Public Lands Transportation Scholar
Final Report

Private Vehicle Reduction Strategies and Access Improvements at Kīlauea Point National Wildlife Refuge

May 2017

This document was prepared for the US Fish & Wildlife Service by the Federal Lands Transportation Institute of the Western Transportation Institute.

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ABSTRACT

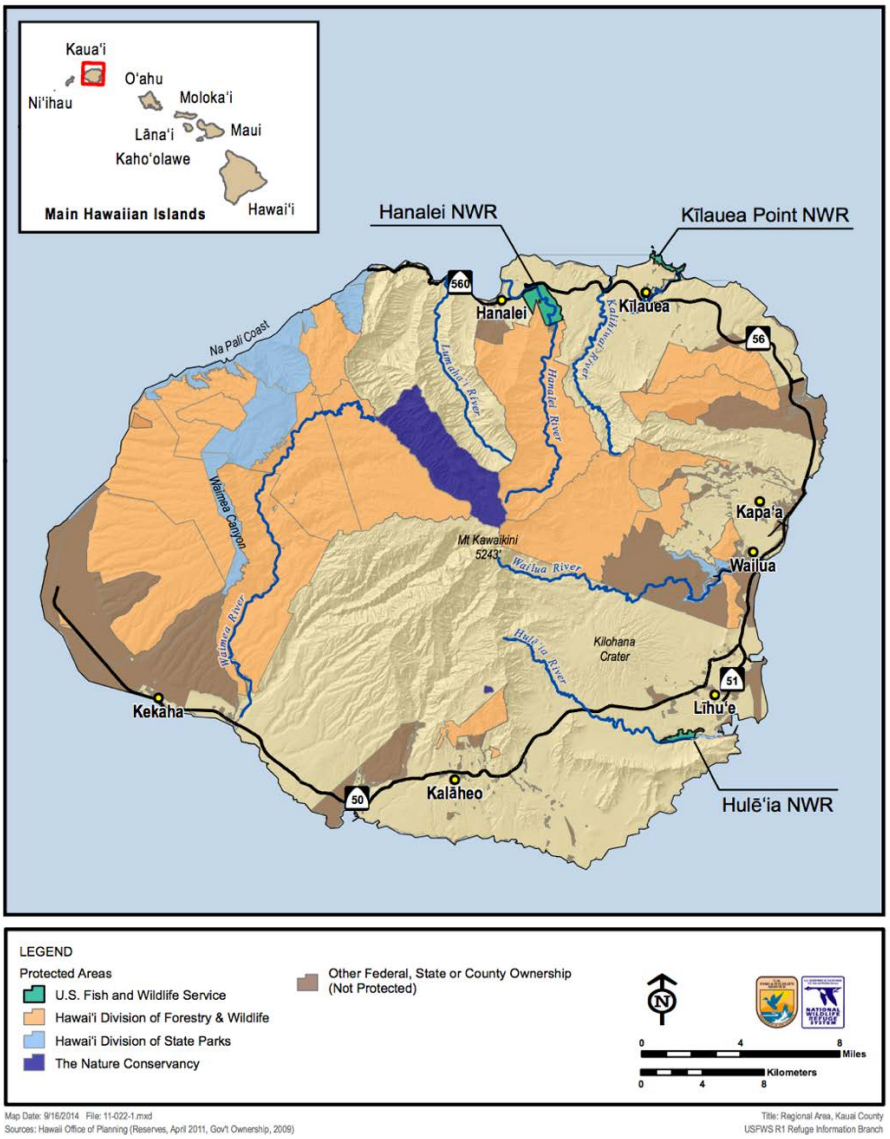
Between June 2016 and April 2017, Public Lands Transportation Scholar Alex Roy assessed transportation concerns leading to and at the Kīlauea Point National Wildlife Refuge (Kīlauea Point NWR or Refuge). Part of the Kauaʻi National Wildlife Refuge Complex, Kīlauea Point NWR is the only U.S. Fish and Wildlife Refuge on Kauaʻi open to the public and one of the most visited refuges in the United States. Established in 1985, the Refuge is home to the famous historic Daniel K. Inouye Kīlauea Point Lighthouse, as well as world class wildlife viewing opportunities.

With only one access point and peak daily visitation over 1,000 people per day, vehicle congestion and safety concerns are some of the most pressing issues facing Kīlauea Point NWR. This document describes efforts related to reducing the impacts of private vehicles and peak visitation at the Refuge. The Kīlauea Point NWR Comprehensive Transportation Planning Study (Transportation Study) was completed during the Scholar's tenure. The Transportation Study was an extensive planning process extending over several years. The Scholar contributed to the Transportation Study and designed his work to complement the Transportation Study's findings and recommendations. Transportation recommendations promoted by the Transportation Study included Kīlauea Point NWR shuttle service and a reservation system. This report details findings and recommendations developed by the Scholar, as well as presenting a first-hand account of Alex's experience and understanding of transportation topics as they relate to federal land units.

INTRODUCTION

Kauaʻi is the oldest and furthest west of the main Hawaiian Islands. It is one of the most geographically and climactically diverse islands in the chain, and is home to the world-renowned Nā Pali coast, 5,000 foot peaks, record setting rainfall, tropical canyons, and scenic waterfalls. The 2016 census data estimates the population of Kauaʻi was 72,000[1]. The largest population center is Kapaʻa and Līhuʻe is the primary business district and transportation hub. In addition to residents, Kauaʻi is a very popular tourist destination with over a million visitors a year. [2]

Figure 1: Kauaʻi Refuges[3]

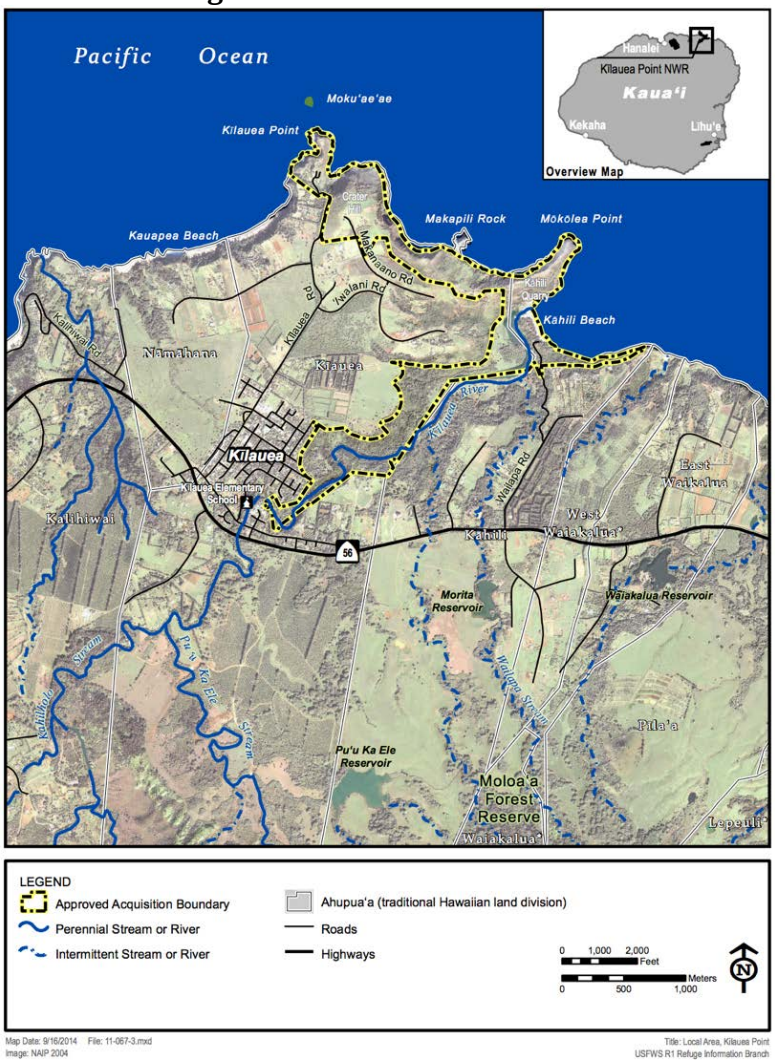


[1] https://www.census.gov/quickfacts/table/PST045216/15007
[2] http://hawaiitourismauthority.org/research/research/visitor-highlights/
[3] Kīlauea Point National Wildlife Refuge Comprehensive Transportation Planning Study

The Kauaʻi National Wildlife Refuge Complex consists of three Refuges: Hulēʻia, Hanalei, and Kīlauea Point. Hulēʻia National Wildlife Refuge is not open to the public. The visitor amenities at Hanalei National Wildlife Refuge are limited to information boards and a small viewpoint parking lot. Kīlauea Point National Wildlife Refuge (Kīlauea Point NWR or the Refuge) is the only refuge on Kauaʻi open to the public and providing visitor services.

An average of 400,000 people a year visit the Kīlauea Point NWR, making it the 19th most visited refuge in the Unites States. Around half of the total visitors pay to enter the Point and Lighthouse area. Kīlauea Point NWR was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The Refuge includes the historic Kīlauea Point Lighthouse and world class wildlife viewing opportunities. The Refuge is 203 acres and is located 2 miles north of historic Kīlauea town on the northernmost tip of Kauaʻi.

Figure 2: Kīlauea Point NWR[4]



[4] Kīlauea Point National Wildlife Refuge Comprehensive Transportation Planning Study

The Kīlauea Point NWR has completed several transportation studies since 2000. In 2017 the Refuge, along with partners from the Volpe Center, Central Federal Lands Highway Division, and US Fish & Wildlife Region 1, completed the Kīlauea Point National Wildlife Refuge Comprehensive Transportation Planning Study (Transportation Study). The Transportation Study built upon and refined previous efforts to develop a comprehensive range of transportation concepts and recommendations for the Refuge.

As one of the most popular visitor destinations on Kauaʻi, Kīlauea Point NWR experiences very high visitation periods. During these peak visitation periods the Refuge frequently has more vehicles entering the Point than available parking. This leads to vehicle queuing on the entrance road, vehicle congestion, and visitors parking in unmarked spaces. These conditions are exacerbated by a single-entry point and limited transportation alternatives to the private vehicle; walking into the Refuge is not allowed and there are minimal private tour shuttles. Due to safety concerns, wildlife and habitat located along the entrance road, and impacts to the visitor experience, queues greater than 5-10 vehicles along the entrance road are prohibited. Frequently during these peak periods Refuge staff are forced to leave their ranger and maintenance duties and direct traffic, and during the worst periods the Refuge is closed until there are multiple available spaces.

Alternative modes, shifting visitation periods, and increased capacity are the transportation improvements for the vehicle conditions experienced at Kīlauea Point NWR. Due to limited land and wildlife concerns, increased capacity is not a valid alternative. During his tenure, the Public Lands Transportation Scholar (Scholar) focused on alternative modes and identifying methods of shifting visitation to less busy times. The Scholar advanced alternative transportation by contributing to the Transportation Study, working on the active transportation FLAP project, developing shuttle alternatives, and collaborating on the County of Kauaʻi's FLAP grant application. To identify methods of shifting visitation the Scholar conducted data collection and developed reservation system alternatives.

Figure 3: Queuing Vehicles and Refuge Staff Directing Traffic

METHODOLOGY

The Transportation Study recommended and outlined a Kīlauea Point NWR shuttle service and an advance reservation system. To refine the shuttle service and reservation system recommendations, three different approaches were utilized by the Scholar to understand the specific transportation needs of the Kīlauea Point NWR:

- Data Review and Data Collection
- Literature and Background Review
- Field Observations

This methodology lead to understanding of the visitation and vehicle data behind the transportation concerns and the conditions and "on-the-ground" impacts.

Data Review and Data Collection

A data collection plan was designed by the scholar to develop baseline conditions for existing vehicle and parking use, as well as to identify those periods that vehicle and parking issues are most severe. The existing conditions were then used to evaluate transportation alternatives and scenarios.

The data collection plan used data such as visitor services and fee collection data, as well as, a comprehensive data collection plan to gather brand new data. The visitor services and fee collection data was used to summarize daily, monthly, and yearly visitation trends. The comprehensive data collection concentrated on collecting data that was not readily available from the visitor services / fee data. Data that was collected during 2016/2017 includes parking occupancy, visitation length, and driveway counts. Key finding from the data review and data collection are discussed in the Kīlauea Point NWR Visitation Chapter. The Data Review and Data Collection report is included as Appendix I. Raw data was provided to the Kīlauea Point NWR and stored on the Refuge shared drive.

Literature and Background Review

Documents reviewed include the following: Kīlauea Point National Wildlife Refuge Comprehensive Conservation Plan (CCP) (2016), the Kaua'i National Wildlife Refuge Complex Comprehensive Transportation Planning Study (2016), Kīlauea Point Alternative Transportation Systems Study (2006), Kīlauea Point TAG Study (2009), The U.S. Fish and Wildlife Service's Plan 2035 the National Long Range Transportation Plan (LRTP) (2016), U.S. Fish and Wildlife Region 1 LRTP (2012), and the North Shore Path Alternative Report (2012). These documents supplemented discussions with U.S. Fish and Wildlife The Kaua'i National Wildlife Refuge Complex leadership to gain an understanding of the transportation issues facing the Refuge.

A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of the transportation environment and conditions was conducted based on the U.S. Fish and Wildlife Service's Plan 2035 the National Long Range Transportation Plan strategic goals.

A SWOT analysis is an exercise that is frequently used when a business, municipality, or other government agency is looking at starting or expanding into a new market, or providing new services. It can be a helpful exercise in both identifying potential benefits and areas of concern. During SWOT exercises, strengths and weaknesses are factors or conditions internal to the organization, while opportunities and threats are factors or conditions external to the organization. Opportunities and strengths identified in the SWOT analysis include continued collaboration with the County and Town and an interest in alternative transportation on the Kaua'i. Threats and weaknesses included increased tourism, dispersed population and hotels, and limited funding opportunities. The SWOT analysis for Kīlauea Point NWR transportation environment is included as Appendix VII.

Field Observations

Field observations consisted of walking to the Refuge from Kīlauea Town, assisting with parking direction, watching vehicle parking lot maneuvers, observing conditions at the Overlook, and observing active transportation use on Kīlauea Road. While this information was not conducted in a manner to provide quantifiable data, it did prove to be beneficial in gaining a sense of existing conditions. The following conditions were especially relevant to the transportation environment at and accessing the Refuge.

- *Active Transportation on Kīlauea Road* - cyclists and pedestrians frequently travel to the Kīlauea Point NWR Overlook, located at the end of Kīlauea Road and open to the public 7-days a week. Past the Seacliff development, the multi-use path abruptly ends forcing cyclists and pedestrians onto the roadway. While vehicle speeds are relatively low (15 – 20 MPH), bends and blind curves make on-street active transportation use uninviting. Existing use indicates that with improved facilities active transportation use would rise.

- *Kīlauea Point NWR Overlook Parking* - One of the most scenic views of the Refuge and Lighthouse is from the Overlook. The popularity of the Overlook combined with open access leads to high usage. When parking at the Overlook is full, pedestrians are forced to walk in the roadway to access the scenic area.

Figure 4: Jogger with Stroller on Kīlauea Road

Figure 5: Pedestrians in the Roadway at Refuge Overlook

CONSTITUENCIES

Kīlauea Point NWR transportation projects require strong partnerships with government and non-government organizations. The most immediate of these partnerships is with the County of Kauaʻi, which owns and maintains Kīlauea Road and a portion of the Overlook parking lot. Other partnerships include potential shuttle stop locations and neighborhood groups. Below are the jurisdictions, agencies, partners, and stakeholders that have or could play a critical role in the transportation environment at Kīlauea Point NWR.

County of Kauaʻi

The County of Kauaʻi is a frequent partner with the Kīlauea NWR. A county road, Kīlauea Road is the only access to the publicly open area of the Refuge. The County and the Refuge have partnered on a Federal Lands Access Program (FLAP) project along with Central Federal Lands Highway Division (CFL) and an engineering consultant. The FLAP project is identifying ways to improve active transportation to the Refuge. Preliminary designs include a separated path on the section of road closest to the Refuge and sharrows/signage in Kīlauea Town. The FLAP project is also examining redesigning the Overlook parking area. In Spring 2017 the County, with support from the Refuge, applied to have this project receive further funding and complete designs to 100% and develop "shovel-ready" plans.

Kīlauea Point Natural History Association (Friends Group)

The Kīlauea Point Natural History Association (KPNHA) is a non-profit organization, or "friends group," that works to advance the mission and goals of the Kīlauea Point NWR. They operate the Refuge bookstore daily when the Refuge is open. They also offer support in many other fashions including, managing and administering private donations for Lighthouse rehabilitation and other large projects, work with the Refuge on educational programs, and organize public art shows and events.

Kīlauea Community Agriculture Center

The nonprofit organization ʻĀina Ho'okupu o Kīlauea has established the Kīlauea Community Agriculture Center in partnership with the County of Kauaʻi. The mission of the Agriculture Center is to strengthen the community and teach responsible farming practices. Once completed, the Agriculture Center will host community events, including a farmer's market. Given its proximity to the Refuge and available parking, the Agriculture Center has been identified as the preferred pick-up/drop-off location for a Refuge Shuttle. Initial conversations have indicated that the Agriculture Center is open to hosting shuttle parking. As of Spring 2017 construction was in progress and no formal conversations had been held or agreements reached.

Kīlauea Neighborhood Association

The Kīlauea Neighborhood Association (KNA) is the oldest community association on Kauaʻi. KNA is led by a Board of Directors and is very active in planning, working with developers and governments, and organizing community events. Their mission is "to promote the general welfare of the Kīlauea District encouraging a thriving community based on a strong foundation of community values, preservation of its culture and traditions of its people and to promote participation, responsibility and accountability to each other"[5]. The Refuge works closely with KNA regarding Kīlauea Point projects that could impact the community. The Refuge also gives monthly updates at KNA meetings.

Hawaii Department of Transportation (HDOT)

Kīlauea Town is accessed via the Kuhio Highway (SR-56). The Kuhio Highway is owned and maintained by the Hawaii Department of Transportation (HDOT) and is the one of the principal highways on Kauaʻi, running from Hanalei to Lihue.

John A. Volpe National Transportation Systems Center (Volpe Center)

The Volpe Center was the lead of the Transportation Study, completed in 2017.

U.S. Department of Transportation, Central Federal Lands Highway Division (CFL)

Along with the Volpe Center, the U.S. Department of Transportation, Central Federal Lands Highway Division (CFL) prepared the Transportation Study. They also are a partner and the funding agency on the County of Kauaʻi led FLAP project.

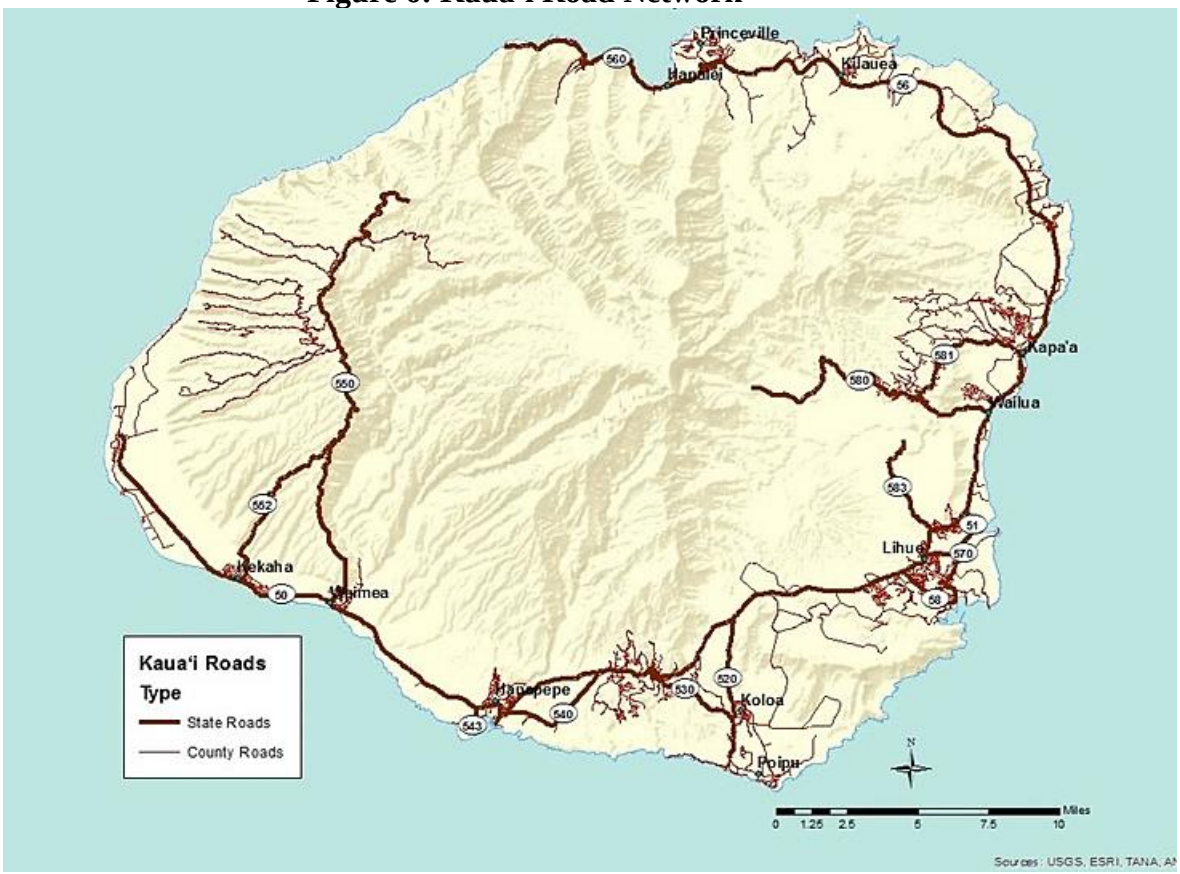
[5] http://kna-Kauaʻi .org/about/

KAUA'I TRANSPORTATION NETWORK

Kaua'i Road Network

HDOT owns and operates the highway network on Kaua'i. Several highways combine to make a semi-circular route from Koke`e State Park to Hā'ena State Park. While the route consists of multiple highways (SR 50, 550, 56, and 560) it functions similar to a sole highway. State and County roads provide access from the main highway route. Due to the Nā Pali Coast and other rugged geological features, Kaua'i does not have a road that circumnavigates the island.

Figure 6: Kaua'i Road Network[6]



Public Transportation

Kaua'i Bus, operated by the County of Kaua'i is the only public transportation on the island. Kaua'i Bus operates four mainline routes and four shuttles, reaching most of the island. The public transportation system is primarily designed for residents and commuters with service every ½ hour during commute times, every hour during weekday off-peak hours, and every other hour during

[6] Kīlauea Point National Wildlife Refuge Comprehensive Transportation Planning Study

the weekend. Kaua'i Bus operated a pilot North Shore Shuttle from Hanalei to Hā'ena State Park in 2016. As of Spring 2017, it was undecided if future service funding would be approved.

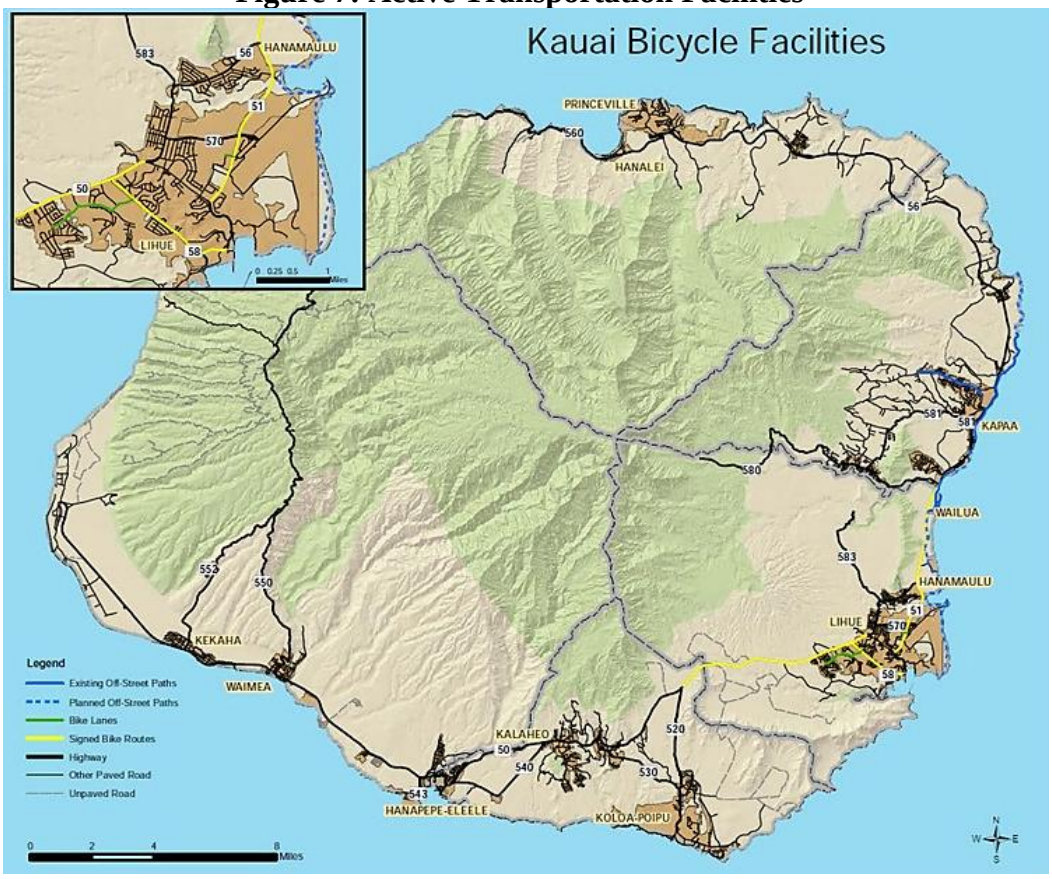
Cruise Ships

Cruise visitation averages nearly 4,800 people per week.[7] Typically, large cruise ships dock in Lihue on Thursday and sail to the Nā Pali coast on Friday.

Active Transportation

Active transportation is limited by potentially hazardous conditions on many of the State highways. The Kuhio Highway (SR-56) accessing Kīlauea Town has minimal shoulders, vegetation overgrowth, and high speeds. Much of cycling and walking is done on multi-use paths or local streets. These usually do not connect between cities. The most used multi-use path is the Ke Ala Hele Makalae, in Kapaa. An initial planning process for a north shore multi-use path was completed in 2012.

Figure 7: Active Transportation Facilities[8]



[7] Hawai'i Department of Business, Economic Development, and Tourism,, Visitor Statistics 2014.
[8] Kīlauea Point National Wildlife Refuge Comprehensive Transportation Planning Study

Transportation Culture

There is a transportation culture that exists on Kauaʻi that is different from transportation on the mainland. On Kauaʻi transportation facilities are often designed to seek a balance between natural preservation and operations; roadways are kept smaller than their mainland counterparts, sidewalks are sporadic, and traffic lights are few and far between. Speeds are typically slower and local culture encourages slowing down. An example of balance between preservation and operations is the Hanalei Bridge. When a larger two-way bridge was proposed, residents of the area fought to keep the existing bridge and maintain the 5-7 vehicle one-way bridge crossing pattern, informing motorists that they are entering a slow speed area.

Figure 8: Hanalei Bridge

KĪLAUEA POINT NWR TRANSPORTATION FACILITIES

Entrance Road

Kīlauea Point NWR is accessed via a narrow entrance road between the Overlook and the Point (primary visitation area). The entrance road ranges from 15-18 feet wide for 1,500 feet. Due to the narrow travel lanes and steep grade, pedestrians and large busses are prohibited. Pedestrians occasionally walk into the Point, past two walking prohibited signs (Figure 9). The speed limit on the entrance road is 10 MPH. Smaller shuttle busses are allowed and cyclists are not encouraged, but usually not forbidden. There is no sidewalk or pedestrian path access on to the Refuge due to steep slopes with endangered and threatened birds that nest along the road.

Figure 9: Pedestrians Walking down the Entrance Road

Refuge Parking Areas

The Refuge parking area consists of 55 marked parking spaces and 5 unmarked dirt spaces. During peak visitation 2-3 overflow spots are used. Thirteen paved spaces with two handicapped spaces are in the upper parking lot, twenty paved spaces are in the lower lot, and twenty-three marked gravel spaces are in the south lot. Two-way traffic flow, small parking spaces, and narrow aisle width make parking lot circulation between the lots difficult. The parking lot difficulties are exacerbated during peak periods, but functions adequately during slower seasons. In 2012, Kīlauea Point NWR contracted a parking redesign project, uncompleted as of 2017. This redesign would have improved the traffic flow and would not require a staff member to direct traffic to available spaces, but would reduce the number of spaces from 60 to 45.

Figure 10: Kīlauea Point NWR Parking Lots

Overlook Parking Area

Parking for the Kīlauea Point NWR Overlook is located at the end of Kīlauea Road, before the Refuge gate. Five marked parking spaces are located on Refuge property and an unmarked dirt parking area is located on the west side of Kīlauea Road. Depending on parking configuration, between 18-40 vehicles can park in the dirt parking area. The FLAP project is examining redesigns of the parking lot, removing the dirt parking area, and providing approximately 15 marked spaces and a pedestrian path.

Figure 11: Overlook Parking Area

KĪLAUEA POINT NWR VISATATION DATA

A data review and data collection plan was designed by the Scholar for the Kīlauea Point NWR. The purpose of this plan was to develop baseline conditions for existing vehicle and parking use, as well as to identify those periods which vehicle and parking issues are most severe. Baseline conditions can be used to evaluate future transportation alternatives and scenarios. An example of this would be identifying a shuttle scenario where a single shuttle could meet the transportation demand most of the time, but a supplemental shuttle may be required during peak days, weeks, or months. The baseline data also provides the opportunity to evaluate conditions post pilot implementation and to determine effectiveness. The Visitation Review and Data Collection report is included as Appendix I and raw data was provided to Refuge Staff and saved on the Refuge server.

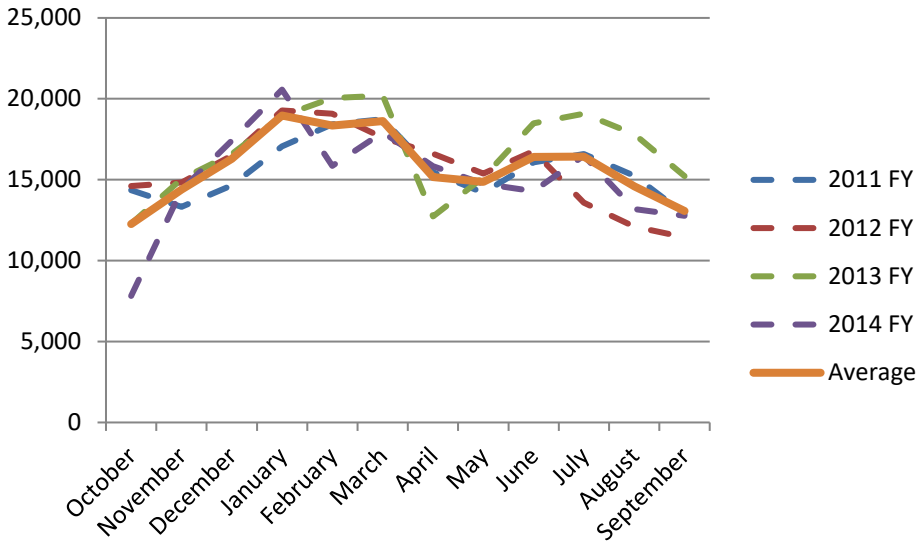
Data Review

Visitor services and fee collection data provided by Refuge staff was used to determine daily, monthly, and yearly trends.

Monthly Visitation

Figure 12 shows the monthly visitation for KPNWR from 2011 to 2014. January, February, and March were the months with peak visitation. Each of the peak months averaged over 18,000 visitors. January was the busiest month with an average of 18,969 visitors. October was the calmest month with an average of 12,262 visitors. The overall peak month was January 2014 with 20,571 visitors.

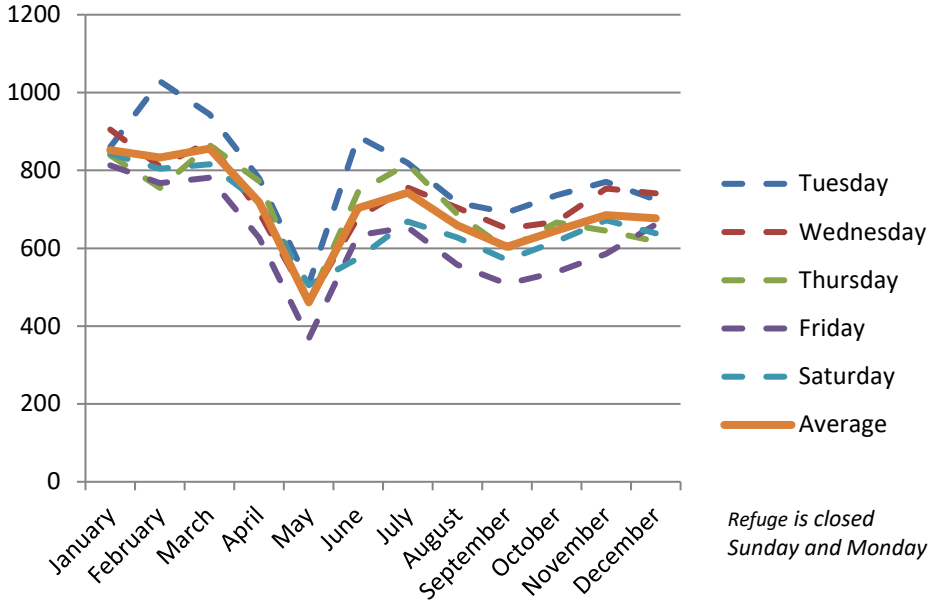
Figure 12: Monthly Visitation 2011-2014 (FY)



Daily Visitation

Figure 13 displays the monthly visitation by day for Kilauea Point NWR. Tuesday was consistently the day with the highest visitation, and Tuesdays in February had the highest overall visitation with an average of 1,029 visitors. This condition is likely due to demand build-up, as the Refuge is closed Monday and Sunday. Friday was consistently the slowest day, and Fridays in May averaged 368 visitors. *Note: The Refuge implemented the 5-day week during January 2014, so data from January 2015 was utilized*

Figure 13: Visitation by Day (2014)



2011 and 2014 Comparison

Figures 14 and 15 display comparisons between the monthly visitation of 2011 and 2014. These months were reviewed to identify the impact of reducing the days that the Refuge was open from a 7-day per week schedule to a 5-day per week schedule. 2011 had a yearly visitation total of 186,995 and 2014 had a yearly visitation total of 177,200. Outside of a drop during May 2014, the monthly visitation was consistent.

Figure 14: Monthly Visitation (2011FY and 2014)

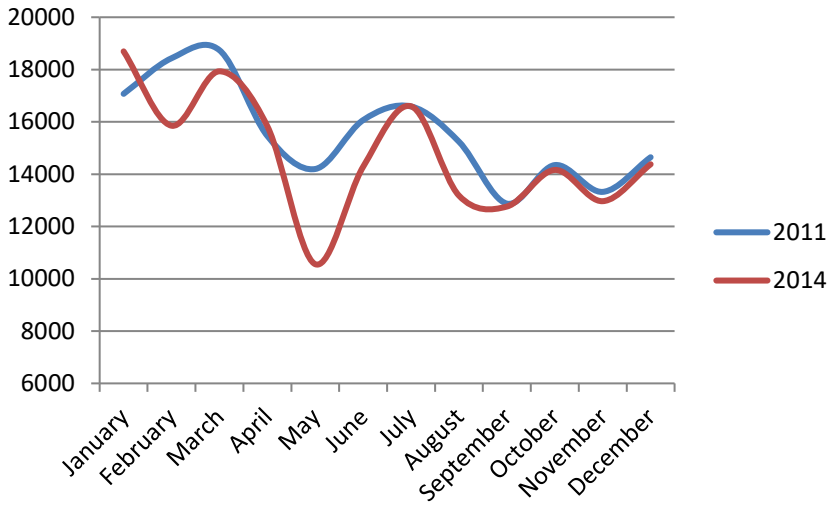
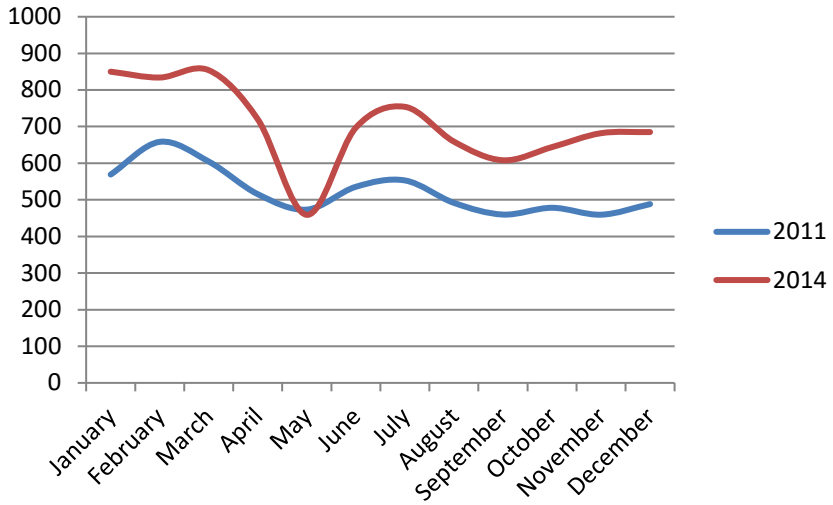


Figure 15 displays that there was a significant increase in the daily visitation after the Refuge schedule was reduced. The visitation daily average in 2011 was 524 and the visitation daily average in 2014 was 704. This growth represents a 34% increase in daily visitors between 2011 and 2014, even though there were less total visitors in 2014.

Figure 15: Monthly Visitation by Daily Average (2011FY and 2014)



Data Collection

A comprehensive data collection was conducted in addition to the data collection review. This data collection was concentrated on obtaining data that was not readily available from the visitor services / fee data. Data that was collected during 2016/2017 includes parking occupancy, visitation length, and entrance road vehicle data.

Parking Occupancy

For the parking occupancy evaluation vehicles were counted every ½ hour once a month on a Tuesday (Figure 16) and a Thursday (Figure 17). These days were chosen to represent a peak day (Tuesday) and an average day (Thursday). Monthly parking occupancy counts were conducted to identify hourly visitation trends and to see if visitor patterns varied based on the time of year. The Refuge parking lots fill early in the morning and occupancy decreases in the afternoon for both Tuesday and Thursday throughout the year. During conversations with Refuge staff, the consensus was that many visitors stop first at Kīlauea Point NWR when visiting the North Shore for the day. One possible mitigation strategy for this condition would be to offer additional tours or events during the afternoon to help encourage afternoon visits.

Figure 16: Tuesday Parking Lot Occupancy (August 2016 – March 2017)

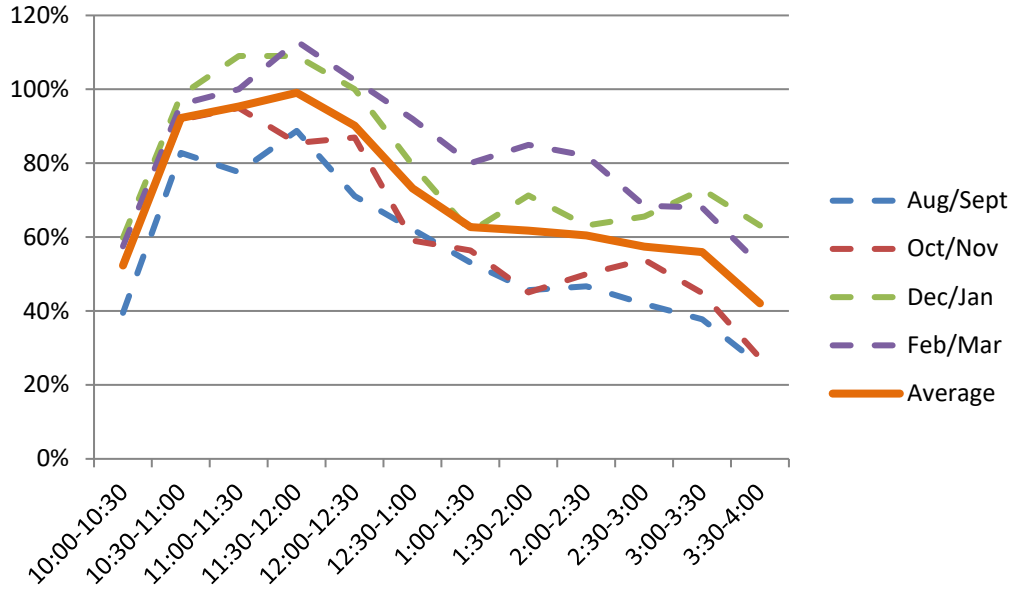
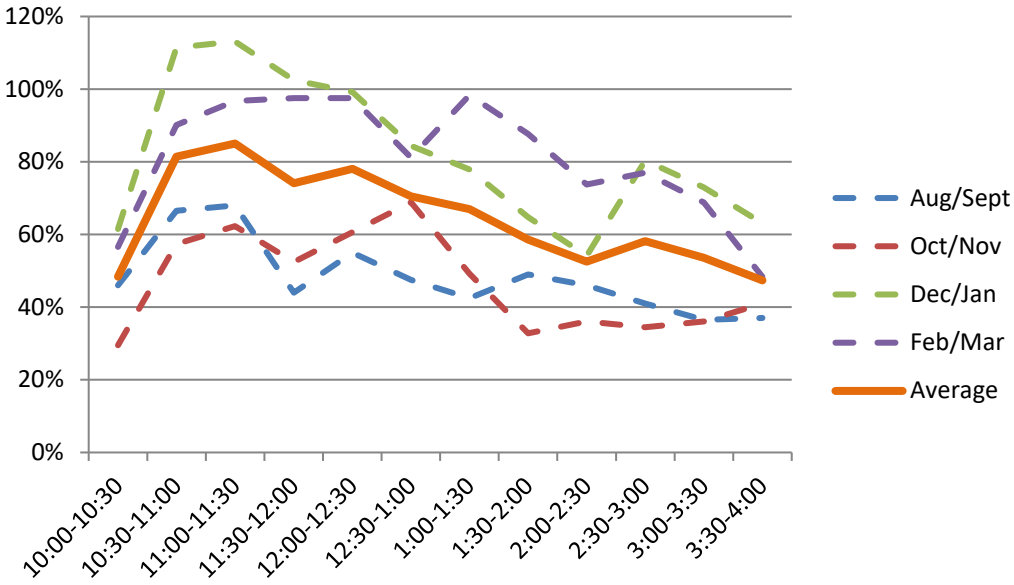


Figure 17: Thursday Parking Lot Occupancy (August 2016 – March 2017)



Visitation Length

The Kīlauea Point National Wildlife Refuge Traffic, Visitor, and Parking Counts Study (TVP Study), conducted in March and August 2003, found that the average duration of stay at the Point was approximately 40 minutes. Lighthouse tours began on a regular basis in 2013, therefore the TVP Study did not distinguish between Lighthouse tour and non-Lighthouse tour days. An updated visitation length (stay duration) data collection was conducted by the Scholar to provide additional detail to visitation length and to determine if length of visitation trends had changed significantly in past decade.

The visitation length remained close to the TVP Study findings with a 5-minute increase for all visits. There was an 8-minute difference between the average visitation during Lighthouse tour and non-tour days. There was a significant difference in the longest visitation and the percentage of visits greater than an hour between Lighthouse tour and non-tour days.

Table 1: Visitation Length

Period (Date)	Vehicles Observed	Average Visitation	Longest Visitation	Shortest Visitation	Percentage of Visits Greater than an Hour
Lighthouse Tour (2/25/2017)	97	48 minutes	2 hrs. & 2 minutes	14 minutes	20%
No Lighthouse Tours (3/17/2017)	85	40 minutes	1 hr. & 23 minutes	10 minutes	8%
Combined	182	45 minutes	2 hrs. & 2 minutes	10 minutes	14%

ALTERNATIVES ANALYSIS

Alternatives developed for this report center on a Kīlauea Point NWR shuttle system and reservation system. The Transportation Study identified the shuttle as the preferred transportation alternative and presented initial cost estimates, route locations, shuttle time tables, vehicle types, and other information for a Refuge shuttle system. A reservation system was presented as an alternative if the shuttle system proved unfeasible.

The Scholar used field observations, Transportation Study information, and visitation and vehicle data to develop pilot shuttle recommendations and reservation system details and operations. The pros and cons, operations, reservation system alternatives, maps, and decision matrix presented below were developed by the Scholar to help Refuge leadership contextualize and analyze the transportation alternatives. The Kīlauea Point NWR shuttle service and reservation system reports are included as Appendix II and III.

Kīlauea Point NWR Shuttle System

A mandatory shuttle and an optional shuttle are the two primary operational alternatives for shuttle service accessing the Refuge. The mandatory shuttle would require anyone entering the Point to access it by the shuttle. An optional shuttle would allow some parking at the current Point parking lots, while also connecting the Refuge with the off-site parking. During overflow periods the shuttle would become mandatory. In addition to providing transportation from off-site parking, the shuttle system could serve as a visitor service amenity and allow staff or volunteers to inform the riders about the Refuge and surrounding area, including Crater Hill and the Mokolea Point.

The following list of pros and cons was created by the Scholar to help Refuge leadership decide which operational model should be developed for a pilot shuttle system at Kīlauea Point NWR.

Mandatory Shuttle Pros

- Removes all parking and parking concerns from the Point parking lots
- Potentially allows for bicycle and pedestrian access to the Point
- Refuge staff or volunteers can engage with all visitors and shuttle riders improving the visitor experience
- Reduction of vehicle mile traveled (VMT) and emissions
- Potentially redevelop existing parking lots into biological areas
- Reduction of vehicles traveling along Kīlauea Road, lessening the impact on wildlife

Mandatory Shuttle Cons

- May reduce the number of visitors, negatively impacting the budget of the Refuge
- Prevents traditional/ most used visitation method (private vehicle)
- Highest Cost
- Shuttles accessing the Point via narrow driveway
- Highest off-site parking requirements

- Concerns with visitors parking at the Overlook and walking to the Refuge Point

Optional Shuttle Pros

- Lessens parking needs and parking concerns for the Refuge Point's parking lots
- Allows some traditional/ most used visitation method (private vehicle)
- Gives visitors the option of having an extra tour experience
- Redevelop parking for maximum circulation, reducing staff needed to manage parking
- Lower impact to off-site parking than mandatory shuttle
- Potentially lower cost than mandatory shuttle

Optional Shuttle Cons

- May reduce the number of visitors, negatively impacting the budget of the Refuge
- Visitor confusion about the shuttle operations
- Vehicle congestion at the Point driveway may still be an issue
- Refuge staff will be required to direct parking during peak periods
- Cost, though potentially lower than mandatory shuttle

Mandatory Pilot Shuttle Operations

Under the mandatory pilot shuttle all visitors to the Refuge who wish to travel to the Point will be required to board a shuttle at the Agriculture Center. Kīlauea Point NWR staff should enter into an MOU agreement with the County and Agriculture Center to allow 2 cutaway shuttles to enter and pick-up/drop-off Refuge visitors. The Memorandum of Understanding (MOU) should allow for 63-85 visitors vehicles to park at the Agriculture Center. If the parking lot becomes over capacity, a secondary or on-call pick-up location may be necessary.

The shuttle system will operate from 10:00 AM until 3:58 PM, 5-days a week (Tuesday – Saturday). It is recommended that the Refuge enter into a USFWS-administered contract or agreement with a private company providing 100% of the shuttle service and maintenance. The pilot shuttle is estimated to cost the Refuge between $137,380 and $206,693 depending on the length of service. These estimates may be reduced once the contract has gone out to bid. It is recommended that the pilot shuttle be operated by a private company to limit the impact on Refuge staff. Volunteers should be approached about providing shuttle narration during the pilot shuttle operating period. The Scholar developed scope of work for the mandatory shuttle contracting companies, included as Appendix III.

Optional Pilot Shuttle Operations

Under the optional pilot shuttle, visitors to the Refuge are given the option of taking a private vehicle or shuttle to the Point. Once capacity has been reached, all visitors who wish to travel to the Point will be required to board a shuttle at the Agriculture Center. Visitor services staff will likely be required to monitor and close the entrance gate, similar to current operations. Once the capacity has been reached vehicles will be directed to the Agriculture Center.

Kīlauea Point NWR staff should enter into an MOU agreement with the County and Agriculture Center to allow 1 cutaway shuttle to enter and pick-up/drop-off Refuge visitors. The MOU should allow for 32-43 visitors vehicles to park at the Agriculture Center. The shuttle system will operate from 10:00 AM until 3:58 PM, 5-days a week (Tuesday – Saturday). It is recommended that the Refuge enter into a USFWS-administered contract or agreement with a private company providing 100% of the shuttle service and maintenance. The pilot shuttle is estimated to cost the Refuge between $117,340 and $149,680 depending on the length of service. These estimates may be reduced once the contract has gone out to bid. It is recommended that the pilot shuttle be operated by a private company to limit the impact of Refuge staff. Volunteers should be approached about providing shuttle narration during the pilot shuttle operating period. The Scholar developed a scope of work for optional shuttle contracting companies, included as Appendix IV.

Reservation System

Reservation systems require or allow visitors to reserve the day that they will enter a site or take a tour. Timed entry systems are a type of reservation that identifies the exact time of entrance or tour. Reservation systems typically operate as a per visitor reservation or a per vehicle reservation. Per visitor reservations require each person to have a reservation prior to entry. Per visitor reservation systems are frequently used in coordination with a tour that has limited spaces. These systems are often located at sites that have excess parking or are near large cities that have multiple transportation options. Per vehicle reservation systems reserve a parking space and allow all visitors in the vehicle to enter on one reservation. These systems are frequently used in areas that have limited parking and are dependent on private vehicles to access the site. Both per visitor and per vehicle reservation systems can charge an entrance fee on top on the minimal reservation fee.

Pros of reservation systems are that they can be used to manage visitation (visitors and time), encourage visitation when there is excess capacity, and provide the Refuge with advance notice of upcoming visitation. Knowing visitor demand ahead of time can inform the amount of staffing, programming, and transportation needs.

The primary con of reservation systems is that they limit visitor freedom and prohibit pass by trips. They can also discourage certain populations who are uncomfortable with or do not have internet or phone access. Reservation systems can also create confusion and potentially visitor anger if they are not well informed about the system. Some of these concerns can be minimized by visitor and community outreach. Special conditions can also be arranged for significant cultural or other important visitors.

Based on the conditions of visitation at the Refuge it was recommended that any reservation system include a timed entry component. As space at the Refuge entry is limited, walk-up reservations should be prohibited. This would prevent visitor vehicles without a reservation from blocking the Refuge driveway entrance. If the reservation system became permanent, walk-up reservations could be accommodated by having a ticket booth in town or at the Community Agriculture Center. The Transportation Study considered a parking reservation system a medium-term recommendation implementable in 3+ years.

Pilot Reservation System

The Pilot Reservation System described below is designed to alleviate impacts on Refuge staff, who are frequently forced to direct traffic. In addition to reducing the need for visitor services staff to manage parking, the pilot reservation system is designed to require minimal significant investments in equipment or considerable alterations to the current fee structure and operation schedule. A critical component of the pilot reservation system will be distributing updated plans to hotels and on-line via USFWS website and the Refuge and Friends Group social media accounts. The Refuge should consider entering into a contract with recreation.gov for setting up and implementing a reservation system. They have extensive experience managing similar services at federal land units and are funded by charging a low (approximately $1.50) service fee.

The Refuge should initiate the initial pilot reservation system for a 3 or 4 month period between December 1 to February 28 or March 31, depending on available funding and Refuge leadership direction. During this period access to the Point and parking areas will require a reservation. Reservations should be an hour in length. Based on current parking capacity 56 spots would be allowed every hour. It is recommended that the dirt and overflow parking areas be utilized for Lighthouse tour and other visitors that have prior approval to spend more than one hour. Lighthouse tours tickets should be combined with the parking reservations to streamline both ticketing processes. During the pilot reservation period, it is recommended that ½ of the parking reservations be distributed every ½ hour; 28 parking reservations released for 10:00 – 11:00 AM and then 28 parking reservations released for 10:30- 11:30 AM. This minimizes vehicle congestion from all reservation holders arriving at once. If congestion is an issue under this approach, reservations could be further distributed as 14 reservations every 15 minutes.

The pilot reservation system would require a staff member or volunteer to be positioned at the top of the driveway checking reservations. The pilot reservation system should not allow drive-up reservations. If a visitor vehicle comes to the reservation inspector and it does not have a reservation they will be directed to turn around in the existing loop. Staff or volunteers can suggest that they consider a reservation for later that day or later during their trip. It may be the case that there is parking availability when they arrive but they do not have a reservation. In this scenario, the vehicle will need to leave the queue, travel to a safe location, park their car and make the reservation from a smart phone or other web enabled device. After they have a reservation they can re-enter the reservation inspection line. Vehicles will not be allowed to place reservations while in line. This should be prohibited due to both time concerns and limited WIFI availability. Reservations can be printed out or displayed on a web enabled device. The holder of the reservation will be required to be in the vehicle that is using the reservation.

Figure 18: Pilot Reservation System Map

Permanent Reservation System

The Permanent Reservation System described below is designed to eliminate impacts on Refuge staff, who are frequently forced to direct traffic. As a Permanent Reservation System could reduce the need for future staff, it is justified in requiring significant investments in equipment and allowing alterations to the current fee structure or operation schedule. A critical component of the permanent reservation system will be working with the County, KNA, hotels, tourism agencies and other groups to ensure that the reservation system information is well distributed. In addition to information being and on-line via US FWS website and the Refuge and Friends Group social media accounts. The Refuge should contact guide books regarding the reservation system.

There are two options for inspecting a reservation in a permanent reservation system: relocating the booth to the driveway gate area or having a scanner or keypad entry. Providing entry via a scanner or keypad entry would be a significant departure from standard practices at federal public

land units, though pre-paid smart cards have started to be used for visitor entry at Rocky Mountain National Park. The Kilauea Point NWR should work closely with Regional Staff and a parking contractor if a permanent parking reservation system is preferred transportation option. Moving the fee booth and having it staffed to check reservations would more closely resemble current federal public land unit practices. Due to internet limitations, it is recommended that all reservations be made offsite. To reduce time at the reservation booth, it is recommended that the reservation fee be combined with a per vehicle entrance fee of $25. In this scenario, an offsite reservation ticket machine could be placed at the Community Agriculture Center or in Kīlauea Town. Advanced signs advising of the reservation requirement and location of ticket machines should be installed to reduce confusion at the booth and direct traffic flow. As reservation fees are combined with entrance fees, no payments will need to be accepted at the booth. Additional visitor service programs, such as the Jr. Rangers, will remain at the Point.

Figure 19: Permanent Reservation System Map

Decision Matrix

The Scholar developed a decision matrix as a tool to help Refuge leadership determine a transportation alternative. The decision matrix scored five transportation alternatives, Mandatory Shuttle, Optional Shuttle, Peak Period Shuttle (December-March), Reservation System, and Peak Period Reservation System according to nine criteria. The decision matrix was designed to be a living document, allowing Refuge leadership to update scoring, add new criteria, and make changes to importance throughout the process. Table 2 presents a draft decision matrix completed by the Scholar. The Peak Period Shuttle (December-March), Reservation System, and Peak Period Reservation System alternatives were the highest scoring alternatives. Year-round shuttle alternatives scored low in the initial draft scoring due to the need to raise fees and ongoing costs. If the Refuge received funding from the Region or was successful in future grant applications, the shuttle alternatives scoring would improve.

Table 2: Draft Decision Matrix

		Mandatory Shuttle	Optional Shuttle	Peak Period Shuttle	Reservation System	Peak Period Reservation System
Criteria	**Importance**					
Bike/Ped Access	1	4	1	2	1	1
Impact to Commerical Tours/Programs	1	2	2	3	3	3
Impact to Visitor Freedom	2	1	2	2	2	3
Improved User Experience	2	4	3	2	1	2
Physical Infrastructure Needs	2	2	2	2	2	3
Similar Programs	2	2	3	3	2	2
Staffing Impact	2	2	2	2	3	3
Need to Raise Fees	3	1	1	2	3	3
Ongoing Costs	3	1	2	3	3	2
Total		34	36	42	42	42
Notes:						
Importance Ranked 1 (low) - 3 (high)						
Scoring 1 (negative impact/difficult) - 4 (positive impact/benefical)						

NEXT STEPS/IMPLEMENTATION

The next decision that Kīlauea Point NWR leadership will have to make is a difficult one. Both the Refuge shuttle service and reservation system have benefits and drawbacks, while taking no action may exacerbate the parking situation as visitation rises.

Under both the shuttle service and reservation system alternatives, the initial first step will be to increase the Kīlauea Point NWR entrance fee. In 2017, initial efforts began to raise the fee from $5 to $10 per visitor. Pass holders and visitors under 16 will continue to enter free of charge. This fee increase will help fund ranger staffing and other visitor service amenities. The initial fee increase will also help fund a pilot shuttle or reservation transportation system, as well as other transportation related expenses (signage, parking etc.).

Kīlauea Point NWR Pilot Shuttle Service Next Steps

As noted in the Alternatives Analysis chapter, it is recommended that the Refuge enter into USFWS-administered contract or agreement with a private shuttle company for the pilot shuttle service. The Refuge should also work with the Agriculture Center or other partner to develop a MOU for allowing shuttle pick-up / drop-off and visitor parking.

If a Refuge shuttle service is desired to be implemented permanently, Kīlauea Point NWR should enter into a service contract, concessionaire contract, or memorandum of understanding with a private, non-profit, or public partner to run a shuttle, that would be available for all visitors. The feasibility of these options depends on availability of partners or private companies. The Refuge should begin discussions with the Hawaii office of the GSA to lease three cutaway vehicles to provide contracted service.

Payment for the pilot shuttle system should be funded by the initial fee increase. For a permanent shuttle system, the Refuge should work with the regional office or other partner to determine if funding options exist. If no funding options are available, Kīlauea Point NWR will need to raise entrance fees to $15 per person based upon findings in the Transportation Study. The Refuge should also request funding from the Region to design and reconstruct parking lots to better accommodate transit.

Kīlauea Point NWR Reservation System Next Steps

As noted in the Alternatives Analysis chapter, it is recommended that the Refuge work with recreatation.gov to develop reservation system. The Transportation Study recommended requesting Regional funding to hire a contractor to further refine the cost estimates for reservation and timed entry systems as well as the cost of conducting public meetings.

Other Recommendations

Beyond significant transportation operations and infrastructure developments, there are several smaller scale transportation improvements that the Refuge should complete:

- Update the Kīlauea Point NWR website and social media accounts to inform visitors of busy periods
- Develop afternoon programs to encourage visitation after peak hours
- Work with local hotels and tour groups to encourage afternoon visitations
- Partner with the Kīlauea Neighborhood Association to improve in-town signage
- Install advanced warning signs for periods where the Refuge is closed due to full parking lots

Figure 20: Refuge Closed Sign

CONNECTION TO WIDER TRANSPORTATION COMMUNITY

Across the U.S., refuges, state and national parks, and other public lands are experiencing a surge in popularity. While increased visitation expands the visibility and brand of natural areas, increased visitation can also negatively impact the natural setting and beauty. Many of these places hold special meaning in their solitude. On the transportation side, increased visitation leads to congestion, parking lots over capacity, and concerns with safety and wildlife impacts.

In the past or in a more suburban setting, the answer to transportation concerns may have been to increase capacity; whether more parking lots, wider roads, or intersection signalization. Limitations of space, environmental concerns, and the desire to keep public lands as natural as possible have discouraged using capacity increases to improve transportation issues. Due to existing buildings and infrastructure, many cities are no longer prioritizing increased capacity and are looking to alternative transportation and improved utilization to improve transportation concerns. Similarly, natural land units are implementing alternative transportation options to accommodate the next generation of outdoor lovers.

Natural lands are starting to develop bus systems, Zion's mandatory shuttle maybe the largest and most well-known, but it is far from a solitary example. Cycling and walking have long had a recreational purpose on public lands, but now there is an increased sense that they can be transportation initiatives as well. Kīlauea Point NWR is looking toward alternative transportation and optimizing efficiency to improve transportation issues and increase safety. A Kīlauea Point NWR shuttle service or reservation system would serve to reduce transportation concerns without having to build additional parking or negatively impact wildlife and natural systems. The Refuge is working with the County to improve cycling and walking and have also considered possibilities to allow pedestrians to access the Point.

Refuges and other natural lands face unique obstacles when planning for private vehicle alternatives. Many areas are far away from population centers and dependent on private vehicles to reach them, which limits home based trips. Natural land users are predominantly visitors who are unfamiliar with the transportation options. To offset these limitations, it is critical to make the visitors transportation experience as straightforward and comfortable as possible. Alternative transportation options should be reliable, but also clean, efficient, and educational. Making alternative transportation easier and more pleasant than a congested parking lot can leave visitors wondering why they would want to drive.

THE PUBLIC LANDS TRANSPORTATION LANDSCAPE

Working on transportation projects in a public lands setting brings a unique set of opportunities and challenges. Kīlauea Point NWR is tasked with a wide range of responsibilities. Providing habitat and safe nesting for native and endangered sea birds is at the forefront of management efforts by the Refuge. However, as one of the most visited sites on Kauaʻi providing a safe, educational, and enjoyable visitor experience is also one of the Refuges primary objectives. As Kīlauea Point NWR becomes more popular, the visitor experience and wildlife protection can seem at odds with each other. Identifying transportation alternatives, having a solid understanding of the transportation pros and cons, and recognizing transportation data and trends are ways that the transportation planning process can help improve the transportation setting while ensuring that sensitive species remain protected.

As part of the federal government, additional layers of approval are required for projects, employment, and entrance fee changes. Communication between agencies and regions can be challenging especially with Kauaʻi's remote location. These factors can make projects move a little more slowly. One of the concerns with a Refuge owned and operated shuttle service for the Kīlauea Point NWR, was hiring the needed drivers and support staff. During my scholar term, there were several employment needs that were not filled due to difficulties in the federal hiring process and Kauaʻi's high cost of living and remote location.

While it may seem like public land units should have an unlimited budget, the truth is that Refuge staff does an excellent job of running visitor services and protecting wildlife with limited funds. Employees take on multiple roles to make sure critical jobs are completed, and interns and volunteers play an important role in day to day operations. From the regions to the refuges, US Fish and Wildlife has dedicated and compassionate employees who do everything in their power to protect and maintain invaluable natural resources.

Figure 21: Visitor Services Park Ranger – Fee Booth

CASE STUDY FOR FUTURE PUBLIC LANDS TRANSPORTATION SCHOLARS

The Public Lands Transportation Scholar (PLTS) program offers the opportunity to spend several months working on transportation related issues at public land unit, in my case a U.S. Fish and Wildlife refuge. Like the public land units and refuges themselves, the Scholars can have a wide range of experiences. My experiences were based on relatively conventional congestion issues related to high visitation at a very well know tourist destination. Past scholars and the other 2016/2017 scholar often dealt with developing a relationship with the community and increasing awareness of the refuge on a regional scale. Before becoming a PLT scholar, I was a private transportation consultant for 2 1/2 years. I believe this background was unique as many Scholars come straight from graduate programs. My professional background was helpful in both developing the project and understanding the processes that would be helpful in meeting the scope of work (SOW). I would recommend that all future scholars have a realistic expectation of their tenure and use the SOW as a template if they are puzzled on how to move forward.

Before my tenure as a scholar, I had a very limited knowledge of the mission and operations of the U.S. Fish and Wildlife service. I believed that the primary purpose of the refuge system was to protect land solely for wildlife preservation. The orientation at Chincoteague National Wildlife Refuge in Virginia, showed me that there is a great deal of public recreation and visitation amenities in addition to wildlife preservation aspects. This trip also served as an introduction to the visitor service and natural preservation programs that I would see at Kilauea Point NWR.

The orientation also provided an excellent exposure to the different agencies that are involved in planning transportation on public lands. There were employees of US Fish and Wildlife headquarters, US DOT Central Federal Lands, Chincoteague NWR, and the Western Transportation Institute (WTI) at Montana State University Bozeman. Visiting the Refuge and touring Chincoteague NWR with a diverse and experienced group provided a greater understanding of what my role would be for the next 10 months. The orientation attendees were very approachable and encouraging of questions regarding the PLTS program. I would recommend asking as many questions as you can, the orientation will be the best time to interact with all the groups involved with the program in person.

One of the most changeling aspects of being a transportation scholar is combining the needs of the Refuge, timeline of existing projects or developments, and the internal scholar timeline. When I first got to the Refuge, the staff were very inviting and helpful detailing the operations and concerns of the Refuge. Almost everybody asked what I was there to do. Based on the orientation and scope of work I could answer these questions in general terms, but providing specifics was more difficult and it was not until several weeks after being at the Kīlauea Point NWR that I began to feel comfortable with what I hoped to accomplish.

One method I used to feel more involved with Refuge operations was to volunteer for almost everything that I could. In my tenure, I helped with bird surveys, directed traffic, worked on

memorandums of understanding, and helped with public events. While these did not always directly impact my project, they did connect me with different branches of the Refuge and helped my understanding of where I could add value.

A difficulty that I encountered was physical distance from mentors and other members of the PLTS program. Kaua‘i is the furthest west point in the U.S. and many of the other PLTS associates were on the east coast. The distance and time difference made it difficult to always feel connected to the other PLTS team members. Fortunately, I worked closely and had weekly meetings with the Supervisory Park Ranger, Jen Waipa. and regular meetings with the Refuge Complex Manager, Heather Tonneson. These interactions allowed me to feel connected to the project.

My final piece of advice to future transportation scholars would be to really listen to the concerns of the public lands staff and work to develop recommendations and projects that will benefit them. They will be at these areas long after the scholar term ends. The PLTS program provides a great opportunity to anyone who is interested in transportation planning and natural lands. One of the very best things about the job was working every day in such a beautiful place, no future job will have as good of a view!

PROFESSIONAL DEVELOPMENT

PLT Scholars are given a high degree of independence and responsibility when working on their public land unit. It is primarily up to the Scholar to work with Public Lands staff to ensure that the project is moving smoothly. There were multiple opportunities for professional development in multiple arenas of transportation planning. Being a PLT Scholar requires you to be well versed in many different transportation aspects and improves your understanding of how transportation planning concepts are incorporated in many "real-world" situations.

When I first arrived at the Refuge, I realized that a comprehensive data collection process would help inform my project and the transportation concepts that had been developed by the Transportation Study. Working with PLTS mentors and Refuge staff I designed and conducted data collection during my period on the Refuge. Designing and conducting the data collection effort helped me develop both qualitative and quantitative transportation approaches.

As the Transportation Scholar, you are encouraged to develop communications skills when dealing with the public and partner agencies. During my scholar tenure, I presented to the Kīlauea Neighborhood Association, during the FLAP open house, and at the monthly Refuge volunteers meeting. One of the most interesting parts of the PLTS program was attending and presenting at the TRB conference in Washington DC. With over 12,000 attendees, every transportation discipline and topic was presented. During my poster session, I interacted with professionals in the transportation field and discuss the transportation planning at Kīlauea Point NWR and the PLTS program.

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APPENDIX I DATA REVIEW AND DATA COLLECTION

APPENDIX I

Visitation Review & Data Collection

Kīlauea Point National Wildlife Refuge
Transportation Scholar Report

Alex Roy | Public Lands Transportation Scholar
Stationed at Kauaʻi National Wildlife Refuge Complex

Contents

Introduction

Kīlauea Point National Wildlife Refuge (KPNWR) recently released a finalized Comprehensive Conservation Plan (CCP). The CCP outlines the goals, objectives, and strategies for managing KPNWR for the next 15 years. Objective 4.1 Improve Visitor Access of the CCP specifies one of the management strategies will be to develop a data collection plan. This document can serve as a blueprint of the transportation, vehicle, and parking sections of the data collection plan. In addition to the CCP management strategy, the prior vehicle data collection was conducted in 2003. This report provides updated transportation data, which is especially critical as several significant changes have occurred during the past decade. These changes include an entrance fare increase and a reduction in the number of days that the refuge is open to the public (from seven days to five).

The following data collection plan is designed to develop baseline conditions for existing vehicle and parking use, as well as to identify those periods which vehicle and parking issues are most severe. The baseline conditions can be used to evaluate future transportation alternatives and scenarios. An example of this would be a shuttle scenario where a single shuttle could meet the transportation demand the majority of the time, but a supplemental shuttle may be required during peak days, weeks, or months. The baseline data also provides the opportunity to evaluate conditions post pilot implementation and to determine effectiveness. Raw data was provided to Jennifer Waipa, Supervisory Park Ranger, and added to the Refuge computer network's shared drive.

Visitation Review

Visitor services and fee collection data was used to summarize daily, monthly, and yearly visitation trends. Chart 1 shows the monthly visitation for KPNWR. January, February, and March were the months with peak visitation. Each of the peak months averaged over 18,000 visitors. January was the busiest month with an average of 18,969 visitors. October was the calmest month with an average of 12,262 visitors. The overall peak month was January 2014 with 20,571 visitors.

Chart 1: Monthly Visitation 2011-2014 (FY)

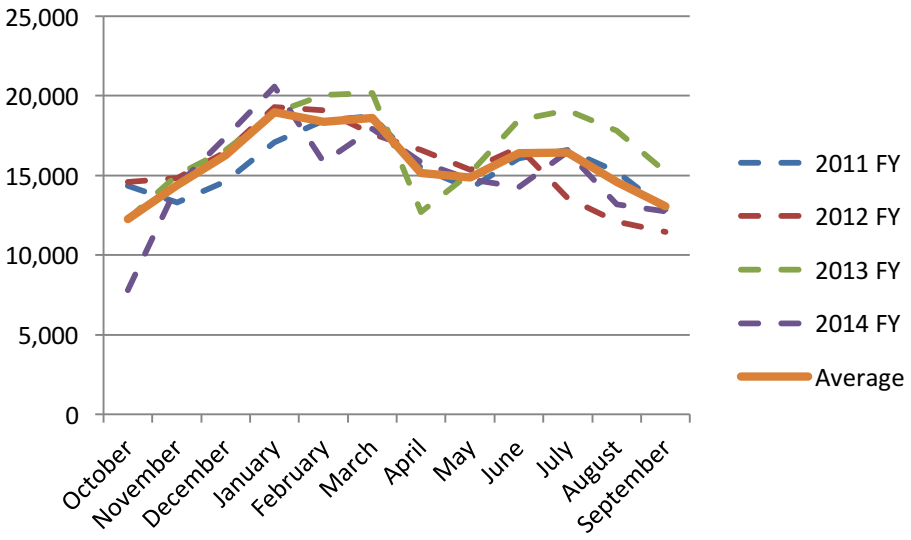
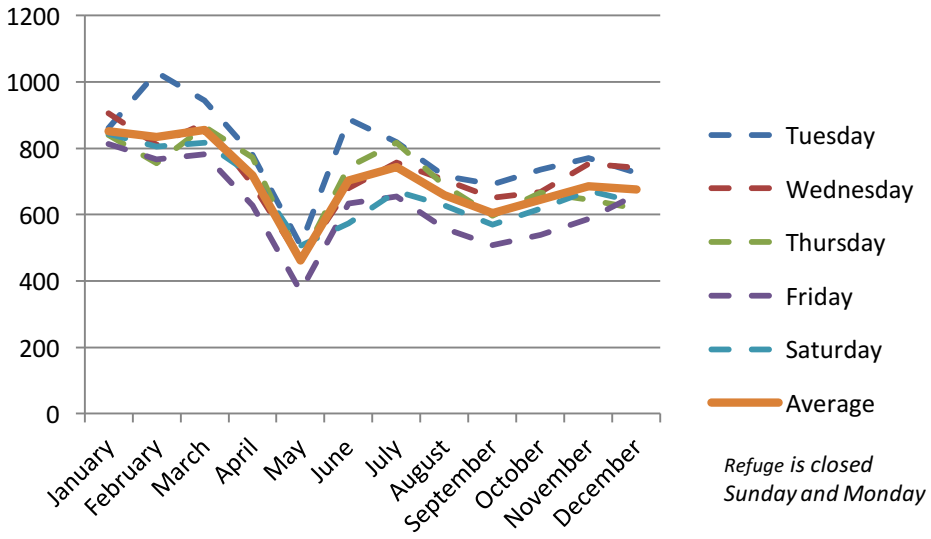


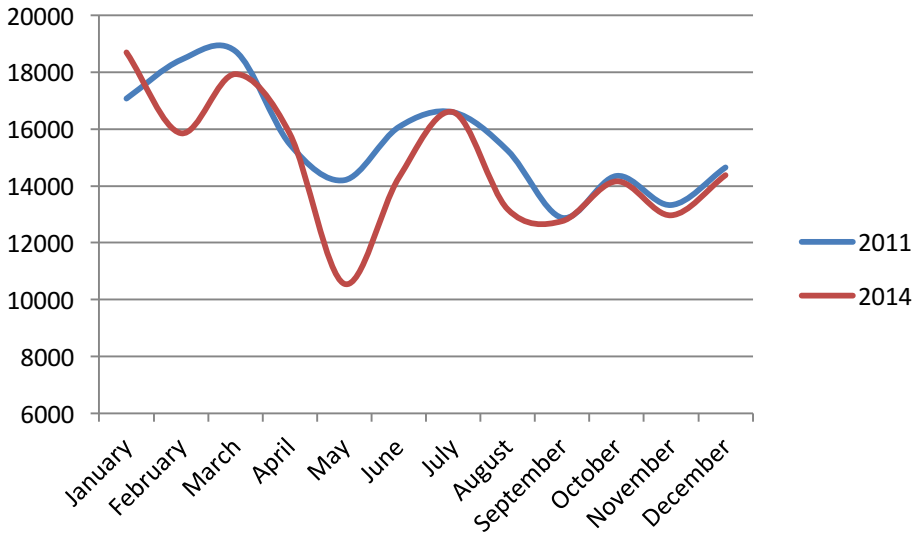
Chart 2 displays the monthly visitation by day for KPNWR. Tuesday was consistently the day with the highest visitation, and Tuesdays in February had the highest overall visitation with an average of 1,029 visitors. Friday was consistently the slowest day, and Fridays in May averaged 368 visitors. *Note: The Refuge implemented the 5-day week beginning February 2014, so data from January 2015 was utilized*

Chart 2: Visitation by Day (2014)



Chart's 3 and 4 display comparisons between the monthly visitation of 2011 and 2014. These months were reviewed to identify the impact of reducing the days that the Refuge was open from a 7-day per week schedule to a 5-day per week schedule. 2011 had a yearly visitation total of 186,995 and 2014 had a yearly visitation total of 177,200. Outside of a drop during May 2014, the monthly visitation was consistent.

Chart 3: Monthly Visitation (2011FY and 2014)



While Chart 3 displays that the monthly averages remained fairly consistent between 2011 and 2014, Chart 4 displays that there was a significant increase in the daily visitation after the KPNWR schedule was reduced. The visitation daily average in 2011 was 524 and the visitation daily average in 2014 was 704. This growth represents a 34% increase in daily visitors between 2011 and 2014, even though there were less total visitors in 2014.

Chart 4: Monthly Visitation by Daily Average (2011FY and 2014)

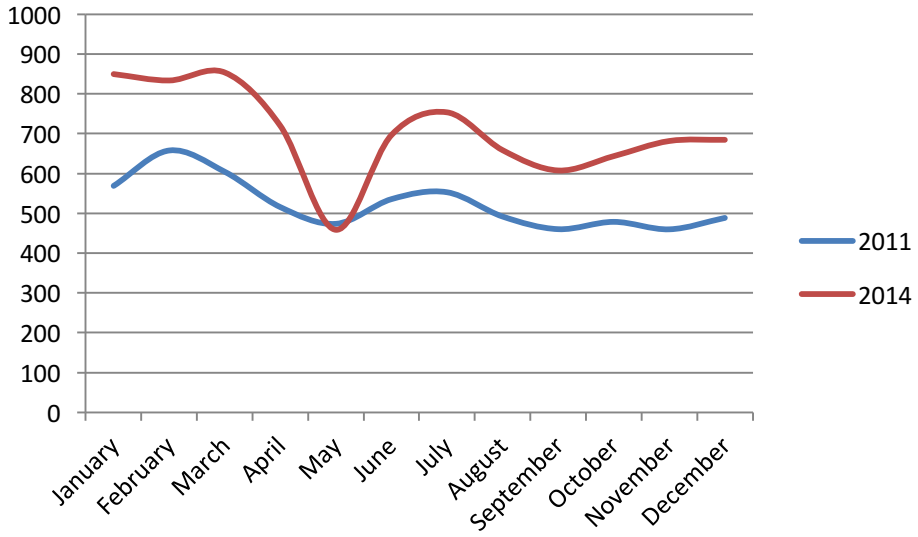


Chart 5 and Table 1 present a comparison of 2014 and 2016/17 visitation data. This comparison was presented to highlight the increase of recent visitation. Every month in 2016 has seen an increase in visitation over 2014. The monthly visitation in 2014 was 14,670 and the monthly visitation in 2016/17 was 16,688. This growth represents a 14% increase in average monthly visitors between 2014 and 2016. *Note: assessment was conducted before April 2017; April 2014 data was removed from the comparison*

Chart 5: Monthly Visitation Comparison (2014 and 2016/17)

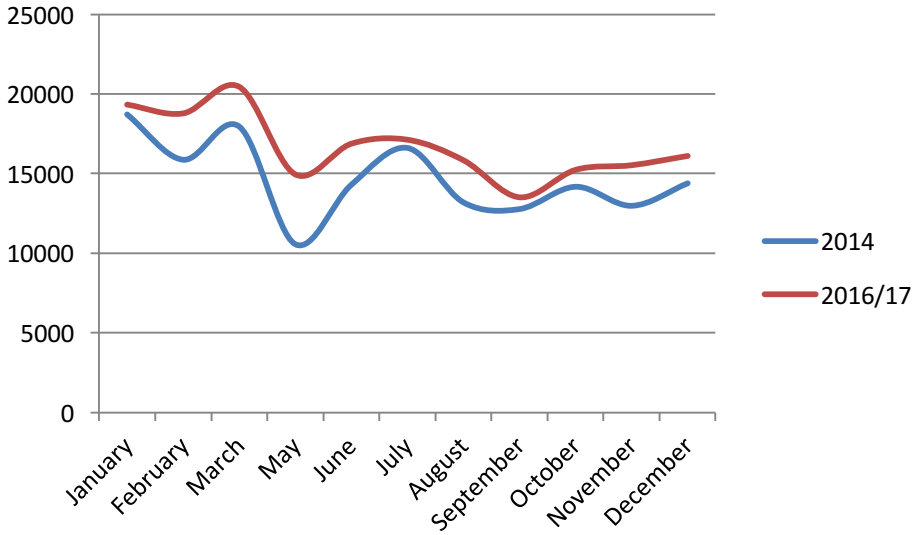


Table 1 shows a comparison of 2014/15 and 2016/17 visitation data increases during the peak visitation months. 2016/2017 had increases in monthly visitation between 3% to 16% and an increase of 10% for the entire 4 month period.

Table 1: 2014/15 to 2016/2017 Visitation Increase (Peak Months)

	2014/15	2016/17	Percentage Increase
December	14,379	16,093	11%
January	18,695	19,316	3%
February	15,853	18,766	16%
March	17,933	20,433	12%
Total	66,860	74,608	10%

2016/2017 Data Collection

A comprehensive data collection was conducted in addition to the historic data collection review. This data collection was concentrated on providing data that was not readily available from the visitor services / fee data. Data that was collected during 2016/2017 includes parking occupancy, visitation length, and KPNWR driveway vehicle data.

Parking Occupancy

For the parking occupancy evaluation vehicles were counted every ½ hour twice a month. Charts 6, 7, and 8 depict parking occupancy by time of day. Days of the week were chosen to represent a peak day (Tuesday) and an average day (Thursday). Monthly parking occupancy counts were conducted to identify hourly visitation trends and to see if visitor patterns varied based on the time of year.

Chart 6: Parking Lot Occupancy (August 2016 – March 2017)

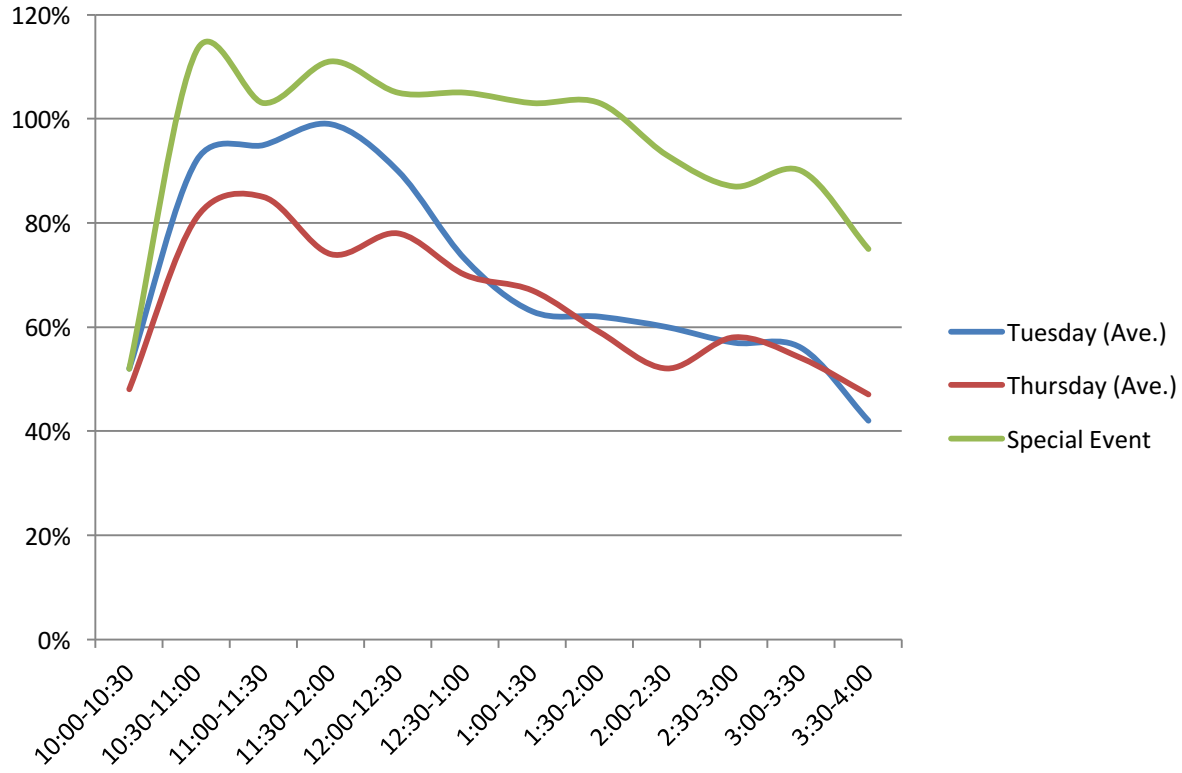


Chart 7: Tuesday Parking Lot Occupancy (August 2016 – March 2017)

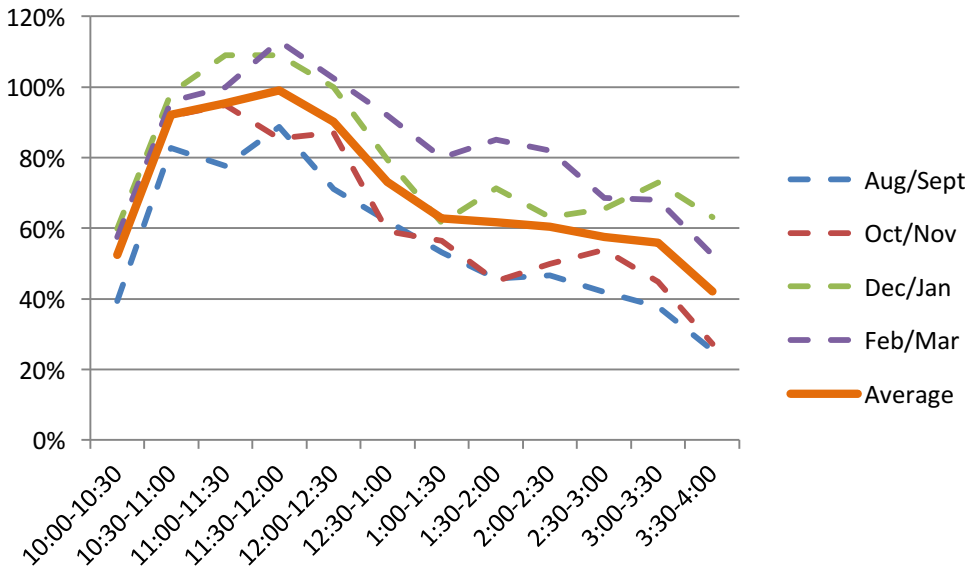
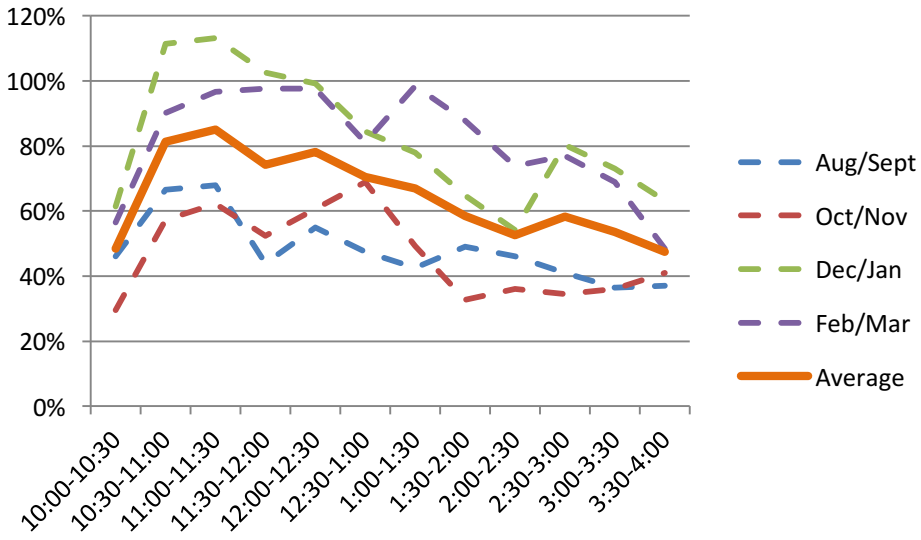


Chart 8: Thursday Parking Lot Occupancy (August 2016 – March 2017)



Charts 9, 10, and 11 depict parking occupancy by lot. All days see the Upper and South lots filling first, with the Lower lot filling last and emptying first. This is likely due to lack of visibility and signage for the Lower lot. During periods where Refuge staff directed traffic specifically to this lot it had a quicker fill rate, while still being the first lot emptied.

Chart 9: Parking Occupancy by Lot (Tuesday August 2016 – March 2017)

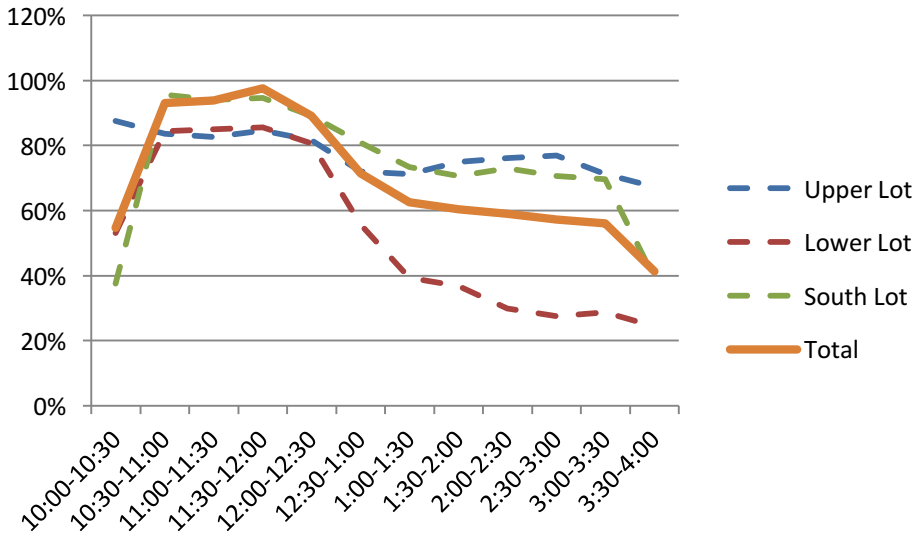


Chart 10: Parking Occupancy by Lot (Thursday August 2016 – March 2017)

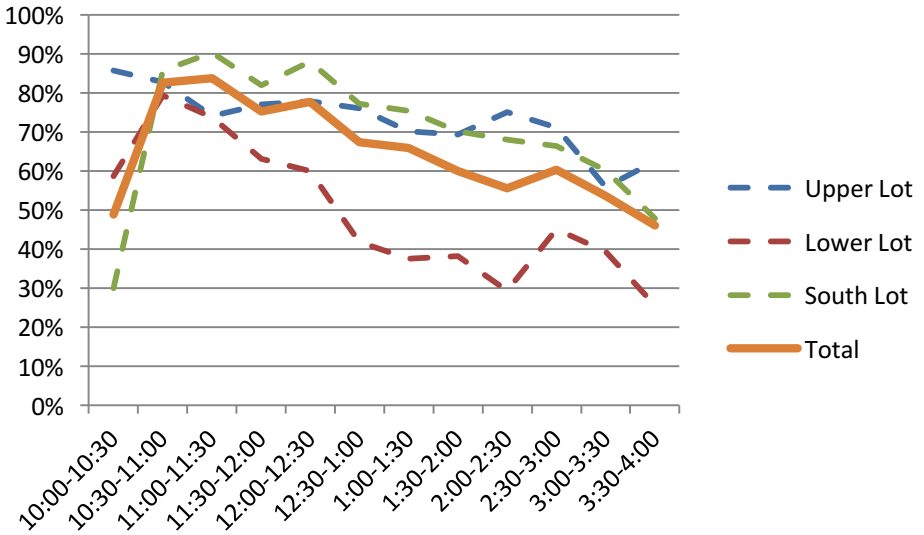
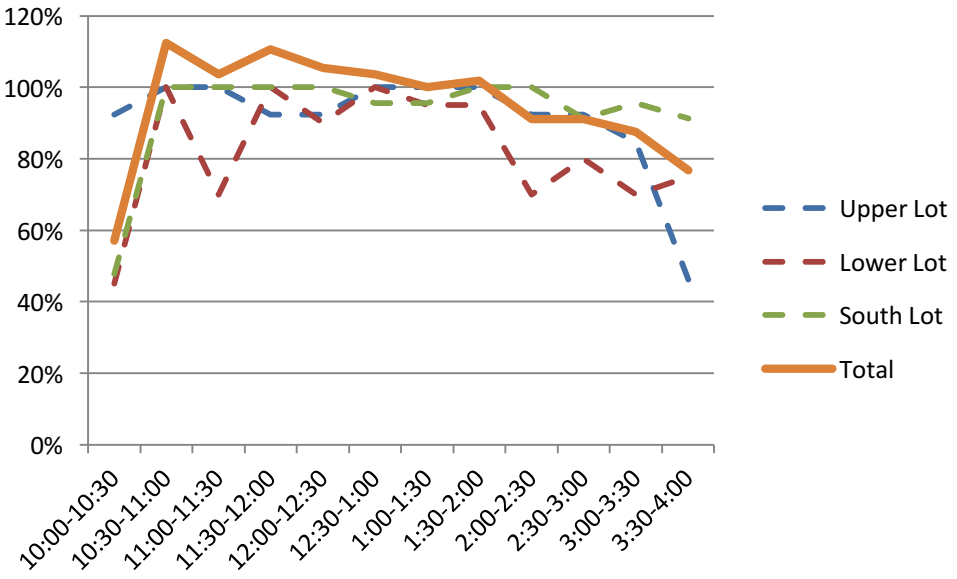


Chart 11: Special Event Parking Lot Occupancy by Lot (Fee Free Day – February 18, 2017)



Refuge visitation was divided by AM / PM breakdown during the parking occupancy data collection periods. This breakdown was collected by visitor services staff by running an AM payment tape as well as a PM. The AM/PM breakdown was consistent between Tuesdays and Thursdays; average visitation for Tuesdays being 65% in the AM and 35% in the PM and 64% in the AM and 36% in the PM for Thursdays (Table 2 and Table 3). The highest AM visitation was November (Tuesday) with 70% and the highest PM visitation was December (Thursday) 44%.

Table 2 Tuesday AM/ PM Visitation Breakdown

	Total	AM	PM	AM %	PM %
August	735	499	236	68%	32%
September	642	437	205	68%	32%
October	739	505	234	68%	32%
November	813	570	243	70%	30%
December	1160	764	396	66%	34%
January	1013	621	392	61%	39%
February	1038	632	406	61%	39%
March	989	617	372	62%	38%
Total	7129	4645	2484	65%	35%

Table 3 Thursday AM/ PM Visitation Breakdown

	Total	AM	PM	AM %	PM %
August	585	378	207	65%	35%
September	626	404	222	65%	35%
October	697	435	262	62%	38%
November	630	430	200	68%	32%
December	957	537	420	56%	44%
January	898	621	277	69%	31%
February	950	596	354	63%	37%
March	933	603	330	65%	35%
Total	6276	4004	2272	64%	36%

Visitation Length

The Kīlauea Point National Wildlife Refuge Traffic, Visitor, and Parking Counts Study (TVP Study) found that the average duration of stay at the Point is approximately 40 minutes. This study was conducted during March and August 2003. When the TVP Study was conducted, Lighthouse tours were not regularly given, therefore the TVP Study did not distinguish between Lighthouse tour and non-Lighthouse tour days. An updated visitation length (stay duration) data collection was conducted provide additional detail to visitation length and to determine if length of visitation trends had changed significantly in past decade.

The visitation length remained close to the TVP Study findings and there was only an 8 minute different between the average visitation during Lighthouse tour and non-tour days. There was a significant difference in the longest visitation and the percentage of visits greater than an hour.

Table 4 Visitation Length

Period (Date)	Vehicles Observed	Average Visitation	Longest Visitation	Shortest Visitation	Percentage of Visits Greater than an Hour
Lighthouse Tour (2/25/2017)	97	48 minutes	2 hrs. & 2 minutes	14 minutes	20%
No Lighthouse Tours (3/17/2017)	85	40 minutes	1 hr. & 23 minutes	10 minutes	8%
Combined	182	45 minutes	2 hrs. & 2 minutes	10 minutes	14%

Traffic Counter Data

A traffic counter was placed on the Kīlauea Point NWR entry road between February 20 to March 7, 2017. The traffic counter was provided from the U.S. Department of Transportation, Central Federal Lands Highway Division (CFL). The traffic counter and traffic data was provided to the Refuge with the understanding that results were expected to be within 80% accuracy. A manual traffic count conducted during the period that the traffic counter was installed recorded accuracy within the expected parameters.

Vehicle Counts

The total recorded volume showed 3,940 vehicles passed through the location. The 15-min peak period vehicle volume was 42 on February 22, 10:00-10:15 AM. The peak hour volume 96 on March 1, 2017 at 10:00-11:00 AM. The peak hour for all observed days was between 10:00-11:00 AM, with an average of 83 vehicles. The peak daily volume was 420 on February 28 and March 1, 2017. The average daily vehicle count for days which the Refuge was open was 392 all day and 381 during Refuge open hours. The additional vehicles can be attributed to employees and volunteers. Table 5 presents daily vehicle counts during Refuge hours (2-day average).

Table 5 Daily Vehicle Counts During Refuge Hours

Tuesday	Wednesday	Thursday	Friday	Saturday
403	406	351	357	390

Speed

The average speed for all vehicles was 14 MPH with 38.51% vehicles exceeding the posted speed of 10 MPH. 0 % percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 10MPH and the 85th percentile was 18.63 MPH.

APPENDIX II SHUTTLE SYSTEM

APPENDIX II

Shuttle System

Kīlauea Point National Wildlife Refuge
Transportation Scholar Report

Alex Roy | Public Lands Transportation Scholar
Stationed at Kauaʻi National Wildlife Refuge Complex

Table of Contents

Introduction

Kauaʻi is one of the most geographically and climactically diverse islands on the Hawaiian chain encompassing a number of 5,000 foot peaks, record setting rainfall, tropical canyons and scenic waterfalls. Kīlauea Point National Wildlife Refuge (Refuge or Kīlauea Point NWR) the only refuge on Kauaʻi open to the public and providing visitor services to about 400,000 people a year, making it the 19th most visited refuge in the U.S. The refuge was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The refuge includes the historic Daniel K. Inouye Kilauea Point Lighthouse and world class wildlife viewing opportunities.

High visitation and limited parking frequently results in more vehicle demand than parking capacity, this is especially prevalent during peak months (December – March). This condition forces vehicles to que and wait until a space opens. To find ways to improve this situation, Kīlauea Point NWR completed a Comprehensive Transportation Planning Study (Transportation Study) in 2017. Identified as the preferred alternative, the Transportation Study provided significant details on the costs and operations of shuttle system. There are many shuttle systems operating in federal public land units, and it is frequently seen as a positive way to alleviate dependence on private vehicles. This report summarizes finding from the shuttle chapter of the Transportation Study, provides recommendations based on scholar observations and data collection, and outlines two pilot shuttle alternatives.

Visitation

Via visitor services visitation and parking occupancy data collection it was determined that December, January, February, and March are the months with the most significant visitation concerns (Figures 1 and 2). It is recommended that any shuttle or pilot shuttle program be designed to accommodate visitation during these months.

The Transportation Study found that visitation numbers since 2006 reflect a distinct seasonal pattern to visitation with roughly 50 percent increase between the peak winter months and the fall low season. Refuge visitation peaked during 2007 and decreased slightly during the economic downturn between 2008 and 2011. Since 2011, visitation has increased and is approaching 2007 levels. Parking lot occupancy 2016/2017 counts found that visitation exceeded parking lot capacity from December to March on Tuesdays (Figure 1), and January and February on Thursdays (Figure 2).

Figure 1: Tuesday Parking Lot Occupancy

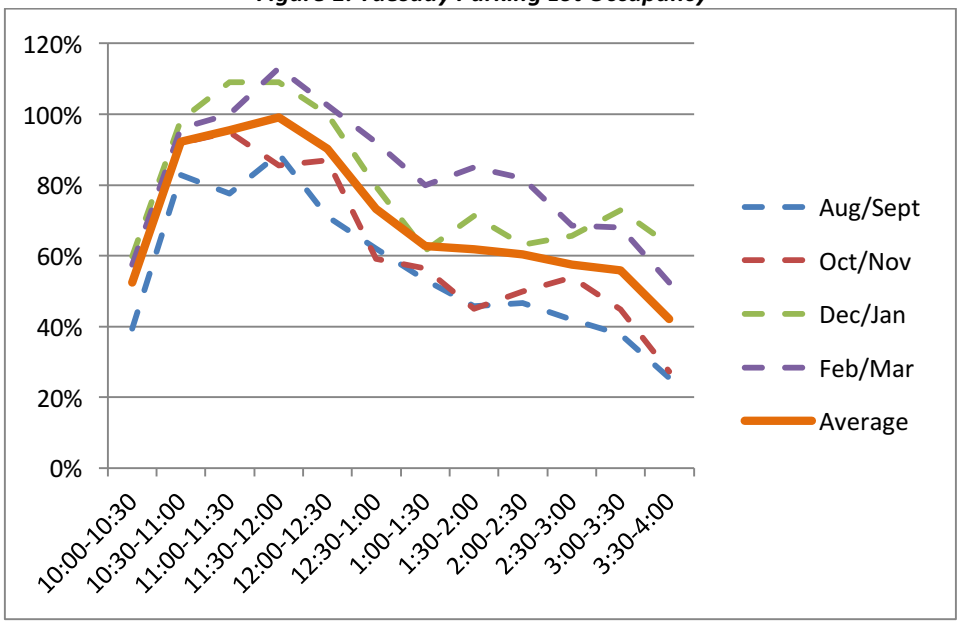
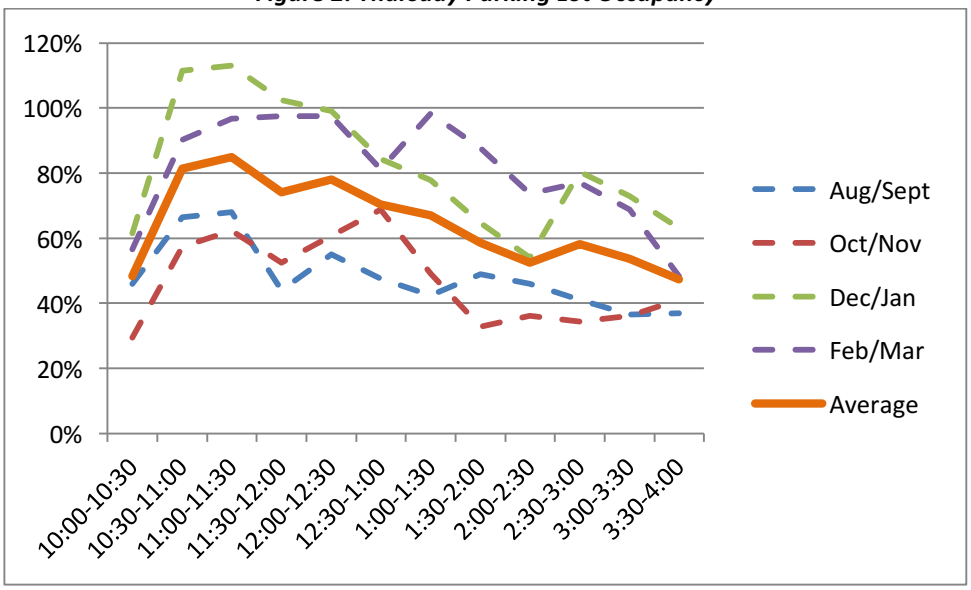


Figure 2: Thursday Parking Lot Occupancy



Potential Stops

The Transportation Study identified 3 potential locations for the shuttle pick-up and drop-off locations in Kīlauea:

- Kīlauea Community Agriculture Center (Agriculture Center) - 0.85 miles from Refuge parking
- Kīlauea Lighthouse Village - 1.35 miles from the Refuge parking
- Anaina Hou Community Park - 2.2 miles from Refuge parking

Based on proximity, mission statement, and willingness to work with and accommodate Kīlauea Point NWR visitation, the Agriculture Center was determined to be the preferred pick-up/drop-off location. The County of Kaua'i and the nonprofit organization 'Āina Ho'okupu o Kīlauea began construction of the Kīlauea Community

Agriculture Center in 2015, and they are planning to have farming lots developed in 2017 and farmers market and parking developed in 2018. The other potential stops should remain in consideration to serve the Kīlauea shopping area and connect with the County shuttle and park-and-ride lots.

Parking

Based on an estimated daily ridership demand of 801 (Year 1), travel times, and an average occupancy rate of 2.9 visitors per vehicle, the Transportation Study identified the following minimum parking spaces for each of the potential stops. The Transportation Study identified each of the potential locations parking demand if that location were the sole parking location. If the Community Agriculture Center was the primary parking location, the Lighthouse Village and Anaina Hou locations could serve as reserve parking.

Table 1: Minimum Parking Spaces from Comprehensive Transportation Planning Study

Route	Minimum Parking Spaces Required
Agriculture Center	63
Lighthouse Village to Agriculture Center	67
Anaina Hou to Lighthouse Village	73

The Transportation Study estimated daily ridership demand from the 90th percentile visitation day and a visitation reduction due to the inconvenience of shuttle system. Under current conditions, there are frequently over 63 vehicles parked in the Point's parking lots. January and March had days where over 75 vehicles were parked or waiting to park in the Point's parking lots. If visitation does not decrease as predicted by the Transportation Study, the high visitation and additional length of stay from the shuttle system could lead to significantly more vehicles than the minimum parking spaces required developed by the Transportation Study. As of 2016, plans for the Agriculture Center include a parking lot with approximately 120 spaces. This amount of spaces should provide ample parking for a mandatory Refuge shuttle. While the minimum parking spaces required could be used as a typical parking requirement, the Refuge should inform the Community Agriculture Center that there may be greater parking demand during peak periods and jointly plan for contingency or overflow parking.

If an optional shuttle is the direction decided on by Kīlauea Point NWR leadership, the minimum parking spaces required would decrease. As a guideline, it is recommended that half of the parking demand be planned for. Table 2 presents the amount of parking the Refuge should work with the Community Agriculture Center to identify under mandatory and optional shuttle systems.

Table 2: Community Agriculture Center Parking Needs

Shuttle/Parking Scenario	Parking Spaces
Mandatory Shuttle - Minimum Required	63
Optional Shuttle - Minimum Required	32
Mandatory Shuttle - Peak Period	85
Optional Shuttle – Peak Period	43

A Memo of Understanding (MOU) has been drafted for an agreement between Kīlauea Point NWR and the County of Kaua'i and the nonprofit organization 'Aina Ho'okupu o Kīlauea. This MOU (addendum) should serve as an informal agreement over the amount of parking spaces that can be utilized by the Refuge and the amount of service the Refuge will provide in terms of maintained and facilities upkeep.

Shuttle Types

The Transportation Study identified two types of shuttles that would be best suited for the Kīlauea Point NWR's shuttle system. The findings were based on criteria including Kaua'i availability, maintenance, and cost per passenger. These are 30-passenger cutaway type shuttle buses and 12-15 passenger vans. In order to accommodate the expected visitor demand, the Refuge would need to operate two cutaways for the Community Agriculture Center and Lighthouse Village routes, and three cutaways for the Anaina Hou Route; or it could operate three passenger vans on the Community Agriculture Center route, four passenger vans on the Lighthouse Village route, or six passenger vans on the Anaina Hou route. Based on the above criteria and vehicles needed, the 30-passenger cutaway shuttle buses are the preferred vehicle for the Refuge shuttle system.

Mandatory and Optional Shuttle Service

A mandatory shuttle and an optional shuttle are the two primary operational alternatives for shuttle service accessing the Refuge Point. The mandatory shuttle would require anyone entering the Point to access it by the shuttle. An optional shuttle would allow some parking at the current Point parking lots, while also connecting the Refuge with the off-site parking. During overflow periods the shuttle would become mandatory. In addition to providing transportation from off-site parking, the shuttle system could serve as a visitor service amenity and allow staff, volunteers, or operator to inform the riders about the Refuge and surrounding area, including Nihokū and Mōkōlea Point.

Mandatory Shuttle Pros

- Removes all parking and parking concerns from the Refuge Point's parking lots
- Potentially allows for bicycle and pedestrian access to the Point.
- Extra opportunities for Refuge staff or volunteers can engage with all visitors, reduced parking lot congestion, and minimal parking wait combine to improve the visitor experience
- Reduction of vehicle mile traveled (VMT) and emissions
- Potentially redevelop existing parking lots into biological areas
- Reduction of vehicles traveling along Kīlauea Road and in the Refuge, lessening the impact of nēnē crossings and other wildlife interaction

Mandatory Shuttle Cons

- May reduce the number of visitors, negatively impacting the budget of the Refuge
- Prevents traditional/ most used visitation method (private vehicle)
- Highest Cost
- Shuttles accessing the Point via narrow driveway
- Highest off-site parking requirements
- Concerns with visitors parking at the Overlook and walking to the Refuge Point

Optional Shuttle Pros

- Lessens parking needs and parking concerns for the Refuge Point's parking lots
- Allows some traditional/ most used visitation method (private vehicle)

- Gives visitors the option of having an extra tour experience
- Potential to redevelop parking for maximum circulation, reducing staff needed to manage parking
- Lower impact to off-site parking than mandatory shuttle
- Potentially lower cost than mandatory shuttle

Optional Shuttle Cons

- May reduce the number of visitors, negatively impacting the budget of the Refuge
- Visitors confusion about the shuttle operations
- Vehicle congestion at the Point driveway may still be an issue
- Refuge staff will be required to direct parking during peak periods
- Cost, though potentially lower than mandatory shuttle

Shuttle Service Operating Plans

The first shuttle operating plan is a USFWS administered plan. Under this operating plan, the Refuge could provide a service operator with vehicles, either by leasing through GSA or purchasing them and the service operator could operate and maintain them. A service operator could also own the vehicles and operate and maintain the service.

Under the USFWS administered or agreement operating plan, there are three types of potential service models that the Refuge could employ:

- Private Concessionaire – a private entity that privately operates tours on the Refuge. The concessionaire agrees to provide a certain level of service and sets prices on its own in order to operate sustainably. Refuges have a very hands-off approach in this model. USFWS Region 1 has not managed a concessionaire contract. It may be an unpopular model if the price required to operate is high and/or visitors are required to pay to get on the shuttle and to enter the Point.

- Service Contract – an agreement with a private for-profit company, a public partner, or a local nonprofit organization. A service contract is a legal instrument that reflects a relationship between a Federal agency and another entity when the purpose is to acquire a service. The Refuge would need to release a Request for Proposals (RFP) and open bids for entities to compete for a service contract. This RFP would initially have to be solicited as a small-business set-aside, which would exclude public partners and non-profits. If there were no small businesses that bid, it could then be resolicited as full and open to allow non-small businesses and non-profits to bid. This may be the simplest option and most practical for a pilot shuttle service as the Refuge may not need to purchase vehicles or hire drivers.

- Nonprofit Partnership - entering into Memorandum of Understanding/Agreement would allow the Agriculture Center, KPNA Friends Group, or other NPO to provide the shuttle service using vehicles leased through the GSA or purchased. Initial outreach has indicated some interest on the part of the NPOs, though conversations have been very minimal to this point (2017).

In addition to the plans described above, there are two non-USFWS administered or agreement operating plan service alternatives.

- Refuge Operated - under this shuttle service operating plans, the Refuge would purchase the vehicle and hire the shuttle drivers. Federal hiring processes and limitations, as well as the economies of scale with shuttle upkeep make this operating difficult.

- County-Administered - if the County starts a permanent North Shore Shuttle and would like to extend it to the Refuge; the County could also operate or contract the shuttle service to the Point under an agreement with the USFWS. The County has expressed interest in this option, but funding and current shuttle service limitations make this an unlikely alternative at this time.

While the Transportation Study did not recommend a single approach to managing the operation of the service, it was determined that the most feasible option is a USFWS-administered contract or agreement with a private company or nonprofit organization to provide the service.

Costs

The Transportation Study estimated for a Refuge shuttle costs based on quotes provided by private contractors to run two cutaway vehicles at 10-minute headways between the Agriculture Center and the Refuge for six hours per day. However, these private contractors on the island indicated that if the service were put out for bid, the cost would likely be lower than the hourly service cost provided. Cost estimates are presented as the total annual costs column on Table 3. The mandatory pilot shuttle costs were based on 3 and 4 month operating windows, rather than a complete year, and represent the operations of two shuttles. The optional pilot shuttle costs were based on 3 and 4 month operating windows, as well as ½ of the annual contractor cost estimates from the Transportation Study, in order to estimate the costs of one shuttle. Refuge contract administration and facility maintenance costs remained constant.

Table 3: Estimated Annual Cost of Cutaway Contracted Service Based on Current Quotes

Estimate	Total Annual Cost (12-months)	Mandatory Pilot Shuttle Cost (3- months)	Mandatory Pilot Shuttle Cost (4- months)	Optional Pilot Shuttle Cost (3- months)	Optional Pilot Shuttle Cost (4- months)
Low	$549,520	$137,380	$183,173	$117,340	$137,920
High	$620,080	$155,020	$206,693	$126,160	$149,680

Mandatory Pilot Shuttle Operations

Under the mandatory pilot shuttle all visitors to the Refuge who wish to travel to the Point will be required to board a shuttle at the Agriculture Center. Kīlauea Point NWR staff should enter into an MOU agreement with the County and Agriculture Center in order to allow 2 cutaway shuttles to enter and pick-up/drop-off Refuge visitors. The MOU should allow for 63-85 visitor vehicles to park at the Agriculture Center. If the parking lot becomes over capacity, a secondary or on-call pick-up location may be necessary.

The shuttle system will operate from 10:00 AM until 3:58 PM, 5-days a week (Tuesday – Saturday). It is recommended that the Refuge enter into a USFWS-administered contract or agreement with a private company providing 100% of the shuttle service and maintenance. The pilot shuttle is estimated to cost the Refuge between $137,380 and $206,693 depending on the length of service. These estimates may be reduced once the contract has gone out to bid. It is recommended that the pilot shuttle be operated by a private company in order to limit the impact of Refuge staff. Volunteers should be approached about providing shuttle narration during the pilot shuttle operating period. A scope of work for the mandatory shuttle contracting companies has been included in the addendum.

Optional Pilot Shuttle Operations

Under the optional pilot shuttle visitors to the Refuge are given the option of taking a private vehicle or shuttle to the Point. Once capacity has been reached, all visitors who wish to travel to the Point will be required to board a shuttle at the Agriculture Center. Visitor services staff will likely be required to monitor and close the entrance gate, similar to current operations. Once the capacity has been reached vehicles will be directed to the Agriculture Center.

Kīlauea Point NWR staff should enter into an MOU agreement with the County and Agriculture Center in order to allow 1 cutaway shuttle to enter and pick-up/drop-off Refuge visitors. The MOU should allow for 32-43 visitor vehicles to park at the Agriculture Center. The shuttle system will operate from 10:00 AM until 3:58 PM, 5-days a week (Tuesday – Saturday). It is recommended that the Refuge enter into a USFWS-administered contract or agreement with a private company providing 100% of the shuttle service and maintenance. The pilot shuttle is estimated to cost the Refuge between $117,340 and $149,680 depending on the length of service. These estimates may be reduced once the contract has gone out to bid. It is recommended that the pilot shuttle be operated by a private company in order to limit the impact of Refuge staff. Volunteers should be approached about providing shuttle narration during the pilot shuttle operating period. A scope of work for the optional shuttle contracting companies has been included in the addendum.

Addendum

1. Scope of Work for Mandatory Pilot Shuttle Service
2. Scope of Work for Optional Pilot Shuttle Service
3. Memorandum of Understanding between the ʻĀina Hoʻokupu O Kīlauea & County of Kauaʻi for the Kīlauea Community Agriculture Center

APPENDIX III SCOPE OF WORK FOR MANDATORY PILOT SHUTTLE SERVICE

APPENDIX III

Scope of Work
For
Kaua‘i National Wildlife Refuge Complex - Hawaii
Mandatory Pilot Shuttle Service

By

U.S. Fish & Wildlife Service

For

Shuttle Contracting Companies

XX/XX/20XX

Problem Statement and Background Summary

Kaua‘i is one of the most geographically and climactically diverse islands on the Hawaiian chain encompassing a number of 5,000 foot peaks, record setting rainfall, tropical canyons and scenic waterfalls. Over 25% of the landmass on the island is public land, including three National Wildlife Refuges (NWR): Kīlauea Point NWR, Hanalei NWR and Hulē‘ia NWR.

Kīlauea Point NWR is currently the only refuge on Kaua’i open to the public and providing visitor services to about 400,000 people a year, making it the 19th most visited refuge in the U.S. The refuge was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The refuge includes the historic Daniel K. Inouye Kilauea Point Lighthouse and world class wildlife viewing opportunities.

The Kīlauea Point NWR experiences significant issues with private vehicle congestion at the lower parking lot and at the upper overlook at the Refuge. Congestion results in frequent parking in undesignated spaces, as well as inadequate flow of traffic in and out of the site, which has the potential to harm wildlife habitat and species and requires several staff members to manage the parking and traffic flow during visiting hours. Bicycle and pedestrian access is also currently prohibited because the Refuge it is concerned about the safety of visitors along the steep and windy access road, in close proximity to high vehicular traffic volumes with low visibility around turns and wildlife nesting areas.

Kīlauea Point NWR, along with the US Department of Transportation Volpe Center and the US Department of Transportation Central Federal Lands Division completed a comprehensive transportation feasibility study in 2017. This study serves as the basis for the pilot shuttle scope of work.

Shuttle Summary

The Kīlauea Point NWR pilot shuttle will connect the Refuge with the Community Agriculture Center and additional locations (as needed) in Kīlauea town. Details of the pilot shuttle are as follows:

- Pickup Locations:
    - Primary - Community Agriculture Center (0.8 miles from KPNWR)
    - Secondary/On Call – Lighthouse Village (1.4 miles from KPNWR)
    - Emergency or Large Event - Anaina Hou (2.2 miles from KPNWR)
    - Route Map below
- Vehicle: Two (2) 30-passenger cutaway shuttles
- Operation Period: December 1 – February 28, Tuesday through Saturday, 10:00 AM to 4:00 PM (Shuttle Service Schedule below)
    - Contract may be extended until March 31, based on success of the 3-month period
- No fee to the rider, shuttle costs will be paid to the contractor by US Fish and Wildlife
- A staff member or volunteer of Kīlauea Point NWR will ride on the shuttle and provide narration to shuttle riders. Shuttle operators may provide narration after completing a training course.
- Shuttle operators will be given a remote to open the KPNWR gate. They need to be aware of their entrance and not allow other vehicles to follow them into the Refuge
- Bicycle and Pedestrian access may be allowed to access KPNWR via a separate entrance

Shuttle Contractor Tasks

Task 1 – Shuttle Operations

The contractor will be responsible for all shuttle operations including two (2) cutaway shuttles, driver salary and benefits, and fuel. Shuttle drivers will need to be aware and extremely careful when operating the vehicle around wildlife, including endangered nēnē.

Task 2 – Shuttle Maintenance

The contractor will be responsible for all shuttle maintenance and upkeep, ensuring a clean and safe ride for Kīlauea Point NWR visitors.

Task 3 – Visitor Interface

Shuttle drivers will need to be prepared to answer visitor questions regarding the shuttle operations, timetable, and occasion general Kīlauea Point NWR information.

Route Map


Extended Route
Anaina Hou to Refuge
via Lighthouse Village & Ag Park
Legend
Ag Park Hub
Anaina Hou Location Hub
Downtown Kilauea Stop
Kilauea Point NWR
Shuttle Route
A
B
C
D
N
3000 ft
Kilauea Rd
Wailapa Rd
56

Shuttle Service Schedule

Vehicle	Community Agriculture Center	Refuge
Cutaway 1	10:00 AM	10:08 AM
Cutaway 2	10:10 AM	10:18 AM
Cutaway 1	10:20 AM	10:28 AM
Cutaway 2	10:30 AM	10:38 AM
Cutaway 1	10:40 AM	10:48 AM
Cutaway 2	10:50 AM	10:58 AM
Cutaway 1	11:00 AM	11:08 AM
Cutaway 2	11:10 AM	11:18 AM
Cutaway 1	11:20 AM	11:28 AM
Cutaway 2	11:30 AM	11:38 AM
Cutaway 1	11:40 AM	11:48 AM
Cutaway 2	11:50 AM	11:58 AM
Cutaway 1	12:00 PM	12:08 PM
Cutaway 2	12:10 PM	12:18 PM
Cutaway 1	12:20 PM	12:28 PM
Cutaway 2	12:30 PM	12:38 PM
Cutaway 1	12:40 PM	12:48 PM
Cutaway 2	12:50 PM	12:58 PM
Cutaway 1	1:00 PM	1:08 PM
Cutaway 2	1:10 PM	1:18 PM
Cutaway 1	1:20 PM	1:28 PM
Cutaway 2	1:30 PM	1:38 PM
Cutaway 1	1:40 PM	1:48 PM
Cutaway 2	1:50 PM	1:58 PM
Cutaway 1	2:00 PM	2:08 PM
Cutaway 2	2:10 PM	2:18 PM
Cutaway 1	2:20 PM	2:28 PM
Cutaway 2	2:30 PM	2:38 PM
Cutaway 1	2:40 PM	2:48 PM
Cutaway 2	2:50 PM	2:58 PM
Cutaway 1	3:00 PM	3:08 PM
Cutaway 2	3:10 PM	3:18 PM
Cutaway 1	3:20 PM	3:28 PM
Cutaway 2	3:30 PM	3:38 PM
Cutaway 1	3:40 PM	3:48 PM
Cutaway 2	No pickup	3:58

APPENDIX IV SCOPE OF WORK FOR OPTIONAL PILOT SHUTTLE SERVICE

APPENDIX IV

Scope of Work
For
Kaua‘i National Wildlife Refuge Complex - Hawaii
Optional Pilot Shuttle Service

By

U.S. Fish & Wildlife Service

For

Shuttle Contracting Companies

XX/XX/20XX

Problem Statement and Background Summary

Kaua‘i is one of the most geographically and climactically diverse islands on the Hawaiian chain encompassing a number of 5,000 foot peaks, record setting rainfall, tropical canyons and scenic waterfalls. Over 25% of the landmass on the island is public land, including three National Wildlife Refuges (NWR): Kīlauea Point NWR, Hanalei NWR and Hulē‘ia NWR.

Kīlauea Point NWR is currently the only refuge on Kaua’i open to the public and providing visitor services to about 400,000 people a year, making it the 19th most visited refuge in the U.S. The refuge was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The Refuge includes the historic Daniel K. Inouye Kilauea Point Lighthouse and world class wildlife viewing opportunities and wildlife nesting areas.

The Kīlauea Point NWR experiences significant issues with private vehicle congestion at the lower parking lot and at the upper overlook at the Refuge. Congestion results in frequent parking in undesignated spaces, as well as inadequate flow of traffic in and out of the site, which has the potential to harm wildlife habitat and species and requires several staff members to manage the parking and traffic flow during visiting hours. Bicycle and pedestrian access is also currently prohibited because the Refuge it is concerned about the safety of visitors along the steep and windy access road, in close proximity to high vehicular traffic volumes with low visibility around turns.

Kīlauea Point NWR, along with the US Department of Transportation Volpe Center and the US Department of Transportation Central Federal Lands Division completed a comprehensive transportation feasibility study in 2017. This study serves as the basis for the pilot shuttle scope of work.

Shuttle Summary

The Kīlauea Point NWR pilot shuttle will connect the Refuge with the Community Agriculture Center and additional pickup locations will not be in use or allowed. Details of the pilot shuttle are as follows:

- Pickup Locations:
  - Primary - Community Agriculture Center (0.8 miles from KPNWR)
  - Route Map below
- Vehicle: One (1) 30-passenger cutaway shuttles
- Operation Period: December 1 – February 28, Tuesday through Saturday, 10:00 AM to 4:00 PM (Shuttle Service Schedule below)
  - Contract may be extended until March 31, based on success of the 3-month period
- No fee to the rider, shuttle costs will be paid to the contractor by US Fish and Wildlife
- A staff member or volunteer of Kīlauea Point NWR will ride on the shuttle and provide narration to shuttle riders. Shuttle drivers may provide narration after completing a training course.
- Shuttle operators will be given a remote to open the KPNWR gate. Drivers will operate the shuttle during period when access is both allowed and prohibited due to parking limitations. When open operators need to be aware of sharing a narrow driveway with other vehicles. When closed drivers need to be aware of their entrance and not allow other vehicles to follow them in the Refuge
- Bicycles and Pedestrians will **not** be allowed to access KPNWR

Shuttle Contractor Tasks

Task 1 – Shuttle Operations

The contractor will be responsible for all shuttle operations including one (1) cutaway shuttle, driver salary and benefits, and fuel. Shuttle drivers will need to be aware and extremely careful when operating the vehicle around wildlife, including endangered nēnē.

Task 2 – Shuttle Maintenance

The contractor will be responsible for all shuttle maintenance and upkeep, ensuring a clean and safe rider for Kīlauea Point NWR visitors.

Task 3 – Visitor Interface

Shuttle drivers will need to be prepared to answer visitor questions regarding the shuttle operations, timetable, and occasionally general Kīlauea Point NWR information.

Route Map


Ag Park to KPNWR
Legend
Ag Park Hub
Kilauea Point NWR
Shuttle Route
A
B
Kauapea Rd
Mihi Rd
Iwalani Ln
Pali Moana Pl
Tri Comb St
Kuhio Hwy
56
Kawelia St
Kehau St
Moku St
Oka St
Secret Beach
3000 ft
N

Shuttle Service Schedule

Vehicle	Community Agriculture Center	Refuge
Cutaway 1	10:00 AM	10:10 AM
Cutaway 1	10:20 AM	10:30 AM
Cutaway 1	10:40 AM	10:50 AM
Cutaway 1	11:00 AM	11:10 AM
Cutaway 1	11:20 AM	11:30 AM
Cutaway 1	11:40 AM	11:50 AM
Cutaway 1	12:00 PM	12:10 PM
Cutaway 1	12:20 PM	12:30 PM
Cutaway 1	12:40 PM	12:50 PM
Cutaway 1	1:00 PM	1:10 PM
Cutaway 1	1:20 PM	1:30 PM
Cutaway 1	1:40 PM	1:50 PM
Cutaway 1	2:00 PM	2:10 PM
Cutaway 1	2:20 PM	2:30 PM
Cutaway 1	2:40 PM	2:50 PM
Cutaway 1	3:00 PM	3:10 PM
Cutaway 1	3:20 PM	3:30 PM
Cutaway 1	3:50 PM	4:00 PM

APPENDIX V MEMORANDUM OF UNDERSTANDING BETWEEN THE ʻĀINA HO'OKUPU O KĪLAUEA & COUNTY OF KAUA'I FOR THE KĪLAUEA COMMUNITY AGRICULTURE CENTER

APPENDIX V

MEMORANDUM OF UNDERSTANDING

Between the

ʻĀINA HOʼOKUPU O KĪLAUEA & COUNTY OF KAUAʻI
For the
KĪLAUEA COMMUNITY AGRICULTURAL CENTER

and the

U.S. FISH AND WILDLIFE SERVICE

For the

OPERATION, MAINTENANCE, AND UPKEEP OF RESTROOMS AND PARKING LOT FACILITIES FOR THE KĪLAUEA POINT NATIONAL WILDLIFE REFUGE SHUTTLE PARKING LOT
KAUAʻI , HAWAII

This MEMORANDUM OF UNDERSTANDING, hereinafter referred to as the "MOU", is made and entered into, by and between, the U.S. FISH AND WILDLIFE SERVICE, an executive agency of the United States Department of the Interior, hereinafter referred to as the "Service" & the Kīlauea Point National Wildlife Refuge, hereinafter referred to as the "Refuge" and the ʻĀina Hoʼokupu O Kīlauea & County of Kauaʻi for the Kīlauea Community Agricultural Center, hereinafter referred as the "Agriculture Center", pursuant to 31 U.S.C. 6305, using Cooperative Agreements; the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended; the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e), as amended; and other laws, as applicable.

PURPOSE AND OBJECTIVE

This MOU is made for the purpose and objective of establishing and continuing a formal relationship between the Service and the Agriculture Center for the operation, maintenance, and upkeep of the restrooms and parking lot facilities for the Refuge Visitor Shuttle. This formal working agreement will present a framework for the Agriculture Center to provide the operation, maintenance and upkeep necessary to safely and effectively manage, in partnership with the Service, the Refuge Visitor Shuttle Park & Ride facility. The objectives of the Shuttle park-and-ride facility are to allow visitors to park their car and ride the shuttle into the Point area of the Refuge, welcome and orient visitors to the Refuge, provide environmental education and interpretation, and act as a gateway to Kīlauea Town.

RECITALS

WHEREAS, the Service is the lead Federal agency responsible for the protection and recovery of endangered species; and

WHEREAS, the County is responsible for local governance of the island of Kaua‘i and ‘Āina Ho’okupu O Kīlauea is responsible for the operations of the Kīlauea Community Agriculture Center; and

WHEREAS, the Service is authorized to enter into this Agreement pursuant to Acts of Congress and regulations issued pursuant thereto as noted above; and

WHEREAS, the County and ‘Āina Ho’okupu O Kīlauea has the authority to enter into an MOU with an agency of the United States, pursuant to the authority granted to it by the Hawaii Revised Statutes; and

WHEREAS, consistent with its purposes and objectives, the Service is presently maintaining a wildlife refuge located in Kīlauea, Island of Kaua‘i with a stated purpose to conserve threatened and endangered species; and

WITNESSETH:

NOW, THEREFORE, in consideration of the initial covenant and agreements hereinafter contained, the parties HERETO AGREE as follows:

AGREEMENT

I. TERM OF AGREEMENT

This MOU shall be for a period of five (5) years from the date of execution. The County shall have the right to extend this Agreement in increments of additional five (5) year periods by submitting written notification thereof to the Service ninety (90) days *prior* to each expiration date. Any such extensions shall then be subject to the same terms and conditions as contained in this Memorandum of Understanding unless amended with the mutual consent of parties.

II. LOCATION OF AGRICULTURE CENTER

The Agriculture Center and off-Refuge shuttle parking site is located on the north shore of Kauaʻi, to the east of Kīlauea Road, adjacent to the Seacliff housing development/along Kāhili Quarry Road.

III. CONSTRUCTION COST RESPONSIBILITIES

It is expressly agreed by the parties that the shuttle parking lot will use and existing parking facility and no additional parking lot and associated features will (curbs, gutters, striping, etc.), will need to be constructed. Additionally, ʻĀina Hoʼokupu O Kīlauea or the County will be responsible for costs associated with constructing additional amenities that are not expressly addressed in the MOU.

The Service will be responsible for the cost of constructing transit waiting area, welcome and orientation visitor signage, environmental, education and interpretation features, and other shuttle amenities.

IV. MAINTENANCE COST RESPONSIBILITIES

It is expressly agreed by the parties that the ʻĀina Hoʼokupu O Kīlauea is primarily responsible for the cost of the maintenance of the Community Agriculture Center and shuttle parking lot.

The Service will be responsible for maintenance costs for the restroom facilities during operational hours, transit waiting area, welcome and orientation visitor signage, environmental, education and interpretation features, and other shuttle amenities.

V. ADMINISTRATION OF AGREEMENT

It is agreed that a joint board responsible for administering this Memorandum Of Agreement shall be comprised of the ʻĀina Hoʼokupu O Kīlauea Executive Director, County Mayor or his/her designee, and the Regional Director of the Service's Pacific Region or his/her designee.

VI. PROJECT DESIGNEES

The ʻĀina Hoʼokupu O Kīlauea at Project Designee shall be:

Yoshito L`Hote
Executive Director
ʻĀina Hoʼokupu O Kīlauea

The Service Project Designee shall be:

The Refuge Complex Manager

Kaua‘i National Wildlife Refuge Complex
3500 Kīlauea Road; P.O. Box 1128
Kīlauea, HI 96754
808-828-1413

Currently the Refuge Manager/Project Leader is Heather Abbey Tonneson.

The project designees are responsible for the day to day operation of the field station and the implementation of this Agreement, but are not authorized to alter or amend this Agreement.

VII. TERMINATION OF AGREEMENT PRIOR TO CONTRACT TERM

All or any part of the MOA may be terminated by the Service or ‘Āina Ho’okupu O Kīlauea for failure to comply with any or all of the terms or conditions of this Agreement or for non-use for a five (5) year period, evidencing abandonment of the rights granted by this Agreement.

XIII. AMENDMENTS

Amendments to this Memorandum of Agreement may be proposed by either party and shall become effective upon being reduced to a written instrument executed by both parties.

VIII. AUTHORIZATION AND SIGNATURES

By authority conferred by the County, and by the Director of the U.S. Fish and Wildlife Service, United States Department of the Interior, this Agreement is mutually executed by an authorized official on the day and year set forth opposite their respective signatures.

U.S. Fish and Wildlife Service Authority

BY: _____ DATE: _____
Regional Director, Region 1
U.S. Fish and Wildlife Service
911 N.E. 11th Avenue
Portland, Oregon 97232-4181

‘Āina Ho’okupu O Kīlauea

BY: _____ DATE: _____

Executive Director
‘Āina Ho’okupu O Kīlauea

APPENDIX VI RESERVATION SYSTEM

APPENDIX VI

Reservation System

Kīlauea Point National Wildlife Refuge
Transportation Scholar Report

Alex Roy | Public Lands Transportation Scholar
Stationed at Kaua'i National Wildlife Refuge Complex

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Introduction

Kaua'i is one of the most geographically and climactically diverse islands on the Hawaiian chain encompassing a number of 5,000 foot peaks, record setting rainfall, tropical canyons and scenic waterfalls. Kīlauea Point National Wildlife Refuge (Refuge or Kīlauea Point NWR) is the only refuge on Kaua'i open to the public and providing visitor services to over 400,000 people a year, making it the 19th most visited refuge in the U.S. The refuge was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The refuge includes the historic Daniel K. Inouye Kīlauea Point Lighthouse and world class wildlife viewing opportunities.

High visitation and limited parking frequently results in more vehicle demand than parking capacity, this is especially prevalent during peak visitation months (December – March). This condition forces vehicles to que and wait until a space opens. To find ways to improve this situation, Kīlauea Point NWR completed a Comprehensive Transportation Planning Study (Transportation Study) in 2017. One of the strategies recommended in the Transportation Study was a reservation or timed entry system. A relativity new tool, reservation systems are gaining popularity at federal and other public land units that see high visitation, but do not necessary have the staffing or infrastructure for a shuttle, land for additional parking, or other alternative transportation system. This report expanded on the reservation section of the Transportation Study, highlights existing reservations systems, provides preliminary cost information, and details initial setups for a pilot reservation system and a permanent reservation system.

Reservation and Timed Entry Systems

Reservation systems require or allow visitors reserve the day that they will enter a site or take a tour. Timed entry systems are a type of reservation that identifies the exact time of entrance or tour. Reservation systems typically operate as a per visitor reservation or a per vehicle reservation. Per visitor reservations require each person to have a reservation prior to entry. Per visitor reservation systems are frequently used in coordination with a tour that has limited spaces. These systems are often located at sites that have excess parking or are near large cities that have multiple transportation options. Per vehicle reservation systems reserve a parking space and allow all visitors in the vehicle to enter on one reservation. These systems are frequently used in areas that have limited parking and are dependent on private vehicles to access the site. Both per visitor and per vehicle reservation systems can charge an entrance fee on top on the minimal reservation fee.

Pros of reservation systems are that they can be used to manage visitation (visitors and time), encourage visitation when there is excess capacity, and provide the Refuge with advance notice of upcoming visitation. Knowing visitor demand ahead of time can inform the amount of staffing, programming, and transportation needs.

The primary con of reservation systems is that they limit visitor freedom and prohibit pass by trips. They can also discourage certain populations who are uncomfortable with or do not have internet or phone access. Reservation systems can also create confusion and potentially visitor anger if they are not well informed about the system. Some of these concerns can be minimized by visitor and community outreach. Special conditions can also be arranged for significant cultural or other important visitors.

Existing Reservation Systems

There are several reservation and timed entry systems in place currently at federal public land units. These are at well know and/or highly visited areas including: The Statue of Liberty, Ford's Theater, Valor of the Pacific (USS Arizona), and Coconino National Forest. Tours of the Washington Memorial were conducted on a reservation

system, until safety concerns closed the elevator and prevented tours. In 2015 Muir Woods National Monument completed an environmental assessment with a permanent reservation system as the proposed action/preferred alternative. The National Park Service posted a prospectus for third-party operators to manage reservations and onsite parking of personal vehicles as well as reservations for the Muir Woods Shuttle in December 2016. The Arches National Park Transportation System and Congestion Management Study included a reservation system alternative in their Final Feasibility Study (2012). The preferred alternative of this study was a shuttle system. Table 1 provides a comparison of existing reservation systems at federal public land units.

Haleakalā National Park Pilot Reservation System

Haleakalā National Park on Maui started a pilot reservation system for their sunrise viewing on February 1, 2017. As Haleakalā shares some important similarities with Kīlauea Point NWR, including island location, visitor makeup, and time of visitation, their system is presented in more detail. The Haleakalā reservation system was implemented to ensure visitor and employee safety, protect natural and cultural resources, protect private property and vehicles, and ensure a quality visitor experience. Haleakalā National Park has four parking lots for the sunrise viewing with a total of 150 spaces. Visitor visitation to these parking lots often exceeds 300 vehicles. When vehicles cannot park in the lots, they park in the shoulder on the side of the road. Frequently the dark conditions and unfamiliar surroundings lead to vehicles parking in dangerous or environmental sensitive locations.

To alleviate these concerns, Haleakalā implemented a reservation system that allows 150 cars between 3:00 and 7:00 AM. The Haleakalā reservation system is operated by recreation.gov and has a convenience fee of $1.50; entrance fees are still required and remain $20 per vehicle and $10 per person (bikes/hikers). 70% of sunrise reservations are released 2 months in advance and 30% of reservations are released the week before, allowing some “last minute” visitation. Reservations are checked at the entrance gate. Vehicles with a reservation are allowed to park in any available space on a first-come first-served basis. Haleakalā does not allow drive-up reservations and vehicles arriving without reservations are turned away. The holder of the reservation is required to be present in the vehicle with a printout or smartphone verification. Once the 150 spots have been allocated no vehicles are allowed to enter until after 7:00 AM.

A limited number of spots are available for Hawaiian cultural activities and other educational/cultural groups. These vehicles are not required to have a reservation, but should let visitor services know of their visitation prior to arrival. This project is considered an interim strategy, until the Sunrise Summit Visitor Management Plan Environment Assessment (started 2017) is complete.

Note: Will be removed from PDF version

Table 1 Reservation System Comparison

Transportation Study Summary

The KPNWR Transportation Study included reservation system recommendations as an alternative if the shuttle system (preferred alternative) was unfeasible. Based on the conditions of visitation at the Refuge it was recommended that any reservation system include a timed entry component. As space at the Refuge entry is limited, walk-up reservations should be prohibited. This would prevent visitor vehicles without a reservation from blocking Refuge driveway entrance. If the reservation system became permanent, this could be mitigated by having a ticket booth in town and/or at the Agriculture Center. The Transportation Study considered a parking reservation system a Medium Term Recommendation implementable in 3+ years.

Reservation System Costs

The Transportation Study talked to a number of different National Park Units about their implementation and ongoing costs. Projected costs for a reservation system break down as follows:

- Administrative costs include staff time to participate in the initial options analysis, moving the preferred alternative through to implementation, and conducting ongoing coordination and monitoring of the website provider.
- Capital costs include some equipment purchase of ticketing machines and/or upgrades to the entrance gate to allow people to scan or enter a reservation code.
- Operations and maintenance would largely be managed through the website. The reservation fees charged the visitor would cover the Recreation.gov operations but some USFWS staff resources to assist visitors with reservation questions or confirm reservations as visitors enter the Refuge may also be required.

The Transportation Study did not anticipate the Refuge would need to hire or dedicate a full position to managing this system. It was assumed that a portion of a staff member's time would need to be dedicated to coordination and oversight of the reservation system. The Transportation Study recommends consulting a contractor to develop a more robust cost estimate based on the needs of the Refuge.

Table 2: The Range of Estimated Cost for Implementing a Reservation System

Cost	Start-Up Range	Ongoing Range
Administrative	$70,000-$125,000	$10,000-$15,000
Capital	$10,000-$100,000	$5,000
Operations and Maintenance	$5,000-$15,000	$5,000
Total Estimated Cost	$85,000-$240,000	$20,000-$25,000

Below are examples of equipment that the Refuge may consider purchasing if a permanent reservation system is implemented. This information is provided to provide approximate cost estimates. Costs may change based on availability, updated needs assessment, and U.S. governmental contracting.

Table 3 Equipment Costs[1]

Gates	Make/Model	Lane Width	Operating Speed	Cost
	DoorKing 1601	14 Ft. Wide	1.5 Seconds	$2,609.00 to $3,384.00
	FAAC 620	Up To 13 Ft.	2 Seconds	$2,272.50
	LiftMaster Mega Arm	12' Aluminum Barrier Arm	2.5 Second Open / Close Speed	$1,525.00 to $1,635.00
Access	**Make/Model**	**Type**	**Misc.**	**Cost**
	Linear AK-11	Keypad	480 programmable codes	$232.00
	DoorKing 1815-233	Card Reader	Read Range Up to 5.5 feet	$407.00
	Linear MegaCode	Gate Receiver	40 transmitter capacity	$67.00
	Linear MegaCode	Transmitter	9V battery	$24.00
Accessories	**Make/Model**	**Type**	**.**	**Cost**
	DoorKing 1603-	210 Traffic Light w / Mounting Kit		$861.00
	DoorKing 1603-	Warning Sign - Stand-Alone Spike Systems		$917.00

[1] http://www.gatedepot.com

Kīlauea Point Capacity

Kīlauea Point NWR averages approximately 400,000 visitors a year. Of the total yearly visitors around half pay to access the Point. Between 2011 and 2015 the yearly average visitation paying to access the Point was 189,000.

One of the drawbacks regarding a reservation system is that there may be periods or days where not all visitors can access the Refuge. KPNWR staff indicated this might not be a disqualifying factor, but communicated an interest in quantifying how many days would be impacted. To determine the number of days that visitation demand would exceed the reservation system capability a capacity analysis was developed. Visitation data for the capacity analysis was derived from 2014 visitor service data (5-day) and 2011 visitor service data (7- day). Table 4 presents the potential days over capacity under a Refuge reservation system. A 15% reduction in visitation was applied to both scenarios to account for a potential reduction in visitation due to lack of familiarity and not knowing how to use the reservation system. This reduction was based on the Transportation Studies shuttle system reduction.

The capacity analysis evaluated three parking lot alternatives, analyzed in the reservation scenarios below:

1. Existing Max Capacity, including dirt parking spaces (61 Spaces)
2. Current Parking Supply, excluding dirt parking spaces (56 Spaces)
3. Redesigned Parking, based on a 2012 KPNWR parking redesign project. This redesign would improve the traffic flow and would not require a staff member to direct traffic to available spaces (45 Spaces)

Two reservation scenarios were analyzed:

A. Scenario A: 1 hour reservations every operating day.
    1. Existing Max Capacity – 366 Spaces Daily (61 x 6 res. periods)
    2. Current Parking Supply – 336 Spaces Daily (56 Spaces x 6 res. periods)
    3. Redesigned Parking – 270 Spaces Daily (45 Spaces x 6 res. periods)

B. Scenario B: 1 hour reservations Tuesday, Thursday, and Friday and 1.5 hour reservations Wednesday and Saturday. This scenario was developed as a way to extend reservation time during Lighthouse Tour days.
    1. Existing Max Capacity – 366 Spaces (61 x 6 res. periods) 3 days a week and 244 Spaces (61 x 4 res. periods) 2 days a week
    2. Current Parking Supply – 336 Spaces (56 Spaces x 6 res. periods) 3 days a week and 224 Spaces (56 x 4 res. periods) 2 days a week
    3. Redesigned Parking – 270 Spaces (45 Spaces x 6 res. periods) 3 days a week and 180 Spaces (45 Spaces x 4 res. periods) 2 days a week

Table 4 Reservation System - Days over Capacity

	Scenario A 5 Day Operation	Scenario B 5 Day Operation	Scenario A 7 Day Operation	Scenario B 7 Day Operations	Scenario A 5 Day 15% Reduction	Scenario B 5 Day 15% Reduction
Existing Max Capacity	**8**	**49**	**1**	**7**	**1**	**20**
Current Parking Supply	**17**	**73**	**3**	**12**	**1**	**32**
Redesigned Parking	**74**	**133**	**11**	**50**	**22**	**84**

The Kīlauea Point National Wildlife Refuge Traffic, Visitor, and Parking Counts Study (TVP Study) found that the average duration of stay at the Point is approximately 40 minutes. Visitation length data collected during 2017

found that the average visitation during Lighthouse tour days was slightly greater than days without Lighthouse tours (48 vs. 40 minutes). While the average visitation remained under an hour during Lighthouse days, the percentage of trips lasting more than an hour rose from 8% to 20%.

Capacity Findings and Recommendations

The days over capacity would rise significantly under Scenario B. As an illustration, under the current parking supply 17 days would be over capacity in Scenario A and 73 days would be over capacity under Scenario B. An easy way to think of this is that there would be 56 more days where visitors were turned away if the Refuge had 1.5 hour reservations twice a week. *Note: Currently, the Kīlauea Point NWR turns away vehicles when the parking lot is full, these days may not be completely captured by the visitor service data used to calculate capacity.*

The number of days over capacity combined with the average visitation length during Lighthouse tour days staying under an hour indicates that Scenario A (1-hr reservations) is the ideal scenario. To accommodate longer stays during Lighthouse tour days, a few parking spots could be bundled with Lighthouse tour tickets. Based on the tour accommodating 15 people every hour, 5-6 spots could be reserved for tour ticket holders.

Per Vehicle Entrance Fee

A potential fee structure of the reservation system would be bundling the reservation cost with entrance cost. This would encourage the Refuge to move from a per person entry fee to a per vehicle entry fee. An added benefit of this fee structure may be to encourage groups to carpool. A hypothetical scenario under this fee structure would be a vehicle paying a $20 entrance fee and a $1.50 reservation fee for a grand total of $21.50 per vehicle to access the Point. Refuge Staff are interested in this model, but are concerned about the potential impacts to funding generated by the entrance fee and what per vehicle charge would be needed to maintain current budget levels. The following comparison in based on February 2017 visitation and fee income. As shown in Table 5 a vehicle fee of $20 would generate $29,000 more than is currently collected and a vehicle fee of $25 would generate $49,500 more than is currently collected. In 2017 Kīlauea Point NWR, began initial steps to raise the entrance fee to $10. The compared to a $10 fee, a per vehicle fee of $20 would generate $24,000 less than projected collections and a vehicle fee of $25 would generate $3,500 less than projected collections.

Table 5 Monthly Revenue Projections Under a Per Vehicle Entrance Fee

Total Visitors	18,500
Paying Visitors	10,600
Seniors	5,000
Children Under 16	1,200
Fee Free	1,200
School, VIP, Other Groups/Passes	500
Revenue Generated from $5 Entrance Fee	$ 53,000
Potential Revenue Generated from $10 Entrance Fee	$ 106,000
Paying Vehicle Riders (Paying Visitors + Children)	11,800
Estimated Number of Paying Vehicles (2.9 per vehicle)	4,100
Revenue Generated from $20 Per Vehicle Entrance Fee	$ 82,000
Revenue Generated from $25 Per Vehicle Entrance Fee	$ 102,500

Pilot Reservation System

The Pilot Reservation System described below is designed to alleviate impacts on Refuge staff, who are frequently forced to direct traffic. In addition to reducing the need for visitor services staff to manage parking, the pilot reservation system is designed to require minimal significant investments in equipment or considerable alterations to the current fee structure and operation schedule. A critical component of the pilot reservation system will be distributing updated plans to hotels and on-line via US FWS website and the Refuge and Friends Group social media accounts.

Similar to Haleakalā National Park, it is recommended that the Refuge contract with recreation.gov in setting up and implementing a reservation system. They have extensive experience managing similar services at federal land units and are funded by charging a low (approximately $1.50) service fee.

The Refuge should initiate the initial pilot reservation system for a 3 or 4 month period between December 1 to February 28 or March 31, depending on available funding and Refuge leadership direction. During this period access to the Point and parking areas will require a reservation. Reservations should be an hour in length. Based on current parking capacity 56 spots would be allowed every hour. It is recommended that the dirt and overflow parking areas be utilized for Lighthouse tour and other visitors that have prior approval to spend more than one hour. Lighthouse tours tickets could be combined with the parking reservations to streamline both ticketing processes; entrance fees would remain separate. During the pilot reservation period it is recommended that ½ of the parking reservations be distributed every ½ hour; 28 parking reservations released for 10:00 – 11:00 AM and

then 28 parking reservations released for 10:30- 11:30 AM. This minimizes vehicle congestion from all reservation holders arriving at once. If congestion is an issue under this approach, reservations could be distributed as 14 reservations every 15 minutes.

The Pilot reservation system would require a staff member or volunteer to be positioned at the top of the driveway checking reservations, or a system to recognize reservations and allow turn arounds at the Overlook. Similar to Haleakalā, the pilot reservation system would not allow drive-up reservations. If a visitor vehicle comes to the reservation inspector and it does not have a reservation they will be directed to turn around in the existing loop. Staff or volunteers can suggest that they look into a reservation for later that day or later during their trip. It may be the case that there is parking availability when they arrive but they do not have a reservation. In this scenario the vehicle will need to leave the que, travel to a safe location, park their car and make the reservation from a smart phone or other web enabled device. After they have a reservation they can re-enter the reservation inspection line. Vehicles will not be allowed to place reservations while in line. This should be prohibited due to both time concerns and limited WIFI availability. Reservations can be printed out or displayed on a web enabled device. The holder of the reservation will be required to be in the vehicle that is using the reservation.

Figure 1: Pilot Reservation System Map

Permanent Reservation System

The Permanent Reservation System described below is designed to eliminate impacts on Refuge staff, who are frequently forced to direct traffic. As a Permanent Reservation System could reduce the need for future staff, if it is justified in requiring significant investments in equipment and allowing alterations to the current fee structure or operation schedule. A critical component of the pilot reservation system will be working with the County, KNA, hotels, tourism agencies and other groups to ensure that the reservation system information is well distributed. In addition to information being available on-line via the US FWS website and social media accounts, Refuge staff should contact guide books and hotels to provide updates regarding the reservation system.

There are two options for inspecting a reservation in a permanent reservation system: relocating the booth to the driveway gate area or having a scanner or keypad entry. Providing entry via a scanner or keypad entry would be a significant departure for current practices federal public land units and the Refuge should work closely with Regional Staff and a parking contractor if this was the preferred option. Moving the fee booth and having it staffed to check reservations would more closely resemble current federal public land unit practices. Due to internet limitations, it is recommended that all reservations be made offsite. In order to reduce time at the reservation booth, it is recommended that the reservation fee be combined with a per vehicle entrance fee of $25. In this scenario an offsite reservation ticket machine could be placed at the Community Agriculture Center or in Kīlauea Town. Advanced signs advising of the reservation requirement and location of ticket machines should be installed to reduce confusion at the booth and direct traffic flow. As reservation fees are combined with entrance fees, no payments will need to be accepted at the booth. Additional visitor service programs, such as the Jr. Rangers, will remain at the Point.

Figure 2: Permanent Reservation System Map

APPENDIX VII SWOT EXERCISE

APPENDIX VII

Kilauea Point National Wildlife Refuge Transportation Project

DRAFT - MEMORANDUM

To: U.S. Fish and Wildlife Staff

Date: August, 2016

From: Alex Roy

Subject: SWOT Analysis

The following memorandum details a Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis that was conducted for the existing Kilauea Point National Wildlife Refuge's (KPNWR) transportation system and potential alternatives (shuttle, parking reservations). The SWOT analysis was designed to provide a high level summary of observations as they relate to the Kilauea Point National Wildlife Refuge's transportation systems (existing and planned) and the six strategic goal areas identified in the U.S. Fish and Wildlife Service's Plan 2035 the National Long Range Transportation Plan (LRTP). Where appropriate, regional transportation was also considered. The SWOT analysis is the work of Alex Roy, Federal Lands Transportation Scholar. This document is disseminated under the sponsorship of U.S. Fish and Wildlife in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Kilauea Point National Wildlife Refuge

Kilauea Point NWR is currently the only refuge on Kaua'i open to the public and providing visitor services to about 400,000 people a year, making it the 19th most visited refuge in the U.S. The refuge was established in 1985 and has multiple purposes, including providing habitat and protection for migratory birds, conservation of threatened and endangered species, and the conservation and management of native coastal strand, riparian, and aquatic biological diversity. The refuge includes the historic Kilauea Point Lighthouse and world class wildlife viewing opportunities.

Documents reviewed in order to conduct the SWOT analysis include the following: Kilauea Point National Wildlife Refuge Comprehensive Conservation Plan (CCP) (2016), draft chapters of the Kaua'i National Wildlife Refuge Complex Comprehensive Transportation Planning Study (2016), Kilauea Point Alternative Transportation Systems Study (2006), Kīlauea Point TAG Study (2009), The U.S. Fish and Wildlife Service's Plan 2035 the National Long Range Transportation Plan (LRTP) (2016), U.S. Fish and Wildlife Region 1 LRTP (2012), Draft Kauai Regional Study (2016), and the North Shore Path Alternative Report (2012).

These documents were supplemented with field observations and discussions with U.S. Fish and Wildlife and Kilauea Point Natural History Association staff.

SWOT Analysis

A Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis is an exercise that is frequently used when a business, municipality, or other government agency is looking at starting or expanding into a new market, or providing new services. It can be a helpful exercise in both identifying potential benefits and areas of concern. It is also frequently used as a team building tool that allows a constructive dialogue and encourages participants to highlight their unique background and perspective. During SWOT exercises, Strengths and Weaknesses are factors

or conditions internal to the organization, while Opportunities and Threats are factors or conditions external to the organization.

Goal Areas Identified in the National LRTP's

The U.S. Fish and Wildlife Service's Plan 2035 the National Long Range Transportation Plan identifies six strategic goals. These goals are as follows: Coordinated Opportunities, Asset Management, Safety, Environmental, Access Mobility and Connectivity, and Visitor Experience. Each of these goals were included in the SWOT analysis.

Coordinated Opportunities Goal

Goal Description: The program will seek joint transportation opportunities that support the Service mission, maximize the utility of Service resources, and provide benefits to the Service and external partners.

Strengths	Weaknesses
• Past success teaming with Kaua'i County (County) staff on FLAP projects. • Staff is interested and willing to team with County and local Non-Profit Organizations (NPOs) including the Kilauea Point Natural History Association, 'Aina Ho'okupu, and Anaina Hou. • Strong connections with the Kilauea Neighborhood Association	• Staff resources are limited and by necessity frequently deal with pressing operational needs. • Complex Manager is new to Kaua'i and while a strong leader, may not have the connections and/or relationships of previous management.
Opportunities	Threats
• County and the local political environment are interested in making alternative transportation more prominent. • Local developers and NPOs have expressed a strong willingness to help with transportation and are close to starting or have started construction ('Aina Ho'okupu and Kilauea Lighthouse commercial development).	• Public has not supported increased taxes for alternative transportation. • Prior attempts to develop additional alternative transportation have been unsuccessful (North Shore Shuttle). • Local NPOs have not been involved in alternative transportation to this point

Asset Management Goal

Goal Description: The program will operate and maintain a functional, financially sustainable and resilient transportation network to satisfy current and future land management need in the face of a changing climate.

Strengths	Weaknesses
• Shuttle service could eliminate the need for	• Existing visitor service staff is frequently

visitor service staff to direct parking and traffic. • There are several current studies (KPNWR Comprehensive Transportation Planning Study and FLAP project) evaluating alternative transportation operations and access to the refuge, ensuring that alternatives are examined when determining future developments. • Existing parking lot could be redeveloped into a shuttle pick-up/drop-off location.	taken away from their duties to direct parking and traffic. • Refuge Staff have not operated a shuttle service and have limited storage space and staff availability. • Entrance costs or transportation costs will need to be raised to facilitate shuttle service. There is not an existing source of funding dedicated. Cost estimates for shuttle options range from $3.07 to 7.23 per visitor, per the draft Kaua'i National Wildlife Refuge Complex Comprehensive Transportation Planning Study. • The CCP recommends a new visitor center, which may alter or remove the need for the shuttle service.
Opportunities • The County lead FLAP project is recommending ways to improve access to KPNWR. • NPOs have expressed an initial interested in being involved. • Potential parking lots have been identified on non-refuge property (ʻAina Hoʻokupu and Kilauea Lighthouse commercial development).	Threats • Physical space is limited to provide parking close to Refuge • If parking and vehicle congestion is significant or maintenance upkeep costs are greater than expected, partners could pull their support for parking at their facilities. • The Hawaii Department of Business and Tourism predicts only modest increases in tourism statewide over the next three years, expecting a 1-2% increase each year though 2017. If there is a faster increase than projected, KPNWR could see increased visitation.

Safety Goal

Goal Description: The program's network will provide a superior level of safety for all users and all modes of transportation to and within FWS lands.

Strengths • One element of the County lead FLAP project is a KPNWR Overlook and parking redesign. This project will provide recommendations on pedestrian and safety improvements. • The proposed shuttle would decrease vehicle pedestrian conflicts in the parking lot and	Weaknesses • Parking lot does not have designated pedestrian pathways. • Speeds along the driveway are too fast for width and grade. • Width and speed on the driveway create bird interaction concerns.

improve visitor safety.	
Opportunities • The FLAP project is looking at improving safety along the corridor leading to the Refuge. • High speeds leading to the Refuge can be mitigated by implementing increased enforcement and traffic calming measures.	Threats • Right-away limitations may prevent preferred roadway redesigns along the Kilauea Dr. corridor leading to the refuge. • Kilauea Rd. is managed by the County and therefore under their jurisdiction to develop speed related enhancements.

Environmental Goal

Goal Description: Transportation infrastructure will be landscape appropriate and play a key role in the improvement of environmental conditions in and around Service lands.

Strengths • Potential shuttle project can reduce greenhouse gas emissions. • Removal of automobiles from the Refuge driveway will reduce conflict with birds. • No existing shuttles, so the Refuge can advocate for electric or natural gas vehicles with lower emissions.	Weaknesses • Initial implementation of the shuttle may cause confusion and actually increase greenhouse gas emissions • The driveway may need to remain closed to pedestrian and bicycles, limiting the appeal of active transportation for refuge visitation.
Opportunities • One aspect of the County lead FLAP project is improving active transportation to the refuge. • Production of more environmentally friendly vehicles is increasing.	Threats • KPNWR visitation is primarily composed of tourists who rely on rented vehicles. • If visitors are not aware of the shuttle system, the Refuge overlook could become the primary destination and may become extremely crowded resulting in conflicts between people and nene.

Access, Mobility and Connectivity Goal

Goals Description: The program will ensure that units open to the public have adequate transportation options for all users including underserved, underrepresented, and mobility limited populations.

Strengths • The shuttle has the opportunity to interface with the existing Kauai Bus network, improving transportation for users without vehicles. • There is a environmental education program in place. • The Kaua'i National Wildlife Refuge Complex Comprehensive Transportation Planning Study has an improved wayfinding chapter. • The Kama'Aina Pass, refuge week, and other events have been popular with residents.	Weaknesses • Tourists have historically been the primary visitors to the Refuge. • The driveway may need to remain closed to pedestrian and bicycles, limiting the appeal of active transportation refuge visitation. • If pedestrian access allowed onto KPNWR, parking along Kilauea Dr. and at the overlook could drastically increase.

Opportunities	Threats
• There may be opportunities for additional resident targeted events. • School events and field trips are well received. • The distance between KPNWR and Kilauea is short (1.5 miles).	• Kilauea has expressed concern about increased amount or size of wayfinding. • Residents have expressed that they are most interested in increased access to areas of the refuge that are closed due to bird habitat. • Larger municipalities with higher local populations are farther away than Kilauea (Kapaa 30 min./17 miles, Lihue 1 hr. /25 miles, and Waimea 1.5 hr./48 miles).

Visitor Experience Goal

The program will enhance the visitation experience through improvement and investment in the transportation network.

Strengths	Weaknesses
• Shuttle could provide narration to improve visitor experience and education. • Well established relationships between FWS Staff, volunteers and friends group. • Visitors would not have to wait for parking to become available or be turned away (this happens infrequently during peak periods).	• Existing visitor service staff is frequently taken away from their duties to direct parking and traffic, which could worsen under a parking reservation system. • If visitors are not aware of the shuttle system, the Refuge overlook could become the primary destination and would be unaware of the comprehensive visitor services located on KPNWR.
Opportunities	**Threats**
• Coordinating with local NPOs could allow for a more complete Kilauea experience and understanding. • If the County did develop a more robust transportation network (North Shore Shuttle), the shuttle could tie into that system to allow a car free visitor experience.	• Off refuge pick-up/drop-off locations would be primarily the responsibility of the land owner. If these areas were not well maintained it would hurt the visitor experience. • Visitors may be confused about the travel options, and could elect to not visit KPNWR.

Closing

Kilauea Point National Wildlife Refuge is one of the most visited refuges in the U.S. Fish and Wild Service and also one of the premier sea bird habitat preserves in the Pacific Islands. While maintaining pristine habitat can limit visitor access/transportation options, but it is important to recognize the biological value and the visitor experience when developing a refuge transportation system. The Kilauea Point National Wildlife Refuge's transportation system has a rare opportunity to connect a majestic refuge to a vibrant and active community. As transportation projects move forward it will be important to recognize limitations as well as benefits to proposed alternative transportation scenarios. The SWOT analysis will hopefully serve as a tool to identify positive and negative potential scenario outcomes. Ultimately, transportation projects should serve to protect and maintain the invaluable natural resources found at the Kilauea Point National Wildlife Refuge.