



***Cost-Benefit and Regulatory Flexibility Threshold Analyses:
Proposed Special Regulations to Designate a New Multi-Use
Pathway for Bicycle Use at Cape Hatteras National Seashore***

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Introduction

This report presents the cost-benefit analysis and regulatory flexibility threshold analysis of the proposed regulatory action to allow bicycle use on a new 1.6-mile multi-use pathway in the Hatteras Island District of Cape Hatteras National Seashore pursuant to the park's Environmental Assessment (NPS, 2023). The National Park Service (NPS) believes that these analyses provide an adequate assessment of all relevant costs and benefits associated with the regulatory action.

The results of the cost-benefit analysis indicate that the costs of the proposed regulatory action are justified by the associated benefits. Additionally, this proposed regulatory action will not have an annual economic effect of \$100 million, and will not adversely affect an economic sector, productivity, jobs, the environment, or other units of government. This proposed regulatory action will improve visitor access and safety while protecting the natural and cultural resources within the park.

The results of the regulatory flexibility threshold analysis indicate no adverse impacts for any sector of the economy or unit of government, including small entities. Given those findings, the proposed regulatory action will not impose a significant economic impact on a substantial number of small entities.

Cost-Benefit Analysis

Background

Cape Hatteras National Seashore, located in the Outer Banks in Dare County, North Carolina, consists of more than 30,000 acres stretching along approximately 75 miles of ocean-facing shoreline. The Seashore provides a variety of recreational opportunities and receives around three million visitors each year. Visitor activities include swimming, surfing, kayaking, canoeing, windsurfing, camping, fishing, auto touring, lighthouse climbing, biking, hiking, and learning about the history and natural features of the unique barrier islands.

Bicycle use has occurred in the Seashore for several decades. Bicycles are currently allowed only on roads and in parking areas that are open to public motor vehicle traffic. These areas that are open to traditional bicycles are also open to electric bicycles. Bicycle use is not currently permitted on any trails or pathways within the Seashore.

The Seashore's 1984 General Management Plan (GMP) recognized the need for a "bikeway" and identified the area adjacent to Lighthouse Road as an appropriate location that would provide access from North Carolina Highway 12 (NC12) and the village of Buxton to popular visitor use areas within the Cape Hatteras Lighthouse District. Multiple modes of transportation currently use the Lighthouse Road corridor, including passenger, recreational, and camping vehicles, as well as pedestrians and bicyclists, who either share the paved road with motor vehicles or use the grassy shoulders along the road. There is currently no designated and safe pathway for pedestrians and bicyclists. The Seashore consistently receives requests from the public to construct a pathway along the road shoulder. In 2022, the NPS initiated a 30-day public scoping process to inform the development of plans to construct a paved, multi-use pathway adjacent to

Lighthouse Road, consistent with the recommendation in the GMP. In 2023, the NPS published an Environmental Assessment (EA) to analyze the potential environmental consequences of no-action and action alternatives. Under the action alternative, which is the NPS' preferred alternative, a new 1.6-mile long, paved multi-use pathway would be constructed, providing a designated and safe pathway for pedestrians and bicyclists. The EA evaluated the potential consequences of constructing the pathway, as well as the potential impacts of allowing bicycles and electric bicycles on the pathway.

A change in designation of bicycle routes and managing bicycle use within a national park system unit has the potential to impact park resources, and the proposed action must comply with 36 CFR 4.30 (the Bicycle Rule). The Bicycle Rule requires a special regulation to authorize bicycle use on new trails outside of developed areas. The Bicycle Rule states that bicycle use may be authorized on administrative roads upon a written determination that such bicycle use is consistent with protection of the park area's natural, scenic and aesthetic values, safety considerations and management objectives, and will not disturb wildlife or park resources. The Bicycle Rule allows the use of bicycles on park roads that are open for motor vehicle use by the general public.

Statement of Need for the Proposed Action

Executive Order 12866 (58 FR 51735) directs Federal agencies to demonstrate the need for the regulations they promulgate. Regulations are often intended to address a market failure that cannot be resolved effectively through other means. Recreation opportunities have characteristics of public goods (i.e., they are non-rival and non-excludable) and at certain levels of use, can be considered common property resources (i.e., they are rival and non-excludable). Because private markets will supply an inefficient quantity of such resources, they are often supplied by the government through the management of public lands such as national parks. However, government provision does not guarantee that resources are allocated in a manner that maximizes social welfare. In the case of common property resources, the use of such resources by one group can diminish their availability or quality for others. For example, motorized vehicle users within a park can impose costs on bicyclists in the form of congestion and health and safety risks if bicyclists are required to use the same roads. The result may be an inefficient allocation of park resources. Determining the socially optimal allocation of such resources is an important need addressed by this regulatory action.

The purpose of this proposed regulatory action is to allow bicycle use on a new, approximately 1.6-mile multi-use pathway adjacent to Lighthouse Road. Connectivity within and near the Seashore is important for realizing one purpose of the Seashore to provide access and opportunities for the benefit and enjoyment of visitors. This off-road pathway would provide increased connectivity and access for pedestrians and bicyclists, meeting the recreational needs of the area while protecting natural resources and public safety.

Alternatives Considered in the Current Analysis

NPS Proposed Action and Preferred Alternative

Under the action alternative, which is the NPS' proposed action and preferred alternative (alternative B), a new 1.6-mile-long, 10-12-foot-wide multi-use pathway would be constructed in two phases – Segment I and Segment II (NPS, 2023). The pathway would be physically separated from but adjacent to Lighthouse Road. It would then extend away from the road to the Trailhead at Cape Hatteras Lighthouse in one direction, and to the Trailhead at Buxton Beach Access in the other direction. The pathway would provide a connection into the Seashore from paved pathways originating in the village of Buxton and would provide visitors with a safe, resilient, and accessible route to many of the Seashore's key visitor use areas.

In addition to the pathway itself, the project would include wayfinding signage, benches, bollards, and the reconfiguration of the Seashore entrance at the start of the pathway, including intersection improvements and connections to local sidewalks.

The proposed action would allow bicycle use on both proposed segments of the new multi-use pathway. No other roads or trails would be designated for bicycle use, and this action would not modify any existing park trails or pathways.

Other Alternatives Considered

In addition to the preferred alternative, several other action alternatives were considered but dismissed from further consideration, as noted in the EA (NPS, 2023). The preferred alternative (alternative B) and a no-action alternative (alternative A) were carried forward. Under the no-action alternative, the NPS would maintain the current conditions at the park.

Baseline Conditions

The costs and benefits of a regulatory action are measured with respect to its baseline conditions. Guidance from the Office of Management and Budget (OMB) for a regulatory analysis suggests that the baseline should represent the agency's best assessment of the way the world would look absent the proposed action (OMB, 2003).

For this proposed regulatory action, the baseline conditions are described in the no-action alternative (alternative A) in the EA (NPS, 2023). Under alternative A, the NPS would continue current management actions and direction into the future. A new multi-use pathway would not be constructed along Lighthouse Road and pedestrians and bicyclists would continue to use the existing road or road shoulder to access the Seashore's popular visitor use areas from North Carolina Highway 12. There would be no additional connectivity to additional park facilities and attractions, and no holistic public interpretation.

Costs and Benefits

Costs of the Proposed Regulatory Action

The costs to the NPS of implementing the proposed regulatory action are determined by summing the estimated construction costs and annual maintenance costs for the new pathway. For the preferred alternative, construction costs incurred by the government for the two proposed trail segments will be a one-time cost of \$2,634,144.¹ The NPS expects to complete construction of Segment I of the pathway in the spring of 2024. The timing for construction of Segment II is dependent on funding and uncertain at this time. For purposes of this analysis, it is assumed that Segment II will also be constructed in 2024. Operations and maintenance costs are estimated to be \$25,000 annually for the two proposed trail segments.

OMB Circular A-94 (OMB, 1992) recommends using a discount rate of 7% when analyzing costs and benefits that occur in different time periods. This is an estimate of the average pretax rate of return to private capital in the U.S. economy and should be used as a base-case for regulatory analysis. However, because the effects of regulation do not always fall primarily on the allocation of capital, OMB Circular A-4 (OMB, 2003) also recommends using a discount rate of 3%, which more closely reflects the rate at which society discounts future consumption flows to their present value.

Construction costs are assumed to occur in the first year, and operations and maintenance costs are assumed to occur annually for the next 29 years. At a 3% discount rate, the present value of all costs over a 30-year time horizon is \$3,023,161 (with an annualized cost of \$154,239). At a 7% discount rate, the present value of costs over a 30-year time horizon is \$2,748,678 (with an annualized cost of \$221,506). These results are presented in Table 1.

Table 1. Construction and Maintenance Costs of the Proposed Regulatory Action (30-year time horizon)

		3% discount rate		7% discount rate	
Construction Cost	Annual Operations and Maintenance Cost	Present Value	Annualized Cost	Present Value	Annualized Cost
\$2,634,144	\$25,000	\$3,023,161	\$154,239	\$2,748,678	\$221,506

This action does not involve fees or other measures that would increase costs to visitors, businesses, communities, or the park. Further, as noted in NPS (2023), the wide nature of the path (10 to 12 feet) would provide enough space to minimize visitor conflicts between pedestrians and bikes, and between traditional bikes and electric bikes. If conflicts do occur, management strategies could be implemented to reduce conflicts and improve the visitor experience. Finally, any impact to horseback riders would be minimal, as this user group would

¹ Total construction costs for the new pathway are \$3,219,081. However, donations from Outer Banks Forever and Eastern National have been secured for \$584,937 of the construction costs, resulting in a total cost of \$2,634,144 incurred by the NPS. Funding for maintenance of the pathway would be the responsibility of the NPS.

still have one side of the road corridor to use to travel down Lighthouse Road and only a few riders per year use this road corridor. Therefore, this action is not anticipated to impose any costs on visitors.

Benefits of the Proposed Regulatory Action

Compared to baseline conditions, this action is anticipated to generate benefits in the form of a new visitor use opportunity, enhanced visitor access and experience, and improved safety for visitors. There are currently no established bike paths in the Seashore. This proposed regulatory action would create the park's first multi-use pathway, creating a new opportunity for visitors to access key destinations within the project area. One of the primary destinations along Lighthouse Road is the Cape Hatteras Light Station, which includes the Lighthouse and its associated support buildings and grounds, as well as the Hatteras Island Visitor Center and Museum of the Sea. Other key destinations along Lighthouse Road include a premier surfing location, as well as one of the park's five lifeguarded beaches, Cape Point Campground, and popular destinations such as access to the Buxton Woods Trail and Open Ponds Trail, the British Cemetery, Loran Road Trail, and Ramps 43 and 44. The new multi-use pathway would connect one of the most highly and densely visited Seashore locations (the Lighthouse) with the beach. Compared to baseline conditions, this would improve the quality of the experience for visitors traveling along Lighthouse Road. Creating a separated pathway along the road would allow pedestrians and bicyclists to travel safely along a busy section of Lighthouse Road and reduce conflicts with motorized vehicles. Additional components of the project that would benefit visitors include wayfinding signage, benches, and the reconfiguration of the Seashore entrance at the start of the pathway, including intersection improvements and connections to local sidewalks.

To quantify the benefits of this proposed regulatory action, the number of affected visitors is multiplied by an appropriate economic value per visit. Visitation to Cape Hatteras has continued to trend upward over the last decade, increasing by 29% since 2013. Although this action has the potential to draw new visitors to the park or cause current visitors to come more frequently due to improved access/connectivity and a new visitor use opportunity, as noted in NPS (2023), the new pathway is not expected to have a measurable impact on visitation or visitor use patterns. Rather, the proposed action is expected to improve the recreational experience for current visitors, specifically bicyclists, who would gain access to the first pathway within the Seashore.

According to a recent visitor survey conducted in July-August of 2022, 9% of park visitors report bicycling during their visit to Cape Hatteras National Seashore (Otak, 2023). This proposed regulatory action has the potential to benefit all bicyclists. Based on a five-year average of past visitation to the Hatteras and Bodie Island portions of the Seashore and excluding the winter months, this would indicate that up to 200,000 bicyclists could be affected annually.² This can be viewed as an upper bound on the number of affected visitors since it is possible that not all visitors who bike in the park would use the new multi-use pathway. It is not known with certainty exactly how many visitors, and specifically bicyclists, currently use Lighthouse Road. However, visitation is tracked at various locations along Lighthouse Road. For instance, based

² Visitation to Ocracoke Island is excluded from this estimate since visitors can only access that portion of the Seashore by air or water.

on a five-year average of past visitation, around 400,000 visitors travel along Lighthouse Road to visit the Hatteras Island Visitor Center each year. Again, excluding visitation in the winter months and assuming 9% of these visitors are bicyclists, this would indicate that around 35,000 bicyclists annually would benefit from the new multi-use pathway. A traffic counter located farther south at Ramp 43/44 indicates that around 25,000 bicyclists travel down Lighthouse Road to access these popular beach access ramps annually, based on a five-year average of past visitation. Of course, some visitors may visit both the Visitor Center and the beach, so summing these numbers could overestimate the number of bicyclists using Lighthouse Road. Based on this information, it can be assumed that at least 35,000 bicyclists annually would be directly affected by this proposed regulatory action. This is a lower bound on the number of bicyclists along Lighthouse Road, as it is based on visitation to one specific destination along the Road.

Based on the available data, for purposes of this analysis, it is estimated that between 35,000 and 200,000 visitors annually would be affected by this proposed regulatory action. To monetize the benefits of the proposed regulatory action, the number of affected visitors is multiplied by an economic value per visitor-day. The appropriate measure of value to capture changes in the quality or quantity of recreational opportunities in national parks is consumer surplus, which is calculated as the difference between what a consumer pays for the recreational experience and the maximum amount they would be willing to pay (OMB, 2003). To estimate the value of a visitor-day to Cape Hatteras National Seashore, a travel cost model is estimated based on data from the most recent visitor survey (Otak, 2023).³ Results of this model indicate that visitors derive a value of \$78.91 per visitor-day to Cape Hatteras National Seashore.

Current bicyclists are expected to experience an increase in this consumer surplus value due to the new multi-use pathway. In the absence of primary data collection, it is difficult to know with certainty the exact increase in value that will be experienced by bicyclists. However, the existing natural resource economics literature has consistently demonstrated that the quality of a recreation site (for example, miles and quality of trails) is an important determinant of recreation demand and consumer surplus (Loomis and Walsh, 1997; Industrial Economics Inc., 2012). A study by Siderelis et al. (2000) found that trail users in North Carolina would be willing to pay \$15 more per trip, a 27% increase in consumer surplus, if trail quality improved to “ideal” conditions. A visitor survey conducted at Blue Ridge Parkway found that visitors were willing to pay at least \$14 for one more mile of quality trail (Matthews et al., 2004). Based on the existing literature, it is reasonable to assume that visitors who currently bike at Cape Hatteras would experience an increase of 5% to 10% in consumer surplus. For purposes of this analysis, a lower bound estimate is based on the assumption that 35,000 bicyclists per year would experience a 10% increase in their value per visitor-day to the Seashore (\$7.89), and an upper bound estimate is based on the assumption that 200,000 bicyclists per year would experience a 5% increase in their value per visitor-day to the Seashore (\$3.95). These benefits are expected to begin in 2025, the year after the pathway is constructed.

³ The travel cost model uses regression analysis to relate the number of trips taken to the park in the past year to travel and time costs required to reach the park. Travel costs are calculated as the round-trip distance to the park from the visitor’s home zip code multiplied by a cost of \$0.2767 per mile (AAA, 2022). Time costs are the opportunity cost of a visitor’s time spent traveling to the park, valued at 1/3 of the visitor’s wage rate. The model is estimated using the *nbstrat* command in STATA, which accounts for truncation, endogenous stratification, and overdispersion in the data. Other explanatory variables in the model include the respondent’s income, age, and group size.

The present value of these benefits using both a 3% and 7% discount rate, as well as an annualized value, is shown in Table 2. This estimate of benefits does not account for any increased visitation that could result from the new multi-use pathway, nor does it account for any potential future increases in visitation to the Seashore generally. Further, some visitors that do not currently bike could start engaging in this recreational activity as a result of the new multi-use pathway, resulting in additional increases in consumer surplus.

Table 2. Increased Consumer Surplus from the Proposed Regulatory Action (30-year time horizon)

	3% discount rate		7% discount rate	
	Present Value	Annualized Benefits	Present Value	Annualized Benefits
Low Estimate of Increased Consumer Surplus	\$5,145,207	\$262,505	\$3,169,074	\$255,384
High Estimate of Increased Consumer Surplus	\$14,700,592	\$766,117	\$9,054,498	\$729,669

Net Benefits of the Proposed Regulatory Action

This proposed regulatory action is expected to result in construction and maintenance costs to the government, and benefits to park visitors in the form of improved access, public safety, and enhanced visitor experience. The net benefits of this proposed regulatory action are calculated as the difference between the monetized benefits to visitors, and the construction, operations and maintenance costs realized in each year. At a 3% discount rate, the present value of these net benefits over a 30-year time horizon ranges from \$2,122,047 to \$11,677,431, depending on the assumed increase in the consumer surplus value per visitor-day and the number of affected bicyclists in the park. At a 7% discount rate, the present value of these net benefits ranges from \$420,396 to \$6,305,819. These results are shown in Table 3.

Table 3. Net Benefits of the Proposed Regulatory Action (30-year time horizon)

	3% discount rate		7% discount rate	
	Present Value	Annualized Net Benefits	Present Value	Annualized Net Benefits
Low Estimate of Net Benefits	\$2,122,047	\$108,265	\$420,396	\$33,878
High Estimate of Net Benefits	\$11,677,431	\$595,774	\$6,305,819	\$508,163

This action does not involve additional measures that would increase costs to visitors, businesses, or local communities. Therefore, the net benefits of the proposed regulatory action are expected to be positive.

Uncertainty

The exact number of affected visitors and the marginal increase in value experienced by these visitors from the proposed regulatory action is not known with certainty. The total benefits generated by this action were estimated with the best available data, and sensitivity analysis was used to quantify a range of expected benefits and net benefits associated with the proposed action. Results indicate that positive net benefits will be generated, as illustrated in the cost-benefit analysis above. Any uncertainty involved in this analysis is associated only with the magnitude of expected benefits. The NPS is not aware of any other sources of uncertainty.

Conclusion

The results of this cost-benefit analysis indicate that positive net benefits, with a present value ranging from \$420,396 to \$6,305,819 at a 7% discount rate, will likely be generated by implementing the proposed regulatory action. Given that, NPS concludes that the benefits associated with the proposed regulatory action justify the associated costs. Further, this proposed regulatory action is not expected to have an annual economic effect of \$100 million, or to adversely affect an economic sector, productivity, jobs, the environment, or other units of government. This proposed regulatory action will improve economic efficiency.

Regulatory Flexibility Threshold Analysis

The Regulatory Flexibility Act, as amended, requires agencies to analyze impacts of regulatory actions on small entities (businesses, nonprofit organizations, and governments), and to consider alternatives that minimize such impacts while achieving regulatory objectives (Small Business Administration, 2012). Agencies must first conduct a threshold analysis to determine whether regulatory actions are expected to have a significant economic impact on a substantial number of small entities. If the threshold analysis indicates a significant economic impact on a substantial number of small entities, an initial regulatory flexibility analysis must be produced and made available for public review and comment along with the proposed regulatory action. A final regulatory flexibility analysis that considers public comments must then be produced and made publicly available with the final regulatory action. Agencies must publish a certification of no significant impact on a substantial number of small entities if the threshold analysis does not indicate such impacts.

This threshold analysis relies on the cost-benefit analysis, which concludes that this proposed regulatory action will generate positive benefits and no costs to visitors, businesses, or local communities. In addition, this action will not impose restrictions on local businesses in the form of fees, training, record keeping, or other measures that would increase costs. As noted in NPS (2023), this action is not expected to have a measurable impact on visitation or visitor use patterns and will thereby not affect visitor spending or businesses, including small entities. Given

those findings, this proposed regulatory action will not impose a significant economic impact on a substantial number of small entities.

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