2020-2022 Public Lands Transportation Fellows Program

Presented by:

Charlie Gould, NPS Emerging Mobility Fellow

Webinar Logistics

- Duration is 11:00 AM – 12:00 PM Eastern
- Webinar – recorded and archived. For quality of recording, please stay muted during presentation
- At the end there will be time for Q&A
- Please feel free to use the chat to ask questions or provide comments

Goal of this Webinar

To document and archive the work completed by the PLTF at the NPS Washington D.C. Area Support Office (WASO) from 2020-2022, including his lessons learned and tips and tricks for applying these to other NPS assignments.

Agenda

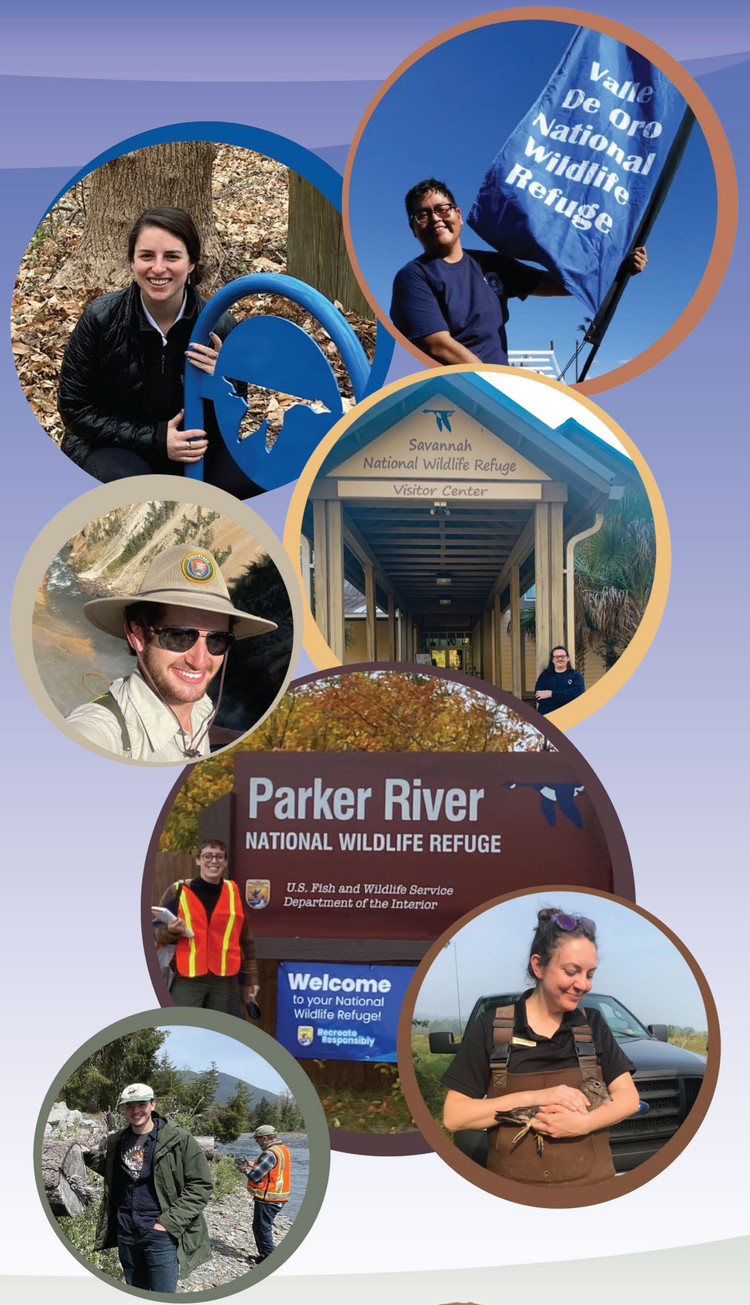
- Program Introduction
- Introduction by Supervisor
- PLTF Projects
- Lessons Learned
- General Suggestions
- Q & A

PLTF Program Introduction

- Began in 2012
- Modeled after the NPS Transportation Scholars Program
- Currently serves NPS and USFWS
- Full time, paid fellowship with benefits
- 12 to 24-month position with the possibility of extension/promotion
- Locations across the U.S. at select National Parks and National Wildlife Refuges

Our Fellows…

- Provide transportation and planning support to National Parks and National Wildlife Refuges
- Develop transportation solutions that preserve valuable resources and enhance visitor experience
- Experience work at park/refuge, regional office, and national headquarters levels
- Work, learn and grow through orientation, conferences, guest lectures, and mentorship



Today's Presenters

Jennifer Miller
Transportation Fee & National Scenic Byways
Program Manager
NPS Park Facility Management Division

Charlie Gould
Public Lands Transportation Fellow (PLTF)
NPS Park Facility Management Division

Introduction

- Name: Charlie Gould
- Assignment: NPS WASO
  Emerging Mobility Initiative
- Start Date: October 2020
- Place of Birth: New Hampshire
- Educational Background: University of Rochester, 2020
- Academic Focus: BA in History (Economic Concentration, trade & transportation); Minors in Environmental Geology & French

NPS Emerging Mobility Initiative

- 2019: former Secretary of Interior Zinke calls for NPS to “make innovative investments in our parks to enhance visitor experiences”
- Emerging Mobility Working Group created
  - Identified recommendations on 3 implementation areas:
    - Regulation/Policy
    - Information Sharing
    - Pilots/Demonstration Projects

What is Emerging Mobility?

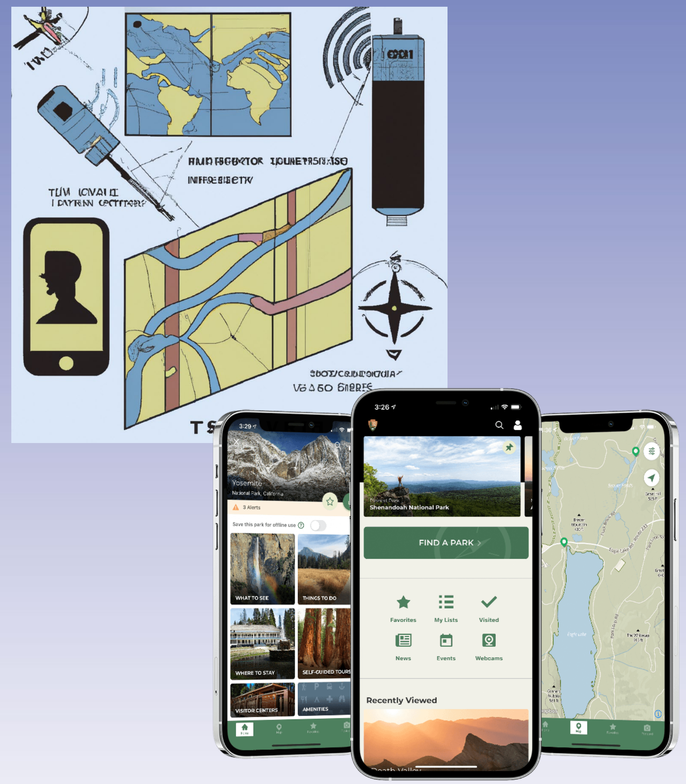
- Emerging Mobility (EM):
  - Shared alternatives to private automobiles,
  - Electrified or human-powered,
  - Integrated and accessed via smart technologies.
- Five Emerging Mobility Technologies
  - Automated Vehicles
  - Traveler Information Technologies
  - Micromobility
  - Ridehailing
  - Electric Vehicles

Automated Vehicles

- Vehicles in which “some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input.”
  - Five levels of automation (L1-L5)
- Examples in NPS
  - Piloted by NPS at Yellowstone NP and Wright Brothers NM
  - More on those later!

Traveler Information Technologies

- Systems that provide real-time information to inform travelers about hazards and increase system efficiency.
  - Interface with smartphone apps, websites, variable message signs, interactive display boards, and simple “next service” displays
- Examples in NPS
  - Ubiquitous “wayfinding apps” used by visitors
  - NPS app (available now!)
  - Numerous examples of physical systems in NPS



Micromobility

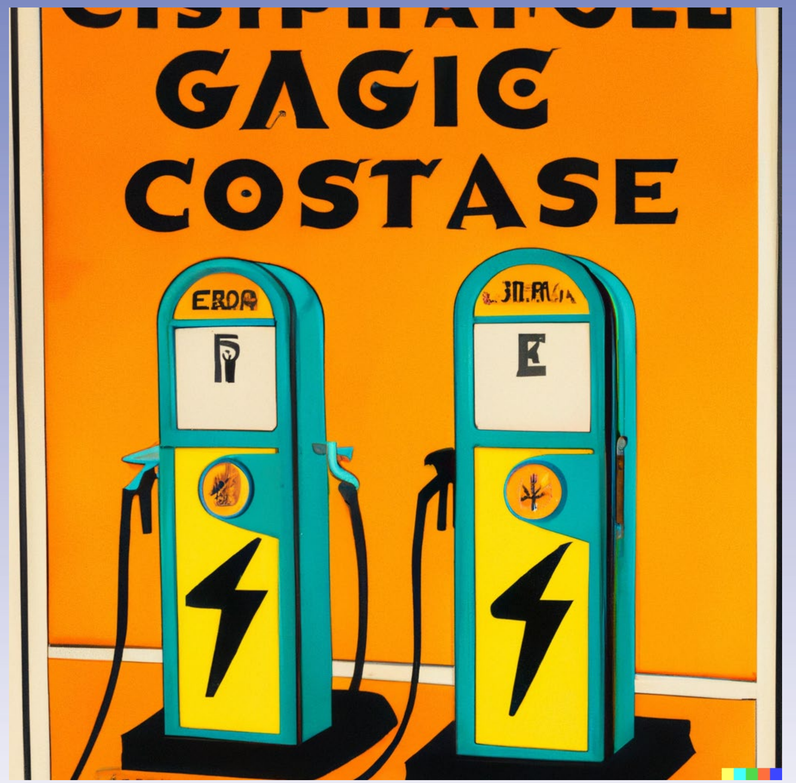
- Shared fleets of low-speed human or electric powered vehicles, including bike share and e-scooter services, accessed using a smartphone app
- Examples in NPS
  - Yosemite Bike Share
    - Internally operated
  - Capital Bikeshare (DC/National Mall)
    - Docked bikeshare, owned by DDOT (gov partner of NPS)
  - Dockless E-Scooters
    - Seemingly every major city in the US
    - Parks can decide whether to allow or disallow

Ridehailing

- On-demand car and microtransit services which users order through smartphone apps.
- Examples in NPS
  - Available at urban parks across the US
  - NPS currently exploring partnership opportunities with Lyft to establish designated pick-up-drop-off zones at Indiana Dunes NP

Electric Vehicles

- Battery electric vehicles are being adopted to replace NPS light- and medium-duty fleet
- Infrastructure which refuels electric vehicles
  - Public-facing vs fleet-facing
- Examples in NPS
  - EV chargers present at parks throughout country
  - Efforts underway to map all EV chargers in NPS
  - Expanding EV charging infrastructure through partnership with State of Michigan



FELLOW’S PROJECTS

Fellow's Projects

1. Automated Shuttle Pilots
    - Wright Brothers National Memorial
    - Yellowstone National Park
2. Supporting EM throughout NPS
3. Partnership with the State of Michigan
4. Grant Writing
    - Federal Lands Highways' (FLH) Innovation and Research Council (IRC)

1. AUTOMATED SHUTTLE PILOTS

1.1 PLANNING THE PILOTS

1.2 TWO PARKS, TWO PILOTS

1.3 EVALUATION

1.4 PUBLIC ENGAGEMENT

1.5 LESSONS LEARNED

1.1. PLANNING

1.1 Planning

Pilot Goals:

- Demonstrate use of automated shuttle technologies for public use in novel operating environments
- Identify and overcome unforeseen regulatory, organizational, and legal barriers
- Enhance the visitor experience

1.1 Planning

Two Parks, Two Pilots:

- Wright Brothers National Memorial (WRBR)
  - Pilot ran from 4/20/21 – 7/16/21
  - Partnership with North Carolina DOT
    - Existing contract between NCDOT and EasyMile
- Yellowstone National Park (YELL)
  - Pilot ran from 6/09/21 – 8/31/21
  - Grant funded by Technology & Innovation Deployment Program (FHWA)
    - Contract awarded to Beep, Inc. of Florida

1.1 Planning

Charlie's Work

- Attended planning calls for both teams and helped coordinate between them
- Participated in NCDOT/EasyMile's Site Visit to WRBR
- Assisted with risk assessment process
- Prepared maps of routes in ArcGIS
- Helped design rider survey

1.2. PARKS

1.2.1 Wright Brothers NM

1.2.2 Yellowstone NP

1.2.3 Summary

1.2.1 Wright Brothers National Memorial

- Wright Brothers NM, on the Outer Banks of NC, commemorates the first airplane flights by Wilbur and Orville Wright in 1903
- Connected Autonomous Shuttle Supporting Innovation = CASSI
- One shuttle, simple loop
  - 2 stops, 1.5 mi

1.2.1 Wright Brothers National Memorial

- Subtropical climate; flat, coastal terrain; suburban environment
  - Air conditioning drained battery, but was an attractive alternative to walking in the Carolina heat!
  - Service was sometimes disrupted by high winds, rain, and storms
- CASSI Shuttle:
  - EasyMile EZ10 Gen 3
  - Operated by TransDev for EasyMile

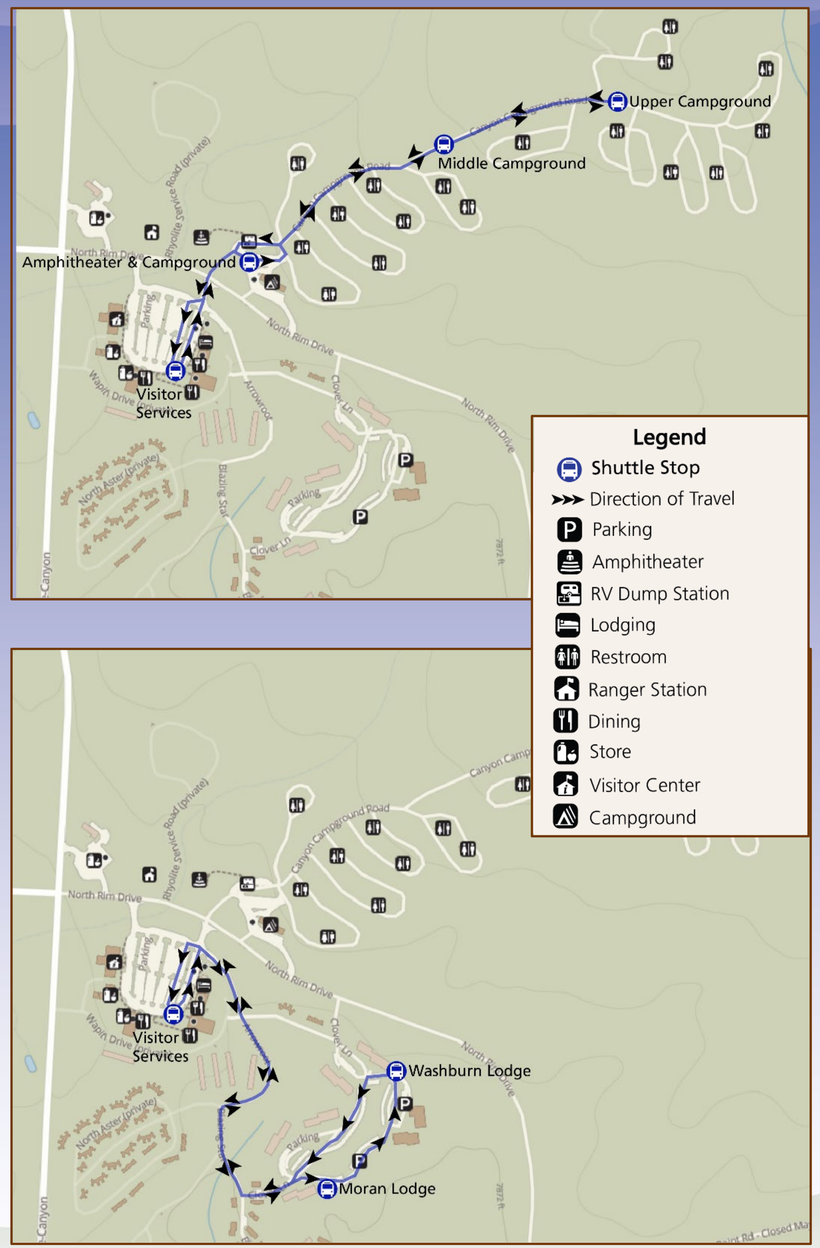
1.2.1 Wright Brothers National Memorial

Charlie at WRBR

- Point-of-contact between CASSI team and TransDev operators
- Created brochure to inform visitors about CASSI pilot
- Helped plan social media strategy
- Reported on pilot to Federal Lands Highway's Annual Business Meeting from the field, in front of CASSI

1.2.2 Yellowstone National Park

- Yellowstone is the oldest NP in the US, also one of the largest and most popular NPs
- The Electric Driverless Demonstration in Yellowstone = TEDDY
- Two shuttles, two routes
  - Shuttle pilot occurred in Canyon Village area, North of the Grand Canyon Yellowstone
  - Lodge Route: 3 stops, 1.5 mi
  - Campground Route: 4 stops, 1.6 mi



1.2.2 Yellowstone National Park

- Subarctic climate; hilly terrain at 8,000 ft, very rural
  - Snow drifts on roadside delayed mapping (and launch) by several weeks
  - Hilly route through Campground increased battery usage
  - Wildlife did not interfere with service
- TEDDY shuttle:
  - Local Motors Olli 1.0

1.2.2 Yellowstone National Park

Charlie at YELL

- Point-of-contact between NPS TEDDY team and Beep operators
- Compiled reports on survey
- Reported on and documented daily operations for the NPS team
- Briefed NHTSA site visit team on shuttle incidents

1.2.3 Summary of the Pilots

	Yellowstone (TEDDY)	Wright Brothers (CASSI)
Operator	Beep	Transdev
Vehicle	Local Motors Olli	EasyMile EZ10
Number of Shuttles	Two	One
Operating Days of the Week	Seven days, Monday–Sunday	Five days, Monday–Friday
Service Day	7:00 am – 9:00 pm (with two breaks)	10:00 am – 4:30 pm (with one break)
Planned Hours per Day	9 hours	5.5 hours
Number of Unique Routes	Two Routes	One Route
Route Miles	1.5 miles / 1.6 miles	1.5 miles
Number of Stops	Three / Four	Two

1.3. EVALUATION

1.3.1 Methodology

1.3.2 Vehicle Performance

1.3.2.1 Performance Challenges

1.3.3 Ridership

1.3.4 Rider Survey

1.3.4.1 Survey Results

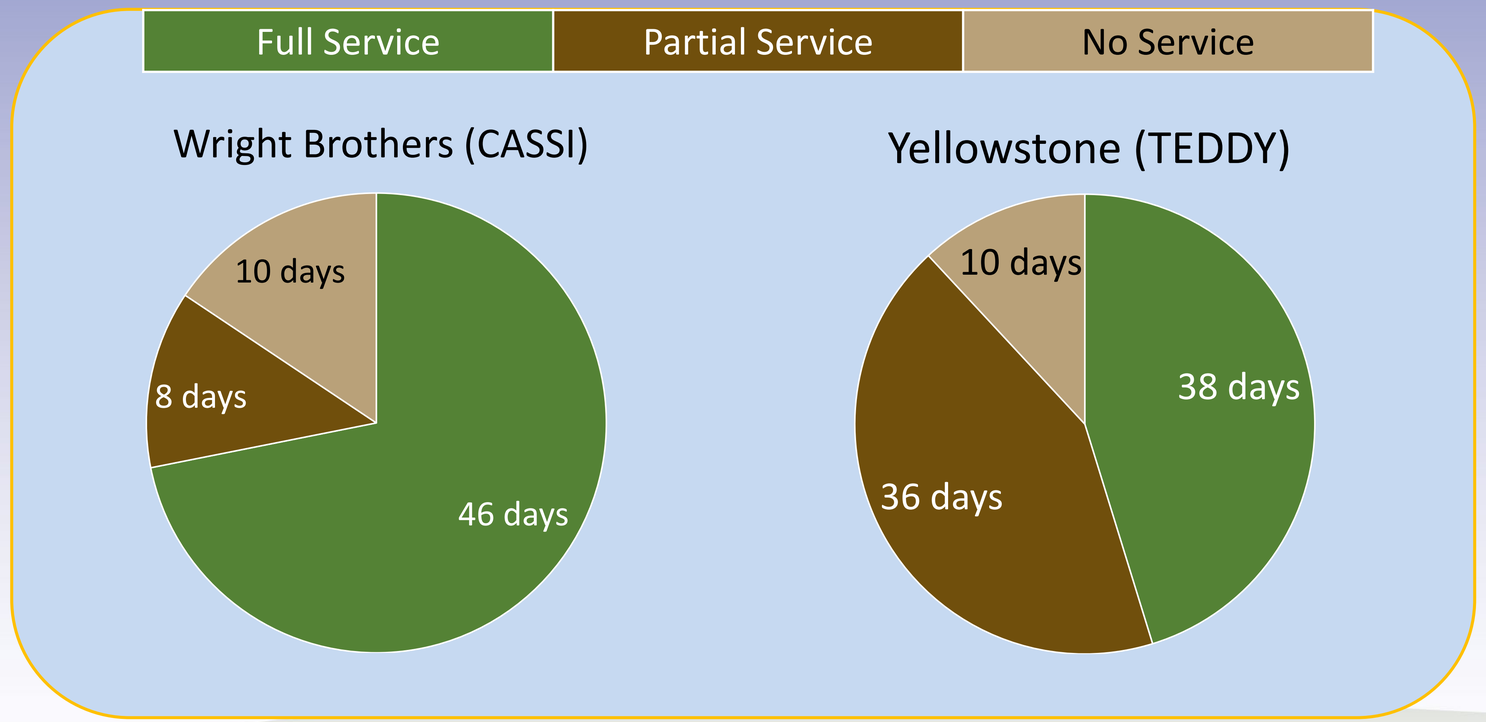
1.3.1 Evaluation Methodology

- Mixed-Methods Approach
- Data Sources:
  - Vendor-Provided or Operator-Provided Data
  - Disengagement Reports
  - Survey Responses
- Limitations
  - Low survey response rates
  - Data is not available per-ride
  - First month’s data is missing from YELL

1.3.2 Vehicle Performance

Service Suspensions

Both pilots had multiple days of partial or complete service suspension



1.3.2 Vehicle Performance

Disengagements

- WRBR (CASSI) had a higher rate of disengagements than Yellowstone (TEDDY). When fully operating:
  - CASSI: 10.7 disengagements/day
  - TEDDY: 7.0 and 6.9 disengagements/day for the two shuttles, respectively
    - Note: Jun 2021 disengagement data for TEDDY pilot is not available. Disengagement rates between two pilots were likely similar.
- More Disengagements: Parking lots, high-volume pedestrian crossings
- Fewer Disengagements: Main roadways, backroads in campground

1.3.2.1 Performance Challenges

Specific challenges included:

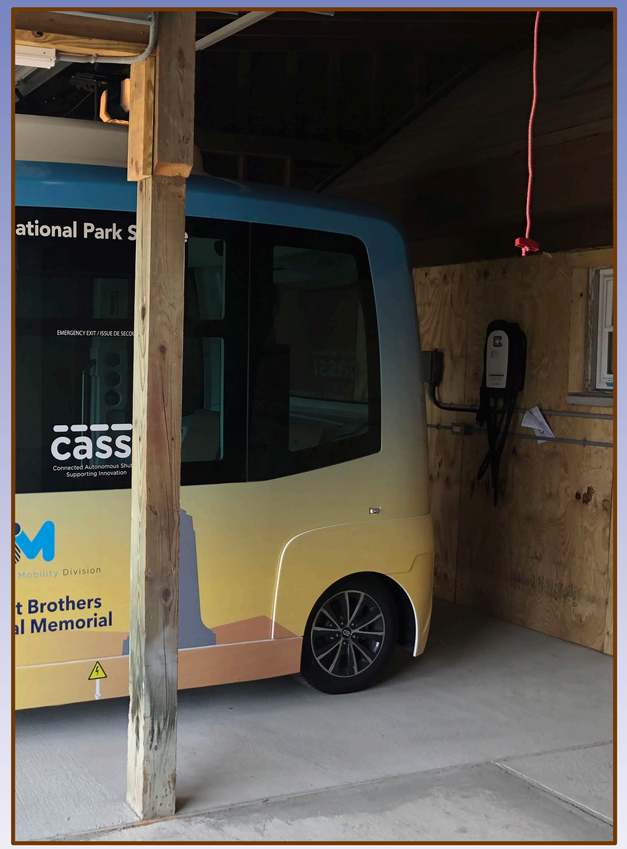
- Connectivity
- Battery Usage & Charging
- Roadway Conditions
- Parking Lots

1.3.2.1 Performance Challenges: Connectivity

- Internet connectivity streamlines operations, but is not critical
  - Shuttles need to upload data regularly to their command centers
  - WRBR has fast LTE, allowing daily data transfers
  - YELL has poor LTE and no WIFI
    - Beep adapted by mailing full hard drives back to Florida every day and replacing them with empty ones
- RTK (Real-Time Kinematic) technology is required
  - RTK enhances GPS accuracy, and is needed to keep the shuttle on course
    - Both YELL and WRBR had to install temporary RTK stations onsite to facilitate deployments.
  - Many municipalities or states already have a network of permanent RTK stations for surveying use
  - These are compatible with AV shuttles, but require permission to use

1.3.2.1 Performance Challenges: Battery Usage & Charging

- Both pilots required additional, midday charging due to high rate of battery depletion
- Battery Charging is flexible
  - AC Level 1 charging: standard 120 V outlets, slow to charge
  - Canyon Village parking lot at YELL: more frequent and longer charging periods required
- AC Level 2 charging: 240 V outlets, charges rapidly
  - WRBR facilities garage and YELL “shuttle barn”
  - Both deployments use Level 2 chargers overnight while in storage
- Midday Charging in Canyon Village: opportunity for public engagement



1.3.2.1 Performance Challenges: Roadway Conditions

- Striping is not critical
  - Both CASSI (WRBR) and TEDDY (YELL) were able to operate with existing road striping
    - This included areas where striping was degraded or absent at YELL deployment
- Pavement can be imperfect
  - Consistent pathing accelerates wear to already-damaged pavement. Spalling or potholes may worsen if in shuttles' paths.
- Landscaping must be kept up
  - Removed low-hanging branches near roadway at WRBR
  - Cleared 2 feet of roadside vegetation from shoulder at YELL
  - Swaying vegetation near roadway triggers Lidar sensors in both shuttles: vegetation must be kept trim
- Shuttles are sensitive to changing road conditions, including stormwater, sedimentation, snow accumulation and melt on roadside

1.3.3 Ridership

- Each had high ridership, given the characteristics of the pilots
- Yellowstone (TEDDY) had more passengers and trips overall
- The two pilots had a similar number of riders per trip

Category	Wright Brothers (CASSI)	Yellowstone (TEDDY)
Number of Days in Operation	54	74
Number of Trips	809	2,544
Number of Passengers	3,380	10,057
Average Passengers per Trip	4.2	4.0
Average Passengers per Vehicle per Operating Day	62.6	68.0
Average Trips per Vehicle per Operating Day	15.0	17.2

1.3.2.1 Performance Challenges: Parking Lots

Parking lots are especially challenging for automated shuttles

- Shuttles couldn’t adapt to complex movements by pedestrians and other vehicles
- Irregular parking by motorists disrupted shuttle pathfinding
- Shuttles sometimes passed pedestrians or motorists at uncomfortably-close distances
- Cars backed into shuttles twice in parking lot, causing minor damage

1.3.4 Rider Survey

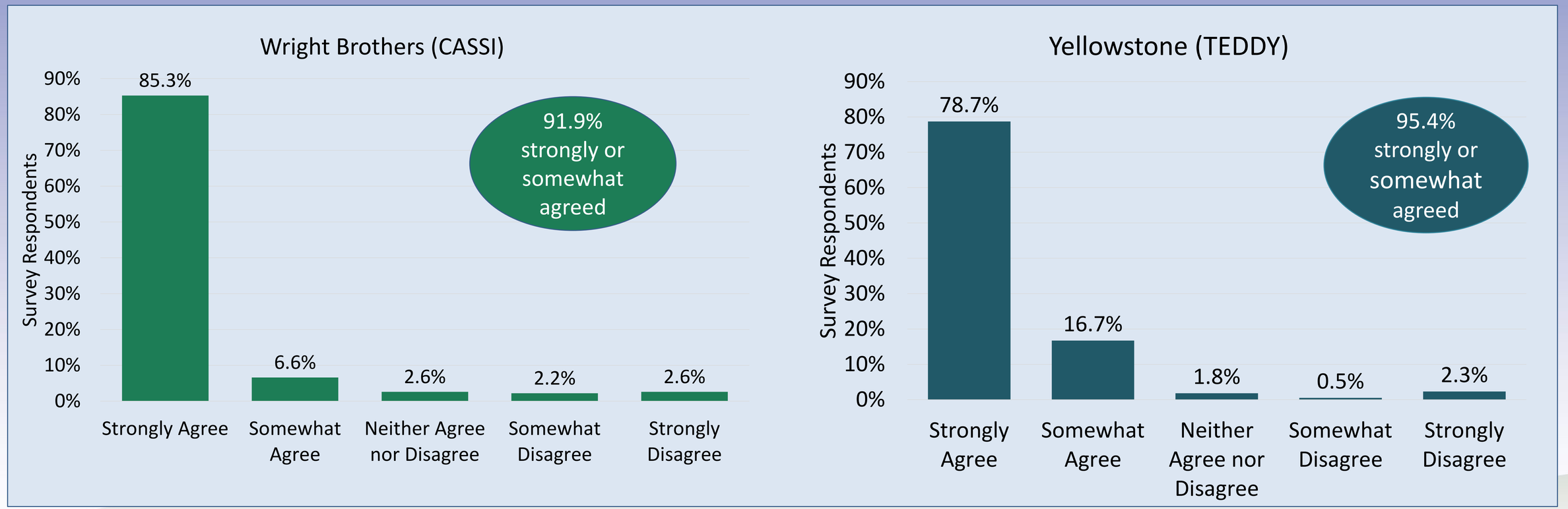
Survey Format

- Customer Feedback Survey
  - Must be fewer than 10 questions,
  - Qualitative feedback only
  - Do not need to use “Pool of Known Questions”
  - Faster OMB approval than other surveys
  - More information can be found under “OMB 1090-0011”
- Accessed with smartphone via QR code
  - Not optimal: only 2-5% of riders completed the survey

1.3.4.1 Survey Results

Overall Experience

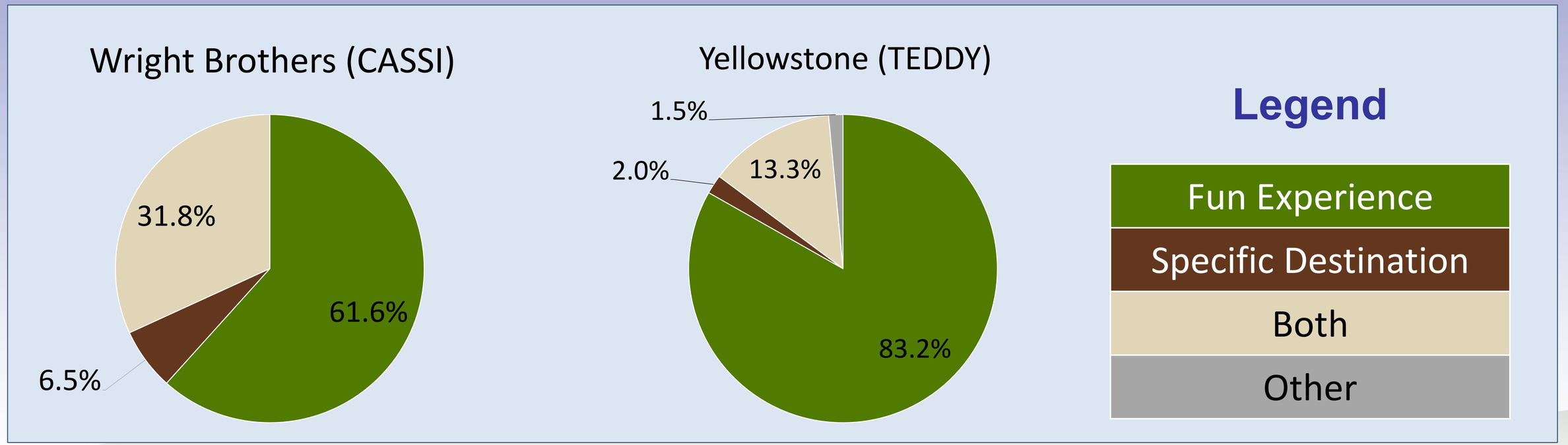
- Most respondents somewhat or strongly agreed with the statement: “I had a good experience using the shuttle.”



1.3.4.1 Survey Results

Purpose of Ride

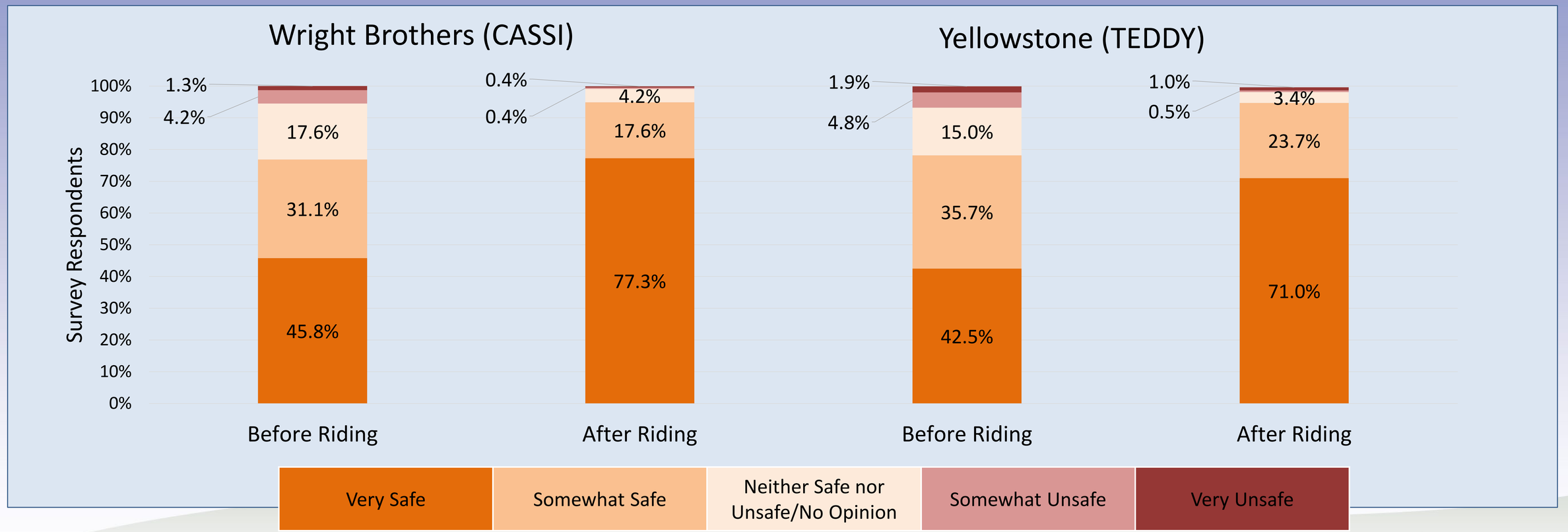
- Most respondents only rode the shuttle for a fun experience (62% at Wright Brothers; 83% at Yellowstone), indicating the shuttle may not have been filling a strong transportation need.



1.3.4.1 Survey Results

Safety Perception

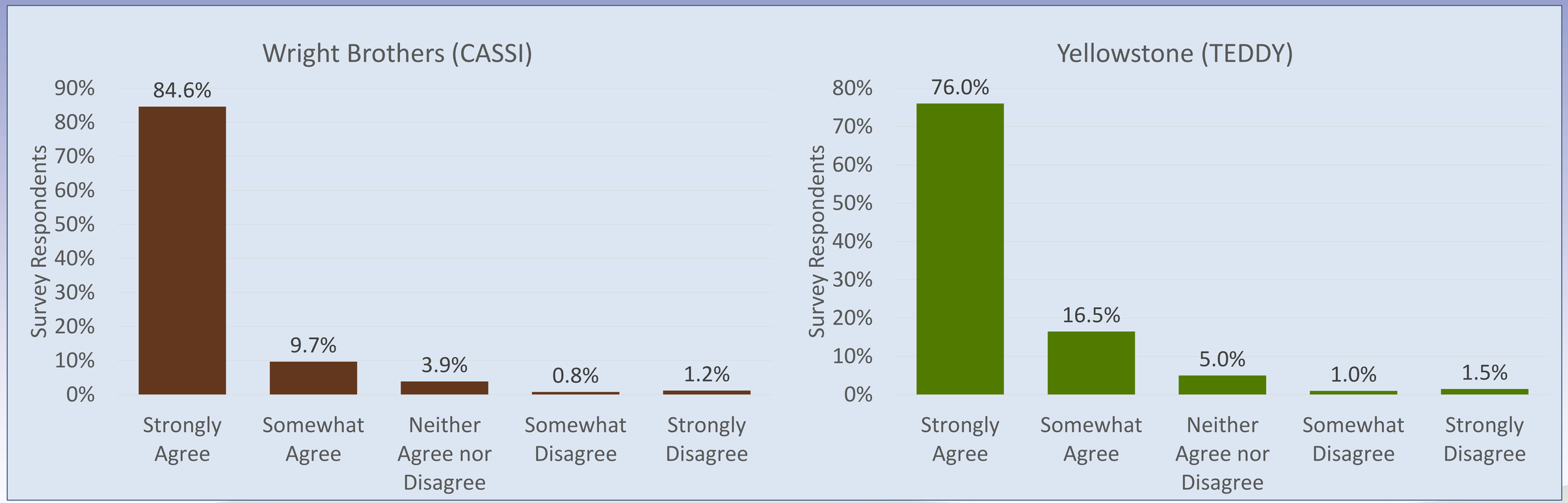
- When asked to indicate how safe they felt before and after riding the shuttle, visitors indicated an increased perception of safety after taking a ride



1.3.4.1 Survey Results

Support for Pilots

- The majority of respondents somewhat or strongly agreed with the statement: “I would like to see driverless shuttles in more National Parks.”



1.3.4.1 Survey Results

Open-Ended Comments

Wright Brothers

My kids loved it, the driver was very knowledgeable and fun! He knew a lot about the site as well as about the vehicle!

Not unsafe but I felt it impractical with the current technology limitations. … Someday when these flaws are fixed I will have more confidence.

I would ride because it's easier when you are less able to walk.

Yellowstone

It was a fun experience and can see not just Yellowstone, but other national parks benefiting from this service

I felt safe riding the shuttle WITH an attendant. I'm unsure of what my opinion would be if the shuttle was truly automated.

The shuttle was definitely in the development phase. I would definitely be interested when it is more fully developed.

1.4. PUBLIC ENGAGEMENT

1.4.1 PR & Launch

1.4.2 Challenges

1.4.3 Successes

1.4.1 Public Engagement: PR & Launch

- WRBR: “Rightsizing” the event to match a small scale of deployment
  - Joint effort between WRBR, NCDOT, and Washington-level NPS staff
  - Inviting relevant VIPs
- YELL: Creating a regional media splash
  - Cooperation between YELL and Beep PR teams
  - Media presence at event resulted in widespread coverage and public awareness in WY, MT, and ID
  - Received some national coverage

1.4.2 Public Engagement: Challenges

- While AV shuttles were popular with those who rode them, other road users were frustrated by them
  - Slow driving and sudden stops could upset human drivers, leading to passing or aggression
  - Shuttles don’t replicate human driving behavior
- Survey results are biased: most respondents were comfortable enough with the technology to ride the shuttles
  - Very few people who didn’t ride filled out the survey

1.4.3 Public Engagement: Successes

- High ridership and survey results indicated strong public engagement
- Anecdotal conversations with visitors and locals showed curiosity and interest among those who encountered the shuttles
- Valuable educational opportunity
  - Onboard operators educates the public on tech in their shuttles
  - Kids were particularly enthusiastic about AVs

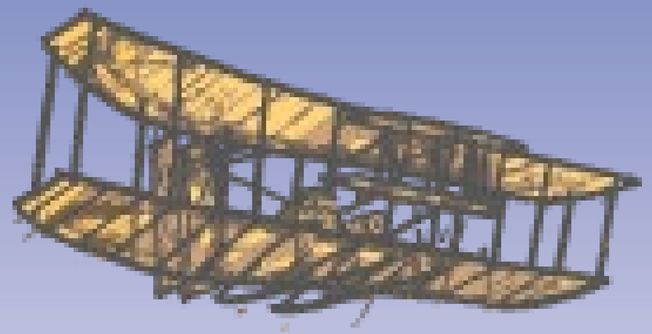
1.5. CONCLUDING THE PILOTS

1.5.1 Lessons Learned

1.5.2 Next Steps

1.5.1 Lessons Learned

- Specificity in contracts saves future headaches
- Plan extra time for on-the-ground setup
  - Pay attention to mapping, staffing, infrastructure, etc.
- Anticipate technology issues & service disruptions
- Be prepared to adapt to changing conditions
- Emphasize accessibility and user-friendliness whenever possible



1.5.2 Next Steps

- Future deployments will not seek to replicate the CASSI and TEDDY pilots (e.g., fixed route service with novel-design low-speed automated shuttles)
- Future pilots may consider distinctly different:
  - Service types (e.g., on-demand or point-to-point services),
  - Vehicle formats (e.g., light-duty passenger vehicles, cutaway buses, and full-size transit buses), or
  - Applications(e.g., personal individual transportation, ridehailing service, interpretive services, or goods delivery)
- NPS is hopeful to consider more permanent installations in the future when technology requirements, needs, and park suitability align

2. PARTNERSHIP WITH STATE OF MICHIGAN

2.1 MOU BETWEEN NPS & STATE OF MICHIGAN

2.2 NATIONAL PARKS IN MICHIGAN

2.3 PLANNING FUTURE PILOTS

2.1. MOU BETWEEN NPS & STATE OF MICHIGAN

2.1.1 Background

2.1.2 Memorandum of Understanding

2.1.1 Background

January 2020: NPS issues a Request for Information on Emerging Mobility (EM) and Automated Shuttles.

SOM responds with interest.

2020: NPS & SOM teams begin meeting to discuss EM opportunities in parks.

2021: Parks in Michigan set visitation records

- Contributed $294m to local economies
- Raised concerns about effects of crowding on sustainability and safety

April 2022: NPS & SOM sign a Memorandum of Understanding (MOU), partnering to deploy EM technologies.

2022: Presently, joint NPS-SOM team collaborating to plan EM projects in Michigan parks

2.1.2 Memorandum of Understanding

NPS & SOM jointly agree to research and develop innovative mobility projects to improve:

a) sustainability;
b) visitor access;
c) traffic congestion;
d) transportation safety.

Each party lists additional objectives, namely:

a) The SOM seeks to generate economic growth & support a vibrant mobility industry in the state.
b) The NPS seeks to provide equitable access opportunities for all Americans and uphold the NPS mission.

MDOT Dir. Paul C. Ajegba and NPS Dir. Chuck Sams meet in Detroit to sign the MOU.
https://www.michigan.gov/whitmer/news/press-releases/2022/04/19/state-of-michigan-and-national-park-service-announce-innovation-partnership

2.2. NATIONAL PARKS IN MICHIGAN

2.2.1 Sleeping Bear Dunes National Lakeshore

2.2.2 Pictured Rocks National Lakeshore

2.2.3 River Raisin National Battlefield

2.2.4 Isle Royale National Park

2.2.5 Keweenaw National Historical Park

2.2.1 Sleeping Bear Dunes National Lakeshore

Visitation (2021)	**1,545,535**
Busy Seasons	Peak: July Busy: May-Oct Off-season: Sledding, cross-country skiing, snowshoeing
Geographic Character	Rural, Recreational In Glen Arbor (pop. 860) and Empire (350). Near Traverse City (15,600).
Land Area (acres)	Total: 71,199 Wilderness: 32,557 (45.7%)
Electricity	16.81¢/kWh
Connectivity	~70% LTE coverage 100 MBPS satellite (parkwide) 1000 MBPS cable (developed areas)
Transit	Bay Area Transp. Auth. offers seasonal service between Traverse City and Sleeping Bear Dunes. Bikes ride free!
Active Transportation	Sleeping Bear Heritage Trail connects Empire; Glen Arbor; north of the park. Trail is mostly paved.

Takeaways:

- Popular, high-visitation park
- Accessible vacation destination
- Front-country resources can support ambitious undertakings

2.2.2 Pictured Rocks National Lakeshore

Visitation (2021)	**1,313,179**
Busy Seasons	Peak: July Busy: Jun-Oct Off-season: ice climbing, cross-country skiing, snowmobiling, snowshoeing
Geographic Character	Rural, Recreational Between Munising (population 2,000) and Grand Marais (230).
Land Area (acres)	Total: 33,929 (NPS-owned) Wilderness: 11,740 (34.6%)
Electricity	13.65¢/kWh
Connectivity	~15% LTE coverage (cell service) 35 MBPS satellite (parkwide) 1000 MBPS cable (Munising)
Transit	Alger Co. Transit offers “backpacking” shuttle service between Munising and park, if booked in advance
Active Transportation	Street cycling permitted. Bikes not permitted on trails or access roads.

Takeaways:

- Popular, high-visitation park
- More remote than Sleeping Bear
- Development highly concentrated in West of park, limited elsewhere

2.2.3 River Raisin National Battlefield

Visitation (2021)	**218,090**
Busy Seasons	Peak: varies Busy: Mar-Oct Off-season: Jan 22: battle anniversary (reenactment)
Geographic Character	Urban, Industrial In Monroe (20,000). Between Detroit (630,00) and Toledo, OH (270,000)
Land Area (acres)	Total: 42 Wilderness: 0
Electricity	13.32¢/kWh
Connectivity	100% LTE coverage 1200 MBPS cable (parkwide)
Transit	No transit at present. Opportunity to connect park to Monroe's well-developed bus transit
Active Transportation	River Raisin Heritage Trail connects park to downtown Monroe and Sterling State Park. Trail is paved.

Takeaways:

- Moderate visitation
- Urban situation comes with infrastructure opportunities
- Small size limits transportation needs, options

2.2.4 Isle Royale National Park

Visitation (2021)	**25,932**
Busy Seasons	Peak: July Busy: Jun-Sep Off-season: none. Park closed Nov 1 to Apr 15 annually
Geographic Character	Wilderness Island, remote from all population centers. Cars are forbidden.
Land Area (acres)	Total: 133,788 (Land-only) Wilderness: 132,018 (98.6%)
Electricity	55.12 ¢/kWh (generated onsite w/ diesel)
Connectivity	~15% LTE coverage 35 MBPS satellite (parkwide)
Transit	Ferries ($80-$170 per round trip) and seaplanes ($320-$420 round trip) are only means of access
Active Transportation	Kayaking is a key means of exploring the island, but biking is prohibited in wilderness areas.

Takeaways:

- Extremely remote wilderness
- No car access, limited electricity
- Any project attempted here would be very costly and difficult

2.2.5 Keweenaw National Historical Park

Visitation (2021)	**11,590**
Busy Seasons	Peak: July Busy: Jun-Oct Off-season: Low recorded visitation, usage of adjacent trails likely high
Geographic Character	Rural, Post-Industrial Located in Calumet (6,200) and Hancock (4,500). Near Houghton (7,600).
Land Area (acres)	Total: 1,870 (136 NPS-owned) Wilderness: 0
Electricity	13.65¢/kWh
Connectivity	100% LTE coverage 1000 MBPS cable (parkwide)
Transit	No transit at present. Opportunity to connect park to existing on-demand shuttles in Hancock
Active Transportation	Hancock-Calumet rail trail connects the two towns. Local trails are shared w/ ATVs, snowmobiles.

Takeaways:

- Rural, but developed
- Low visitation may not reflect actual recreational activity in area
- Future expansion of park is planned

2.3. PLANNING FUTURE PILOTS

2.3.1 PRIORITIZATION

2.3.2 QUICK WINS

2.3.3 PRIORITY PROJECTS

2.3.4 LONG-RANGE “SLOW BURNERS”

2.3.1 Prioritization

- Timing, effort, cost, viability
- All variables must be balanced for successful pilots
- Multiple “waves” of pilots can be attempted:
  - “Quick wins”
  - Priority projects
  - Long-range “slow burners”

2.3.2 Quick Wins

- Can be planned and implemented quickly
- Require little additional infrastructure
- Take advantage of existing partnerships or projects
- Examples
  - Electric mobility demonstrations by private companies
  - Expanding existing fleet of all-terrain electric wheelchairs
  - Expanding existing EV charging locations

2.3.3 Priority Projects

- May take a year or more to plan and implement
- Require additional infrastructure
- Make significant improvements to transportation systems at parks
- Goal: be sustainable and useful for long-term
- Examples
  - AV & Transit expansions at Sleeping Bear Dunes
  - Micromobility at Pictured Rocks, Sleeping Bear, and Keweenaw

2.3.4 Long-Range “Slow Burners”

- Other developments will influence viability of these projects
- Accomplish major regional or national goals
- Potential to be transformative
- Need to prove viability of other projects before attempting these
- Examples
  - Transitioning NPS fleet in Michigan to EVs
  - Decarbonizing electricity infrastructure at Isle Royale
  - Improving internet connectivity in and around parks

3. SUPPORTING EM THROUGHOUT NPS

3.1 EMERGING MOBILITY SUBGROUPS

3.2 SITE VISITS

3.3 CASE STUDY: ACADIA NATIONAL PARK

3.0 Supporting EM Throughout NPS

- Tasked with supporting EM initiative in NPS
  - Participating in Emerging Mobility Working Group (EMWG) and its constituent subgroups
  - Performed site visits to many parks to learn about their transportation systems and offer technical assistance
  - Assisted Acadia National Park with transportation planning efforts

3.1 Emerging Mobility Subgroups

- EMWG subgroups created following 2021 AV shuttle pilots
  - Members from NPS (WASO, regions, parks); USDOT Volpe Center
  - Specialize in specific EM technologies
  - Conduct outreach to parks interested in adopting or testing their technologies
  - Talk to private companies or nonprofit operators to evaluate state of industry and form partnerships
  - Inform the broader EMWG on their efforts every other week

3.1 Emerging Mobility Subgroups

- Three Subgroups
  - Automated Vehicles
    - Conducted outreach to nearly all major AV companies (manufacturers, operators, tech providers)
    - Exploring novel applications for AVs beyond what was achieved during 2021 pilots
  - Traveler Information Technologies
    - Working with NPS webservices team to improve real-time traveler information for visitors to parks
    - Conducted outreach to tech companies to make sure NP data is accurately reflected online
  - Micromobility & Ridehailing
    - Helping NPS Division of Regulations with forthcoming rules for powered micromobility devices
    - Working on a partnership with Lyft to set designated ridehailing pick up & drop off zones in parks

3.2 Site Visits

- During Fellowship, Charlie conducted official site visits to 9 parks
  - Gettysburg National Military Park (GETT)
  - Harpers Ferry National Historical Park (HAFE)
  - National Mall & Memorial Parks (NAMA)
  - Cape Hatteras National Seashore (CAHA)
  - Indiana Dunes National Park (INDU)
  - Yellowstone National Park (YELL)
  - Minute Man National Historical Park (MIMA)
  - Acadia National Park (ACAD)
  - Yosemite National Park (YOSE)
- Toured facilities, met staff, observed issues & opportunities, took notes & pictures, offered input/assistance (when asked)

3.2 Site Visits

- General Observations:
  - Park leadership needs a vision for the park
    - High-level goals define management priorities
    - Transportation works best when it synergizes with the park's vision
  - Parks need to maintain good relationships with gateway communities
    - Friendly neighbors at local or state levels support their parks, advancing shared goals
    - Unfriendly neighbors can impede the park's goals
    - Challenge: easier for parks to act unilaterally inside their boundaries than to integrate surrounding community into the planning process
  - Busy parks need to think critically & creatively about how to control car traffic on their roadways

3.3 Case Study: Acadia National Park (ACAD)

- Charlie visited in December 2021
- Met with park leadership
- Taken on tour by John Kelly, management assistant
- Met with nonprofit transit operator Downeast Transportation
- Given two priority items to work on by the park:
  - Evaluating cost of electrifying Island Explorer bus system
  - Fixing congestion at Bass Harbor Head Light Station

3.3 Case Study: Acadia National Park (ACAD)

- Electrification of Busses:
  - Opportunity identified by Steve Suder for a study by National Renewable Energy Laboratory (NREL)
    - Study by Maine DOT completed 07/22
    - No further pursuit of NREL study
- Fixing congestion at Bass Harbor Head Light Station
  - Charlie wrote several draft proposals for a study
    - Not pursued further by park
  - Further efforts may be undertaken in 2023 to identify better transportation alternatives

3.3 Case Study: Acadia National Park (ACAD)

- Lessons learned:
  - All work needs persistent advocacy to come into being
  - Consistent, regular communication between parties is the most important practice to follow during planning
  - Build a team, don't tackle it alone
    - Funding may be required as early as the planning stages
  - Recognize the extent of the task early on.
    - Know your limits.

4. THE PATH FORWARD

4.1 GRANT: MULTIMODAL EQUITY

4.0 The Path Forward

- Charlie will continue to work as a PLTF for the next two years
- Continuing to support NPS EM efforts, including partnership with State of Michigan
- Upcoming focus: Multimodal Equity

4.1 Multimodal Equity

- July 2022: Charlie wrote proposal for a study:
  - Working with underserved communities to create and evaluate digital tools which connect them with local public lands using existing transportation infrastructure
- Awarded $460k by Federal Lands Highways' (FLH) Innovation and Research Council to pursue study as principal investigator
- Helping FLH execute this study will be Charlie's primary task over the coming years.

CONCLUSION

Finally..!

Lessons Learned

PEOPLE ARE EVERYTHING

- Relationships decide whether a PLTF succeeds or fails
- Communicate regularly with everyone you work with
  - Be kind, get personal. You'll need their trust & support when you struggle.
- Stay in touch those you've worked with in the past
  - Transportation is a small world. Your "network" is made of people who are pleased to hear your name.
- Seek mentorship from the wise and experienced
  - Asking questions signals to a potential mentor that you respect them and appreciate their knowledge.

Lessons Learned

UNDERPROMISE, OVERDELIVER

- Phil Shapiro tried his hardest to teach me this
- Counterintuitive for a salesman or an interviewee
- Key: know what question was asked before you answer it
  - Sometimes the person asking doesn't understand, either
- If you don't know what it takes to accomplish something, ask someone who does

Lessons Learned

ALL THE EASY WORK HAS ALREADY BEEN DONE

- Steve Suder’s advice to me on my first day
- Opportunities are always within reach
  - Great opportunities can only be accessed through great work

Thank you

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    - ACAD: John Kelly & Kevin Schneider;
    - NAMA: Laurel Hammig;
    - INDU: Paul Labovitz;
    - YOSE: Jim Donovan, Ansley Singer;
    - MIMA: Margie Coffin-Brown;
    - GETT: Zach Bolitho;
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Resources

- NPS Emerging Mobility
  - Evaluation Reports for the 2021 AV Pilots
- Michigan-NPS Partnership

Questions

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https://westerntransportationinstitute.org/professional-development/public-lands-transportation-fellows/