



Categorical Exclusion Documentation Form (CE Form)

Project: 2021 ZION Proposed Changes to the Superintendent's Compendium

Park Name: Zion National Park (ZION)

PEPC Project Number: 90610

Project Title: 2021 ZION Proposed Changed to the Superintendent's Compendium

Project Location:

County, State: Iron, Utah

County, State: Kane, Utah

County, State: Washington, Utah

Project Leader: Daniel Fagergren

Description of Action (Project Description):

On November 2, 2020, the National Park Service (NPS) issued a final regulation regarding electric bicycles (e-bikes) in national parks, which became effective on December 2, 2020. This regulation was codified in 36 Code of Federal Regulation 4.30 (i) (CFR) and reaffirms a Superintendent's authority to authorize, or not, the use of electric bicycles within a park unit. The NPS Deputy Director, Operations, exercising the delegated authority of the director, signed a memorandum on June 30, 2021 (Reviewing Electric Bicycle Use on Trails and Administrative Roads under the e-bike Regulation Reviewing Electric Bicycle Use on Trails and Administrative Roads under the e-bike Regulation) directing park Superintendent's to reconsider previous decisions regarding e-bike authorization under the new e-bike regulation.

36 CFR 1.4 defines Electric bicycles a two- or three-wheeled cycle with fully operable pedals and an electric motor of not more than 750 watts that meets the requirements of one of the following three classes:

- (1) "Class 1 electric bicycle" shall mean an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.
- (2) "Class 2 electric bicycle" shall mean an electric bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.
- (3) "Class 3 electric bicycle" shall mean an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour.

Additionally, 36 CFR §4.30 Bicycles (i) Electric bicycles specifies types of e-bike use allowed in NPS sites. This includes requirements for continuous pedaling (subsection 3) and bans use in Wilderness (subsection 4). Therefore, individual parks do not have the authority to allow Class 2 bikes within their boundaries or any type of bicycle, electric or otherwise, to utilize areas that are designated Wilderness or managed as Wilderness.

The ZION Superintendent's Compendium authorizes bicycle use in ZION on four roadways open to the public (Kolob Canyons Road, Kolob Terrace Road, Zion Mt. Carmel Highway and Zion Canyon Scenic Drive) and one paved trail (Pa'rus). All cyclists, including e-bikes, are prohibited within the Zion-Mt. Carmel Tunnel and must be transported through the tunnel by a motor vehicle due to size constraints of the tunnel. This includes 31.2 miles of paved roadway and 1.8 miles of concrete trail surface, none of which are in areas managed as wilderness. All other areas of ZION remain closed to the use of bicycles and e-bikes. Pursuant to the June 2021 Memo, ZION recertifies the use of e-bikes on park roads open to the public and hardened Pa'Rus Trail.

E-bikes are specifically addressed in the Superintendent's Compendium under section 1.5 Road and Vehicle Closures and Use Limits (a)(1)(xvi), General Use Limits (a)(2)(viii) and (a)(2)(xi), 4.21 Speed Limits (b), and 4.30 Bicycles and E-bikes. Regulations for e-bikes include:

- (1) Limits e-bike use in the park to class 1 bicycles
- (2) Authorizes the use of traditional and e-bikes on paved park roads open to the public, except within the Zion-Mt. Carmel Tunnel.
- (3) Authorizes the use of traditional and e-bikes on the Pa'rus Trail, a paved or hardened trail
- (4) Restricts the speed to 15 mph for traditional and e-bikes
- (5) Requires that bikes and e-bikes must pull out of the roadway when shuttle buses approach as soon as a safe location has been found
- (6) Requires all bikes and e-bikes to be equipped with a bell

A previous National Environment Policy Act (NEPA) review designated the use of e-bikes in ZION in September of 2019. Since the NEPA process concluded in 2019, visitors are using e-bikes in the park and have become extremely popular. E-bike rental opportunities have also been established by private entrepreneurs within the local community. Minor user group conflicts and accidents involving e-bikes in ZION have been reported. The park has no known impacts from e-bikes and are assumed to be proportionate to impacts from traditional bicycles. If unintended impacts arise, park management would re-evaluate e-bike use and/or restrictions.

Project Locations:

Location 1

County:	Iron	State:	UT
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Location 2

County:	Kane	State:	UT
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Location 3

County:	Washington	State:	UT
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Mitigations:

- Future efforts to manage e-bikes in the park would be documented prior to implementation and would include a debrief or discussion on lessons learned from previous management decisions and/or information that could be used to help shape future events.
- Copies of news releases, press, social media posts, and other forms of media used to communicate to the public would also be included in the NEPA decision file to demonstrate the NPS commitment to public outreach, civic engagement, and visitor enjoyment.

CE Citation: D.3 Minor changes in programs and regulations pertaining to visitor activities.

CE Justification: E-bike speeds are comparable to traditional bicycles and except for having a small electric motor to assist the rider, e-bikes are generally operated like traditional bicycles. E-bike use at ZION would reflect existing use by traditional cyclists. Therefore, the Compendium updates to allow e-bikes represents a minor change to programs pertaining to visitor activities. The Superintendent's Compendium will be updates to reflect these changes.

Decision: I find that the action fits within the categorical exclusion above. Therefore, I am categorically excluding the described project from further NEPA analysis. No extraordinary circumstances apply.

Signature

JEFFREY BRADYBAUGH Digitally signed by JEFFREY BRADYBAUGH
Date: 2021.09.21 15:50:14 -06'00'

Superintendent:

Jeffrey Bradybaugh

Extraordinary Circumstances:

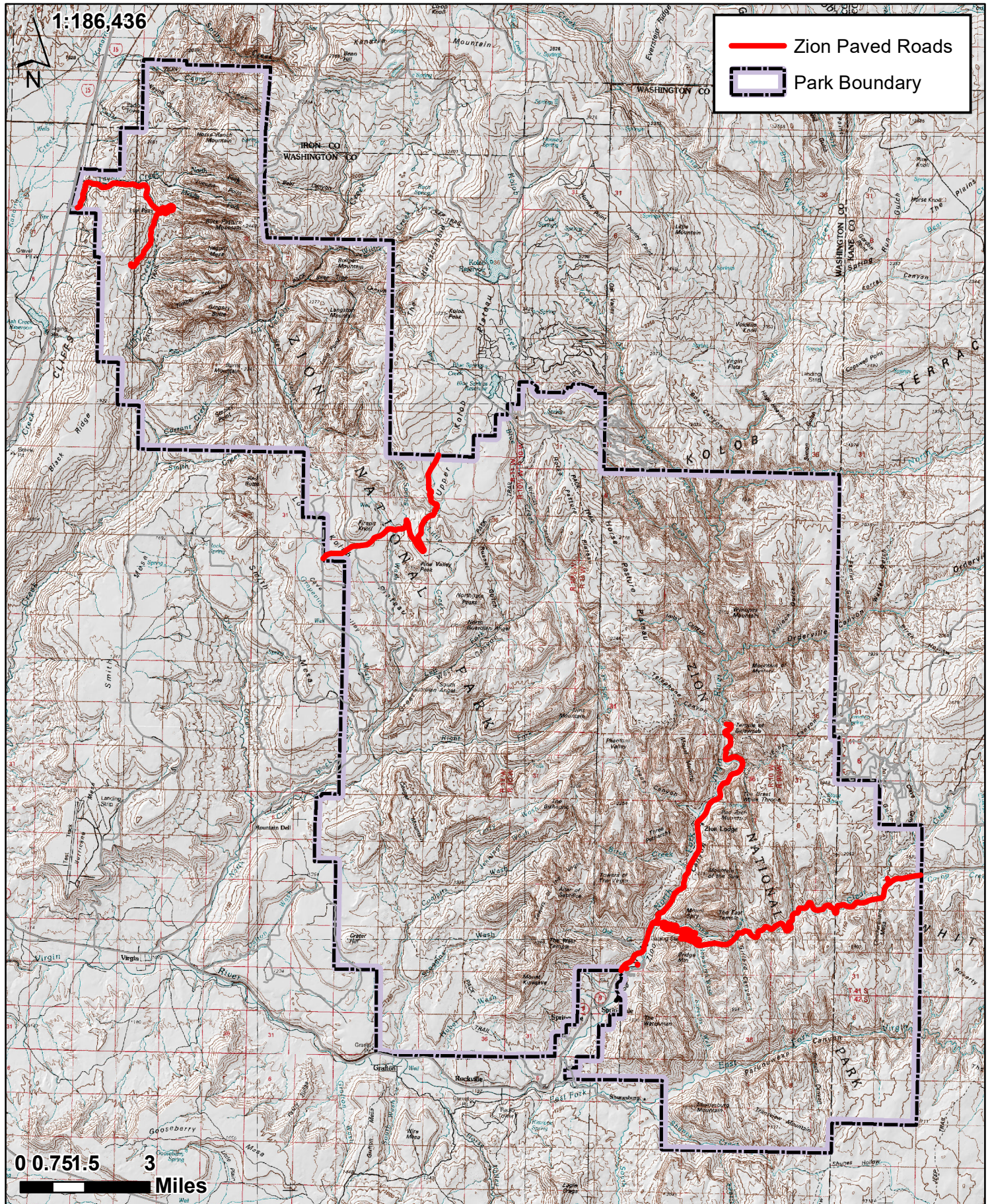
If implemented, would the proposal...	Yes/No	Notes
A. Have significant impacts on public health or safety?	No	Since allowing e-bikes in 2019, minor user group conflicts and accidents involving e-bikes in ZION have been reported. However, such conflicts and accidents do not represent a meaningful increase in impacts above the baseline of what occurs from other users, including traditional bicyclists. Although research on e-bikes and safety varies, none of the information/literature reviewed (NPS 2021) indicates a potential for significant impacts. Refer to the Environmental Screening Form (ESF) for further analysis.
B. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?	No	Although there has been a noticeable increase in e-bike use since ZION started allowing e-bikes in 2019, NPS staff have not observed any increase in impacts above the baseline of what occurs from other users. And because e-bikes operate in a similar manner as traditional bicycles, the additional use by e-bikes is not expected to increase impacts to natural resources or unique geographic resources beyond these baseline levels. As a result and based on the information and literature reviewed (NPS 2021), the analysis herein/attached, any impacts to natural resources and unique geographic characteristics would not be significant. Refer to Assessment of Effect (AEF) and ESF for further analysis
C. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA section 102(2)(E))?	No	There is some minor academic controversy surrounding effects of e-bike use, particularly in terms of safety. However, none of the information/literature reviewed (NPS 2021) indicates e-bike use presents the potential for significant scientific controversy over effects. And as e-bikes are only allowed where traditional bicycles are allowed, there are no unresolved conflicts over use of available resources. Refer to the ESF for further analysis.
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	No	None of the information/literature reviewed (NPS 2021) or analysis herein/attached indicates that e-bike use has the potential for effects or risks that are unique, known, or potentially be significant
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	No	E-bikes, which are operated similar to traditional bicycles, would only be allowed where traditional bicycles are currently allowed and in accordance with applicable laws and regulations. As a result, allowing e-bikes does not set any precedents and would not lead to future actions with significant impacts.
G. Have significant impacts on properties listed or eligible for listing on the National Register of Historic Places, as determined by either the bureau or office?	No	Riding e-bikes on paved roads and trails currently used by pedestrians, non-motorized bicycles, or vehicles has no potential to affect properties listed or eligible for listing on the National Register. Refer to the ESF for further analysis.
H. Have significant impacts on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?	No	Since allowing e-bikes in 2019, NPS staff have not observed any increase in disturbance to threatened and endangered species, migratory birds, State species of concern nor critical habitats above the baseline of what occurs from other users. Since e-bike operates in a similar manner to traditional bicycles, the additional use by e-bikes is not expected to increase disturbances to species of concern

		above the existing baseline levels from other users. Refer to the ESF for further analysis.
I. Violate a federal, state, local or tribal law or requirement imposed for the protection of the environment?	No	E-bikes, which are operated similar to traditional bicycles, would only be allowed where traditional bicycles are currently allowed and in accordance with applicable laws and regulations. As a result, allowing e-bikes would not violate any law or requirement imposed for the protection of the environment. Refer to the ESF for further analysis.
J. Have a disproportionately high and adverse effect on low income or minority populations (EO 12898)?	No	Individual representatives of minority and low-income populations are likely present within visitor demographics at ZION. The use of e-bikes is not required; therefore, allowing e-bikes would not disproportionately affect low-income or minority populations as all people would be affected in the same way and all people would be allowed to use e-bikes on park roads and trails regardless of demographics. Refer to the ESF for further analysis.
K. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)?	No	There are no known sacred sites in the vicinity of areas open to e-bike use. No access constraints to sacred sites have been identified during the IDT Review process. Refer to Assessment of Effect (AEF) and ESF for further analysis.
L. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?	No	Since allowing e-bikes in 2019, NPS staff have not observed any increase in noxious weed or non-native species above the baseline of what occurs from other users. Since e-bike operates in a similar manner to traditional bicycles, the additional use by e-bikes is not expected to increase the spread and introduction of nonnative species above the existing baseline levels from other users. Refer to the ESF for further analysis.

Paved Roads in Zion

National Park Service
U.S. Department of the Interior

Zion National Park





ASSESSMENT OF ACTIONS HAVING AN EFFECT ON HISTORIC PROPERTIES

A. DESCRIPTION OF UNDERTAKING

1. **Park:** Zion National Park

2. **Project Description:**

Project Name: 2021 ZION Proposed Changes to the Superintendent's Compendium

Park Name: Zion National Park (ZION)

Prepared by: Courtney Mackay **Date Prepared:** 09/14/2021

PEPC Project Number: 90610

Locations:

County, State: Iron, UT

County, State: Kane, UT

County, State: Washington, UT

Project Leader: Daniel Fagergren

Area of potential effects (as defined in 36 CFR 800.16[d])

Parkwide roads and paths previously approved for bicycle use.

3. **Has the area of potential effects been surveyed to identify historic properties?**

☐ No

☒ Yes

Source or reference: ZION-2015-01 Zion-Mt. Carmel Highway and Floor of the Valley Road Documentation

ZION-1986-01 Archaeological Investigations at Zion NP

ZION-2017-01 3D Trail Documentation

ZION-2017-03 National Register Amendment to Zion-Mt. Carmel Hwy and Floor of the Valley Road

ZION-2017-05 Protect and Interpret Heritage Properties in High Use Visitor and Concession Corridors

ZION-2018-07 Kolob Canyons Road Survey

ZION-1994-05 Bike Path Survey

4. **Potentially Affcted Resource(s):**

Archeological Resources Present: Yes

Archeological Resources Notes: 42WS2864 is buried directly below the current alignment and pavement of the Pa'rus trail. The proposed use of e-bikes on the Pa'rus trail does not adversely affect the site as it is buried and protected by the pavement.

Historical Structures/Resources Present: Yes

Property Name: Kolob Canyons Road **LCS:**

Location: Kolob Canyons District

Property Name: Floor of the Valley Road (Scenic Drive) **LCS:** 51304 **ParkID:** RT-0996 **Asset:** 65486

Location: Zion Canyon

Property Name: Zion-Mt. Carmel Highway **LCS:** 51307 **ParkID:** RT-1000 **Asset:** 65424

Historical Structures/Resources Notes: Historic resources present include the current roads systems in Zion that account for multi-use of various means of transportation and traffic. The addition of the proposed use will not adversely affect the historic road systems.

Cultural Landscapes Present: Yes

Property Name: Zion Canyon Cultural Landscape **LCS:**

Location: Zion Canyon

Property Name: Zion Lodge/Birch Creek Historic District **LCS:**

Location: Zion Canyon

Property Name: Zion Lodge/Birch Creek Cultural Landscape **LCS:**

Location: Zion Canyon

Ethnographic Resources Present: No

5. The proposed action will: (check as many as apply)

☐ No Destroy, remove, or alter features/elements from a historic structure

☐ No Replace historic features/elements in kind

☐ No Add non-historic features/elements to a historic structure

☐ No Alter or remove features/elements of a historic setting or environment (inc. terrain)

☐ No Add non-historic features/elements (inc. visual, audible, or atmospheric) to a historic setting or cultural landscape

☐ No Disturb, destroy, or make archeological resources inaccessible

☐ No Disturb, destroy, or make ethnographic resources inaccessible

☐ No Potentially affect presently unidentified cultural resources

☐ No Begin or contribute to deterioration of historic features, terrain, setting, landscape elements, or archeological or ethnographic resources

☐ No Involve a real property transaction (exchange, sale, or lease of land or structures)

☐ Other (please specify): _____

6. Supporting Study Data:

(Attach if feasible; if action is in a plan, EA or EIS, give name and project or page number.)

B. REVIEWS BY CULTURAL RESOURCE SPECIALISTS

The park 106 coordinator requested review by the park's cultural resource specialist/advisors as indicated by check-off boxes or as follows:

[X] 106 Advisor

Name: Courtney Mackay

Date: 09/14/2021

Check if project does not involve ground disturbance []

Assessment of Effect: ☐ No Potential to Cause Effect ☐ No Historic Properties Affected ☒ No Adverse Effect ☐ Adverse Effect ☒ Streamlined Review

Recommendations for conditions or stipulations:

Doc Method: Streamlined Review (PA)

Streamlined Activity:

2. Rehabilitation and/or Minor Relocation of Existing Trails, Walks, Paths, and Sidewalks

No Reviews From: Curator, Archeologist, Historical Architect, Historian, Other Advisor, Anthropologist, Historical Landscape Architect

C. PARK SECTION 106 COORDINATOR'S REVIEW AND RECOMMENDATIONS

1. Assessment of Effect:

☐ No Potential to Cause Effects
☐ No Historic Properties Affected
☒ No Adverse Effect
☐ Adverse Effect

2. Documentation Method:

[] A. Standard 36 CFR Part 800 Consultation

Further consultation under 36 CFR Part 800 is needed.

[X] B. Streamlined Review Under the 2008 Servicewide Programmatic Agreement (PA)

The above action meets all conditions for a streamlined review under section III of the 2008 Servicewide PA for Section 106 compliance.

Applicable Streamlined Review Criteria

(Specify 1-16 of the list of streamlined review criteria.)

2. Rehabilitation and/or Minor Relocation of Existing Trails, Walks, Paths, and Sidewalks.

[] C. Undertaking Related to Park Specific or Another Agreement

The proposed undertaking is covered for Section 106 purposes under another document such as a park, region or statewide agreement established in accord with 36 CFR 800.7 or 36 CFR 800.14.

[] D. Combined NEPA/NHPA Process

Process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with Section 106 is in accord with 36 CFR 800.8.c.

[] E. Memo to Project File

3. Consultation Information

SHPO Required: No
SHPO Sent:
SHPO Received:

THPO Required: No
THPO Sent:
THPO Received:

SHPO/THPO Notes:

Advisory Council Participating: No
Advisory Council Notes:
Additional Consulting Parties: No

4. Stipulations and Conditions: Following are listed any stipulations or conditions necessary to ensure that the assessment of effect above is consistent with 36 CFR Part 800 criteria of effect or to avoid or reduce potential adverse effects.

5. Mitigations/Treatment Measures: Measures to prevent or minimize loss or impairment of historic/prehistoric properties: (Remember that setting, location, and use may be relevant.)

No Assessment of Effect mitigations identified.

6. Assessment of Effect Notes:

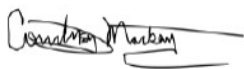
The proposed undertaking consists of a change in the permitted use of the roads and trail(s) in question. The newly permitted use will have no greater impacts than present use and will have no adverse effect to the trails and roads in question or to any other historic property which they cross.

D. RECOMMENDED BY PARK SECTION 106 COORDINATOR:

Compliance Specialist:

NHPA Specialist

Courtney Mackay



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Date: 2021.09.21 14:37:33 -06'00'

E. SUPERINTENDENT'S APPROVAL

The proposed work conforms to the NPS *Management Policies* and *Cultural Resource Management Guideline*, and I have reviewed and approve the recommendations, stipulations, or conditions noted in Section C of this form.

Signature

Superintendent:

JEFFREY BRADYBAUGH

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Date: 2021.09.21 15:56:01 -06'00'

Jeffrey Bradybaugh



ENVIRONMENTAL SCREENING FORM (ESF)

Updated Sept 2015 per NPS NEPA Handbook

A. PROJECT INFORMATION

Project Title: 2021 ZION Proposed Changes to the Superintendent's Compendium
PEPC Project Number: 90610
Project Type: Other Administrative Activities (ADM)
Project Location:
County, State: Iron, Utah
County, State: Kane, Utah
County, State: Washington, Utah
Project Leader: Daniel Fagergren

B. RESOURCE IMPACTS TO CONSIDER:

Resource	Potential for Impact	Potential Issues & Impacts
Air Air Quality <i>Emissions</i>	Potential	Issue: Greenhouse Gases & Climate Change Impact: Increases in the use of e-bikes is one way to reduce the use of passenger vehicles within ZION and realize greenhouse gas reduction goals. However, substantial increase in use levels of e-bike ridership would be necessary to realize significant reduction in vehicle carbon emissions. Though increases in e-bike ridership would only contribute modestly to a reduce carbon dioxide emission, when combined with alternate forms of transportation at ZION, specifically the ZION Shuttle Bus, significant reductions in greenhouse gases may be realized. As a result, e-bike use within the authorized areas would result in a beneficial means to help combat climate change.
Biological Nonnative or Exotic Species <i>Invasive Vegetation</i>	Potential	Issue: Invasive, Exotic, & Non-native Vegetation spread. Impact: With increased use in traditional and e-bikes comes the potential for invasive species, especially seed born, to be spread more quickly throughout the park, especially along the Pa'rus trail and the Canyon Scenic Drive. However, these areas occur within the ZION General Management Plan Front Country High Development Zone which are continuously monitored and treated to reduce the proliferation of non-native, invasive species. As a result, e-bike use within the authorized area would not result in significant impacts to native vegetation.
Biological Vegetation	Potential	Issue: Disturbance, trampling, and/or loss of native vegetation.

<p><i>Native Vegetation</i></p>		<p>Impact: Native vegetative cover would be removed, disturbed and/or trampled, exposing soils. E-bike use, along with other recreational uses (such as hiking) has the potential for users to go off-trail or off-road and trample vegetation (NPS 2021).</p> <p>While traditional and e-bike use is not authorized in off-road areas, advances in technology and affordability may enlarge public user groups. As cyclist user groups expand, there is a potential for an increase in the number of violations involving e-bikes going off-road. In the rare case that a user rides off road or trail, individual plants may be lost. However, this effect is not greater than that caused by hikers or other bicyclists (NPS Literature Review 2021), and impacts at the plant community level would not occur. If necessary, native revegetation efforts, exotics monitoring, and rehabilitation efforts could occur in collaboration with the ZION Vegetation Program. ZION staff have also increased public messaging on authorized locations and appropriate cycling etiquette while recreating in the park. As a result, the authorization of e-bike use is not anticipated to incur any more impacts off-road than the authorized use of traditional bikes.</p>
<p>Biological Wildlife and/or Wildlife Habitat including terrestrial and aquatic species</p> <p><i>Native Wildlife & Protected Species</i></p>	<p>Potential</p>	<p>Issue: Wildlife Disturbance</p> <p>Impact: Studies have identified that, although motorized and non-motorized activities had similar evidence for overall effects on wildlife, non-motorized had greater negative effects (Larson et al 2016). Effects of nonmotorized traffic were observed 1.2 times more frequently. Negative effects included: disturbance at the community, population, or individual (behavioral or physiological) levels: decreased species richness or diversity; decreased survival, reproduction, occurrence, or abundance; behaviors typically assumed to reflect negative responses to anthropogenic disturbance (e.g., decreased foraging or increased vigilance); and physiological condition typically assumed to reflect disturbance effects (e.g., decreased weight or increased stress).</p> <p>As use of traditional and e-bikes increase these effects may become more pronounced. However, traditional and e-bike use would be localized to occur along the roadway and the paved Parus trail. These areas occur within the ZION General Management Plan Front Country High Development Zone that experiences high volumes of anthropogenic disturbance. Wildlife requirements are larger than the footprint of the areas authorized for e-bike use. As a result, e-bike use within the authorized area would not result in significant impacts to native wildlife or habitat.</p>
<p>Cultural Archeological Resources</p>	<p>Potential</p>	<p>Issue: There are archaeological resources present in the proposed project area.</p> <p>Impact: Site 42WS2864 is located directly below the pavement of the Pa'rus trail. The site is currently protected in its buried state. The current use of pedestrian and traditional bike traffic does not adversely affect the site. The additional use of e-bikes would not add additional adverse effects to the buried site. The use of e-bikes is limited to pavement and would not adversely affect additional archaeological sites along trails or roads corridors. Refer to the associated Assessment of Effect (AEF).</p>

Cultural Cultural Landscapes	Potential	<p>Issue: There are cultural landscapes and historic districts within the proposed project area.</p> <p>Impact: Transportation and circulation corridors presently exist in ZION's Cultural Landscapes and Historic Districts. The additional use of e-bikes on roads and the Pa'rus trail would not adversely affect these landscapes. Refer to the associated Assessment of Effect (AEF).</p>
Cultural Prehistoric/historic structures	Potential	<p>Issue: Historic Roads</p> <p>Impacts: Transportation and circulation occur on historic roads in ZION: Floor of the Valley Road, Zion-Mt. Carmel Highway, Kolob Canyons Road. The addition of e-bikes to the present use of traditional bikes, vehicular, and pedestrian traffic on park roads will not adversely affect the historic roads. Refer to the associated Assessment of Effect (AEF).</p>
Other Human Health and Safety <i>Traffic law compliance</i>	Potential	<p>Issue: Traffic law compliance</p> <p>Impact: Data showed that e-bike riders exhibit nearly identical safety behavior for wrong-way riding, stop sign compliance, and traffic signal compliance, as traditional bike riders (Langford 2015). As a result, no change in compliance with traffic law is anticipated when authorizing the use of e-bikes in areas where traditional bike use already occurs at ZION.</p>
Other Human Health and Safety <i>User group conflicts</i>		<p>Issue: Multi-modal transportation conflicts.</p> <p>Impact: At ZION, traditional and e-Bike users may encounter more conflicts as they interact with pedestrians, cars, and shuttle buses. To reduce vehicle – cyclist conflicts, ZION would mirror current allowance for traditional cyclists and authorize the use of e-bike on the Parus Trail. The potential for vehicle – cyclist conflicts is further reduced during the summer months, when motorized passenger vehicle traffic is prohibited north of Canyon Junction. As a result, the potential for conflicts between pedestrians and cyclists on the Parus would remain or may increase as the user group expands. Similarly, conflicts between shuttles and cyclists would remain or may increase as the user group expands. Conflicts between user groups would continue to be monitored by ZION staff to determine if additional measures need to be implemented to reduce or remove conflicts observed. Based on this analysis, NPS does not believe that allowing e-bikes would result in significant impacts to public health and safety.</p>
Other Human Health and Safety <i>Collisions</i>	Potential	<p>Issue: Collisions within and across user groups</p> <p>Impact: E-bikes have been found to have twice the rate of crashes at intersections over traditional bikes. The speed immediately preceding a conflict was higher for riders of e-bikes compared to traditional bicycles, a pattern that was also found for mean speed (Petzoldt et al 2017). Crashes are more likely to occur with users who are between 40–65 years old and less likely with e-bikers below 23 years of age were. These crashes have the potential to be more serious and lead to longer lasting injuries in seniors (Weber et al 2014). E-bike users are more likely to be involved in a crash that requires treatment at an</p>

		<p>emergency room. However, when they occur, crashes with e-bikes are about equally as severe as crashes with traditional bicycles (Schepers et al 2014). Similarly, Cherry and MacArthur (2019) concluded that there was no difference in crash rates between conventional bikes and e-bikes, and that injury severity was slightly higher for Class 3 e-bikes than for conventional and Class 1 and 2 e-bikes. Currently, only minor user group conflicts and accidents involving e-bikes in ZION have been reported. Most of the accidents have been single e-bike collisions where only minor injuries were sustained. ZION has only authorized the use of Class 1 e-bikes to help mitigate safety concerns and maintain safe speeds throughout the park. As a result, if unintended impacts or human health and safety concerns arise, park management would reevaluate e-bike use and/or restrictions. Based on this analysis, NPS does not believe that allowing e-bikes would result in significant impacts to public health and safety.</p>
<p>Socioeconomic Minority and low-income populations, size, migration patterns, etc.</p> <p><i>Low-income populations</i></p>	Potential	<p>Issue: Visitor transportation & access.</p> <p>Impact: Individual representatives of minority and low-income populations are likely present within visitor demographics at ZION. The high cost of e-bikes is restrictive and may not be available to all user groups either through purchase or rental. The use of e-bikes is not being required; therefore, allowing e-bikes would not disproportionately affect low-income populations as all people would be affected in the same way and all people would be allowed to use e-bikes on authorized park roads and trail regardless of demographics. Further, the shuttle bus operations at ZION are free to all user groups. As a result, all user groups would retain access via ZION shuttle bus operations and would not result in significant adverse impacts to representative visitors of low-income populations.</p>
<p>Socioeconomic Socioeconomic</p> <p><i>Local economy</i></p>	Potential	<p>Issue: Local enterprise</p> <p>Impact: The introduction of authorizing e-bike use at ZION has prompted a new business opportunity, e-bike rentals, within the local community. As a result, authorizing the use of e-bikes is anticipated to have a beneficial impact on the socioeconomics within the surrounding community.</p>
<p>Soundscapes Soundscapes</p> <p><i>Natural Soundscapes</i></p>	Potential	<p>Issue: Noise from e-bike (motorized equipment, mechanical transport).</p> <p>Impact: Although e-bikes have small electric motors, available information indicates that noise pollution from e-bikes is no different than conventional bikes. And while several studies show that trail users who are unfamiliar with e-bikes express a preference to not share the trail with them, the majority of these users did not even notice that they were sharing the trail with e-bikes (Nielson et al 2019). Also, increases in e-bikes use may cause subsequent reductions in vehicle related noise within the park. As a result, authorizing the use of e-bikes is anticipated to have a beneficial impact on Natural soundscapes at ZION.</p>

Visitor Use and Experience Recreation Resources <i>Expanding accessibility</i>	Potential	<p>Issue: Visitor Access</p> <p>Impact: Throughout the civic engagement period many visitors report increased enjoyment of the park from a bike/ e-bike over ZION shuttle access, particularly to circumvent waiting in long shuttle bus lines. Visitors have commented on being motivated to purchase e-bikes to remove barriers that preventing individuals from riding a traditional bicycle. These include reducing physical exertion, challenging topography, and replacing car trips. Additionally, E-bikes have made it possible for more people to ride a bicycle, and are generating more trips, longer trips, and different types of bicycle trips. As a result, authorizing the use of e-bikes is anticipated to have a beneficial impact on the visitor experience at ZION.</p>
Water Floodplains	Potential	<p>Issue: Proposal occurs within 100 and/or 500-year floodplain.</p> <p>Impact: No additional development is required to permit e-bike use. E-bikes would be restricted to areas where traditional bicycles and/or motor vehicles are allowed and in accordance with applicable laws and regulations. In addition, e-bikes use electric motors without fuel reservoirs that could leak, so there are no concerns about pollutants entering the water system. Therefore, e-bikes would not affect floodplain values or functions in any meaningful way. Trails and roads are closed as necessary during flooding events; therefore, use of e-bikes would not create any safety risks during flooding.</p>
Water Wetlands	Potential	<p>Issue: Proposal occurs within 100 and/or 500-year floodplain. The presence and/or absence of wetlands has not been delineated and is therefore unknown.</p> <p>Impact: No additional development is required to permit e-bike use. E-bikes would be restricted to areas where traditional bicycles and/or motor vehicles are allowed and in accordance with applicable laws and regulations. In addition, e-bikes use electric motors without fuel reservoirs that could leak, so there are no concerns about pollutants entering the water system.</p> <p>The authorization of e-bike use is not anticipated to incur any more impacts off-road than the authorized use of traditional bikes. However, this effect is not greater than that caused by hikers or other bicyclists (NPS Literature Review 2021) and impacts at the system level would not occur. In the rare case that a user rides off road or trail, e-bikes would not affect wetland values in any meaningful way. Therefore, e-bikes would not affect wetland values or functions in any meaningful way. Refer to ESF: Biological Vegetation, Native Vegetation and ESF: Floodplains for further analysis.</p>
Wilderness Wilderness	Potential	<p>Issue: Impacts to Wilderness areas</p> <p>Impact: While traditional and e-bike use is not authorized in areas managed as Wilderness, advances in technology and affordability may enlarge public user groups. As cyclist user groups expand, there is a potential for an increase in the number of violations involving</p>

		Wilderness Act Section 4(c) prohibited uses: motorized equipment, and mechanical transport. ZION staff have increased public messaging on authorized locations and appropriate cycling etiquette while recreating in the park. As a result, the authorization of e-bike use is not anticipated to incur any more impacts to wilderness than the authorized use of traditional bikes.
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C. References

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