Driving Themselves (into the) Wild: Automated Shuttles in National Parks

Goal

Pilot Automated Vehicle (AV) shuttles at parks to evaluate their usefulness as mobility tools in NPS.

Short-term:

- Consider mobility and interpretive benefits AV shuttles offer to visitors - Assess infrastructure, personnel, and budgetary needs for AV operations

Long-term:

- Evaluate usefulness of AVs as transit in NPS - Enhance visitor access and encourage car-free trips

NATIONAL PARK

JWJJ

January 2020 FHWA's Innovation and Research Council (IRC) awards grant to fund automated shuttle pilot t Yellowstone NP.

August 2020 as vendor by NPS.

June 2021 NPS & Beep, Inc. launch The Electric Driverless

Demonstration at ellowstone (TEDDY).

August 2021 TEDDY pilot concludes.



Route: Lodges (Jun-July) Campground (July-Aug)

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Federal Highway Administration

Western

May 2020

NPS applies to North Carolina DOT (NCDOT) and is selected to host its Connected Autono mous Shuttle Supporting Innovation (CASSI) at Wright **Brothers National Memorial** (WRBR) using an EasyMile shuttle

October 2020 Discussions begin between NPS and NCDOT for a Spring 2021 pilot at WRBR.

April 2021

CASSI pilot launches at WRBR.

July 2021 CASSI pilot concludes.

Photo Credits: Charlie Gould, Western Transportation Institute Katy Warner, North Carolina Department of Transportation Jacob W. Frank, Yellowstone National Park

STATE UNIVERSITY Institute

MONTANA Western Transportation

Charlie Gould PUBLIC LANDS TRANSPORTATION FELLOW Alternative Transportation Program (ATP) National Park Service (NPS) Washington D.C. Area Support Office (WASO)

Site Selection: Canyon Village

- Decent LTE connectivity and electricity infrastruture - Lower congestion and ample parking Minimal popular/dangerous wildlife or thermal features - Lower risk of visitor stranding than more remote sites

Remote Environment: Contractor drove long distances to work & access services. Few large animals at pilot site. Shuttles stopped for small animals (chipmunks, ravens).

Congestion: Shuttles struggled with unpredictable traffic. Cars backed into shuttles in parking lot twice.

Roadway: Intersections, parking lot, and campground challenged navigation.

Terrain: Hilly route drained batteries. Schedule changed to meet charging requirements.

Internet: Poor LTE connection & no WiFi prevented wireless data transfer & reduced access to online survey. Contractor mailed hard drives to Florida office every other day to transfer data.

Vegetation: Shuttles' LiDAR detected swaying plants near road as hazard, triggering stops. Roadside vegetation cleared for mapping and trimmed often.

Subarctic Climate: Snowdrifts on roadside in May delayed mapping & launch by several weeks.



Route: Visitor Center to First Flight Sculpture

Site Selection: Wright Brothers NM

High interest from park leadership Simple loop road Pedestrian alternatives to shuttle - Historic symbolism of Wright Brothers' 1903 "First Flight" from the same site Available opportunity from NCDOT

Suburban Environment: Services & lodging First Flight Sculpture for contractor readily available. Humans are most common large species at site.

> **Congestion:** Abundant cars, pedestrians, & cyclists interacted regularly with shuttle.

Roadway: Mostly one-way route mitigated conflict points like intersections. Roads freshly-repayed in 2019.

Terrain: Flat terrain eased battery use.

Internet: Reliable LTE connectivity eased data transfer and visitor survey response.

Vegetation: Roads surrounded by trimmed lawns reduced vegetation interference.

Subtropical, Coastal Climate: Temperatures in 80s- 90s, high humidity. Air conditioning drained battery quickly. High winds, rain, & storms not uncommon.

What is the Public Lands Transportation Fellows (PLTF) Program?

The PLTF program provides fellowships to recent graduates in a transportation-related field. The fellows are provided with a unique opportunity for career development and public service working directly with staff of Federal Land Management Agencies (FLMAs) on key visitor transportation issues. The assigned projects help the land units develop transportation solutions that preserve valuable resources and enhance the visitor experience. See footer for a list of sponsors.



TEDDY

Lessons Learned



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		General Lessons Learned
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