analyzed to better understand bicycle visitation over time. For more information about data collection and count technology, see the [Innovative Technologies and Emerging Trends](#) chapter.



Figure 4-6: Skyline Drive in Shenandoah National Park, often used by bicyclists. (Source: NPS)

digital maps online for active transportation trails with specific details on the trail type and places of interest for pedestrians and bicyclists. Active transportation users can research their trip to San Antonio Missions National Historical Park in advance to find the safest and most comfortable route.

Wayfinding and Signs

Wayfinding and signs provide valuable information to active transportation and roadway users. Wayfinding uses maps and signs to improve visitor understanding and experience of a place. Digital wayfinding kiosks or bicycle and pedestrian maps can also be used for wayfinding; these resources can be easily updated with new, relevant information as it becomes available. With effective wayfinding systems, active transportation users can navigate NPS units in a more comfortable and more predictable way, which will improve safety for all roadway users. Signs communicate bicycle and pedestrian safety laws and regulations to all roadway users.¹⁹ Often, signs alert drivers to the potential presence of bicycles or pedestrians, while advising drivers to proceed with caution. See the [Infrastructure and Multimodal Connectivity](#) chapter for more information on wayfinding signs.

Improving Safety Enforcement Strategies and Emergency Response

To create safer environments for bicyclists and pedestrians, law enforcement and emergency services plans should consider the specific needs and vulnerabilities of these users.²² Depending on roadway ownership, law enforcement may be the responsibility of the local jurisdiction, NPS rangers, or in partnership with municipal or state police.

Law enforcement efforts should focus on drivers, as well as bicyclists and pedestrians. Enforcement is particularly important at new active transportation facilities and in areas that attract young or inexperienced bicyclists. Policy can be used to promote bicycle and pedestrian safety within parks and their surrounding areas. Policies may be directed at bicycles and pedestrians or at other roadway users, such as

motorized vehicles, to ensure these roadway users are practicing safe behaviors. For drivers, law enforcement should focus on crosswalk and stop sign compliance, bicycle passing distance, congestion in parking lots, cell phone use while driving, and speeding, especially in high pedestrian and bicycle activity areas. For pedestrians and bicyclists, law enforcement emphasis is critical for safe walking along roads; yielding to traffic when crossing at unmarked and mid-block locations; bicyclist speeding and following single file riding regulations; and resource-damaging activities like bicycling off trail. NPS law enforcement activities can include safety education for bicyclists, motorists, and pedestrians. NPS policies can be used to encourage bicycling during high visibility hours, increasing the overall safety of all road users. For more information, see the [Natchez Trace Parkway Bicycle Planning Study](#) example below.²³

Emergency response plans should encourage the implementation of design elements that would accommodate emergency response vehicles along bicycle and pedestrian routes. Such design accommodations might include the provision of adequate roadway, sidewalk, or multiuse trail width; the installation of multiuse/multi-purpose signs; or the installation of other infrastructure such as gates or removable bollards. Parks or partners may consider arranging a service that travels to bicyclists to provide repair services or bicycle supplies, particularly when parks are long distances from bicycle shops. Providing this service with partners or vendors could increase comfort and confidence for visitors who may fear bicycle breakdowns.



Figure 4-7: NPS law enforcement at Natchez Trace Parkway. (Source: Saara Snow)



Education and Enforcement Best Practice: Natchez Trace Parkway

Natchez Trace Parkway, which runs from Nashville, Tennessee to Natchez, Mississippi, has made significant efforts to build awareness of bicycle safety practices and enhance safety enforcement.²⁴ The Natchez Trace Parkway is a premier cycle touring destination. The park partnered with the Natchez Trace Parkway Association and Adventure Cycling Association to implement a bicycle safety campaign in 2014, in response to bicyclist fatalities caused by vehicle speeding and distracted driving. The goals of the campaign were to:

- Rebrand the parkway as a national park instead of a commuter route;
- Create understanding and cultural acceptance that the parkway is a multiuse road, to be safely and respectfully shared by all road users;
- Educate and encourage safe driving and cycling behavior; and
- Measure cyclists' use of the parkway.

After receiving feedback from public meetings in gateway communities along the parkway, the park focused on four areas to improve safety for bicyclists: education/outreach, visibility/enforcement, signs, and data collection. The Natchez Trace Parkway Association raised money to help fund these efforts, including a bicycle light giveaway program to promote visibility; public service announcement “share-the-road” messages on local radio

and television stations; installing safe passing signs; installing bicycle counters; and working with the U.S. Department of Transportation Volpe Center to study the effectiveness of these strategies.²⁵ The park's involvement included participation by staff from many different departments, including interpretation, law enforcement, maintenance, and resource management, providing the internal support needed for the success of the campaign. Additionally, partnering with outside groups allowed the park to draw from additional expertise, resources, and connections.



Figure 4-8: Visitors riding bicycles on the Natchez Trace Parkway. (Source: NPS)



Figure 4-9: NPS employees installing bicycle signage at Natchez Trace Parkway. (Source: NPS)



Additional Resources

FDOT Pedestrian and Bicycle Safety Webpage.

<http://www.fdot.gov/safety/2A-Programs/Bicycle-Pedestrian.shtm>

FHWA Bicycle and Pedestrian Program, Designing Sidewalks and Trails for Access Webpage.

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks208.cfm

FHWA Road Safety Audits.

<https://safety.fhwa.dot.gov/rsa/>

FHWA Safety Benefits of Walkways, Sidewalks, and Paved Shoulders.

https://safety.fhwa.dot.gov/ped_bike/tools_solve/walkways_trifold/

NHTSA Countermeasures that Work (2013).

<https://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf>



End Notes

- ¹ FHWA BikeSafe. <http://www.pedbikesafe.org/bikesafe/index.cfm>
- ² FHWA Pedsafe. <http://www.pedbikesafe.org/pedsafe/index.cfm>
- ³ FHWA Pedestrian and Bicycle Safety. https://safety.fhwa.dot.gov/ped_bike/
- ⁴ FHWA Bicycle Road Safety Guidelines and Prompt Lists (2012). https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa12018/
- ⁵ FHWA Pedestrian Road Safety Guidelines and Prompt Lists (2007). <http://www.pedbikeinfo.org/cms/downloads/PedRSA.reduced.pdf>
- ⁶ FHWA Road Safety Audits. <https://safety.fhwa.dot.gov/rsa/>
- ⁷ FHWA Traffic Calming ePrimer. https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm
- ⁸ FHWA Road Diets (Roadway Reconfiguration). <https://www.fhwa.dot.gov/innovation/everydaycounts/edc-3/roaddiets.cfm>
- ⁹ NCHRP Synthesis 490: Practice of Rumble Strips and Rumble Stripes (2016). https://www.adventurecycling.org/default/assets/File/Travel_Initiatives/Rumble%20Strips/2016%20Rumble%20Strips%20-%20NCHRP%20report%20490.pdf
- ¹⁰ NPS Rumble Strips: National Park Service Review (2016). <http://www.adc40.org/presentations/summer2016/Rochat1%20TRB16.pdf>
- ¹¹ Adventure Cycling Association. Rumble Strip Best Practices. <https://www.adventurecycling.org/bicycle-tourism/national-advocacy-projects/rumble-strips/>
- ¹² Tefft, B. Impact of Speed and a Pedestrian's Risk of Severe Injury (2013). <http://www.sciencedirect.com/science/article/pii/S000145751200276X>
- ¹³ NPS Natchez Trace Bicycle Planning Study (2016). <https://rosap.ntl.bts.gov/view/dot/12330>
- ¹⁴ Oregon Department of Transportation Traffic Manual (2009). <ftp://ftp.odot.state.or.us/techserv/Traffic-Engineering/Litigated/trafficmanual101019.pdf>
- ¹⁵ NHTSA Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Office, 8th Edition (2015). <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/812202-countermeasures-that-work-8th.pdf>



¹⁶ NPS Operational Leadership Program.

https://www.nps.gov/training/nrs/academy/G_both_graphic/operational_leadership.html

¹⁷ NPS Find a Park. <https://www.nps.gov/findapark/index.htm>

¹⁸ NPS San Antonio Missions National Historical Park

<https://www.nps.gov/saan/planyourvisit/directions.htm>

¹⁹ NPS National Mall and Memorial Parks: New Pedestrian Guide Signs (2009).

<https://parkplanning.nps.gov/document.cfm?parkID=427&projectID=24465&documentID=25959>

²⁰ Adventure Cycling Association. Bicycle Safety Accessibility Campaign Workplan (2016). Internal document, no link is publicly available.

²¹ Center for Disease Control and Prevention (CDC). Injury Prevention & Control: Motor Vehicle Safety.

<https://www.cdc.gov/motorvehiclesafety/bicycle/>

²² Florida Department of Transportation: Pedestrian and Bicycle Safety Webpage (2016).

<http://www.fdot.gov/safety/2A-Programs/Bicycle-Pedestrian.shtm>

²³ NPS Natchez Trace Bicycle Planning Study (2016). <https://rosap.nrl.bts.gov/view/dot/12330>

²⁴ Ibid.

²⁵ Ibid.



Chapter 5: Partnerships and Funding

This chapter describes the important role partnerships play in building connections between communities and national parks and helping them achieve common goals. It discusses recent successes parks have had working with partners, including leveraging resources, technical expertise, and funding.



Introduction

Parks and partners can coordinate to create multimodal transportation opportunities, both within park boundaries, and beyond park boundaries to connect with surrounding transportation networks. These connected networks better accommodate a variety of visitor modal preferences and abilities, and provide better access between parks and communities. Coordination often also requires engaging in state, metropolitan, and local planning processes. This involvement could open the door for exploring potential partnerships and may provide opportunities to access and leverage external funding. Partnerships can help national parks and their surrounding communities achieve common goals, while also providing considerable benefits, including leveraging resources, staff support, and funding.

This chapter provides an overview of the important role that partnerships play in building connections between communities and national parks. Furthermore, it explores the role of partnerships in securing funding and provides relevant case studies of recent successes. As many partnerships are defined through formal agreements, the chapter also discusses the use of agreements as tools through which to define roles and responsibilities in managing infrastructure, projects, and programs.

Promoting Active Transportation through Partnerships

Local partners, such as national park friends groups, city and state governments, and walking and bicycling advocacy groups, can help promote and improve opportunities for active transportation to and within parks. Partnerships can benefit active transportation projects located within or beyond park boundaries, championed by NPS staff or a partner. Partnerships can have many different purposes:

- Promoting awareness and excitement about active transportation in national parks;
- Finding support and champions among a wide range of stakeholders;
- Pursuing and securing funding;

- Utilizing non-funding resources, such as labor and technical expertise, to complete projects;
- Collaborating on planning products, programs, and projects;
- Improving bicycling and pedestrian infrastructure in gateway communities;
- Receiving diverse and useful input; and
- Encouraging continuous engagement and participation by the community in planning transportation facilities.

Park visitors often bring economic benefits to local gateway communities, which can be a motivating factor for parks and communities to pursue partnerships. Improving pedestrian and bicycling networks can accommodate more visitors and extend stays in gateway communities. Active transportation facilities within and around parks help improve quality of life and attractiveness for residents, who often value places to walk and bicycle safely within and near their surrounding communities. Additional economic benefits include higher public tax revenues, increased jobs related to recreational visits, new businesses related to trails, and direct spending attributed to trail users.¹ A low cost way to improve active transportation connections to a park is to work with gateway communities to ensure routine resurfacing and maintenance of access roads to the parks includes improvements to pedestrian and bicycling infrastructure, where appropriate.

NPS staff and partners can maintain project momentum and support through regular communication with project stakeholders. The NPS can share information with park visitors and stakeholders by holding workshops for surrounding community stakeholders to discuss active transportation efforts, and by distributing newsletters and project updates to maintain engagement. Local user groups, advocacy groups, or friends groups can also communicate active transportation efforts and accomplishments through their organizations' networks. For example, bicycle organizations can disseminate park information and trail maps to local bicycle shops, the bicycling community, elected officials, and agency contacts (tourism, transportation, etc.).²



Potential Partners

Partners have various interests, roles, and responsibilities, which are relevant to different components of active transportation plans and projects. Finding internal NPS supporters and external partners is key to building enthusiastic support for walking and bicycling. Often, initiatives are strengthened by having a “champion,” or a person who is willing to lead or spearhead a project, event, or push a cause forward, and use their knowledge,

expertise, and connections to maintain momentum. Champions are often NPS staff or passionate local residents within the community. This role is usually based on a person’s interests, experience, commitment to seeing a project implemented, and desire to enhance access to resources.

Table 5-1 below identifies external partners, including both public and private entities that may value and benefit from shared active transportation projects within and near NPS parks.

Table 5-1: Description of External Partners

Partner	Description	Example
State and local governments	State and local governments include community, municipal, county, state, and tribal governments. These different levels of governments and agencies can assist in gathering input from a wide range of stakeholders. Often the state department of transportation (DOT) or the city DOT have ongoing transportation construction and maintenance programs, and may own transportation facilities that offer the necessary rights-of-way to connect communities and parks. Therefore, engaging these agencies can be critical to making these connections.	City of Grandview in Missouri partnered with the NPS Harry S. Truman National Historic Site to complete a multiuse trail. ³
Metropolitan Planning Organization (MPO)	MPOs are federally funded transportation policy-making organizations for any urbanized area with a population greater than 50,000, and include representatives from local government and transportation authorities. MPOs develop a long range transportation plan (LRTP) and a transportation improvement program (TIP), along with other planning documents. LRTPs and TIPs are discussed in more detail in the Planning and Project Development chapter. The FHWA Metropolitan Pedestrian and Bicycle Planning Handbook documents practical information and examples for planning bicycle and pedestrian facilities. ⁴	Northwest Indiana Regional Planning Association is coordinating an effort to build a trail, the Marquette Greenway, which connects several towns and cities in northwest Indiana and extends through the Indiana Dunes National Park. ⁵
User groups and friends groups	User groups represent an organization of people who utilize the park in a similar way. Friends groups can provide an outlet for citizens’ passion about a park’s mission. These groups often fundraise for parks, assist with park events and other tasks, and can provide parks with important input from park users and interested individuals.	International Mountain Bicycling Association , ⁶ a user group, promotes friendly and safe policies for mountain bicyclists within national parks and other federal lands.



Table 5-1: Description of External Partners

Partner	Description	Example
Organizations representing people with disabilities	Parks may consider establishing partnerships with groups that represent people with disabilities, which can include federally funded programs, such as Centers for Independent Living and Independent Living Services , ⁷ or nonprofit organizations. These groups often advocate for disabled persons and can provide parks with crucial information about accessibility and how to include the disabled. ⁸ The NPS National Accessibility Branch ⁹ can help guide parks on accessibility design standards inside and outside of park boundaries. Parks and partners can reach the NPS National Accessibility Branch through their email, accessibility@nps.gov . The U.S. Access Board is a federal agency that promotes equality for people with disabilities through guidance in accessible design for the built environment, including active transportation facilities. ¹⁰	Easter Seals ¹¹ is a nonprofit organization that has worked to promote NPS efforts in accessibility to the disabled, such as the Access Pass, which allows those with disabilities to access entry to most federal lands for free. ¹²
Advocacy groups	Advocacy groups are typically mission-driven nonprofit organizations, and there are many whose mission aligns with that of the NPS. Advocacy groups may even be established primarily to assist or benefit a specific park area, a series of park areas, a program, or the entire national park system.	People for Bikes ¹³ often advocates for the development of bicycle facilities and promotion within national parks.
Organizations representing underserved communities	There are many nonprofit groups or community organizations that represent minority groups or underserved communities. These groups can partner with parks to encourage and empower culturally and racially diverse community members to engage with wilderness and parks. Often, these groups hope to inspire the community to become long term environmental stewards with strong connections to the natural world in both the wilderness and their communities.	WildLink ¹⁴ has partnered with Yosemite National Park to encourage California high school students from diverse backgrounds to experience wilderness and public lands.



Table 5-1: Description of External Partners

Partner	Description	Example
National partners	National partners include federal governmental agencies. The Federal Highway Administration (FHWA) and the Department of Interior (DOI) can provide resources and documents to guide parks in transportation planning. These national partners can also impact local governments through rulemaking and funding distribution, and often offer guidance to local government.	The FHWA ¹⁵ offers NPS staff high level guidance in federal regulation and legislation that is relevant to the NPS and partners.
Federal Land Management Agencies (FLMAs)	FLMAs are agencies within the federal government that manage public lands. The NPS is a FLMA, along with the U.S. Bureau of Land Management, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, and U.S. Forest Service. The NPS and partners can collaborate with other FLMAs on programs and policy development, and also on projects where the agencies have units in close proximity to each other. In addition, partnering with other FLMAs can be an avenue for sharing best practices and lessons learned on active transportation projects.	The NPS and partnering FLMAs collaborated in the development of data collection for the Collaborative Visitor Transportation Survey (CVTS) . ¹⁶ This partnership established a streamlined process for pre-approved transportation survey questions by the Office of Management and Budget.
Private companies, business associations, and tourism associations	Private companies, business associations, tourism associations, and other organizations in the surrounding communities can be partners. These groups may have an interest in promoting active transportation for their employees or clientele. Additionally, these groups may want to explore branding the company or organization as active transportation-friendly.	L.L. Bean, an outdoor retailer, contributed funding for a transit system that serves Acadia National Park and the surrounding community. ¹⁷ The system’s buses include bicycle racks, facilitating multimodal connectivity in the park.



The NPS draws on many resources to build support for walking and bicycling in national parks, and to implement projects. Table 5-2 includes resources that provide technical assistance in transportation planning, engineering, and construction to NPS units.

Table 5-2: Technical Assistance Support Groups

Resources	Description
NPS Federal Lands Transportation Program Coordinators ¹⁸	<p>Each NPS region has a Federal Lands Transportation Program Coordinator, who oversees the programming and funding for transportation projects in the region, including bicycle and pedestrian facilities. These coordinators, in partnership with Federal Lands Highway, are jointly responsible for administering transportation funds. Federal Lands Transportation Program Coordinators and regional transportation staff are valuable resources for park staff, because they can connect parks to technical resources and advise on funding opportunities.</p>
NPS Rivers, Trails, and Conservation Assistance Program (RTCA) ¹⁹	<p>The RTCA program provides technical support to communities and parks for trails, greenways, and other projects. RTCA, a national network of NPS employees who are conservation and recreation planning professionals, collaborates with community groups, nonprofit organizations, tribes, and state and local governments to design trails and parks, conserve and improve access to rivers, protect special places, and create recreation opportunities. The program’s staff provide technical assistance to community groups and government agencies that work to protect and enhance parks; it helps achieve on-the-ground success on projects initiated by the community. The NPS provides this resource to parks and partners with no cost through an application process.</p>
NPS Denver Service Center ²⁰	<p>The Denver Service Center is a contracting service division within the NPS that provides start-to-finish project management and delivery for NPS staff and partners. More specifically, this center can provide expertise and support in contracting, small business support, design and construction, planning, information management, GIS, and many other technical services.</p>
FHWA Office of Federal Lands Highway (FLH) ²¹	<p>The Office of FLH provides transportation planning, engineering, and construction assistance for transportation assets that service the needs of federal and tribal lands. FLH is a part of the FHWA that is divided into three divisions, Eastern, Central, and Western. FLH also administers Federal Lands Transportation Planning funding and Federal Lands Access Program funding to NPS and ensures these programs are administered according to regulation. More broadly, the FHWA provides valuable resources for parks and their partners through technical guidance documents for active transportation.</p>
U.S. DOT Volpe Center ²²	<p>The Volpe Center is a fee-for-service agency within the U.S. DOT that supports FLMAs, including NPS parks, all seven NPS regions, and the Washington Support Office, in addition to state and local agencies and other parts of the U.S. DOT. The Volpe Center works to resolve complex transportation challenges at both the program and project levels. More specifically, the Volpe Center’s Public Lands Team²³ assists FLMAs with bicycle and pedestrian planning and policy; road safety audits; program and policy development; environmental compliance and modeling; multimodal systems planning; long term planning; partnerships and outreach; and stakeholder involvement.</p>



Strategies for Building Connections between Parks and Communities

Building on the relationships formed through partnerships, physical connections can be created between parks and communities, which often begin with transportation planning and project development efforts.

Planning & Project Development

Often, building physical connections between parks and a community requires a preliminary analysis of needs, goals, and alternatives analyses, in order to produce recommendations or preferred outcomes for active transportation facilities. Planning documents can be guided by policies, laws, and initiatives, as outlined in the [Planning and Project Development](#) chapter. The [Infrastructure and Multimodal Connectivity](#) chapter can be used to explore different bicycle and pedestrian transportation facilities, and the [Bicyclist and Pedestrian Safety](#) chapter can be



Local Partnership to Improve Connectivity with the Mantua Greenway

In West Philadelphia, Pennsylvania, NPS RTCA, Philadelphia Local Initiatives Support Corporation, the William Penn Foundation, the Philadelphia City Planning Commission, Commerce Department, and Mantua residents formed a partnership to create the Mantua Greenway. This effort began as a local initiative in the Mantua neighborhood of Philadelphia, and eventually residents

established the Mantua Greenway Resident Advisory Committee. This advisory committee and the partners are planning to fill a gap in Philadelphia's growing bike trail network and simultaneously beautify the neighborhood's northern border along Amtrak's rail tracks. This project will renovate a community greenway along a portion of Mantua Avenue and Parrish Street with the addition of trees, permeable pavement, and other stormwater management infrastructure; murals and art installations; and a tribute to Mantua history and community leaders.²⁴



Figure 5-1: RTCA and community groups have worked together to organize, plan, and renovate the Mantua Greenway, pictured above, which will work to connect residents to several different National Recreation Trails and national parks in the city of Philadelphia, Pennsylvania. (Source: NPS)

This project will improve the connectivity of the bicycle network in Philadelphia, where there are seven trails recognized as National Recreation Trails that help to link four national parks: Edgar Allan Poe National Historic Site, Thaddeus Kosciuszko National Memorial, Gloria Dei Church National Historic Site, and Independence National Historical Park. NPS RTCA staff helped organize community members and stakeholders to conduct a feasibility study, working with the resident advisory committee to coordinate outreach events, and developing a long term maintenance plan.



used to explore different approaches to creating safe active transportation facilities. NPS planning products are often developed by park staff or by consultants with direction from the park staff. These documents organize and prioritize park efforts for improving connections of active transportation networks, and communicate the park's preferred projects to decision makers. They can be used to build support for funding specific projects. Park and surrounding community stakeholders can provide input for external planning documents through attending public meetings and communicating directly with state DOT and MPO staff.

Parks and their partners can advance projects by completing planning documents and preliminary engineering even before funding is available. "Shovel-ready" projects, or proposed projects that are at the stage where construction could begin if funding were provided, are often in a better position to compete for capital grant or program funding, particularly for priority or stimulus-type funding.

Table 5-3 below includes examples of several types of NPS transportation planning documents that can help park staff in the project development process.²⁵ The list below is not exhaustive, and park staff can contact their regional NPS Federal Lands Transportation Coordinator for additional information on which study best suits the needs of the park.

Table 5-3: Sample of NPS Planning Document Types

Planning Document	Description	Example
Bicycle and Pedestrian Plans	Bicycle and pedestrian plans provide research, analyses, and recommendations to promote the safe travel of pedestrians, bicyclists, and motorists. Comprehensive bicycle and pedestrian plans involve various levels of government, institutions, businesses, and the public. In the past, it has not been common for NPS to create a bicycle and pedestrian plan, but NPS does partner with nearby communities to help improve connectivity to and within the park.	<i>Outer Cape Bicycle and Pedestrian Master Plan Final Report</i> ²⁶
Five-Year Active Transportation Plan	A five-year plan for alternative transportation projects can be created to coordinate efforts among partners and stakeholders, and prioritize projects in a specified timeframe. These plans may outline high priority transportation projects involving park resources and identify lead sponsors for each project where applicable. Often, these plans discuss fiscal constraints, identify funding sources and estimate overall project costs.	The case study of the Mississippi National River and Recreation Area on page 5-9 explores the development of their five-year plan.



Table 5-3: Sample of NPS Planning Document Types

Planning Document	Description	Example
Accessibility Conceptual Site Plan	Accessibility Conceptual Site Plans assess the current level of accessibility and identify opportunities for improvement in park programs and services, as well as the park’s facilities and amenities. The findings and recommendations of the plan are intended to guide the park in planning for future projects and incorporating universal design and accessibility into planned work.	Through the Targeted Accessibility Improvement Program, Mammoth Cave National Park in Kentucky constructed a one half mile trail to provide access to the Echo River Spring. ²⁷
Trail Management/ Stewardship Plan	Trail management/stewardship plans aim to identify management objectives and strategies to guide the development, protection, management, maintenance, and use of the trail system within the park over a 15 year period to meet new challenges and opportunities. These plans are consistent with the park’s purpose and related/applicable laws and policies.	Yosemite National Park Half Dome Trail Stewardship Plan ²⁸ discusses trail management, conservation, and visitor experience.
Visitor Use Management Plan	A visitor use management plan develops a collaborative vision for providing for and managing visitor use by aligning visitor opportunities and experiences with the park’s purpose and providing direction for protecting fundamental resources and values.	Delaware Water Gap National Recreation Area Visitor Use Management Plan/Environmental Impact Statement ²⁹
Feasibility Study	A feasibility study can identify potential active transportation improvements and may provide an environmental screening of projects in the NPS unit or gateway community. This type of study typically inventories existing conditions and features alternatives with possible improvements to existing facilities; at times, these studies may present the potential for new infrastructure and programs. The alternatives provided by a feasibility study may present a preferred alternative or may simply narrow options to eliminate alternatives that do not fit the project’s criteria.	Partnership between the NPS and the Cape Cod Commission produced a Bicycle Feasibility Study . ³⁰



Mississippi National River and Recreation Area Five-Year Plan

The Mississippi National River and Recreation Area is located in the Minneapolis-St. Paul metropolitan area, running along 72 miles of the Mississippi River with multiple access points, parks, and trails. NPS staff organize a quarterly meeting with approximately 20 transportation stakeholder representatives from city, county, and other agencies to discuss priorities for the park and other governmental entities in advancing alternative transportation access to

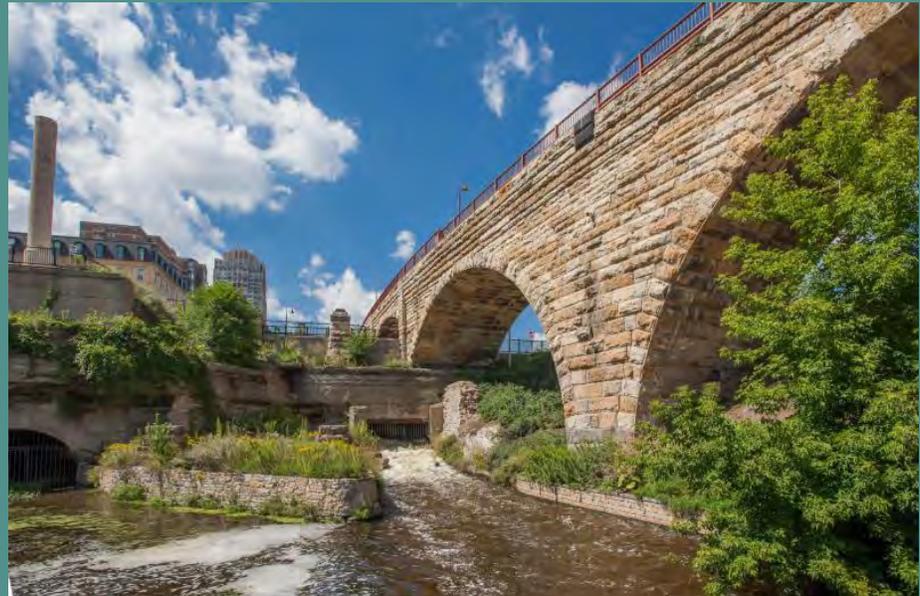


Figure 5-2: Stone Arch Bridge and Mill Ruins Park in Mississippi National River and Recreation Area. (Source: NPS)

and within the park. A key product developed through this partnership is the Five-Year Alternative Transportation System Implementation Plan for fiscal years 2016-2020 (Five-Year Plan). This plan outlines high priority transportation projects involving park resources and identifies lead sponsors for each project (e.g., NPS, city, county, nonprofit). Although the plan is not fiscally constrained, it identifies the amount of funding that each partner has committed to complete each project. The Five-Year Plan enables the park and its partners to show that there is broad support for the projects identified in the plan, and helps each partner make a strong case when requesting funding internal to his/her organization or applying for external funding opportunities for identified projects.

Funding and Partnerships

Partnerships often present opportunities for leveraging funding and other resources. In some cases, a partnership is needed, because an individual entity or agency would not be an eligible applicant for grant funding alone. In other cases, a partnership may create a better and more dynamic effort using shared resources. For example, the Federal Lands Access Program (FLAP) funds transportation facilities located on, adjacent to, or providing access to federal lands, for which title or maintenance responsibility is vested in state, county, town, township, tribal, municipal, or local government on and connecting to federal lands. Only non-federal and tribal partners are eligible to apply for FLAP. This program requires the relevant FLMA or other eligible entity to endorse

the application that must be submitted by the local government, state government, or tribal entity that owns or maintains the transportation facility. Established partnerships between local entities and parks often make more competitive applications to receive funding. For more information on the FLAP program, visit the U.S. DOT Federal Highway Administration, Office of Federal Lands Highway [FLAP program website](#).

Usually, the initial steps of developing a funding application involve collaborating and communicating with potential partners. New funding opportunities sometimes catalyze new partnerships with stakeholders who see value in the potential project. Previously established partnerships are also valuable, because partners already have a shared



understanding of respective needs and interests. Projects with preliminary planning and engineering already completed are often more competitive for grant funding; they demonstrate already dedicated resources to the project, and that construction can begin within a shorter time frame.

Federal Funding

Various federal transportation funding sources can support active transportation efforts for national parks and their surrounding communities. In 2012, the Moving Ahead for Progress in the 21st Century (MAP-21) Act established the Federal Lands Transportation Program (FLTP), which was formerly called the Federal Lands Highway Program and Park Roads and Parkways Program. The FLTP provides funding to improve transportation infrastructure owned and maintained by FLMAs. The FHWA Office of Federal Lands Highway (FLH) administers the program under the Highways title of the U.S. Code (Title 23). The FLH distributes FLTP funding to the NPS, which then distributes the funding to its regional offices. The regional offices allocate funding to priority transportation projects, a portion of which includes active transportation projects.

As mentioned earlier, the [FLAP program](#)³² can provide funds for active transportation projects to improve transportation facilities that provide access to, are adjacent to, or are located within federal lands. New and rehabilitated facilities must be owned and/or maintained by a state or local agency. In recent years, NPS partners have received FLAP funding for the Bryce Canyon bicycle and pedestrian trail in Utah; the Assateague Gateway bicycle and pedestrian trail in Maryland; and the Pullen Creek Stream bicycle and pedestrian walk in Alaska; among many other active transportation facilities. FLTP funding is eligible for use to fulfill the local match requirement of FLAP; the requirement for a local match can range depending on the state, but is typically 20 percent of the project's total cost.

Other federal funding programs considered the most applicable for active transportation projects include the the Transportation Alternatives Set-Aside,³³ Recreational Trails Program,³⁴ and Congestion Mitigation and Air Quality Improvement Program.³⁵ These funding programs are typically accessed

through states or MPOs, and priorities and deadlines for these funding programs often vary from state-to-state. Parks can contact their NPS FLTP Coordinator to discuss project eligibility, program requirements, and partnership ideas. To learn more about external transportation funding opportunities, please visit the NPS Transportation web page on [Funding & Finance](#).³⁶ Also, the FHWA offers a comprehensive table of potential pedestrian and bicycle projects with corresponding federal funding programs, as a part of the [FHWA Bicycle and Pedestrian Program](#).³⁷

Local and Private Funding

Local funding sources for active transportation projects can be line items in budgets from state governments, municipalities, other local governments or nonprofit organizations, or they can be grants from private or public sources, such as walking and bicycling clubs, advocacy groups, health and well-being enterprises and programs, and environmental organizations.

- State agencies can provide funding from the departments of transportation and natural resources, or other state agencies with an interest in active transportation or outdoor recreation.
- Municipalities, cities, townships, and other local government agencies fund bicycle and pedestrian facilities from their capital budgets; these local governments should also plan to maintain these facilities and include additional needs related to bicycle and pedestrian infrastructure in their maintenance budgets.³⁸
- Private interest groups, such as user groups, advocacy groups, or friends groups, may offer funding or fundraise for projects that coincide with their needs and the park's project prioritization.

In general, local funding sources vary by state; parks can develop a better understanding of these funding opportunities by contacting the regional NPS Federal Lands Transportation Coordinator.³⁹ Often, local fund sources are required as a match for federal funding to serve as an indication of the local community's commitment to the project and to further leverage the federal funding.



Formalizing Partnerships through Agreements

NPS parks and their partners often use formal agreements to define roles and responsibilities when working together on mutually beneficial projects, programs, or services. Agreements document the roles and responsibilities for each entity, and outline the terms and conditions for what each entity will provide and receive. This section includes a brief introduction to the types of agreements parks may wish to pursue related to active transportation.

Parks and their partners may wish to enter into formal agreements for a variety of reasons, including defining responsibility for certain programs, to transfer funding, to allow for a specific use on NPS property, or to transfer management responsibilities of NPS property to another entity. The typical elements of a formal agreement often include the following:

- Partners and parties involved
- Background of the effort
- Purpose and need
- Authority under which NPS is allowed to enter into the agreement
- Timeframe of the effort and period of performance for the agreement
- Roles and responsibilities of each entity
- Funding responsibility and budget (if applicable)
- Other requirements (e.g., federal statutes, reporting requirements, points of contacts, terms of termination, etc.)

While agreement types can vary widely, they most commonly take the following forms when related to active transportation:

Friends Group Agreement: These agreements are used with nonprofit organizations that are established primarily to assist or benefit a specific park. They provide the legal and policy framework for the work to be done by a park friends group and are described

in an annual work plan. For example, a friends group may operate a trail ambassadors program in which volunteers greet and establish contact with visitors.

Special Use Permit: Special use permits allow for short-term activities (not to exceed five years) that provide a benefit to an individual, group, or organization rather than the public at large. For example, NPS might issue a special use permit that allows a non-profit group to conduct a group ride or operate regular bicycle tours of the park. Commercial outfitters conducting similar activities would need to secure a Commercial Use Authorization from park staff.

Interagency Agreement: Written between two or more federal agencies, interagency agreements are used to transfer funds and exchange services between federal agencies or DOI bureaus. For example, NPS might enter into an agreement with another federal agency to receive technical services for a trail design or share maintenance with another federal land management agency.

Memorandum of Understanding: These general agreements describe responsibilities and relationships with federal and non-federal partners, including state and local governments, nonprofit organizations, corporations, and individuals. There is no exchange of funding through MOUs and they are generally reviewed every five years. For example, a park may enter into an MOU with a local partner to share operations and maintenance of a trail within park boundaries.

Memorandum of Agreement: MOAs could involve the same parties as MOUs, but they authorize and document the receipt of funds, goods, or services by the NPS from another party. These general agreements are also typically renewed every five years. For example, a local partner may agree to provide engineering expertise for a proposed project.

Cooperative Agreement: These agreements are a mechanism by which to move funding between NPS and partners, including state or local governments, to implement a project or program. For example, the NPS may use a cooperative agreement to transfer funding to a local partner in order to meet match requirements associated with a FLAP grant project.



Easement: In some cases, partners may only be able to make investments in infrastructure if they have a long term ownership interest in the proposed asset. With certain authorities, parks may be able to issue easements or legally convey partial ownership in a piece of property or right-of-way, either temporarily or permanently, without fully divesting of land. An easement is a realty mechanism that can be used for a partner to construct, own, and maintain a transportation facility such as a trail.

 Some examples of active transportation programs and projects that are supported by formal agreements include:

- Acadia National Park manages trail maintenance with Friends of Acadia, under a Friends Group Agreement;
- Capital Bikeshare and the National Mall and Memorial Parks use a special use permit to allow for bike share stations to be positioned on NPS park property in Washington, D.C.; and
- Fort McHenry National Monument uses an easement to allow the Department of Defense better access to its nearby property.

The NPS has also signed national-level MOUs with national bicycle advocacy organizations, including the International Mountain Bicycling Association and Adventure Cycling Association, for providing expertise and support on collaborative bicycling efforts. Individual parks may utilize these agreements for obtaining bicycling support and guidance by reaching out to staff in the NPS Conservation and Outdoor Recreation Division.

The regional NPS Federal Lands Transportation Program Coordinators, contracting and financial assistance office, and regional partnership leads can provide park staff with resources and technical support in pursuing agreement opportunities with partners. [Director's Order #20](#)⁴⁰ provides more information on NPS policies and procedures for administering agreements.



District Department of Transportation MOU for the Anacostia

The NPS entered into an MOU with the District of Columbia Department of Transportation (DDOT) in 2013 for the maintenance and operation of the portion of the Anacostia Riverwalk Trail (ART) on NPS property. The NPS's National Capital Parks-East and DDOT created this MOU as an element of a larger project, called the Anacostia Waterfront Initiative, which was a collaborative effort of several federal agencies and a quasi-governmental organization. While the original initiative launched the construction of the trail with a federal transportation grant, this 2013 agreement focuses on the maintenance and operation of the trail without the transfer of funding. Each party is responsible for securing funding required to perform responsibilities outlined under the MOU. Typically, MOUs are permitted to last around five years, but this agreement lasts for 25 years because it establishes long term responsibilities of each entity. DDOT will maintain the ART's lighting, bridge structures, boardwalks, and pavement, and the NPS will provide sanitation, landscaping, trail signs, and visitor furnishings, such as benches, picnic tables, trash receptacles, etc. The MOU also outlines joint duties between DDOT and the NPS, which include general site inspections and bridge inspections over specified time periods. Additionally, the MOU identifies specific terms of the agreement, such as key points of contact from both parties, terms for dispute resolution, and allowances for modification or termination of the agreement.



Figure 5-3: A child runs on the Anacostia River Walk in Washington, D.C. (Source: NPS)



Additional Resources

Advocacy Advance. How Communities are Paying to Maintain Trails, Bike Lanes, and Sidewalks (2014). https://www.recpro.org/assets/Library/Trails/how_communities_pay_bike_infra_maintenance.pdf

Cape Cod Commission. Outer Cape Bicycle and Pedestrian Master Plan Final Report. <http://www.capecodcommission.org/resources/initiatives/OuterCapeBikePedMasterPlan/OCBMPFinalReport9-2016UpdateFeb2017.pdf>

FHWA Pedestrian and Bicycle Funding Opportunities Website. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

FHWA STIP State of the Practice Review. <https://www.fhwa.dot.gov/planning/processes/statewide/practices/stip/page00.cfm>

National Park Service. Healthy Parks Healthy People U.S. https://www.nps.gov/public_health/hp/hphp.htm



End Notes

- ¹ American Trails. Economic Benefits of Trails Webpage. <http://www.americantrails.org/resources/economics/economic-benefits-trails-macdonald.html>
- ² NPS Collaboration and Conservation: Lessons Learned from National Park Service Partnership Areas in the Western United States (2004). <https://www.nps.gov/orgs/1412/upload/Collaboration-and-Conservation-Western-US-508.pdf>
- ³ Federal Lands Access Program, Missouri. <https://flh.fhwa.dot.gov/programs/flap/reports/documents/mo.pdf>
- ⁴ FHWA Metropolitan Pedestrian and Bicycle Planning Handbook. https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/publications/mpo_handbook/index.cfm
- ⁵ Marquette Greenway Proposal. <http://www.nirpc.org/media/3607/mgposterplanfinalside2.pdf>
- ⁶ International Mountain Bicycling Association Website. <https://www.imba.com/>
- ⁷ Administration for Community Living Website. <https://www.acl.gov/programs/aging-and-disability-networks/centers-independent-living>
- ⁸ NPS Office of Partnerships and Philanthropic Stewardship Webpage. <https://www.nps.gov/orgs/partnerships/index.htm>
- ⁹ NPS Accessibility Webpage. <https://www.nps.gov/aboutus/accessibility.htm>
- ¹⁰ United States Access Board. <https://www.access-board.gov/>
- ¹¹ Easter Seals Nonprofit Organization Website. <http://www.easterseals.com/who-we-are/history/>
- ¹² USGS Access Pass. <https://store.usgs.gov/access-pass>
- ¹³ People for Bikes Website. <http://www.peopleforbikes.org/>
- ¹⁴ WildLink Website. <http://wildlinkprogram.org/about/about-us>
- ¹⁵ FHWA Website. <https://www.fhwa.dot.gov/>
- ¹⁶ Collaborative Visitor Transportation Survey (CVTS) Information Collection Webpage. http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma_lrtп_cvts/cvts_info_collections.htm
- ¹⁷ Friends of Acadia Website. <https://friendsofacadia.org/what-we-do/sustainable-visitation/the-island-explorer/>
- ¹⁸ NPS Federal Lands Transportation Coordinator Contact. <https://www.nps.gov/orgs/1548/contactus.htm>



- 19 NPS Rivers, Trails, and Conservation Assistance Program (RTCA) Webpage. <https://www.nps.gov/rtca/>
- 20 NPS Denver Service Center Website. <https://www.nps.gov/orgs/1804/index.htm>
- 21 Federal Lands Highway Website. <https://flh.fhwa.dot.gov/>
- 22 U.S. DOT Volpe Center Website. <https://www.volpe.dot.gov/>
- 23 U.S. DOT Volpe Center Public Lands Team. <https://www.volpe.dot.gov/publiclands>
- 24 Plan Philly Website.
<http://planphilly.com/eyesonthestreet/2014/04/16/greenway-in-the-works-for-mantua-s-northern-border>
- 25 NPS Catalog of Products and Services.
https://www.nps.gov/subjects/sound/upload/CatalogofProducts_MAY2016_smallfile.pdf
- 26 Outer Cape Bicycle and Pedestrian Master Plan Final Report (2017). <http://www.capecodcommission.org/resources/initiatives/OuterCapeBikePedMasterPlan/OCBPMPFinalReport9-2016UpdateFeb2017.pdf>
- 27 National Park Service Planning, Catalog of Products and Services, Accessibility Conceptual Site Plan, pg 4 (2016). https://www.nps.gov/subjects/sound/upload/CatalogofProducts_MAY2016_smallfile.pdf
- 28 NPS Yosemite National Park Half Dome Trail Stewardship Plan (2012).
<https://parkplanning.nps.gov/documentsList.cfm?parkID=347&projectID=29443>
- 29 NPS Delaware Water Gap National Recreation Area Visitor Use Management Plan/Environmental Impact Statement. <https://parkplanning.nps.gov/projectHome.cfm?projectID=55912>
- 30 NPS Bicycle Feasibility Study in Partnership with the Cape Cod Commission (2010).
http://www.capecodcommission.org/resources/transportation/2010_CCNS_Bike_Feasibility.pdf
- 31 Denali National Park and Preserve LRTP. <https://parkplanning.nps.gov/document.cfm?documentID=82607>
- 32 FLH Federal Lands Access Program. <https://flh.fhwa.dot.gov/programs/flap/>
- 33 Transportation Alternatives Set-Aside Website.
https://www.fhwa.dot.gov/environment/transportation_alternatives/
- 34 Recreational Trails Program Website. https://www.fhwa.dot.gov/environment/recreational_trails/
- 35 Congestion Mitigation and Air Quality Improvement Program Website.
https://www.fhwa.dot.gov/environment/air_quality/cmaq/



³⁶ NPS New Funding Opportunities Website. <https://www.nps.gov/subjects/transportation/funding.htm>

³⁷ FHWA Bicycle and Pedestrian Program Website.
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

³⁸ Advocacy Advance. How Communities are Paying to Maintain Trails, Bike Lanes, and Sidewalks (2014).
https://www.recpro.org/assets/Library/Trails/how_communities_pay_bike_infra_maintenance.pdf

³⁹ NPS Federal Lands Transportation Program Coordinator Contact Webpage.
<https://www.nps.gov/orgs/1548/contactus.htm>

⁴⁰ NPS Director's Order #20.
<https://www.nps.gov/policy/dorders/dorder20.html>

Chapter 6: Visitor Activities and Programs

This chapter discusses how parks and partners can get more visitors walking and bicycling through programming such as guided tours, special events, bicycle travel policies, and touring routes.



Introduction

Offering activities and programs that provide park visitors the opportunity to bicycle or walk can encourage them to learn about or experience the park in new ways. Many park visitors have benefitted from programs and activities, such as a ranger-led walking or biking tour, a partner-led event, or a bicycle touring route that goes through a national park, as just a few examples. These activities and programs can be organized by park staff, concessionaires, volunteers, or friends groups, and also provide an opportunity for parks to partner with nearby communities, nonprofits, or other entities with an interest in encouraging walking and bicycling to and within national parks. As with any effort, providing the public with advance notice and detailed information about these active transportation programs and activities online and in printed materials is an important aspect of a successful program.

Through the provision of fun, safe, and accessible active transportation visitor programs and activities, parks and their partners can get more visitors walking and bicycling. In addition to walking and bicycling during these activities, visitors may choose to walk or

bicycle to the activities as well, either from another location within the park, a nearby community, or even longer distances. Guided or structured opportunities can help encourage visitors who may be new to walking and bicycling in national parks to do so, while also being an attraction for visitors who regularly walk and bike.

Active transportation programs can be designed to accommodate participants of varying ages and abilities, including children and families, older adults, people with disabilities, and people new to bicycling. Offering tours or group rides of various distances and difficulties, as well as promoting them in different ways, can help ensure that parks equitably reach and engage a broad group of visitors. Programs can also be targeted to reach groups that may be less likely to regularly visit the park, such as low-income or minority residents from a nearby community (for example, by providing transportation or partnering with community groups on marketing).

The following sections provide information on several types of visitor programs and activities: bicycle and walking tours and classes, special events, bicycle touring routes, and policies promoting bicycle



Figure 6-1: A Ranger leads a bicycle tour at Governors Island National Monument in New York City, New York. (Source: NPS)



and pedestrian travel. The chapter also includes information on how websites, maps, and other tools can help communicate information about these programs to park visitors, and discusses key considerations for parks and partners interested in implementing or expanding active transportation programs and activities.

Bicycle and Walking Tours and Classes

A number of parks offer regular or occasional bicycle or walking tours led by park rangers or volunteers, which provide visitors an opportunity to learn about and see the park's natural or cultural resources while engaging in physical activity. For example, Everglades National Park in Florida offers a number of free guided bicycle tours in different areas of the park. Visitors are encouraged to bring their own bicycles or rent them from a park concessionaire.¹ In an urban context, Boston National Historical Park has occasional free walking tours led by a NPS ranger on portions of the Freedom Trail, a delineated route along city streets connecting historic sites in Boston, Massachusetts.²

Through obtaining a special use permit (SUP) issued by the park, a nonprofit organization or other entity could also lead bicycle and walking tours in parks. Tours could also be operated by an approved park concessionaire, in which case these activities must be mutually agreed upon by the park and concessionaire in the concession contract.

External companies and organizations, both for-profit and nonprofit, may also organize commercial tours for walking and biking activities in national parks. The walking and biking tours offered by these groups vary in size and style and require a commercial use authorization (CUA) issued by the park. In general, CUAs and SUPs define the terms and conditions for what is allowed to take place in the park and allow the park to plan accordingly for resource protection, safety, and other factors. For these same reasons, the authorization or permit may define limitations for the approved group size. Operators and activity organizers should reach out to park staff well in advance of the proposed activity to obtain the appropriate permit and

ensure compliance to park management restrictions and regulations. In some instances, group size limitations and other defined restrictions may limit the operator's ability to conduct a tour, particularly in consideration of the operator's profitability. In these cases, although flexibility in park restrictions and regulations is typically not possible, the activity might be allowed if the operator can adjust how it is conducted. Tour operators, activity organizers, and park staff can work together when issuing a commercial use authorization or special use permit to ensure that a balance is met.

In addition to bicycle tours, some parks host other bicycle-focused programs, such as bicycle safety or learn to ride classes. For example, George Washington Memorial Parkway offers "Learn to Ride" classes on most Saturdays between April and September.³ While this program is geared towards children over age five, adults are encouraged to participate as well.



Figure 6-2: Volunteer-led bike tour at Everglades National Park in Florida. (Source: NPS)

National Park Foundation Active Trails Program

The National Park Foundation⁴ offers an Active Trails grant program that provides funding to parks and partners for a wide range of activities to promote healthy lifestyles along trails to and within national parks. Some of these programs focus on the public health benefits of walking or bicycling. For example, Martin Van Buren National Historic Site in New York used an Active Trails grant to host youth recreational programs to promote the use of national parks as places to be healthy and enjoy the outdoors. A local environmental educator led programs that focused on fun and exercise, but also included reflection activities and questions to help youth connect their experience on trails and in the outdoors with their physical, mental, and emotional health.⁵



Figure 6-3: A park ranger leads a bicycle tour at Saratoga National Historical Park, New York. (Source: NPS)

Car-free opportunities are a type of visitor program or event that allows visitors to experience park roads without automobile traffic. The [Open Streets](#) chapter provides additional information about types of car-free events and how to organize car-free activities in national parks.

Some parks have hosted events to highlight the health benefits of being outdoors and being active. Many of these events align with broader NPS initiatives, such as [Healthy Parks, Healthy People](#).⁷ For example, in 2012 Cuyahoga Valley National Park in Ohio partnered with the Cleveland Clinic to launch a “Walk with a Doc and a Ranger” pilot program. The program involved several three-to-five mile casual walks in the park led by a doctor and a park ranger. Attendees were able to learn more about health issues, improve fitness, and enjoy the national park.⁸



Figure 6-4: Richard Kratche, M.D. and Park Ranger Brady Bourquin lead a hike in Cuyahoga Valley National Park, Ohio. (Source: NPS/Courtesy of Cleveland Clinic)

Special Events and Activities that Promote Walking and Bicycling

Special events, which can be held annually or semi-regularly, are another way to promote bicycling and walking in national parks and provide visitors a unique opportunity to explore parks without a car. These events may be organized by parks, partners, or outside organizations such as nonprofits or athletic clubs.

Many events are also held during National Bike Month, which is organized by the League of American Bicyclists each May. For example, in May 2017 Saratoga National Historical Park in New York planned a day long Bike Summit to coincide with National Bike Month. During the Bike Summit, the park unveiled new repair stations, held bicycle skills trainings, offered tune-ups and safety checks, and held a five mile ranger-guided bicycle tour.⁶



National Park Rx Day

Park Rx (i.e., park prescription) is an initiative designed in collaboration with healthcare providers and community partners to promote parks, trails, and open space for the purpose of improving individual and community health.¹⁰ On April 24, 2016, the NPS participated in National Park Rx Day⁹, an event to promote the growing movement of health practitioners prescribing parks and nature to patients to improve human health. National parks and their partners around the country organized events for National Park Rx Day, including events related to walking, bicycling, and physical activity in parks.



Figure 6-5: A physician leads a group of children on a walk as part of the Park Rx program in Washington, D.C. (Source: NPS)

Where appropriate, parks may also host active transportation-related events organized by outside groups, such as nonprofit organizations or bicycle clubs. This is often achieved through special use permits, which are required for certain special events that are not organized or sponsored by the NPS.¹¹ Those interested in holding a special event in a national park should reach out to the park to discuss the proposed event and learn more about the permits that it would require. Although these types of events often primarily benefit the organizing entity, the event may also engage a new audience of park visitors and provide a unique opportunity for visitors to experience their park by bike or by foot. Examples of these types of temporary, short term events include walkathons, fun runs, and charity bicycle rides.

For instance, [Bike Your Park Day](#)¹² is an annual event started by the Adventure Cycling Association to encourage people to ride a bicycle to or in a national park or other public lands. In the event's first year, held on National Public Lands Day (September 24, 2016), over 11,000 people participated in 1,400 organized rides in parks and public lands in all 50 states, including many rides in national parks. Rides are organized by event participants, including individuals, groups, parks, or partners. The event is held annually on the last Saturday in September, and national parks can participate by organizing rides for the public or encouraging visitors to register a ride.

Events organized by outside groups often require close coordination with the park, to ensure that the event minimizes impacts to park resources and visitors. Organizers of these rides should check in advance with the park (or other public land manager) to determine relevant policies that may require permits for activities, particularly for those involving large groups. This also allows the park to prepare accordingly for the upcoming activity (i.e., emergency planning, increased staffing, public notification, etc.). If a permit is necessary, activity allowances and restrictions will be outlined in the special use permit.

Many running and bicycle clubs use parks on a regular basis for club training rides and runs. These activities do not typically require the significant coordination and planning that a race or other large-scale event does, but still involve groups of people walking and bicycling within parks. For example, Greenbelt Park in Maryland has hosted practice bicycle races on its perimeter roadway for over 30 years. The races are scheduled on Wednesday evenings during the summer, and are organized by the Route 1 Velo bicycle club. While these informal events likely do not require a special use permit, for NPS staff planning and visitor management purposes, it is best to notify the park in advance of these proposed activities.



Long-Distance Active Travel

The term “active travel” refers to long-distance traveling by bicycle or foot, usually over the course of multiple days (or even weeks or months). The sections below discuss two forms of active long-distance travel: bicycle touring routes and long-distance hiking trails. Policies and programs that can encourage and accommodate active long-distance travelers along their journey include establishing and providing information about bicycle touring routes and long-distance hiking trails, and offering lower entrance fees or a more flexible campground reservation policy for those arriving by bicycle or foot.



Figure 6-6: Cyclists ride in a practice race in Greenbelt Park, Maryland. (Source: NPS)

Bicycle Touring Routes

Designated bicycle touring routes and long-distance trails can help people traveling by bicycle plan their trips by identifying safe or recommended routes for bicycle travel. Many designated bicycle routes and trails pass through national parks, and can help encourage bicycle tourism in parks and surrounding communities.

The U.S. Bicycle Route System is a network of officially numbered and signed bicycle routes connecting across the country. These routes are developed, designated, and signed by the state department of transportation, often in collaboration with local or state bicycle/trail advocacy groups and volunteers. Route designation requires agreement from all road owner jurisdictions (municipalities, counties, national parks, etc.) along the route, and the route numbering is approved by the

American Association of State Highway Transportation Officials (AASHTO). As of 2018, over 13,000 miles of U.S. Bicycle Routes have been designated in 26 states, and approximately 4,000 miles include signs.¹³



Figure 6-7: U.S. Bicycle Route 10 volunteer coordinator John Pope meets with a North Cascades Park Ranger in the inaugural ride of U.S. Bike Route 10 in Washington State. (Source: Michelle Pope)

Several U.S. Bicycle Routes (USBRS) pass through national parks, including:

- North Cascades National Park, Washington (USBR 10)
- Sleeping Bear Dunes National Lakeshore, Michigan (USBR 35)
- Indiana Dunes National Lakeshore, Indiana (USBR 37)
- Mississippi National River and Recreation Area, Minnesota (USBR 45)
- Chesapeake & Ohio Canal National Historical Park, Maryland and West Virginia (USBR 50)
- Mammoth Cave National Park, Kentucky (USBR 76)

Adventure Cycling Association is the lead organization that coordinates USBRS development and promotion nationally. Routes are selected based on a National Corridor Plan showing 50-mile wide corridors where routes could feasibly be developed and officially designated. Park staff can partner with their state department of transportation, nearby communities, and other stakeholders to develop and designate



routes through national parks. This process involves formalizing a letter of agreement allowing the route to be designated through the park. Providing bicycle route information on websites and other printed materials helps to inform visitors of routes to access parks by bicycle.

The USBR numbered system encompasses existing bicycle routes and trails that pass through national parks including the Mississippi River Trail, East Coast Greenway, the Katy Trail in Missouri, and the Chesapeake and Ohio Canal towpath in Washington D.C., Maryland, and West Virginia. Although not fully connected yet, the [East Coast Greenway](#)¹⁴ is a long distance route with the goal of connecting cities of the Eastern Seaboard on traffic-free greenways from Maine to Florida. The USBR also encompasses most of the paved routes in the 47,000-mile [Adventure Cycling Route Network](#).¹⁵

Long-Distance Hiking and Walking Trails

Similar to bicycle touring, long-distance hiking involves traveling by foot over the course of several days, weeks, or months. Examples of long-distance hiking trails include the Appalachian National Scenic Trail, a 2,180 mile long public footpath that stretches from Maine to Georgia, and the Pacific Crest Trail, which stretches 2,650 miles from Mexico to Canada through California, Oregon, and Washington. While some hikers (known as “thru hikers”) choose to travel the length of these trails in a single season, many others hike only a portion at a time. Some of the multiuse paths mentioned in the “Bicycle Touring” section above, such as Chesapeake and Ohio Canal Towpath, are also popular with long-distance hikers.

Long-distance hiking trails may provide connections between different national parks and between parks and surrounding communities, facilitating car-free access to national parks. For example, the Appalachian National Scenic Trail connects Shenandoah National Park in Virginia to Great Smoky Mountains National Park on the Tennessee-North Carolina border, and creates an option for active transportation between the parks for long-distance hikers.



Figure 6-8: A bicyclist on the Chesapeake & Ohio canal towpath, which at 184.5 miles is one of the longest bicycle trails in the continental U.S. (Source: Laurel Hamilton)

The National Park Service plays a role in managing approximately 30 National Scenic and Historic Trails,¹⁶ some of which are long-distance hiking trails. The Appalachian National Scenic Trail is managed by the National Park Service, U.S. Forest Service, Appalachian Trail Conservancy, and other state agencies. The Pacific Crest Trail is administered by the U.S. Forest Service in conjunction with the National Park Service, Bureau of Land Management, California State Parks, and the Pacific Crest Trail Association. The trail passes through or close to several national parks, including Sequoia & Kings Canyon, Yosemite, Lassen Volcano, Crater Lake, and North Cascades National Parks.

Policies Promoting Active Travel

Individual park policies and procedures can support and encourage visitors to travel by bicycle and foot by making it cheaper and easier for them to arrive to the park without a car. Some parks charge a lower (or no) entrance fee for visitors arriving by bicycle or by foot than for those arriving by car. For example, Assateague Island National Seashore, located off the coasts of Virginia and Maryland, charges a \$25 entrance fee for vehicles, and no fee for visitors arriving by bicycle or foot.



Natchez Trace Parkway Bicycle-Only Campgrounds

Natchez Trace Parkway, which runs from Nashville, Tennessee to Natchez, Mississippi, has five bicycle-only campgrounds that provide basic camping for visitors who are biking the Natchez Trace Parkway. By using the parkway campgrounds, bicycle-only campgrounds, and communities near the Parkway, visitors can plan their trips to ride between 30 and 60 miles each day. The Natchez Trace Parkway website provides information about the bicycle-only campgrounds, including their locations along the Parkway, bicycle directions to the campgrounds, a list of campground amenities, and pictures.¹⁸



Figure 6-9: Bicyclists on the Natchez Trace Parkway. (Source: U.S. DOT Volpe Center)

In addition, visitors traveling long-distance by bicycle and foot may find it difficult to make or keep campground reservations due to unforeseen circumstances like weather, injury, or necessary bicycle repairs. To address these challenges, some campgrounds have designated “hiker-biker” campsites that are first come, first served and do not require a reservation. Recognizing that bicycle tourists are unlikely to stay in the same location for more than one night, some parks have exempted bicyclists from minimum length of stay requirements for campground reservations.

A handful of state parks, including those in Indiana, Massachusetts, Michigan, Minnesota, Nevada, Virginia, and Wisconsin, have implemented “no-turn-away” policies that guarantee space for active transportation travelers in the event of a full campground. Informing the public about [these policies](#)¹⁷ is essential to ensuring that hikers and touring bicyclists are able to take advantage of them when planning their trips.

Campgrounds can also provide amenities for campers arriving by foot or bicycle, including bicycle parking, bicycle maintenance tools or repair stations, lockers for valuables, electrical outlets for charging cell phones, and wildlife-proof storage for food.

Communication and Visitor Outreach

Providing information about walking and bicycling to the public on park websites, social media, park maps, bulletin boards, and other promotional materials is another way to facilitate active transportation in and around parks. This type of information can prepare visitors for what to expect when walking or bicycling within a park, give them ideas about how to travel to or within a park by bicycle, and allow them to learn about active transportation programs and activities happening in and around a park.

As a federal agency, the NPS is required by law to ensure that it effectively communicates with persons with disabilities. It must ensure that communications are available in multiple formats, and websites and other electronic media conform to Section 508 Standards for Electronic and Information Technology established by the U.S. Access Board.¹⁹



Some effective ways that park staff can share information about active transportation with their visitors include:

- Providing information on getting to and traveling through the park by bicycle or foot in the “Plan Your Visit” section of the park website.
- Listing bicycle and walking safety tips, such as information about terrain, where to refill water bottles or access bicycle repairs, or how to safely share the road with vehicles, on the park’s website or in a brochure.
- Distributing a map showing multiuse paths, bike lanes, and roads that are well-suited for bicycling, as well as other park landmarks and amenities.
- Posting on social media about upcoming bicycle or walking events, such as a tour led by a park ranger or a special event hosted by a friends group.
- Using social media to inform visitors about conditions at the park, such as road closures and weather, which could help them plan their bicycle or walking trip.

- Providing information on the park website about policies to encourage travel by foot and bicycle, such as lower entrance fees for those arriving by foot or bicycle, or campsites reserved for hikers and bicyclists.

For example, Yosemite National Park publishes a bicycle map, available online and in print (Figure 6-10). This enables bicyclists to better plan their routes by understanding which roads are shared with other vehicles and which are meant primarily for nonmotorized modes. It also helps bicyclists estimate distances between amenities and attractions. Parks can encourage use of active transportation by providing information that may help the trip be more predictable and comfortable for the visitor.



Providing Essential Traveler Information to NPS Visitors

The NPS Long Range Transportation Plan²⁰ recommends that, when applicable, the following information be available to visitors on the “Directions & Transportation” section of the park’s website:

- The description of the transportation experience within the park, including typical congestion at certain sites.
- Information on how to access the park via motorized and nonmotorized methods of transport.
- Alternative modes of transport available within the park (e.g., bicycle rentals).
- Parking availability for all modes of transport (e.g., parking lots, RV spaces, bicycle racks).
- Travel distances and times between key points within the park.
- Accessibility information for those with disabilities.

Providing detailed and clear information can help encourage active transportation by making visitors aware of all transportation options, possibilities for multimodal trips, and constraints and amenities related to each mode (e.g., limited parking or the presence of bike lanes).

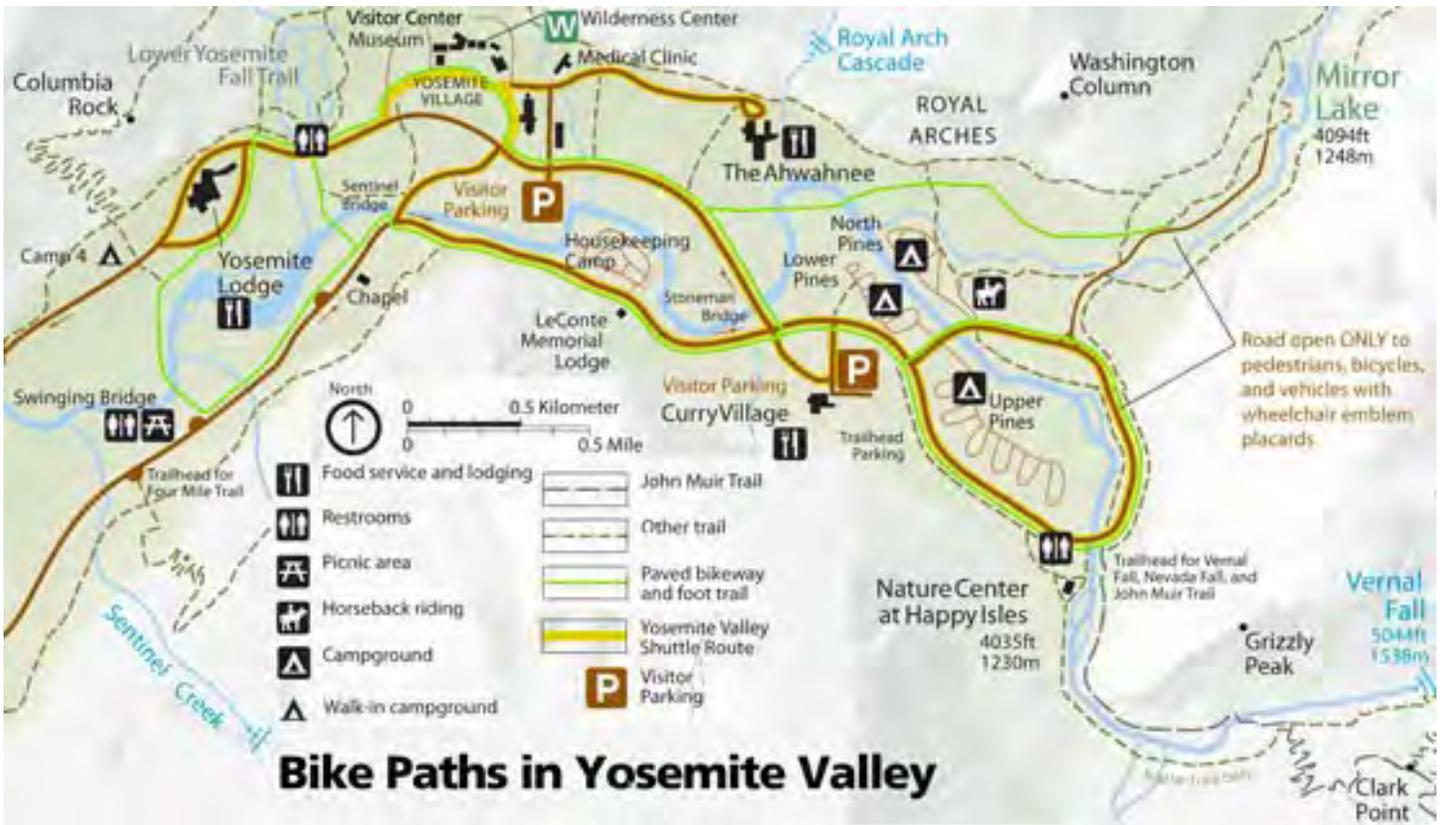


Figure 6-10: Map showing bike paths in Yosemite National Park in California. (Source: NPS)



Online Information about Bicycling: Denali National Park & Preserve

Denali National Park & Preserve in Alaska has extensive information on its website about bicycling in the park so that visitors who choose to bicycle know what to expect. The website includes several suggested itineraries for bicycle day trips, and information about bicycle camping, riding the park shuttle bus with a bicycle, and spring cycling before the park road is open to cars. The website also includes safety tips related to repairs, staying hydrated, wildlife, weather, and rules of the road.²¹



Figure 6-11: Bicyclists on the park road in Denali National Park, Alaska. (Source: NPS)



Considerations for Implementing Active Transportation Programs

Active transportation programs and activities in national parks may be organized by the parks themselves, or by friends groups, nonprofits, concessionaires or other private companies, bicycle or running clubs, or other groups or individuals.

There are a variety of elements to consider when implementing bicycle and pedestrian programs and activities in and around parks:

- **Audience:** Consider tailoring active transportation programs to different audiences, such as people of different ages, physical and fitness abilities, and levels of comfort on a bicycle. For example, holding two bicycle tours on the same day—a 10 mile ride on roads for experienced bicyclists and a three mile ride on a multiuse path for those who want a shorter ride or are traveling with children—could provide options for a broad range of participants.
- **Impact on park visitors, staff, and resources:** The size and type of the visitor program will affect the impact it has on park staff, visitors not participating in the program, and natural and cultural resources. Encouraging visitors to walk and bicycle rather than drive can help reduce the negative impacts of vehicle travel on natural and cultural resources. However, an organized event might require additional staff to support the event and road closures that could impact other park visitors. As a result, parks may decide to limit the frequency of these types of events (e.g., once a year), or develop strategies to minimize impacts.
- **Planning:** Entities interested in pursuing an organized event involving a national park should reach out to that park to discuss their proposed event and follow any necessary permitting processes. Even if a permit is not required, those

leading large groups (such as an organized bicycle ride of 10 or more participants) should also notify the park ahead of time in order to ensure necessary preparations.

- **Supporting policies:** Policies can encourage visitors to travel by foot or bicycle and to take part in active transportation programs and activities. Policies that support active transportation include a lower entrance fee for active transportation users, a no-turn-away policy for hikers and bicycle campers, and a delineated bicycle route within the park.
- **Infrastructure:** Visitors are unlikely to participate in active transportation activities and programs if they do not feel safe doing so. Providing safe infrastructure for walking and bicycling allows visitors to use these modes and participate in active transportation programs. For more information about active transportation infrastructure, see the [Infrastructure and Multimodal Connectivity](#) chapter.
- **Information and outreach:** Providing information about active transportation programs online and in printed materials can inform visitors about these programs and what to expect when walking and bicycling to and within a park. Working with partners, friends groups, and nearby communities to get the word out can help ensure the information reaches a broad audience of potential visitors.
- **Education and safety:** Active transportation programs can be an opportunity to educate visitors about safe riding and walking. For example, some parks specify in their permits for companies that lead group rides that these companies must conduct safety training with each group of bicyclists before they ride in the park. For more information, see the [Bicyclist and Pedestrian Safety](#) chapter.



Additional Resources

U.S. Bicycle Route System National Corridor Plan.

<https://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/national-corridor-plan/>

Adventure Cycling Association. Parks Partnerships & Resources.

<https://www.adventurecycling.org/bicycle-tourism/national-advocacy-projects/parks-partnerships-resources/>



End Notes

- ¹ Everglades National Park. Biking. <https://www.nps.gov/ever/planyourvisit/biking.htm>
- ² Boston National Historical Park. Guided Tours. <https://www.nps.gov/bost/planyourvisit/guidedtours.htm>
- ³ George Washington Memorial Parkway. Learn to Ride. <https://www.nps.gov/gwmp/planyourvisit/learntoride.htm>
- ⁴ National Park Foundation. Active Trails. <https://www.nationalparks.org/our-work/programs/active-trails>
- ⁵ National Park Foundation. Connecting Youth with Outdoor Recreation. <https://www.nationalparks.org/our-work/programs/active-trails/youth-explore-martin-van-buren-site>
- ⁶ Saratoga National Historical Park. Bicycling. <https://www.nps.gov/sara/planyourvisit/bicyclinginformation.htm>
- ⁷ National Park Service. Healthy Parks Healthy People U.S. https://www.nps.gov/public_health/hp/hphp.htm
- ⁸ Cuyahoga Valley NPS Walk with a Doc and a Ranger. <https://www.nps.gov/resources/2016.htm?id=10DABFBE-155D-4519-3E0C6C2C29C92A34>
- ⁹ National Park Service. Park Rx Day. <https://www.nps.gov/planyourvisit/healthy-events.htm>
- ¹⁰ The National Park Rx Initiative. <http://www.parkrx.org/>
- ¹¹ For more information on special use permits, see section 8.6 of the 2006 NPS Management Policies. https://www.nps.gov/policy/MP_2006.pdf
- ¹² Adventure Cycling. Bike Your Park Day. www.bikeyourparkday.org
- ¹³ For more information about the U.S. Bicycle Route System, see: www.adventurecycling.org/usbrs
- ¹⁴ East Coast Greenway. <http://www.greenway.org/>
- ¹⁵ Adventure Cycling. Interactive Network Map. <https://www.adventurecycling.org/routes-and-maps/adventure-cycling-route-network/interactive-network-map/>
- ¹⁶ NPS National Trail System. <https://www.nps.gov/subjects/nationaltrailssystem/index.htm>
- ¹⁷ For more information about bicycle travel best practices for campgrounds, see the Adventure Cycling Association's A Guide to Bicycle Camping. https://www.adventurecycling.org/default/assets/File/Travel_Initiatives/National%20Advocacy%20Projects/A%20Guide%20to%20Bicycle%20Camping_Adventure%20Cycling%20Assn.pdf



¹⁸ NPS Bicycle-Only Campgrounds. <https://www.nps.gov/natr/planyourvisit/bicycle-only-campgrounds.htm>

¹⁹ United States Access Board. Section 508 Standards for Electronic and Information Technology (2000). <https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards>

²⁰ NPS National Long Range Transportation Plan. <https://www.nps.gov/subjects/transportation/planning.htm>

²¹ The “Cycling” page of the Denali National Park & Preserve website. <https://www.nps.gov/dena/planyourvisit/cycling.htm>

Chapter 7: Open Streets Opportunities in National Parks

This chapter explores the potential benefits of open streets, or “car-free” opportunities in national parks. It describes recent successes parks have had with open streets events of varying scale, frequency, and level of partnership involvement, and discusses best practices for car-free events.



Introduction

Open streets or “car-free” opportunities and events enable visitors to enjoy walking and bicycling on park roads without automobile traffic (open streets and car-free are used interchangeably in this chapter). Car-free opportunities have occurred in some cities and in local, state, and national parks around the country for over 50 years, and there are currently a number of National Park Service sites that provide such experiences for visitors. These events vary in scale, frequency, and level of partnership involvement.

Open streets are excellent ways for visitors to experience parks without automobile traffic, while also engaging in active transportation and recreation; some parks have noted that their car-free experiences have attracted first time visitors. Car-free opportunities can provide many health, environmental, safety, economic, and visitor experience benefits for parks, their partners, and nearby communities by:

- Promoting active living and encouraging modes of travel other than private motor vehicles;
- Assisting parks with addressing congestion and air quality issues;
- Providing opportunities for visitors to engage more meaningfully with the surrounding landscape and experience the park in a new way;
- Encouraging more visitors to use active transportation to travel in the park beyond the car-free event;
- Encouraging partnership efforts and building relationships with gateway communities;
- Spurring tourism and economic growth in surrounding communities; and
- Increasing the value that communities place on having a national park in their backyard.

The following sections discuss open streets opportunities that currently take place in national parks, as well as best practices and key considerations for NPS car-free opportunities. The chapter concludes with a brief resource guide for parks and partners interested in pursuing car-free programs.



Figure 7-1: Bicyclists during a car-free morning at Acadia National Park in Maine. (Source: NPS)

In developing this chapter, staff from multiple national parks that have or are successfully hosting car-free opportunities were interviewed in order to learn more about the details and how-to’s of these events.

The Open Streets Project

Urban open street events typically feature various types of health-focused, active lifestyle activities such as walking, bicycling, yoga, and dance. These events can have different names (Ciclovía, Sunday Streets, etc.) and usually take place in city centers. The Open Streets Project,¹ a collaboration between two organizations, Street Plans Collaborative and 8 to 80 Cities, shares information about open street events with the goal of increasing the number, size, and frequency of initiatives taking place across North America. The Open Streets Project published the *Open Streets Toolkit*,² which tracks open street events in the U.S. and Canada, and outlines the range of public health, environmental, economic, community, and social benefits that open street events provide.



Existing NPS Car-Free Opportunities and Programs

Several national park units currently offer visitors an opportunity to experience park roads in a car-free environment. Table 7-1 below categorizes NPS car-free events into three typologies, and includes a description, considerations, and examples of parks that currently hold each type of car-free opportunity.

Table 7-1: NPS car-free typology

Type	Description	Level of Effort/ Considerations	Example Parks
Seasonal opportunities	<p>Seasonal access for visitors during the shoulder season in the spring/fall when select roads are not open to vehicles due to snow (visitors are still able to access other areas of the park using motorized vehicles). Exact timeframe varies year to year depending on weather and snowfall.</p> <p>Seasonal opportunities can bring tourism to gateway communities and encourage park visitation during shoulder seasons, which are typically in the spring and fall.</p>	Requires minimal to moderate effort from park staff as plowing would take place anyway, but there are maintenance and safety considerations while visitors are using park roads. Notifications are often posted on the park website, and there may be other communications to let users know that the road is available for use. Typically no programming or amenities are provided.	Catoctin Mountain, Denali, Glacier, Grand Teton, Lassen Volcanic, Mount Rainier, Rocky Mountain, Yellowstone
Routine (weekly/monthly) opportunities	Temporary use restrictions on a park road (or a portion of a road) to allow for only nonmotorized uses on a scheduled, recurring basis. Allows visitors to regularly experience vehicle-free days at the park.	Requires a moderate level of effort to get the event established, though this can decrease once the event is routine. Event information is often available on the park website. Typically little to no additional programming or amenities are provided.	Great Smoky Mountains, Rock Creek Park
Special opportunities or events	Temporary use restrictions on a park road (or a portion of a road) to allow for only nonmotorized uses once or twice a year, typically during the summer or fall.	Level of effort and coordination varies widely. Parks might simply restrict vehicle use on a designated road on specific dates and provide notification on the park website, or a destination event might be created with partner coordination to provide programming and amenities.	Acadia, Crater Lake, Colonial Parkway, Fort Dupont Park, Shenandoah

Examples of Seasonal Car-Free Opportunities

Denali National Park, Alaska: In late March, the park typically starts plowing the Denali Park Road. Once snow-free, visitors are allowed to use portions of the road that remain closed to vehicular traffic until the summer season begins in May. Popular uses of Denali Park Road include cycling, hiking, skiing, and dog-mushing. This seasonal opportunity has increased in popularity over the past five years and offers visitors another way to experience the park during spring months.³ As this opportunity becomes more widely known, local communities benefit from increased out-of-town visitation and economic growth during the shoulder season.



Figure 7-2: A bicyclist riding the Denali Park Road before it opens to vehicles. (Source: NPS)

Glacier National Park, Montana: Starting in about mid-April, bicyclists can use the plowed portions of the Going-to-the-Sun-Road (GTSR) until the road is reopened to vehicles in late June.⁴ Bicyclists have unrestricted access to the plowed portions of the road on weekends and can cycle the road after the plow crews have stopped for the day on weekdays. In 2016, the park launched a new shuttle service for visitors on the GTSR that operates during the spring months beginning in May to the end of June, when the road reopens to vehicles.⁵ For bicyclists, this shuttle is also equipped with a bicycle trailer to transport up to 16 bikes; this allows bicyclists of all ages to access GTSR (see image below).



Figure 7-3: The bicycle trailer and visitor shuttle at Glacier National Park. (Source: Saara Snow)



Figure 7-4: Bicyclists on the GTSR during the spring shoulder season. (Source: Saara Snow)

Starting in 2016, Glacier National Park also established strong volunteer presence during the spring shoulder season. Park staff anticipated more participation in the spring shoulder season due to the shuttle, and began a formalized volunteer bike patrol program. Volunteers support the event by providing a park presence on the road, managing parking, and riding the GTSR to ensure visitors are safe.



Examples of Routine Car-Free Opportunities

Great Smoky Mountains National Park, Tennessee:

Each year between May and September, Great Smoky Mountains National Park provides car-free mornings⁶ from 6:00 a.m. to 10:00 a.m. on Wednesdays and Saturdays along Cades Cove Loop Road. These car-free mornings along the 11 mile road have become popular with visitors and local residents alike as an opportunity to view cultural landscapes and wildlife by foot or bicycle without disturbance from vehicles. Typically, up to 800 bicyclists and joggers participate on peak season Saturdays. Although the events are routine, it takes considerable effort from staff and volunteers to manage parking and monitor bicyclist safety on the Loop Road.

Rock Creek Park, Washington D.C.: Since 1981, the NPS has closed 4.3 miles of Beach Drive to motor vehicles from 7:00 a.m. on Saturday to 7:00 p.m. on Sunday, every weekend throughout the year. The purpose of this schedule is to provide a regular opportunity for visitors to engage in active recreation in a car-free environment. The weekend closure of Beach Drive to vehicles has become a routine operation for staff, requiring minimal effort, and gives D.C. residents and visitors an opportunity to escape the sounds and stress of the city streets.⁷



Figure 7-5: Bicyclists on Beach Drive during the regular vehicle-free weekends. (Source: NPS)

Examples of Special Car-Free Opportunities and Events

Acadia National Park, Maine: Over the past 10-15 years, the Park Loop Road has been maintained in great condition through regularly scheduled repaving. The upkeep of the road has led to increased interest from road cyclists, but the road is narrow and lacks shoulders, and there are often conflicts between bicyclists and vehicles sharing the road. In 2015 and 2016,⁸ the park piloted two car-free Saturday mornings, one in May and one in September. For the event, motorized vehicles were not allowed along portions of the Park Loop Road on Mt. Desert Island from 7:00 a.m. to 12:00 p.m. and the visitor entrance fee was waived. In 2015, there were over 600 participants (runners, bicyclists, skaters, etc.) at the May event, and over 900 participants at the September event.

These opportunities were held only in the morning to ensure that visitors not participating in the event could still visit the park as planned in the afternoon. The park also worked with the gateway community of Bar Harbor to recommend that visitors spend time in the downtown as an alternate activity in the morning. In addition, the Island Explorer shuttle bus system providing access to the park continued to operate during the event in 2016, which provided visitors another way to access points of interest along the road during the car-free mornings.

As of 2017, Acadia National Park does not plan to continue its car-free morning pilot, but is continuing to look into ways to offer car-free opportunities to visitors.



Figure 7-6: A family enjoying a car-free morning at Acadia National Park. (Source: NPS)

Crater Lake National Park, Oregon: Crater Lake National Park has hosted “Ride the Rim” car-free days in the park for two consecutive weekends each year since 2013.⁹ The annual event typically occurs on the last two Saturdays in September on East Rim Drive. Hikers and bicyclists have access to 25 miles of vehicle-free roadway around Crater Lake to enjoy picturesque views. The opportunity is implemented as a temporary vehicle-use restriction on the 25 mile section of the Rim Road, and is organized in partnership with Discover Klamath Falls, a tourism association in the nearby community of Klamath Falls. In addition to providing advance notice and event information on the park’s website, Discover Klamath Falls manages a separate “Ride the Rim” website that provides additional information about the event and available amenities, as well as free participant registration (participants must still pay the park entrance fee).¹⁰ A shuttle service is provided along the nine mile section of the Rim Road that remains open to vehicles. Visitors, park staff, and the community see the event as a big success, providing a highly-rated visitor experience and giving the local tourism industry a boost during what is otherwise a low-visitation time of the year.

Open Streets Best Practices and Key Considerations for National Parks

The section below contains best practices and key considerations for ensuring the success of open streets programs in parks. The insights below have been gathered from parks experienced with hosting car-free events or activities, and are followed by a brief “getting started guide” intended for parks and partners with interest in pursuing similar opportunities.

Gather support

Coordination with surrounding communities can ensure that parks have the required support to successfully organize and provide an open streets opportunity. Support may come from local tourism groups, friends groups, local cities, or elected officials. For Crater Lake’s “Ride the Rim” days, the park worked closely with their congressional delegation, as well as gateway communities and a tourism association, to ensure support for the car-free days.



Figure 7-7: A participant at Shenandoah National Park’s vehicle-free day on Skyline Drive in Virginia. (Source: NPS)



Link with park policies and existing plans

Consider incorporating use restrictions for car-free days into the park's Foundation Document or Superintendent's Compendium. This will allow the park to develop the management justification and structure to support the opportunities. Additionally, an open streets opportunity may align with park goals or values in the Foundation Document. For example, park staff noted that Shenandoah National Park's vehicle-free day on Skyline Drive aligns with the Foundation values of promoting clean air, scenic beauty, and natural soundscapes.

Obtain required permits

For events organized by external organizations, the partner must apply for a special use permit in order to establish requirements and park approval for the event or activity. See the [Visitor Activities and Programs](#) chapter for more information.

Consider existing agreements

Work with concessionaires to ensure that a car-free event does not violate any existing concession agreements. For example, at Crater Lake, a contract with a shuttle bus operator guarantees access to the road for paid tours during the peak season. By scheduling the event after the concession period ends each year, the park avoided violating that agreement.

Consider safety

Visitor safety is always a consideration for parks, and car-free events are no exception. For car-free events specifically, consider emergency management plans, maintenance of the road where the event is being held, and ensuring there is clear information available on the characteristics of the route, and whether amenities (such as first aid tents, water, restrooms, etc.) will be provided. For example, the maintenance crew at Great Smoky Mountains uses blowers on the Cades Cove Loop Road clear of debris once a week, helping to keep the road safer for cyclists.

Consider potential participants

Consider the level of experience of bicyclists and other roadway users, and communicate information about the course, level of difficulty, and amenities that will be available along the route.

For example, the Park Loop Road at Acadia National Park can accommodate a greater variety of participants than the shoulder season road closure opportunity at Mount Rainier National Park, as the road in Mount Rainier is a steep incline up a mountain. Where possible, try to provide a wide range of opportunities to accommodate varying abilities of visitors and participants.

Outreach to provide information about the car-free opportunities

Many parks use multiple communication tools including the park website, social media, press releases, and partner (e.g., friends groups, volunteers, local bicycle shops) and gateway community outreach to get the word out about the car-free opportunities. Mount Rainier National Park in Washington noted that staff use Twitter daily to update visitors on whether Sunrise Road is open to nonmotorized use, as the availability and length of the road that is open for recreation changes throughout the shoulder season.

Consider a pre-registration process

Some parks work with friends groups or partner organizations to run a pre-registration for events. The registration can be useful to anticipate the number of participants for an event. This is especially helpful if there is limited parking, since an event cap can be set in the registration. If working with a partner to use online registration, ensure the communications, messaging, and key information points are clear for the registration page. It may be useful to develop a frequently asked questions page as well, in anticipation of the types of questions the park may get about the event.

Use signs to provide critical information

It is important to provide information to visitors and the public well in advance of the car-free opportunities, but it is also critical to provide information as they are arriving to the park. For example, Acadia National Park uses variable messaging signs placed on the roads leading to the park to alert visitors of temporary vehicle restrictions on Park Loop Road. Mount Rainier National Park uses a sign at the bottom of Sunrise Road to let visitors know the status of the road for recreation during the shoulder season.

Utilize volunteers to support car-free opportunities

Volunteers can fulfill a variety of support functions at open street events, such as helping manage parking (Great Smoky Mountains National Park, Glacier National Park), greeting visitors, and providing information about the car-free opportunity (Acadia National Park). Great Smoky Mountains National Park and Glacier National Park both have volunteer bike patrols that ride the road during the car-free event, helping to ensure that participants are safe, and also to assist if there are any incidents.

Think strategically about when to offer car-free opportunities

While car-free opportunities provide a unique way to enjoy the park without vehicles, consider how to accommodate visitor access for those not participating in the event. For instance, in Acadia National Park, staff achieved this balance with the timing of their car-free mornings. The park restricted vehicles on Park Loop Road from midnight to noon on the day of the event so that visitors with cars could use the road in the afternoon. While the event is taking place, other features within the park were still accessible by vehicle.



Figure 7-8: A bicyclist at Shenandoah National Park's vehicle-free day in Virginia. (Source: NPS)



Getting Started Guide for Car-Free Opportunities

This section provides preliminary direction for NPS staff and partners who might be interested in holding a car-free event. The steps below have been adapted from The Open Streets Guide by the Open Streets Project,¹¹ but do not reflect additional NPS-specific processes.

When planning a car-free event or activity, the following are suggested steps and timelines. These are general recommendations that may vary depending on the park, the context, and the activity. It is best to begin the planning early in order to coordinate with necessary partners or entities, so as to address any unforeseen issues that may arise.

Develop an event proposal (6-12 months before the event)

An event proposal will help to formalize ideas for an event and serve as a foundation for further planning. This proposal may include information, such as:

- Purpose or objectives for the event;
- Timeline, including when the event will be held, key milestones and meeting dates for planning the event;
- Budget estimate; and
- Proposed route for the event.

Identify partners and key roles (throughout event planning process)

Identify potential partner entities or organizations (e.g., bicyclists groups, advocacy groups, health care partners, friends of the park groups, etc.) that may be interested in supporting or having a key role in the event. In addition, work with these partners to identify roles and responsibilities for the event. For example, partners may be able to help with marketing and outreach, providing donations, providing volunteer support, and more.

Develop a logistical plan (3-6 months before the event)

After an event proposal has been accepted and the partners identified, further event planning is required to determine details for how the event will take place. A logistical plan will help to ensure greater success and may include:

- A marketing/branding and outreach strategy for the event;
- Details about the designated route;
- A traffic control plan for any detours or modifications to normal traffic flow;
- Emergency services and safety considerations;
- A staffing plan for the event;
- Details about any supporting activities or amenities (such as portable toilets, first aid stations, etc.); and
- A detailed “day-of” plan for the event, including timelines for when the road will be closed and reopened to vehicles, and other key day-of items.

Identify and pursue necessary permits and other required documents (4-6 months before the event)

Depending on the proposed event and related activities, a permit or other related documents (e.g., insurance policy, etc.) may be required. Reach out to the park well in advance to discuss the proposal and obtain necessary approvals.

Evaluate the event (during and/or after the event)

Evaluating an event, either during or after the conclusion of the event, informs event organizers of its success or where improvements to event logistics may be necessary. When events are repeated over time, tracking elements such as the number of visitors participating in the event also helps to develop an understanding of event success and trends.

The following are ways to evaluate car-free events in national parks:

- **Track participant numbers:** Track participant numbers through online event pre-registration, or through counting participants the day of the event. Beyond the event, participant data can also be useful to demonstrate support for investments in active transportation.
- **Track resources and cost:** Tracking staff time and monetary costs of conducting the car-free opportunity can help event organizers and/or park staff justify the efficiency of the event and inform the ability to host future car-free events. It may also inform where improvements could be made for future events.
- **Surveys:** Visitor surveys are a great way to get feedback on car-free programs. If park staff do not have the resources to administer the survey themselves, they can consider drawing upon friends groups or other partners for help. In Acadia National Park, volunteers staffing the entrance of the park during the first car-free morning handed out links to an online survey for visitors to take. The park received mostly positive feedback and continued with the car-free mornings in 2016.
- **Debrief with staff:** Consider holding a debrief meeting with staff, volunteers, and others involved in the car-free event to discuss what went well, and what improvements can be made. Glacier National Park created an interdisciplinary working group for their car-free opportunities. The group included staff representing different fields of expertise within the park, including the public information officer, law enforcement, interpretative rangers, transportation staff, and wildlife biologists. Varying perspectives strengthen the planning and implementation of an event.



Additional Resources

Open Streets Guide.

https://nacto.org/docs/usdg/smaller_open_streets_guide_final_print_alliance_biking_walking.pdf

Open Streets Project Toolkit. <http://openstreetsproject.org/open-streets-toolkit/>

880 Cities. Open Streets Trends and Opportunities Policy Brief.

<https://www.880cities.org/images/880tools/openstreets-policy-brief-english.pdf>



End Notes

- ¹ Open Streets Project. <http://openstreetsproject.org/>
- ² Open Streets Project Toolkit. <http://openstreetsproject.org/open-streets-toolkit/>
- ³ Denali National Park. Cycling. <https://www.nps.gov/dena/planyourvisit/cycling.htm>
- ⁴ Glacier National Park. Bicycling. <https://www.nps.gov/glac/planyourvisit/bicycling.htm>
- ⁵ Press release on Glacier National Park hike/biker shuttle (2016). <https://www.nps.gov/glac/learn/news/media-16-21.htm>
- ⁶ Great Smoky Mountains National Park. Biking. <https://www.nps.gov/grsm/planyourvisit/biking.htm>
- ⁷ Rock Creek Park District of Columbia. Calendar, Car-free weekends. <https://www.nps.gov/rocr/planyourvisit/calendar.htm>
- ⁸ Acadia National Park. Bicycling. <https://www.nps.gov/acad/planyourvisit/bicycling.htm>
- ⁹ Crater Lake National Park. Schedule of Events, Vehicle Free Days on East Rim Drive. <https://www.nps.gov/crla/planyourvisit/schedule-of-events.htm>
- ¹⁰ Crater Lake Ride the Rim Event (2017). <http://ridetherim2017.com/>
- ¹¹ Open Streets Guide. https://nacto.org/docs/usdg/smaller_open_streets_guide_final_print_alliance_biking_walking.pdf

Chapter 8: Bicycle Rental and Bike Sharing Systems

This chapter discusses types of bicycle sharing and rental systems, differences between the two, and opportunities and constraints. It provides case studies of parks that have worked with partners to implement bicycle sharing or rental systems.





Introduction

Bicycle rental and sharing systems expand the opportunities for visitors to access and explore national parks by bicycle. They can provide a way for visitors to access national parks from nearby communities or travel within parks without needing a personal vehicle, and can give people who are traveling without a bicycle (e.g., visitors from out of state) the option of using one in the park. The following chapter discusses characteristics of both bicycle rental and bicycle sharing systems, examples of parks that have pursued each option, and considerations for their implementation.

Bicycle Rental Programs offer bicycles for recreational, longer term use (such as several hours or days). Bicycles are rented and returned from a single, staffed location. Bicycle rental programs often offer several types of bicycles, including those that accommodate children and people with disabilities. Many national parks have concession-operated bicycle rental businesses located in the park. Bicycle rental businesses located in nearby communities can also create opportunities for park visitors to bicycle to and within a park.

Bike Sharing Systems provide users with the option to borrow a bicycle from either a defined station location (“kiosk-based” system) or from varying locations within a defined service area (“ad-hoc,” “dockless,” or “tech-on-bike” system). The bicycles are typically used for point-to-point trips.¹ Bicycle sharing systems can be considered a form of public transportation, and are primarily located in urban areas or in a defined area such as a campus setting. Bike sharing systems typically offer memberships (e.g., daily, monthly, or yearly) and use technologies such as smart cards, fobs, or smartphone apps for users to automatically unlock bicycles. Formalized bike share systems in the United States have expanded rapidly since 2010 when the first large-scale kiosk-based systems launched in the District of Columbia, Denver, and Minneapolis.

Table 8-1 shows some of the major distinctions between bicycle rental and bicycle sharing programs. As bicycle rentals and bike sharing serve different purposes, a park could choose to allow for operation of both types of systems within the park.

Table 8-1: Differences between bicycle rental and sharing concepts

Bicycle Rental	Bicycle Sharing
Longer term (hourly, daily, weekly) recreational use is typical	Shorter term use (30-60 minute increments) primarily for transportation purposes
Single location that is staffed for bicycle pickup and drop off	Dispersed network of unattended stations for bicycle pick up and drop off, enabling one way use of bicycles
Targets bicycle use for recreation	Primarily targets bicycle use for public transportation, but can also be used recreationally
Traditional for-profit business model	For profit or subsidized by various sponsors, similar to other forms of public transportation
Traditional bicycles do not incorporate tracking capabilities	Technology is used to track bicycle location and use



Table 8-1: Differences between bicycle rental and sharing concepts (continued)

Bicycle Rental	Bicycle Sharing
May accommodate families by providing children’s bicycles or trailers; also may accommodate people with disabilities or varying preferences with specialty bicycles (tricycles, hand cycles, etc.)	Usually designed for adults (Europe and Canada typically allow riders 14 years and older, while U.S. typically allows 16 years and older); some systems are starting to include bicycles that accommodate people with disabilities or varying preferences (tricycles, hand cycles, etc.)
Lower capital costs (approximately \$300 per bicycle)	Higher capital costs (approximately \$1,000 per bicycle and \$20,000-\$50,000 per kiosk)
Variable annual operating costs	Annual operating cost between \$1,000 and \$2,000 per bicycle

(Sources: [Exploring Bicycle Options for Federal Lands](#)² and [Wichita Mountains Wildlife Refuge Comprehensive Alternative Transportation Plan](#)³)

Bicycle rental and sharing systems work best when they are located in and near safe places to ride. Bicycle and pedestrian infrastructure that provides safe routes and connections between the park, community destinations, and bicycle rental or bike share locations is critical for encouraging bike use. If there is no bicycle infrastructure in and around a park, consider pursuing improvements prior to, or in conjunction with, installing a bicycle rental or sharing program. For more information about bicycle and pedestrian infrastructure, see the [Infrastructure and Multimodal Connectivity](#) chapter.

Overview of Bicycle Rentals

Many national parks have bicycle rentals available either within or near the park. Bicycle rental businesses can be created at a small scale, and capital costs for bicycle rental businesses are also relatively low, making it a feasible option for parks that are interested in expanding recreational bicycle use.

Most bicycle rental systems in national parks are operated by private concessionaires. A private bicycle rental company may operate under a commercial use authorization (CUA) permit, in which the company pays the park a fee to operate inside the park. In some parks, bicycle rental services are operated through a larger concessions contract, such as a lodging contract. Bicycle rental programs can also be operated

by the NPS, in which case the park would purchase the bicycles and rent them directly to park visitors.

When there is not a bicycle rental business or program within the park, parks often provide information to visitors about how to find bicycle rental businesses in nearby communities, such as by linking to the local chamber of commerce on the park website. This option can be especially beneficial if parking or congestion within the park is an issue, as visitors will have the opportunity to arrive by bicycles that they rent from nearby towns, rather than driving into the park.

Bicycle Rental Considerations for National Parks

To determine whether initiating a bicycle rental program would be a good fit, consider the park and its surrounding communities’ landscape for bicycle use, the park context, visitation information, park operation goals, and bicycle-related policies. Bicycle rental programs might work best in or near parks that have high numbers of visitors and existing bicycle infrastructure or safe places to ride. Bicycle rentals can also help parks address policy or operational goals, such as reducing congestion and private vehicle trips, or providing recreational opportunities for visitors.

When pursuing or initiating a bicycle rental program in or near a park, consider the following factors:

- **Operating model:** Consider whether a bicycle rental program should be operated by the NPS or through a concessions agreement or other partnership arrangement. If pursuing bicycle rentals through a concessions or cooperative agreement, decide whether to establish a new agreement to provide bicycle rental service, or whether bicycle rentals could be offered under a larger, existing concession contract, such as a lodging contract.
- **Capital and operating costs:** Capital costs for bicycle rental businesses will vary depending on the number and types of bicycles and other equipment offered. Operating costs will vary depending on the number of staff, number of locations, and what other services are offered. With NPS-operated bicycle rentals, the park will be responsible for the up-front costs of buying the bicycles as well as the staff time and costs for operating the system, while with a program operated through a concessions agreement the concessioner will pay these costs.
- **Types of bicycles offered:** Bicycle rental operators can provide a variety of different types of bicycles, including road bicycles for people who want to travel longer distances or at faster speeds, bicycles for children or with child trailers/carriers, and recumbent or other types of bicycles to accommodate people with disabilities. Consider encouraging operators to offer bicycles for a range of potential users.
- **Community partnerships:** Partnerships can be a key to implementing bicycle rentals in or near a national park. For example, a bicycle rental operator could have two locations – one in a park and one in a nearby community – to allow for one way trips. Alternatively, if a park does not have a bicycle rental business within the park, it can provide information about where to find rental providers or partner with bicycle rental operators in nearby communities as a way to encourage visitors to bicycle to the park. See the [Partnerships and Funding](#) chapter for more information.



Figure 8-1: Bicyclists enjoy the multiuse pathways at the Grand Canyon National Park in Arizona. (Source: NPS)

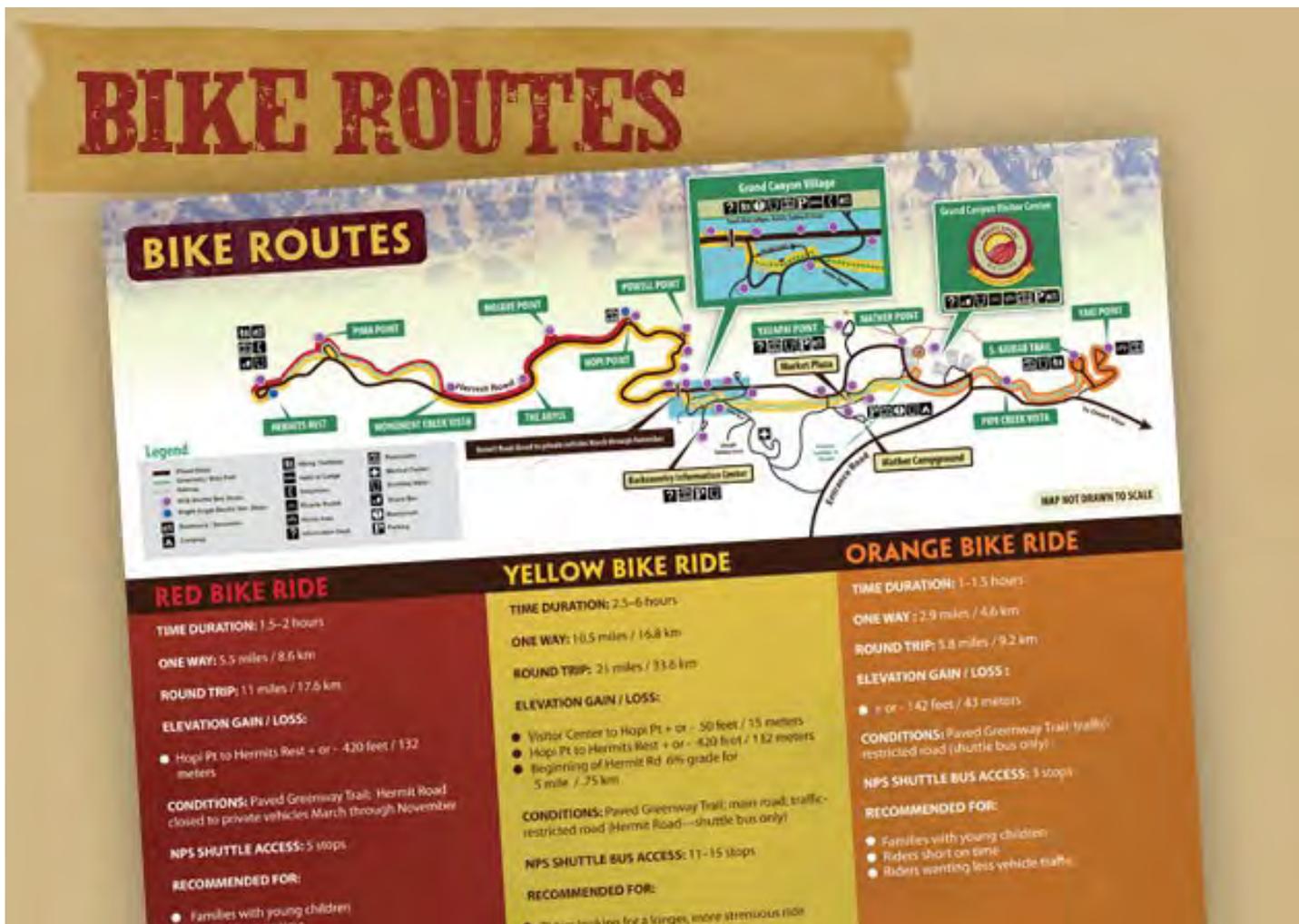


Figure 8-2: The bicycle rental company in Grand Canyon National Park provides riders with recommended bicycle routes in the park. (Source: Bright Angel Bicycles)

- Pricing:** Bicycle rentals are typically more expensive for users than bicycle sharing per ride, but the rental pricing structure encourages longer trips and single or multiple day rentals. If funding is available or provided by community partners, consider implementing a bicycle library model that offers bicycles for free or at a very low cost.
- Visitor information:** When renting bicycles to park visitors, consider providing information about bicycle policies, safety considerations, and information about bicycle paths or other places to ride. This information could be provided by the park directly; alternatively, it could be a requirement of a bicycle rental concessions contract to provide this type of information to people renting bicycles.

Bicycle Rental Examples

Grand Canyon National Park: In-park bicycle rental business

Grand Canyon National Park has a multimodal transportation system with 13 miles of multiuse trails along the South Rim of the canyon with a shuttle bus stop every one-half to one mile. This gives visitors and residents the opportunity to walk, bicycle, and ride a shuttle bus along any portion of the trails and tailor activities to their comfort level and physical abilities. All park shuttle buses are wheelchair accessible and equipped with a front-end bicycle rack.

At Grand Canyon National Park, bicycle rentals are provided by Bright Angel Bicycles (BAB), a private bicycle rental company located in the park. Since 2012, BAB has had a 10 year concession contract



Figure 8-3: Bicyclists ride on the Fountain Freight Road trail next to Midway Geyser Basin in Yellowstone National Park, Wyoming. (Source: NPS)

with the NPS. To accommodate riders of various ages and abilities, BAB offers various sizes of bicycles, as well as trailers, adult tricycles, and tandems; it also offers bicycle tours at two locations, Hermit Road and Yaki Point. BAB also provides information about several recommended bicycle routes within the park, ranging in distance from three and a half to 21 miles, and information about how to connect to the park’s shuttle bus system to bicycle one way and take the shuttle back.

Yellowstone National Park: In-park bicycle rentals through lodging contract

In Yellowstone National Park, bicycle rentals are offered by Xanterra Parks and Resorts, the primary authorized concessioner in the park that also provides



Figure 8-4: A rental fleet outside a bicycle shop in Bar Harbor, Maine, near Acadia National Park. (Source: U.S. DOT Volpe Center)

lodging, camping, and recreational activities. Bicycle rentals are offered from the Old Faithful Snow Lodge. Adult and child bicycles, as well as bicycle trailers, are available. Xanterra provides suggestions of popular bicycle routes to follow, ranging in distance from three to 21 miles, on paved multiuse paths, gravel roads closed to automobile traffic, and roads with automobile traffic. One popular route is a two mile round-trip paved path that passes by three geysers.⁴

Acadia National Park: Bicycle rentals nearby the park

Acadia National Park does not have bicycle rentals within the park, but several businesses in Bar Harbor, Maine and other nearby communities offer rentals. Visitors can ride from these businesses to the park, or use the Island Explorer shuttle bus service (all buses are equipped with bicycle racks). Once in the park, visitors can ride on the park’s carriage roads, which have a hard-packed gravel surface and are closed to motorized traffic, or on the Park Loop Road, a heavily traveled automobile route that provides a 21 mile scenic loop around the park.

Overview of Bike Share Systems

Bike share systems are typically located in large urban areas with existing bicycle infrastructure, although some smaller cities, as well as college and large company campuses, have also implemented bicycle sharing. Bicycle sharing systems might work well in national parks that are located in densely populated urban areas, especially cities that have existing bicycle sharing systems. They might also work well in and near parks with high visitation, extensive bicycling infrastructure, connections to transit, and many destinations and attractions within several miles.

Bike share systems can take several forms, including:

- A “kiosk-based” system: bikes are secured to and rented from an automated docking station;
- A “dockless” system: locking and renting technology is located on the bike itself and riders can pick up and drop off bicycles at almost any location; and



- An “ad-hoc” system: bikes are distributed across a defined area without any locking or tracking technology.

Most urban bike share systems are kiosk-based. The docking stations for these systems may be installed semi-permanently at a location (fixed systems), or they may be portable stations that can be moved when necessary (such as for special events or for the winter). With both types of kiosk systems, bicycles must be regularly redistributed to allow customers space to return bicycles when the set number of docks at a station fills up or to provide bicycles when a station

becomes empty. The stations, which can be battery, solar, or electric-powered, are typically connected to a centralized programming system that informs system managers when the bicycles need to be redistributed.

Some bike share systems incorporate a smart lock technology (also known as “tech-on-bicycle” systems) that places the unlocking and rental technology on the bicycles themselves. Bicycles are typically rented using a smartphone and may or may not use stations or kiosks for docking the bicycles. For example, a bike share system in Evansville, Indiana offers 70 bicycles across seven stations. Bicycles are unlocked using a smartphone app and come with a U-lock so that users



Figure 8-5: Visitors and park staff using the bike share at San Antonio Missions National Historical Park in Texas. (Source: NPS)

can lock their bicycle at an interim destination before returning it to a station. The program is sponsored by several local companies and health organizations and the Evansville Area Trails Coalition, a nonprofit citizens group promoting area trail use. Proceeds from the program's user fees go directly to the trails coalition.⁵

"Dockless" bike share systems are emerging in a growing number of cities and locations across the U.S. Systems without designated stations have lower capital costs, since each bike share docking station typically costs \$20,000 to \$50,000. With dockless systems there is also less need to redistribute the bicycles, as bicycles do not have to be rented from stations with a fixed number of spots.

Finally, with ad-hoc bicycle sharing, bicycles are purchased and distributed around a defined area without any stations or tracking technology. Bike share users can pick up a bicycle for free, ride it, and drop it off elsewhere in the area. While the ad-hoc model is not common for municipal bike share systems, several parks have implemented small scale ad-hoc bicycle sharing programs geared towards employees. For more information about those types of systems, see the [Employee Programs and Park Operational Uses](#) chapter.

There are a number of companies that offer bike share equipment and technologies. There are also a number of entities that provide bike share services, from providing the stations and the bicycles, to managing the system. Municipal governments typically have involvement in the management of bike share systems within their cities, but a variety of business and operating models exist.

In most cases, bike share systems are financed by a combination of user and member fees, grants, and sponsorships or advertising. Bike share docks and equipment, though not the purchase of bicycles, may be eligible for certain Federal Transit Administration (FTA) funding.⁶ A bike share system may be publicly owned and privately operated, with the local government or municipality owning the bike share capital infrastructure, but contracting with a private company or partnering with a nonprofit to operate the system.

Another common model is for a nonprofit to own and operate the bike share system or lease it directly from a bike share manufacturing company. The nonprofit could operate the system directly or contract with a private company to provide for operation needs. The nonprofit model is popular because it puts the financial liability on the nonprofit rather than the government, and provides more flexibility for fundraising or applying for grants. Finally, a bike share system could be both owned and operated by the private sector with minimal government involvement.⁷

If there is an existing bike share system in a community near a national park, understanding more about how this system operates can help parks and partners determine the relevant stakeholders and begin the discussion on connecting bike share between the park and the community.

Integrating Municipal Bike Share Systems into Urban National Parks

Many U.S. cities and urban areas have integrated bike share systems into the local or regional transportation network in recent years. National parks interested in providing bike share as an option for visitors could reach out to the nearby community or bike share operator, if one exists, to discuss opportunities for expanding or implementing a system to connect with key park destinations.

Several national parks have had success partnering with municipalities to provide bike share stations on and adjacent to park property, including the National Mall and Memorial Parks in the District of Columbia; Mississippi National River and Recreation Area in Minneapolis-St. Paul, Minnesota; and San Antonio Missions National Historical Park in Texas. All three parks are located in urban settings, making bike sharing a desirable option for accessing and experiencing park sites. In all three cases, park staff worked with the city governments and bike share operators to plan bike share stations in and around the park sites and routes.⁸





Dockless Bike Sharing

The next generation of bike share is being introduced in cities across the U.S. When approved to operate within a particular area, typically by the local municipality, this new model of dockless, tech-on-bike system allows riders to pick up and drop off bicycles at almost any location, as long as the bicycles do not block access to public rights-of-way, infringe upon protected areas, or are placed in unapproved locations. These bicycles can be tracked using GPS technology and are typically self-locking (via the rear wheel) or come with a U-lock in order to lock the bicycle to a bicycle rack. Users can unlock these bicycles by using a smartphone app, which also shows where they can find available bicycles. Unlike kiosk-based systems, which are typically subsidized by the municipal government or require advertising revenue to operate, the majority of dockless bike sharing systems are for-profit with revenues large enough to not require grants or sponsorships from local agencies.

Cities that allow dockless bike sharing systems to operate generally issue permits to companies that meet certain operating requirements. For example, the permit may lay out how many bicycles a company is allowed to have within an approved operating area, where users are allowed to park the bicycles, what responsibility a company has to remove improperly parked bicycles (e.g., to remove them within a certain amount of time or pay a fine), and what type of liability insurance a company is required to carry. Some cities also require payment from the operator based on the number of bicycles in operation, to be used for additional amenities like bike racks or improving bicycle infrastructure. National parks are often destinations that riders seek to visit in many of these cities, making communication between the NPS, the local municipality, the regional transportation authority, and the bike share operators important. For example, they could collaborate to determine how the entities will best accommodate and manage these shared bicycles that people ride and park on NPS property. In addition, as bike share operators are required to obtain permits from the municipalities, the same may be required to allow for the operation of these systems on federal public lands – for example, through a Special Use Permit or a Commercial Use Authorization.



Figure 8-6: Two types of dockless bike share in Washington, D.C. (Source: NPS)

Collaboration between parks and partners is critical in order to successfully connect a bike share system to and within a park. Initial topics to discuss for a collaborative bike share effort typically include:

- Planning the siting of stations in and around the park to facilitate easy access to and between destinations;
- Developing signs that both identify the bike share station and provide directions to nearby national park sites;
- Promoting the bike share system through various outreach networks;
- Developing bicycle infrastructure that makes traveling between bike share stations and destinations safe and comfortable for users;
- Sharing and analyzing data collected through bike share usage; and
- Funding the bike share system by working with partners to apply for grants or identify sponsors to fund bicycles, stations, or system operations.

Bike Sharing Considerations for National Parks

When parks and partners are interested in implementing or connecting bike share systems to and within a national park, the primary factors to consider depend largely on the park setting, the type of bike share system that exists or is most appropriate for the area (i.e., “ad-hoc,” “dockless,” or “kiosk-based”), and who the intended user is (i.e., visitors, staff and volunteers, etc.). For example, remote parks that wish to implement their own bike share system primarily for use within park boundaries would need to identify how to operate and maintain the system as well as available funding to pay for the system. In addition, if the intended user of the system is park staff and volunteers, then an “ad-hoc” system may be the most feasible option. See the [Employee Programs and Park Operational Uses](#) chapter for more information on this type of system being used at Glacier National Park in Montana.

The majority of bike share systems that are currently in use across the U.S. are “kiosk-based.” For parks and partners interested in pursuing a connection with an existing system or in implementing a kiosk-based bike share system with the local municipality and other partners, the following are additional considerations:

- **Land ownership:** Bike share operators follow different procedures for station placement depending on who owns the land on which a bike share station will be located. For bike share stations located on NPS managed properties, a formal memorandum of understanding between the NPS and the bike share operator may be required.
- **NPS mission:** Bike share stations cannot conflict with a park’s mission as laid out in its Foundation Document or General Management Plan. For example, bike share stations and signs should not detract from historic preservation objectives or disrupt scenic viewsheds.
- **Advertising limitations:** Many bike share systems are partially funded through advertising on stations. However, commercial advertising is not allowed on NPS sites. Instead of featuring advertisements, stations on NPS land can display informational or educational materials, such as safety messages or information about nearby attractions. The bicycles, however, do not have the same advertisement limitations, as they are considered moving vehicles.
- **Concessions issues:** Parks often have concession agreements with bicycle rental businesses. To install bike share stations in these parks, the NPS will need to demonstrate, as detailed earlier in this chapter, that bike share provides a different service from bicycle rental and that the bike share operation does not infringe upon the concession agreement. Table 8-1 provides information about the differences between these two types of systems, and can help make the case that each provide distinct services.



For example, bike share is used primarily for transportation, while bicycle rentals are typically for recreation. For this reason, installing bicycle stations in national parks can help close gaps in municipal bike share networks and provide additional options for bicycle travel within parks and in the surrounding communities – without detracting from existing bicycle rental businesses.

- **Liability:** Most large public bike share systems in the U.S. are operated by third parties (private company or nonprofit organization) rather than a government agency. Bike share operators address legal liability by requiring members to sign a user agreement and by carrying appropriate insurance. Therefore, bike share systems operated by third parties should not create any additional liability issues for national parks.

Bike Sharing Examples

Nice Ride Minnesota and Mississippi National River and Recreation Area

The Nice Ride Minnesota bike share system launched in 2010 with 700 bicycles and 65 stations in Minneapolis-St. Paul, Minnesota. The system expanded rapidly, and as of 2017 had over 1,800 bicycles and 200 stations. In 2011, the NPS completed



Figure 8-7: Many Nice Ride stations are located in and around Mississippi National River and Recreation Area, allowing visitors to access and enjoy the park by bicycle. (Source: NPS)



Figure 8-8: The Mississippi River Paddle Share allows users to reserve and rent kayaks from stations along the river. The stations are located near Nice Ride stations to allow for one way trips. (Source: NPS)

a plan to create a robust multimodal network that includes bicycle facilities, canoe and kayak rental facilities, and connections to public bus and light rail systems throughout the Mississippi National River and Recreation Area. Based in part on this plan, the NPS and Nice Ride Minnesota are partnering to improve access to the river’s cultural, historic, and natural resources to enable visitors and residents to arrive and travel along the river without the use of a car.

In addition to bike share stations along the river, in 2016 the park launched a paddle share program that allows visitors to rent kayaks from several stations along the river. The paddle share stations are aligned with Nice Ride bike share stations, allowing visitors the option to paddle one way and bicycle the other.

Capital Bikeshare and National Mall and Memorial Parks

The District of Columbia’s bike share system, Capital Bikeshare, launched in 2010 and as of 2017 had expanded to 3,700 bicycles and 440 stations in the region, including Maryland and Virginia. In 2012, five stations were installed on the National Mall. Since then, four additional stations have been installed on and around the National Mall, and visitors can use bike share to access and travel between monuments.



Figure 8-8: Bicyclists using the Capital Bikeshare in front of the Lincoln Memorial. (Source: NPS)

Implementing Capital Bikeshare on NPS managed land is authorized through a memorandum of understanding (MOU) between the District of Columbia Department of Transportation and NPS; these management approaches are discussed in more detail in the **Partnerships and Funding** chapter. Since the MOU is with the National Capital Region rather than a specific park, the agreement allows any park in the region to work with Capital Bikeshare to install stations and sets up a process for obtaining special use permits in order to do so. However, as of 2017, the National Mall is the only park in the region that has bike share stations installed on NPS managed property.

B-Cycle and San Antonio Missions National Historical Park

In 2012, the B-Cycle bike share system in San Antonio, Texas was expanded to connect to San Antonio Missions National Historical Park. The park consists of four 18th century Spanish colonial missions that are located along an eight mile stretch of the San Antonio River. Most park visitors arrive by personal vehicle, and the NPS was interested in providing an alternative that would help reduce vehicle and parking congestion as well as greenhouse gas emissions. Working together,

the park, the city of San Antonio, and the nonprofit San Antonio Bike Share organization implemented a linear expansion of the bike share system along a newly built recreation trail from downtown to the park. With funding from an FTA grant, 12 new bike share stations were installed, providing access to all four NPS missions.

For each of these three kiosk-based bike share examples, the stations that connect visitors to national park sites and routes are among the most highly used in each system.



Figure 8-9: The B-Cycle system in San Antonio extends from downtown to connect to multiple sites within the San Antonio Missions National Historical Park. (Source: NPS)



Additional Resources

Bike Sharing in the United States. State of the Practice and Guide to Implementation (2012).
http://www.pedbikeinfo.org/pdf/Programs_Promote_bikeshareintheus.pdf



End Notes

¹ FHWA Frequently asked Questions and Answers concerning Bike Sharing Relative to the United States Department of Transportation (2012).

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/faq_bikeshare.cfm

² FHWA Federal Lands Highway Division. Exploring Bicycle Options For Federal Lands: Bike Sharing, Rentals And Employee Fleets (2012). <http://www.pedbikeinfo.org/cms/downloads/ExploringBicycleOptionsForFederalLands.pdf>

³ FWS Wichita Mountains Wildlife Refuge: Comprehensive Alternative Transportation Plan (2014).

<https://rosap.ntl.bts.gov/view/dot/12109>

⁴ Yellowstone National Park. Bicycling. <https://www.nps.gov/yell/planyourvisit/bicycling.htm>

⁵ Evansville Courier & Press. City-wide Bike Sharing Program Announced (2016).

<http://www.courierpress.com/story/news/local/2016/10/03/citywide-bike-sharing-program-announced/91462008/>

⁶ Federal Transit Administration Frequently Asked Questions and Answers concerning Bike Sharing Relative to the United States Department of Transportation (2015). https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Informal_Q_and_As_Final_updated_w_new_contacts_9_30_15.pdf

⁷ Pioneer Valley Planning Commission. Regional Bike Share in the Pioneer Valley Feasibility Study (2014).

<http://www.amherstma.gov/DocumentCenter/View/32094>

⁸ Sherwood, K. and Murphy J. Expanding a Municipal Bikeshare System into an Urban National Park Through Community Partnerships: City of San Antonio, Texas, and San Antonio Missions National Historical Park (2014).

<http://trrjournalonline.trb.org/doi/pdf/10.3141/2453-07>

Chapter 9: Employee Programs and Park Operational Uses

This chapter explores how parks can encourage employees to incorporate active transportation into their workplace routines through offering employee bicycle fleets, active transportation incentives, and employee wellness programs. It describes the benefits of such programs to both employees and parks.





Introduction

The National Park Service can encourage and provide opportunities to incorporate active transportation into employee workplace routines. Workplace active transportation can benefit employees and park resources by reducing greenhouse gas emissions and transportation costs for the park and individual employees, increasing employee productivity, and improving employee health, well-being, and overall job satisfaction. To help parks and employees realize these benefits and create a more active and healthy workplace culture, a park can include bicycles in the employee vehicle fleet, provide active transportation incentive programs for employees commuting between home and work as well as traveling between worksites while on duty, or offer employee wellness programs tailored to the interest of park staff and the park environment.

In addition to equipment and programs, safe bicycle and pedestrian infrastructure can allow and encourage employees to use bicycles or walk when commuting and while at work. Bicycle and pedestrian infrastructure in and around parks also benefits park visitors and can improve the visitor experience. For more information on active transportation infrastructure, see the [Infrastructure and Multimodal Connectivity](#) chapter.

The following sections provide more information on 1) the benefits of workplace active transportation; 2) the use of employee bicycle fleets for operation, transportation, and recreation purposes; and 3) programs and incentives that may help motivate employees to walk or bicycle more.

Benefits of Workplace Active Transportation

Promoting workplace active transportation through employer or partner provided equipment, programs, and incentives can provide various benefits to NPS employees, volunteers, and visitors and can help achieve operational and agency goals. These benefits include:

- **Improved employee health and well-being:** Numerous studies show that bicycling has positive benefits for physical health, weight loss, and mental health.¹ In addition, active commuting has been linked to better productivity because of lower absenteeism due to illness, benefitting employers as well as employees.^{2,3,4}
- **Improved employee satisfaction:** Bicycling can be an enjoyable way to travel, and having an opportunity to ride a bicycle to and from work or during the workday might improve employee job satisfaction. For example, one study found that 67 percent of people who bike or walk to work enjoy their commute, compared to 58 percent of those who commute by car.⁵
- **Reduced transportation costs, roadway congestion, and greenhouse gas emissions:** Utilizing bicycles for operational activities and employee or volunteer transportation between work sites may save parks money on fuel and vehicle maintenance costs, reduce roadway congestion by removing employee vehicles from the roadway, and allow them to reduce transportation- and operations-related greenhouse gas emissions.
- **Increased employee understanding of visitor active transportation:** Providing bicycles for employee use can help NPS staff develop a firsthand understanding of the benefits of active transportation and become advocates for expanding active transportation programming and infrastructure within and around the park. Employee bicycle fleets can also increase the visibility of active transportation for park visitors, and show visitors that riding a bicycle in the park can be safe, easy, and enjoyable.



Figure 9-1: Employees and visitors to Grand Canyon National Park in Arizona. (Source: NPS)

Use of Employee Bicycle Fleets

Employee bicycle fleets are collections of bicycles that are provided by an organization and offered to staff and volunteers for their use. Employee bicycle fleets can provide additional transportation options for employees to travel to and from work and between work sites, and for operational activities such as patrolling or hauling materials. Employee fleets can operate like a bike sharing system, with employees borrowing bicycles for short trips within a defined area. Employers may also loan bicycles out for a longer time period, such as a several weeks or months. Employee bicycle fleets may be owned or operated by parks themselves, or by partner organizations such as friends of the park groups or other nonprofits.

In national parks, employee bicycle fleets have been successful for the following uses:

- **Operational:** Job-related tasks, such as leading visitor programs, conducting law enforcement patrols, or hauling materials;
- **Transportation:** Traveling to and from work sites and commuting to and from work; and
- **Recreation:** Exercise or leisure outside of work hours.

The sections below describe each of these three categories in more detail, and provide examples of how parks can use bicycle fleets in these ways.

Operational Uses

Businesses and organizations around the country are discovering that bicycles can be used to accomplish job-related activities that have primarily been accomplished using a motor vehicle. For example, United Parcel Service (UPS) uses an electronically-assisted cargo bicycle for deliveries in Portland, Oregon. The city of Cambridge, Massachusetts, employs a company called Metro Pedal Power to use cargo bicycles to pick up recycling from public bins.

Within national parks, employee bicycle fleets can be used for operational activities such as:

- Patrolling campgrounds, multiuse trails, beaches, or other park areas;
- Hauling materials, such as office supplies, firewood, recycling, or garbage;
- Leading visitor tours or activities; and
- Conducting maintenance activities.



Figure 9-2: Bicycles that are part of the Glacier National Park employee “Red Bike” fleet in Montana. (Source: NPS)

Using bicycles rather than vehicles for operational activities can reduce park fuel expenses and carbon emissions, as well as create visibility around active transportation in the park. Using bicycles to patrol areas of the park can provide employees, law enforcement, and volunteers with greater coverage in areas where vehicle access is limited but bicycle access is permitted. Patrolling by bicycle, for example, can give park employees access to multiuse trails and remote campsites that they would not be able to easily patrol in a vehicle.

When bicycles are used for operational activities, parks may need more specialized types of bicycles and equipment in the fleet. For example, a trailer could be added to equip a bicycle to haul materials, electric bicycles (e-bikes) can enable employees to carry heavy loads or cover hilly terrain, and bicycles with fat tires can allow employees to use bicycles to patrol on dirt, sand, or over snow.

Transportation Uses

Employee bicycle fleets are often used for traveling between sites within a defined geographic area. For example, the Denver Federal Center in Colorado, a 623-acre campus of 28 federal agency offices, has a free kiosk-based bike share program for tenants that includes 50 bicycles and six stations strategically placed throughout the campus. The bike share system is geared towards encouraging short trips between buildings, as well as providing increased access to surrounding public transportation.

Some national parks have adopted this model and provide bicycles for employees to use for travel between sites within the park. Bicycles used for this purpose can replace vehicle trips that employees would have otherwise taken. In this way, bicycles can reduce fuel expenses and carbon emissions, as well as provide an opportunity for physical activity during the work day.



Glacier National Park Red Bike Program

The Glacier National Park Red Bike Program provides 27 bicycles for employees to use within park boundaries. The bicycles, which come equipped with helmets and rear saddle baskets, are located at office buildings, visitor centers, campgrounds, and ranger stations. Park employees can check out a master key to access the bicycles for an entire season, which runs from May 1 to October 15. In an average year, 35 to 40 employees utilize the bicycles. People with this master key can borrow a bicycle at any time, and must return the bicycle to the same location within 72 hours of check-out. Most bicycle use is between offices in the park, although at two locations employees can use the bicycles to get from their living quarters to their office. The bicycles were purchased with a grant from the Glacier National Park Fund, and are maintained by staff, volunteers, and local bicycle shops.



Figure 9-3: Glacier National Park superintendent Jeff Mow rides an employee “Red Bike” near the park headquarters. (Source: NPS)

Employee bicycle fleets can also be used for commuting purposes. Some national parks have provided bicycle fleets to employees and volunteers who live in or nearby the park to use for commuting. These bicycles may be offered to employees or volunteers as a long term loan (e.g., for an entire season), or be checked out for daily use as is a typical bicycle rental. This type of system is especially useful for parks that have many seasonal employees or volunteers who live in or near the park and might not have other forms of transportation available to them.

Recreation Uses

Employee bicycle fleets can be used for exercise and recreational trips outside of work hours, such as after work or during a lunch break. Many workplaces have gyms that employees can use; an employee bicycle fleet for recreation is similar in concept.

It is important to note that bicycles that are government property require special authorization to be used for non-work purposes or personal use, such as recreation. Therefore, parks pursuing bicycle fleets to use for recreation or commuting purposes typically work with a partner, such as a nonprofit organization or employee association, to purchase the bicycles and manage the employee fleet program.

For example, the NPS Midwest Regional Office in Omaha, Nebraska offers 10 bicycles that employees can use for recreation. The program was initiated by the Midwest Region Activities Association, an employee group that plans recreational and social activities. The group used \$5,000 in grants to purchase the bicycles and accessories. NPS employees and their guests and families can borrow the bicycles to ride outside of work hours, such as after work or during their lunch break. The nearby Lewis and Clark National Historic Trail and Missouri Riverfront Trail are popular places for employees to ride.

Employee Bicycle Fleet Considerations

To determine whether an employee bicycle fleet would be a good fit to implement within a park, the following are a few aspects to consider:

- Is the landscape and geography conducive to comfortably riding a bicycle?
- Is the distance between worksites and homes a reasonable distance to travel by bicycle?
- Is there infrastructure in place to ride a bicycle safely?

Bicycle fleets may work best when employees tend to travel between several locations within a relatively small geographic area, and when there are safe places to ride within and around the park, such as multiuse trails, bike lanes, or roads without high speed traffic. They are also attractive for parks that have a large number of seasonal employees who may be living in park-provided housing and do not have personal vehicles. Pursuing a bicycle fleet for operational uses can work well when employees use park vehicles to travel short distances or at low speeds, and if a park faces high maintenance and fuel expenses for these vehicles.

When the determination has been made that an employee bicycle fleet program would be a good fit for a park, consider the following elements for planning and implementing the program:

- **Funding:** Several employee bicycle fleet programs at national parks have been funded through grants from friends of the park groups or other public lands support groups, such as the National Park Foundation. Other parks have used their own budgets to fund employee fleets. Capital costs for an employee bicycle fleet program typically average \$300 to \$600 per bicycle, including accessories. Cargo bicycles, e-bikes, or other specialty bicycles are more expensive.
- **Bicycle ownership:** Bicycles that are government property require special authorization to be used for non-work purposes or personal use. To address this issue and allow employees to use employee fleet bicycles for personal use, such as on a lunch break or commuting, some parks have had another organization, such as a nonprofit, purchase and manage the bicycles.
- **Equipment:** The types of bicycles chosen for the fleet should accommodate the local climate and terrain, and the fleet's intended use. For example, hilly parks may need bicycles with more gears, and parks in rainy climates may want to add fenders to the bicycles. Bicycles that will be used for operational uses such as hauling materials may need to be fitted with a trailer. When purchasing bicycles for the fleet consider purchasing accessories as well, such as helmets, locks, and baskets.
- **Maintenance and operations:** In the planning stage of implementing an employee bicycle fleet, consider how the bicycles will be maintained, including who will do the work and how it will be paid for. Also determine how the system will be managed, such as procedures for signing up and checking out the bicycles. Maintenance costs for employee bicycle fleets vary widely depending on the type and quality of the bicycle, level of use, and exposure to weather. Some parks rely on external volunteers for bicycle maintenance or incorporate the operations and maintenance of the employee fleet into existing job duties.



- **Partnerships:** Partnerships with park friends groups, nonprofits, nearby bicycle shops, or others can provide a variety of benefits to implementing, maintaining, or operating an employee bicycle fleet program. These groups can be involved in a variety of ways, from purchasing or donating the bicycles, to volunteering to maintain the bicycles, to training employees in bicycle skills and maintenance. In some cases, partners own the bicycles and operate the bicycle fleet program.
- **Potential benefits:** Measuring and evaluating the potential benefits of employee bicycle fleets, such as fuel and cost savings and increased employee satisfaction, can help make the case for implementing an employee bicycle fleet. Some parks have quantified benefits of employee fleets by attaching an odometer to the bicycles and calculating fuel and emissions reductions resulting from their use.
- **Employee support:** Employees who are accustomed to using cars for short work-related trips or other work duties might find it difficult to shift to bicycling for these purposes. Education and training about an employee bicycle fleet can help staff change their habits and behaviors and begin to integrate bicycling into their day-to-day work. An initiative such as a “bike buddies” program that pairs experienced riders with new ones could also help employees get comfortable with bicycling.
- **Internal champion:** Having a champion within the park to oversee the bicycle fleet, such as an individual employee or an employee group, can also be helpful for initiating and maintaining the program. This person or group could be responsible for tracking which employees are using the program or when the bicycles need to be maintained, and encouraging employees to use the system.

However, to ensure the longevity of the bicycle fleet beyond one individual’s tenure at the park, it is important that the knowledge about and responsibility for an employee bicycle fleet is spread out across multiple people.

- **Safety and liability:** Many employee bicycle fleets require riders to sign a user agreement agreeing to the rules of the program and assuming all risks of using the bicycles. To enhance safety, employee fleet managers can provide employees with bicycle safety information or training or provide helmets. Bicycle fleet programs can also require riders to wear a helmet when using the bicycle fleet, if there is not an existing state or local helmet law that applies to adult bicycle riders.

Employee Active Transportation Programs and Incentives

Employer-sponsored programs can encourage employees to use active transportation and make it easy and fun for them to walk and bike more. Employee programs include offering bicycle commuting reimbursement or bike sharing memberships, providing workplace amenities that support active transportation, and holding special events and educational and wellness activities focused around active transportation.

Bicycle Commuting Reimbursement

Many employers offer commuting incentives for their employees, such as free or discounted transit passes. Instituting or expanding these incentive programs to include bicycling can be a tool for encouraging employees to use active transportation while commuting. Programs that offer to subsidize bicycle expenses make commuting by alternate means, other than by way of a personal vehicle, more appealing. For



example, the [Department of Interior's Bicycle Subsidy Benefit Program](#)⁶ allows employees to be reimbursed for up to \$20 a month for qualified bicycle commuting costs for the months in which the employee commuted by bicycle at least 50 percent of the time. Bicycle commuting costs can include the purchase of a bicycle, bicycle lock, helmet, bicycle accessories such as reflective lights or racks, and bicycle repairs and maintenance. This bicycle benefit is offered as an alternative to other transportation benefits, such as a transit pass or parking benefits.

Bike Sharing Memberships

Offering free or discounted memberships to existing bike sharing systems can encourage employees to commute by bicycle or to use bicycles for short trips during the work day (for example, to travel to a meeting at a different location). For instance, in Washington, D.C., several federal agencies provide or have temporarily tested offering free Capital Bikeshare memberships to their staff.

Workplace Active Transportation Amenities

Employers can encourage staff to walk or bicycle to work by providing workplace amenities that support these activities, such as covered or sheltered bicycle parking, showers and changing areas, and a bicycle repair area with tools and supplies. Many communities acknowledge local businesses that provide these types of amenities through recognition programs, such as through window decals or listing on a website. These types of programs can help businesses promote their bike-friendly amenities, and encourage visitors to frequent business or organizations that make active transportation a priority. One certification program at the national level is the [League of American Bicyclists' Bicycle Friendly Business initiative](#),⁷ which provides information about actions and policies that businesses and organizations can take to encourage employees to ride to work, and awards businesses that have taken these actions. The National Mall and Memorial Parks in Washington, D.C. was named a Bicycle Friendly Business in 2009, becoming the first park in the National Park Service to receive this designation.

Workplace Educational and Wellness Programs

Workplace educational and wellness programs can provide employees with resources and encouragement to use active transportation, as well as build camaraderie among staff who use active transportation. These programs can include organized social bicycle rides or walks, informal employee groups that meet to share resources about bicycle commuting (such as recommended routes or bicycle repair skills), or speakers or other educational programs about the health benefits of active transportation. Some workplaces have friendly competitions where employees log miles walked or biked, and teams or departments compete against each other to log the most miles.

Many employers also promote Bike to Work Week or Bike to Work Day, which are typically held annually in May. They can do this through promoting the event in advance, providing breakfast for those who bicycle to work, or offering prizes for those who ride. For example, at the NPS Denver Service Center, Bike to Work Day events are organized by employee volunteers, and the employee association pays for snacks and prizes for those who participate.



Additional Resources

FHWA Federal Lands Highway Division. Exploring Bicycle Options for Federal Lands: Bike Sharing, Rentals and Employee Fleets (2012). <http://www.pedbikeinfo.org/cms/downloads/ExploringBicycleOptionsForFederalLands.pdf>

Green Rides Toolkit for National Parks. <https://cleancities.energy.gov/technical-assistance/green-rides/>

People for Bikes Statistics Library: Health Statistics. www.peopleforbikes.org/statistics/category/health-statistics

Implementing a Successful Bicycle and Active Commuting Program in the Washington, DC Metropolitan Area. https://www.fedcenter.gov/kd/items/actions.cfm?action=Show&item_id=15046



End Notes

- ¹ People for Bikes, Health Statistics of Bicycling. <http://www.peopleforbikes.org/statistics/category/health-statistics>
- ² Hendriksen IJM, et al. The Association between Commuter Cycling and Sickness Absence. *Preventive Medicine* (2010). 51:132-135. <https://www.sciencedirect.com/science/article/pii/S0091743510001829?via%3Dihub>
- ³ Deenihan and Caulfield. Estimating the Health Economic Benefits of Cycling. *Journal of Transport and Health* (2014). 1:141-149. <https://www.sciencedirect.com/science/article/pii/S221414051400022X>
- ⁴ Amlani and Munir. Does Physical Activity Have an Impact on Sickness Absence? A Review. *Sports Medicine* (2014). 44:887-907. <https://link.springer.com/article/10.1007%2Fs40279-014-0171-0>
- ⁵ Morris, E. & Guerra, E. "Mood And Mode: Does How We Travel Affect How We Feel?" *Transportation*. (2015). <https://link.springer.com/article/10.1007/s11116-014-9521-x>
- ⁶ DOI Bicycle Subsidy Benefit Program. <https://www.doi.gov/ofas/bicycle-subsidy-benefit-program>
- ⁷ American League of Bicyclists, Bicycle Friendly Business Program. <http://bikeleague.org/business>

Chapter 10: Innovative Technologies and Emerging Trends

This chapter discusses newer topics related to walking and bicycling that are becoming relevant to national parks and gateway communities. These emerging topics include bicycle and pedestrian count data; mobile applications and crowdsourced data; electric bicycles and fat tire bicycles; and the emergence of automated vehicles.



Introduction

Innovation and technology is rapidly changing, influencing shifts in active transportation trends. These advancements are leading to improved access to information and data and transforming modes of travel, while at the same time having implications to existing policies and management practices. This chapter provides an overview of emerging transportation trends and innovative technologies related to bicycling and walking relevant to national parks and gateway communities. The topics highlighted include advancements in bicycle and pedestrian count technology; the increasing availability of mobile applications (apps) and crowdsourced data; the growing use of electric bicycles and fat tire bicycles; and how the emergence of automated vehicles may impact safety for active transportation.

The Value of Active Transportation Data

Data enables managers to make decisions that better reflect the needs of visitors, help to reduce impacts to resources, and support bicycle and pedestrian planning, policies, and investments. This includes information on demographics, bicycling and walking volumes, motor vehicle traffic volumes, and usage patterns. Several national parks currently collect count data to help monitor the impact of trail use on natural resources, but few parks collect data on bicycle and pedestrian counts on park roads and multiuse trails. As more visitors wish to experience parks through active modes, improved bicycle and pedestrian data becomes increasingly important and can be used for a number of purposes, including to:

- Gain a better understanding of the routes, volumes, and visitation patterns (e.g., daily, weekly, and seasonally) of pedestrian and bicycle travel, including modal preferences of visitors;
- Better understand visitor demographics and preferences that may assist with tailored strategies for promoting bicycling and walking in and around national parks;
- Help understand broader safety concerns and exposure rates (as opposed to having solely the total number of crashes or incidents);
- Prioritize projects, programs, and funding, as well as providing data for grant applications;
- Quantify the various benefits (e.g., health, environmental, etc.) of walking and bicycling and communicate those benefits to the public;
- Track the impacts of a new infrastructure investment (e.g., dedicated bike path or lane); and
- Incorporate into the park's visitor count methodology (in coordination with the NPS Visitor Use Statistics office).



Figure 10-1: An example of a trail counter hidden within a sign post at Sleeping Bear Dunes National Lakeshore in Michigan; sign was turned upside down to expose the counter for the photograph. (Source: NPS)



The NPS consistently collects visitation counts for people arriving by vehicle and at visitor centers, but there is no system-wide guidance for the collection of bicycle or pedestrian data. The methodology for incorporating these numbers into the park's monthly visitation counts is typically determined on a park-by-park basis. As parks and their partners start to identify a need to collect more data on walking and bicycling in their parks and nearby communities, they may consider implementing their own counting programs (see below), or gathering relevant data from other sources such as local municipalities, states, partners, or crowdsourced data. Advancements in technology have continued to improve active transportation data systems and their methodologies, which makes counting easier and more efficient.

Collecting Bicycle and Pedestrian Count Data

A growing number of entities, such as parks and recreation departments, counties, cities, metropolitan planning organizations (MPOs), and advocacy groups, have implemented bicycle and pedestrian count programs in order to support their active transportation initiatives. Park staff and their partners can begin collecting counts incrementally based on available resources, investing more in their count program as appropriate. The initial goal of a new bicycle and pedestrian count program is generally to establish baseline counts, which can then be updated annually or as resources are available.

The below steps offer a typical progression when beginning to consider collecting bicycle and pedestrian count data, though some steps may occur concurrently:^{1,2,3}

- **Define the purpose for data collection:** Entities can consider the following questions: "Why is the data going to be collected?" and "How will it be used?" These questions will help parks and communities to decide if bicycle and pedestrian counts are needed and how to frame the program's purpose in order to collect the best and most useful data.

- **Identify count locations:** Count locations are typically selected in areas where bicyclists and pedestrians are known to travel, which could be within or adjacent to the park. Counts can occur at entry or access points, which may be well defined in urban areas but less so in rural areas. The facility type (multiuse trail, on-road bike lane, sidewalk, etc.) will help inform the type of count technology that should be used. See Table 10-1 below for examples of count technology types.
- **Identify count timeframe:** Short term counts are typically done over a period of one to several days for a few hours each day and at several select locations, while longer term counts can be collected continuously using automated counters over months or years at a few locations. When planning the count time frame, consider the visitation patterns at national parks, which often have seasonal variations. The FHWA [Traffic Monitoring Guide](#)⁴ and Travel Monitoring Analysis System recommends certain months, days, and times to collect counts, in an effort to standardize counts collected across the country. Many places often collect count data in September with optional count days in May, July, or January, with the count days including at least one day mid-week (Tuesday, Wednesday, or Thursday) and a Saturday. Park staff may wish to consider the guidance from the [NCHRP Guidebook on Pedestrian and Bicycle Volume Data Collection](#)⁵ as a starting point, and tailor count programs based on known patterns and fluctuations in visitation at the park.⁶
- **Identify available resources needed to collect the data:** Collecting bicycle and pedestrian count data requires resources, which could include staff or volunteer time and funding to purchase counters. The necessary resources are dependent upon the counting process selected, the type of counters chosen, count locations, and timeframe. Parks can consider partnering with agencies that may already be collecting data, such as MPOs or state departments of transportation (DOTs).

- Consider automated counters versus manual counts:** Manual counts require staff or volunteers to collect the count data by tallying bicycles or pedestrians as they pass the count locations. Manual counts often require a lower upfront investment, but require significant staff or volunteer time. With limited resources, count programs can be initiated by conducting manual counts at a limited number of key locations, such as those known to be highly used by bicyclists and pedestrians. When collecting manual counts, parks can also consider recording additional data such as weather (temperature highs and lows, precipitation), month, season, and demographics (gender, age, etc.). Automated counts require the purchase of technology, which continues to improve and become more affordable (the cost of counters generally range between \$700 and \$4,000 each).⁷ Automated counters can collect data continuously and for longer periods of time;

they may provide more accurate data than manual counts, enable data extrapolation to estimate counts during different time periods, and give an understanding of factors such as time of day, season, or weather. Many automated counters record weather, date, and temperature along with the count volumes.

Should the count data be used to determine the park's visitation numbers, the methodology, counter location, etc. will need to be determined in coordination with the NPS Visitor Statistics office.

For parks considering using automated counters, there are a number of options to consider. Table 10-1 below provides a description of some common types of counter technologies that are most applicable to a park setting as well as related considerations. Numerous additional resources are available online to help park staff determine how to implement a count program to best fit their needs (see the Resources section at the end of this chapter).



Figure 10-2: Installation of a pedestrian counter at Sleeping Bear Dunes National Lakeshore. (Source: NPS)



Table 10-1: Common bicycle and pedestrian count technologies

Count Technology ^{8,9}	Description	What Does It Count?	Timeframe	Example Manufacturers*	Considerations for Parks
<i>Manual Observers</i>	Volunteers or staff are stationed at the count location in shifts to tally observed bicyclists or pedestrians passing by.	Bicyclists and pedestrians separately	Temporary/short term counts	N/A	If funding is limited for count programs, manual counts can be a good way to start data collection for a count program. Short term manual counts may be less accurate for extrapolating data to longer time frames
<i>Infrared sensors (active or passive)</i>	These counters are typically in weatherproof boxes, have a long battery life, and are portable. The counters detect changes in energy (temperature/heat) when people pass by them. They can be used for any surface type, and must be mounted on signposts, fences, etc.	Bicyclists and pedestrians combined	Short term or permanent counts	EcoCounter: Pyro; TRAFx Infrared Counter; TrailMaster TM 1550	These counters are portable and easy to set up. They work well on trails, but are difficult to use for on-road bike lanes.
<i>Pneumatic tubes</i>	Tube counters operate with an air switch that detects bursts of air from passing bicycles. They are relatively portable and low cost, and can be used on firm surfaces.	Bicyclists only	Short term counts	EcoCounter: Tube	Pneumatic tube counters are commonly used for counting bicyclists. One should consider heavy vehicle use and falling rocks or debris on the road or trail, which can damage the pneumatic tubes.
<i>Inductive loops</i>	Inductive loops measure the electromagnetic force of bicycle wheels. They must be installed on paved surfaces and may require saw cuts in the pavement to be installed. Short term inductive loops that adhere to the ground, and require no engineering to install, are also available.	Bicyclists only	Short term or permanent counts	Diamond Traffic: TT-41/Pegasus; EcoCounter Easy-ZELT	Inductive loops may be a good alternative to pneumatic tubes if there is a risk of damage to the tubes from falling rocks or debris.
<i>Automated video analysis</i>	Automated video analysis is an emerging technology that uses algorithms, computer vision techniques, and visual pattern recognition. It requires minimal labor, and the cameras are portable for use at multiple locations. Due to technological memory limitations, this technique is best suited for short duration counts.	Pedestrians and potentially bicyclists	Short term counts	N/A	Automated video analysis has been mainly used for pedestrian counts, but use for bicycle counts is becoming more common. In pedestrian counts, error has ranged from 5-13%. ¹⁰

* These lists contain examples of manufacturers, but do not contain all bicycle and pedestrian count manufacturers for the different categories of count technologies.

Crowdsourced Nonmotorized Travel Data

New opportunities to understand bicycle and pedestrian travel patterns have emerged through crowdsourced data. Crowdsourced data includes contributions from internet and mobile app users that are obtained and used by organizations, after the data has been aggregated and anonymized for privacy purposes. The data can be collected actively, with users adding data about where they travel, or passively, with an application running in the background and collecting bicycle speed/route data. Companies that collect crowdsourced data may sell the data to potential users, or be willing to enter into partnerships to share the data. This data can provide agencies with a better understanding of how people use networks of roads, bike paths, sidewalks, and intersections. Parks and partners can use this data to identify roadways or trails with heavy bicycle and pedestrian use, and help focus their efforts to target improvements of specific facilities.

For example, the Oregon Department of Transportation (ODOT) purchased crowdsourced data from a company called Strava Inc., which developed proprietary mobile technology to collect crowdsourced bicycle and pedestrian trip data logged by its community of users. ODOT used the Strava data to fill in gaps where bicycle and pedestrian data is not collected by counters.¹¹

In other cases, private companies will develop a basic mobile app and maintain app servers that collect crowdsourced data; agencies or organizations can buy access to the app's database that stores the raw data, which typically has a lower upfront cost than buying the aggregated data outright. An agency using such data usually contributes additional resources to promote the use of the app, which is critical in order to create enough data points to arrive at accurate conclusions about active transportation. For example, San Francisco County Transportation Authority developed an app called [CycleTracks](#)¹² in 2009 to help transportation planners make informed decisions about bicycle use and facilities in the community. The active transportation community can download the app onto their mobile devices and submit their bicycle

trips. The individual trips are uploaded to the cloud service, and the transportation agency accesses the data through a web login.



Figure 10-3: Bicyclist using GPS technology in Denali National Park in Alaska. (Source: NPS)

NPS Use of Crowdsourced Data and Other Data Sources

For parks and partners that wish to look into using crowdsourced data, consider the following:

- **Establish partnerships to purchase datasets:** Collaborate with partners to purchase data that may be too expensive for one partner to pay for on their own. This may facilitate collaboration on program or project implementation.
- **Encourage the use of apps that produce free data:** Communities and park partners can promote free apps that actively record the bicycle and pedestrian trips of visitors.

For NPS staff, there is an internal data collection system for its geospatial data, called [Places](#), which



can be accessed through a web browser or a mobile application. Places is designed to collect data from all park employees, rather than a smaller group of GIS professionals within NPS staff. Data from Places feeds directly into both Park Tiles and the larger NPS structured data framework, which is used to drive the NPS website and display on individual park websites. Those with access and connected to the NPS network can edit the Places datasets using the web-based Places Editor. These datasets have grown since being initially seeded from existing park, region, and program-level GIS datasets.¹³

Utilizing Mobile Apps for NPS Visitor Experience

While private companies have developed mobile apps to facilitate pedestrian and bicycle route planning, the NPS and partners have also developed mobile apps for visitor use at specific sites. These apps could improve the visitor experience in the park and its surrounding communities with active transportation routes and advice, as well as supplemental information about activities at various sites. The below list highlights examples of NPS-specific apps:

- The Boston National Historical Park and Boston African American National Historic Site have a mobile app called [NPS Boston](#).¹⁴ It was developed to provide visitor information, maps, and directions to these NPS units located throughout downtown Boston, Massachusetts. Visitors with a mobile device can download this app, choose a site to visit, and receive detailed walking directions and estimated travel times.
- The [NPS National Mall app](#)¹⁵ provides visitors with a handheld map and customizable tour plans based on the duration of visit to the National Mall and Memorial Parks in Washington, D.C. Using the mobile device's geolocation capabilities and camera, the app can identify landmarks for visitors as they move around the park; this function is geared towards visitors using active transportation in the park.

- The [NPS Chesapeake Explorer App](#)¹⁶ helps visitors find and access sites, including historical and recreational opportunities, in the Chesapeake region, which includes parts of New York, Pennsylvania, West Virginia, Maryland, Virginia, and Washington, D.C. Visitors can find places by activity, trail name, or type of site. They can also build their own tour, tag favorites, share photos of their visit, or save places to visit later. This app features walking and biking as transportation options to get around the park, while also listing driving routes as another way to experience the park.

If a park or friend group is interested in developing a mobile app to improve visitor trip planning and to promote bicycle and pedestrian options, they can reach out to the [NPS Digital Strategy Team](#).¹⁷

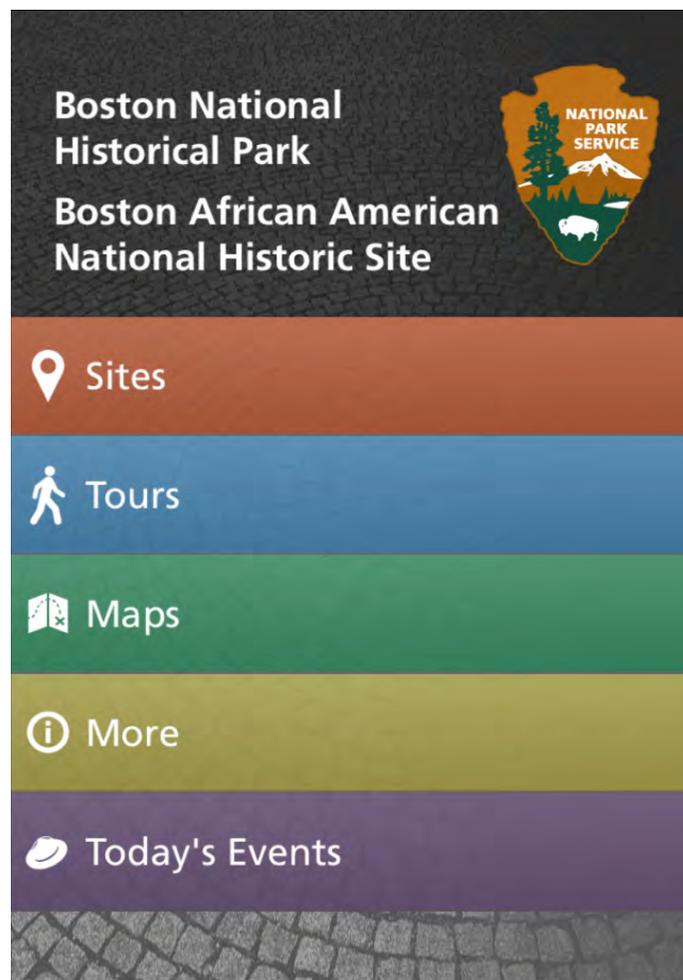


Figure 10-4: Screenshot of Boston National Historical Park and Boston African American National Historic Site mobile app. (Source: NPS)



Use, Regulation, and Considerations for Electric Bikes and National Parks

For the purposes of this Guidebook, electric bicycles (e-bikes) are defined as bicycles with an electric motor that provides pedal or propulsion assistance for inclines and added efficiency. Because the electric motor provides an assist but does not completely power the bike, e-bikes are often hard to distinguish from regular bicycles and are not considered motor bikes. The electric motor is silent, and the bicycles do not produce any fuel emissions. E-bikes also include electric mountain bikes (eMTBs), which are growing in popularity.

E-bikes expand bicycling opportunities to more people, especially elderly and disabled people, who would not otherwise be able to ride a bicycle, especially in hilly or strenuous terrain. They are common in Europe, and are growing in popularity in the U.S. E-bikes are typically categorized into a three-class system for regulation purposes:

- Class 1: pedal assist electric bicycle with a top assisted speed of 20 mph;
- Class 2: throttle assist electric bicycle with a top assisted speed of 20 mph; and
- Class 3: pedal assist electric bicycle with a top assisted speed of 28 mph¹⁸

Most bicyclists without pedal assist travel at speeds between 10 and 15 mph depending on the terrain.¹⁹

E-bike Regulation

Long-standing regulatory structures for trail management have divided trails into motorized and nonmotorized uses, but e-bikes share characteristics of both motorized and nonmotorized transportation. E-bikes are not currently defined or managed consistently across all of the federal land management agencies. For instance, the Fish and Wildlife Service, the Forest Service, the Bureau of Land Management, and the NPS^{20,21} consider e-bikes to be a “motorized” use. As such, e-bikes are not only restricted from nonmotorized bicycle facilities but are also restricted from certain motor vehicle facilities to the same extent that a traditional bicycle might be.

Some state and local authorities treat e-bikes similarly, as “motorized,” and other state and local public land management agencies have decided to open trails to e-bike use. For example, several state parks, county open space organizations, and municipalities treat e-bikes identically to regular non-electric bicycles, or have designated specific areas that are open to e-bikes.²²

Many municipalities and states are updating their local ordinances and state laws to distinguish e-bikes from other motorized transportation and codify the three-class system mentioned above. Nearly 20 states have incorporated e-bikes into their traffic codes and regulate e-bikes similarly to traditional bicycles and, as of 2017, at least seven states (including Arkansas, California, Colorado, Illinois, Michigan, Tennessee, and Utah) have instated this three-class system.²³

As e-bike use becomes more widespread, there may be need for the NPS to clarify and further develop national policy and guidance specific to e-bikes and their use within park boundaries. The next section provides guidance to park managers for considerations for use of e-bikes, where e-bike usage could be allowed, as well as next steps for parks and partners to prepare for and better align with this growing trend.



Figure 10-5: eMTB user in BLM owned Hartman Rocks, located in Gunnison, Colorado. (Source: Leslie Kehmeier)

Considerations for E-bike Use

E-bikes can be used for a variety of purposes and provide a range of benefits. For instance, e-bikes:

- **Expand the option of bicycling to more people:** E-bikes provide a new option for people who want to bicycle but might not otherwise because of physical fitness, age, disability, or convenience, especially at high altitude, and for those whose work commutes are farther than a typical bicycle commute (one to three miles). In recent years, people with disabilities have requested the use of e-bikes to accommodate their disability.
- **Increase access to locations through bicycling:** E-bikes make bicycle travel easier and faster, because they allow bicyclists to travel farther using less energy. E-bikes can also increase access to destinations at a farther distance for those who do not own a car or do not wish to use one.
- **Can be used for utility purposes:** E-bikes can carry up to 400 pounds of cargo and can be equipped with built-in hauling features, specialty baskets, versatile racks, carrying bags, and other accessories. Park staff and park visitors, who need to transport heavier items, goods, or equipment, can benefit from e-bikes as a cost-effective alternative to cars and trucks when used for transport and deliveries.
- **Mitigate negative environmental impacts:** When used as an alternative to gasoline- or diesel-powered modes, e-bikes can reduce greenhouse gas emissions and fossil fuel consumption, improve air quality, and support active modes of transportation for park staff and visitors. Similar to traditional bicycles, e-bikes can decrease traffic congestion, reduce the demand for parking spaces, and increase the number and visibility of bicyclists on the road.

- **Provide an additional source of revenue for bike tour operators:** Realizing a growing trend and accommodating for varying terrains, bike tour operators are beginning to incorporate e-bikes into their fleet to increase interest and boost revenue.

Parks and partners may need to consider regulations on e-bikes that are based on requirements set by the funding source used for the trail. In general, if state, local, or federal regulations permit, Class 1 e-bikes may be used on trails funded with Federal Highway Administration funds (with some exceptions for the Recreational Trails Program). See the [Framework for Considering Motorized Use on Nonmotorized Trails and Pedestrian Walkways](#)²⁴ for more information. Trails funded under the federal funding source of the Recreational Trails Program may have additional restrictions. Contact your state [FHWA](#) office or the national FHWA headquarters office for more information.

Potential Next Steps for Park Managers and Partners

- Reference and follow the guidance of the NPS Bike Rule (36 CFR 4.30)—see the [Policy Context](#) chapter for more information;
- Refer to the state’s laws and regulations to understand the nature of e-bike usage in areas adjacent to the park; and
- On a trail-by-trail basis, assess routes to determine e-bike and eMTB appropriateness by defining trail use and trail type and considering surrounding resource characteristics. Considerations for trails should also include speed and safety, trail width and use-volume for accommodation of additional users, trail surface, and soil conditions.



eMTB Pilot for Law Enforcement Rangers in Grand Canyon National Park

In the remote Tuweep area of Grand Canyon National Park, Law Enforcement Rangers piloted a three month effort, through a partnership with PeopleforBikes and the Grand Canyon Association, to incorporate an eMTB into the NPS equipment fleet. Rangers in this area are required to patrol roadways and other remote areas by foot, bicycle, or other motorized vehicle, where accessible.

This pilot effort quickly demonstrated to Rangers the benefit of electric bike utilization in their daily work toward visitor and resource protection and emergency services. The eMTBs allowed Rangers to access areas more swiftly, quietly, and safely. The rechargeable battery provided for a 60-80 mile travel range, which was sufficient to cover most of the normal needs within the less remote NPS areas. Rangers charged the eMTB batteries at the available ranger stations, powered by solar.

This successful demonstration effort creates a compelling example for other NPS sites to consider utilizing electric bikes within the vehicle and equipment fleet.



Figure 10-6: Bicyclists in Grand Canyon National Park, Arizona. (Source: NPS)



Use, Regulation, and Considerations for Fat Bikes and National Parks

Fat-tire bicycles (fat bikes) are defined as human-powered bicycles that fall under the umbrella of mountain bicycles, equipped with extra wide tires (3.5+ inches wide) operated with less than 10 pounds per square inch (psi) of pressure in each tire. Fat bikes are a form of active transportation that allows bicycling on soft or unstable terrain; they are typically used on sand or snow, but can be used in all seasons on a wide variety of surfaces. While fat bike use is becoming more popular as a way to expand winter recreation, fat bike use may also introduce new resource and user conflicts with other trail users, such as snowmobiles and cross country skiers on groomed winter-use trails. The NPS may need to clarify and further develop policy and guidance specific to fat bikes and its use within park boundaries.

Fat Bike Regulation

Fat bikes are regulated at the federal and state levels under the same conventions as traditional bicycles. Fat bikes tend to be used on trails and beaches; therefore, regulations specific to fat bikes fall within the jurisdiction of the park and its management. Trails can be considered for fat biking on a trail-by-trail basis. The [NPS Sustainable Trails webpage](#)²⁵ can provide guidance in creating different types of trails.

The two examples below highlight state and local park systems with established fat bike regulations:

- **Cuyuna Country State Recreation Area** is part of a pilot program led by the Minnesota Department of Natural Resources (DNR) to create a transportation network that accommodates fat bikes, particularly in the winter. The pilot aims to minimize user conflicts with other winter transportation modes through trail design and management. Cuyuna has over 20 miles of trails groomed for fat biking and provides users with maps, virtual tours, and trail status updates.²⁶



Figure 10-7: Fat bike use on a winter-use trail in the Boreal Forest in Alaska. (Source: U.S. DOT Volpe Center)

In addition, Minnesota's DNR has extensive guidance for land managers on trail maintenance for fat biking and other winter activities.²⁷

- **Marquette trail system** in Michigan has more than 60 miles of fat bike accessible trails, 30 miles of which are shared use and 30 miles of which are dedicated to fat bikes alone. This system is managed by a fat bike nonprofit organization that donates time and money to help offset trail management costs. This system includes education to riders using snowmobile trails with rules to promote safety on the trails, such as prohibiting headphone use, encouraging users to wear brightly colored clothing, requiring flashing bike lights, and prohibiting bike riding on the groomed trails when temperatures are near or above freezing as the bike tires may leave ruts.²⁸

- **Trail management:** Parks or other entities tasked with managing trails and trail-use may experience increased costs for those that allow fat tire biking. For example, opening trails to fat biking in winter may mean that parks incur costs for grooming and other trail maintenance expenses in seasons that did not previously require this upkeep.
- **Environmental impact:** Particular trail environments may be susceptible to soil displacement and erosion; this may necessitate specific fat bike trail designation to accommodate sustainable use that minimizes ground disturbance and impacts to wildlife habitat.
- **Trail conflict:** As with all multiuse trails, certain management practices, use restrictions, and educational initiatives may need to be implemented in order to avoid the potential for trail crowding, safety issues, and conflicts between different users of trails.

Considerations for Fat Bike Use

Fat bikes provide the opportunity to extend bicycling into colder months, and also expand the range of places where bicycling is possible. While there are many positive aspects to fat tire biking, parks may want to consider their impacts on trail management. Considerations for parks include:

- **Improved feeling of stability:** For those who do not have the balance or self-assurance to ride a traditional bicycle, fat bikes offer a more stable bicycle experience, which can be appealing on park trails as well as roadways.
- **Use on variable terrain:** Fat bikes can be used on terrain that traditional bicycles cannot traverse, such as packed snow and sand. For example, fat bikes can allow visitors to bike along national shore lines and winter-use trails in snow.
- **Winter season recreation in variable weather conditions:** Fat bikes may enable travel throughout winter, which could spread out seasonal visitation.

Next Steps for Park Managers and Partners

- Ensure that any introduction of fat tire biking follows the guidance of the NPS Bike Rule (36 CFR 4.30)—see the [Policy Context](#) chapter for more information;
- Determine fat bike access to nonmotorized trails on a trail-by-trail basis or by defining trail characteristics that are appropriate or inappropriate for fat bikes;
- Consider the designation of certain areas of a park open for fat bikes or specific trail types open for fat bikes in various seasons, using maps, signs, or tree markings; and
- Provide education for staff and visitors on appropriate fat bike use through pamphlets, the park's website, workshops, and by partnering with local bicycle and advocacy groups.



Fat Bike Guidance in Routt National Forest

Hahns Peak at the Bears Ears District in Routt National Forest,* Colorado includes 500,000 acres of forest with terrain ranging from sagebrush flatland to forested mountains. This District has published *Fat Bike Guidelines*,²⁹ outlining specific trail conditions that are ideal for fat bikes. The Fat Bike Guidelines document discusses the best practices for fat biking on mixed-use winter trails, including etiquette for sharing the trails with people cross country skiing, snowmobiling, and snowshoeing, and trail grooming practices. The document also discusses best practices for fat biking on snowmobile trails, where fat bike users may be more vulnerable in sharing trails with motorized vehicles. The Guidelines emphasize the value in respecting other trail users, as well as the need for fat bike users to make themselves visible. The document also highlights “Special Areas” that should be avoided by fat bike users, such as those closed to protect wildlife, areas of heavy snowmobile and snowcat use, and the local ski resort during peak hours of trail use.

*Note: National forests and national parks have different mandates from the federal government about how to manage these federal lands. However, this example provides useful information to consider in making allowances for fat bikes, where appropriate in or near a national park.



Figure 10-8: Visitors at Denali National Park in Alaska using fat bikes. (Source: NPS)



Automated Vehicles and Active Transportation

Currently, the automobile industry is on the verge of a technological transformation with the development of advanced automated vehicle technologies. This includes vehicles that operate without direct driver input to control the steering, acceleration, and braking. This technology could change the way visitors and park staff travel through parks. National parks often have rural roadways that accommodate motorized vehicles, bicyclists, and pedestrians; therefore, automated vehicles must be calibrated for these types of environments as well as urban environments.

The Pedestrian and Bicycle Information Center (PBIC), operated by University of North Carolina Highway Safety Research Center, published a document that presents considerations for bicycles and pedestrians in relation to automated vehicles, called [*Discussion Guide for Automated and Connected Vehicles, Pedestrians, and Bicyclists*](#).³⁰

This document presents special issues that need to be considered to ensure that automated vehicles interact safely with nonmotorized users. Many of these issues deal with detection, and how automated vehicles will recognize, react, and communicate with pedestrians and bicyclists. More details on these challenges include:

- Detection and prediction of bicycle and pedestrian movements by vehicles;
- Social customs and communication between bicyclists/pedestrians and vehicles;
- Vehicle movement and roadway design related to bicycle and pedestrian interaction with vehicles, such as passing, parking, and loading/unloading of vehicle passengers;
- Potential risks due to different levels of automation and driver hand-off; and
- Unpredictability of changing technology and data needs.

The U.S. Department of Transportation (U.S. DOT) is focused on regulating the safety of automated vehicles in roadway environments that have many outside variables, including pedestrians and bicyclists. The U.S. DOT recently released updated guidance on automated vehicle technology, [*Automated Driving Systems: A Vision for Safety 2.0*](#), which contains guidance measures and best practices for industry, government, safety advocates and the public.

NPS staff can check the National Highway Traffic Safety Administration (NHTSA) [*Technology & Innovation*](#).³¹ While these technologies are still in the development phases, park staff can remain informed in order to be aware of implications for parks and visitors going forward, and the potential impacts to active transportation.



Additional Resources

Los Angeles Bike Count Data Clearinghouse. Conducting Bicycle and Pedestrian Counts Manual.

<http://www.bikecounts.luskin.ucla.edu/>

FHWA Transportation Planning Capacity Peer Program, North Central Texas Council of Governments.

Peer Exchange on Bicycle and Pedestrian Count Programs.

http://www.planning.dot.gov/Peer/Texas/arlington_5-29-13.pdf

Initiative for Bicycle and Pedestrian Innovation (Portland State University). Guide to Pedestrian and Bicycle Count

Programs: <https://www.pdx.edu/ibpi/count>

NPS Denver Service Center: Resources on Sustainable Trails.

<https://www.nps.gov/articles/dsc-trails.htm>

PBIC Discussion Guide for Automated and Connected Vehicles, Pedestrians, and Bicyclists.

http://www.pedbikeinfo.org/pdf/PBIC_AV.pdf



End Notes

- ¹ NCHRP Report 797: Guidebook on Pedestrian and Bicycle Volume Data. www.trb.org/Main/Blurbs/171973.aspx
- ² FHWA Traffic Monitoring Guide, Chapter 4: Traffic Monitoring for Non-motorized Traffic (2016). https://www.fhwa.dot.gov/policyinformation/tmguidetmg_2013/traffic-monitoring-for-non-motorized.cfm
- ³ FHWA Coding Nonmotorized Station Location Information in the 2016 Traffic Monitoring Guide Format (2016). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/tmg_coding/fhwahep17011.pdf
- ⁴ FHWA Travel Monitoring and Traffic Volume. <https://www.fhwa.dot.gov/policyinformation/tmguide/>
- ⁵ NCHRP Guidebook on Pedestrian and Bicycle Volume Data Collection. <http://www.trb.org/Main/Blurbs/171973.aspx>
- ⁶ National Bicycle and Pedestrian Documentation Project: Bicycle and Pedestrian Count Instructions. http://bikepeddocumentation.org/application/files/3314/6671/8088/NBPD_Instructions_2010.pdf
- ⁷ FHWA Bicycle and Pedestrian Count Technology Deployment Pilot Program (2016). http://www.pedbikeinfo.org/planning/tools_counts_pilot_program.cfm
- ⁸ Texas A&M Transportation Institute. Pedestrian and Bicyclists Counts and Demand Estimation Study (2013). <http://d2dtl5nnpfr0r.cloudfront.net/tti.tamu.edu/documents/TTI-2013-3.pdf>
- ⁹ Transportation Research Board. Monitoring Bicyclist and Pedestrian Travel Behavior: Current Research and Practice (2014). <http://onlinepubs.trb.org/onlinepubs/circulars/ec183.pdf>
- ¹⁰ FHWA Exploring Pedestrian Counting Procedures (2016). https://www.fhwa.dot.gov/policyinformation/travel_monitoring/pubs/hpl16026/
- ¹¹ Striving for Excellence: Oregon DOT's Initiatives in Travel Analysis Tool Development (2014). https://www.fhwa.dot.gov/planning/tmip/publications/other_reports/initiatives_in_travel_analysis/index.cfm
- ¹² CycleTracks Webpage. <http://www.sfcta.org/modeling-and-travel-forecasting/cycletracks-iphone-and-android>
- ¹³ NPS Places. <https://www.nps.gov/maps/tools/places/>
- ¹⁴ NPS Boston Mobile App. <https://www.nps.gov/bost/planyourvisit/app.htm>
- ¹⁵ NPS National Mall Mobile App. <https://www.nps.gov/nama/learn/photosmultimedia/app-page.htm>
- ¹⁶ NPS Chesapeake Explorer Mobile App. <http://chesapeakeexplorerapp.com/>
- ¹⁷ NPS Digital Strategy Team. <https://www.nps.gov/orgs/1207/whatwedo.htm>
- ¹⁸ People for Bikes. Electric Bicycles. <http://www.peopleforbikes.org/pages/e-bikes>
- ¹⁹ NACTO and FHWA Separated Bike Lane Planning and Design Guide (2015). https://nacto.org/wp-content/uploads/2016/05/2-4_FHWA-Separated-Bike-Lane-Guide-ch-5_2014.pdf
- ²⁰ Electronic Powered Bicycles on Public Lands. <http://peopleforbikes.org/our-work/e-bikes/for-land-managers/>
- ²¹ IMBA Electric Mountain Bicycle Regulations for Natural Surface Trails. http://b.3cdn.net/bikes/d4d3792f3643272682_2nm6b4ec8.pdf



- 22 Electric Bike Regulation by State. http://b.3cdn.net/bikes/b3917d951d9f51fb8b_23m6bn4dx.pdf
- 23 People for Bikes. Electric Bicycles. www.peopleforbikes.org/pages/e-bikes
- 24 Framework for Considering Motorized Use on Nonmotorized Trails and Pedestrian Walkways Website. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/framework.cfm
- 25 NPS Denver Service Center: Resources on Sustainable Trails. <https://www.nps.gov/articles/dsc-trails.htm>
- 26 Minnesota DNR. Cuyuna State Recreation Area Fat Bike Webpage (2017). http://www.dnr.state.mn.us/state_parks/cuyuna_country/index.html
- 27 Minnesota DNR, Trail Maintenance. http://www.dnr.state.mn.us/input/mgmtplans/parks_trails/index.html
- 28 Noquemanon Trail Network Website. <http://www.noquetrails.org/snow-bike-route>
- 29 National Forest Service Fat Bike Guidelines on the Hahns Peak. <http://routtcountyriders.org/wp-content/uploads/2014/11/FAT-BIKE-Guidelines-on-the-Hahns-Peak.jpg>
- 30 PBIC Discussion Guide for Automated and Connected Vehicles, Pedestrians, and Bicyclists. http://www.pedbikeinfo.org/pdf/PBIC_AV.pdf
- 31 NHTSA. Technology & Innovation. <https://www.nhtsa.gov/technology-innovation>

