

Regional Alternative Transportation Evaluation

Region 8



Figure 1 Trail from Desert NWR's Visitor Center

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John A. Volpe National Transportation Systems Center

Volpe

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RATE Team:

Nathan Caldwell, FWS

Lauren Deaderick, Volpe Center

Robyn Gray, FWS

Morgan Malley, CFL

Laurie Miskimins, CFL

Benjamin Rasmussen, Volpe Center

Steve Suder, FWS

Contents

List of Figures	i
List of Tables.....	ii
Section 1: RATE Background	1
Section 2: Region 8 Background and Trends	3
Regional Population Growth.....	3
Proximity to Urban Areas	3
Limited and Declining Staff Resources	4
Partnerships and Outreach.....	4
Section 3: Region 8 Strategies for ATS.....	5
Promotion.....	5
Use of Transit.....	5
Use of Nonmotorized Transportation.....	6
Section 4: ATS Questionnaire Analysis	7
Visitation Background.....	7
Transit and Trail Connections	9
Transportation Improvements	10
Conclusion.....	11
Section 5: Underserved Populations Analysis.....	12
Las Vegas, Nevada	13
San Diego, California.....	16
San Francisco, California.....	19
Section 6: Funding Sources for ATS	22
Section 7: Project Selection.....	24
Section 8: Case Studies	26
Desert National Wildlife Range.....	26
Ash Meadows National Wildlife Refuge	29
Stone Lakes National Wildlife Refuge.....	32
Sacramento National Wildlife Refuge Complex.....	35
Coleman National Fish Hatchery	40
Humboldt Bay National Wildlife Refuge.....	44
Don Edwards San Francisco Bay National Wildlife Refuge.....	48
San Diego National Wildlife Refuge Complex.....	53

List of Figures

Figure 1 Trail from Desert NWR's Visitor Center	i
Figure 2 Visitor Transportation Mode (average percent, green represents alternative transportation modes) (N=38)	7
Figure 3 Visitor Demographics (N=38).....	8
Figure 4 Distance Traveled to Reach Station (N=38)	8
Figure 5 Station Distance from Transit Service (N=38) (green represents close proximity to transit service).....	9
Figure 6 Station Distance from Regional Trail (N=38) (green represents close or direct proximity to regional trail).....	10
Figure 7 Potential Transportation Improvements to Improve Visitor Programs (N=31).....	11
Figure 8 High need index populations in the greater Las Vegas-Henderson-Paradise region	14
Figure 9 High need index populations focused on the Las Vegas metropolitan area	15
Figure 10 High need index populations in the greater San Diego-Carlsbad region.....	17
Figure 11 High need index populations zoomed to closer proximity to refuges.....	18
Figure 12 High needs population index near San Pablo Bay NWR	20
Figure 13 High needs population index focused on Don Edwards San Francisco Bay NWR	21
Figure 14 Rating of Funding Shortages as a Transportation Issue for the Stations (N=39).....	22
Figure 15 FWS Project Selection Process Outlined in the National LRTP (source: PLAN 2035).....	24
Figure 16 Desert NWR’s visitor center opened in December 2013 Source: Volpe Center.....	26
Figure 17 Trail in Stone Lakes NWR Source: Volpe Center	32
Figure 18 Sacramento NWR’s entrance to the Auto Tour Route Source: Volpe Center	35
Figure 19 FWS van used for Sacramento NWR photography tours Source: Volpe Center.....	37
Figure 20 Coleman NFH’s RATE Response Estimating Percent of Visitor Access Modes	40
Figure 21 Coleman NFH trailhead with interpretive sign Source: Volpe Center	41
Figure 22 Railroad tracks part of the proposed Humboldt Bay Trail Source: Volpe Center	45

Figure 23 Don Edwards San Francisco Bay NWR’s RATE Response Estimating Percent of Visitor Access Modes 49

Figure 24 San Diego Bay NWR's RATE Response Estimating Percent of Visitor Access Modes..... 54

Figure 25 Tijuana Slough NWR's RATE Response Estimating Percent of Visitor Access Modes..... 55

List of Tables

Table 1 Population Change by Region 8 State Source: U.S. Census Bureau 3

Table 2 Transit Services within Stations 9

Table 3 State ATS Funding Opportunities 23

Section I: RATE Background

The U.S. Fish and Wildlife Service (FWS), Federal Lands Highway (FLH), and the U.S. Department of Transportation (DOT) Volpe Center (Volpe Center) have conducted regional alternative transportation evaluations (RATEs) in nearly all of FWS's eight regions. RATEs help ensure effective consideration and integration of alternative transportation systems (ATS, Box 1) into the goals and recommendations of the region's long-range transportation plans (LRTPs). Staff from the FWS, Central Federal Lands Highway Division (CFLHD), and the Volpe Center conducted a RATE in Region 8, which is comprised of California, Nevada, and the Klamath Basin in southern Oregon, in the summer of 2014.

FWS Headquarters and Regional staff approached the RATE in Region 8 with the understanding that increased ATS would be beneficial to the region's stations and complement Service-wide goals, particularly those contained in the National LRTP and likely to be contained in the Region 8 LRTP. Where viable, ATS can play an important role with regard to each of these goals:

- **Safety:** Provide a safe and secure transportation system to and within Service lands.
- **Access, Mobility, and Connectivity:** Ensure that service lands have appropriate levels of access, mobility, and connectivity for all users and staff.
- **Sustainability:** Provide a sustainable transportation program to address current and future needs.
- **Partnerships:** Develop partnerships to leverage resources and implement integrated transportation solutions.
- **Visitor Experience:** Develop and maintain a transportation network that welcomes and orients visitors.
- **Natural and Cultural Resource Protection:** Conserve and protect natural and cultural resources through comprehensive transportation planning and management.

Box 1: What are Alternative Transportation Systems?

Alternative transportation systems generally include any travel means other than personal automobile, such as:

- Motorized transportation systems operating internally within stations
- Shuttles and van transit connecting stations with other destinations
- Regional transit connections (bus, light rail, trolley, commuter rail, passenger rail)
- Bicycle and pedestrian infrastructure (sidewalks, paths, bicycle lanes, regional trails)
- Water-based transportation
- Publicly and privately operated systems

By reducing the use of personal automobiles, the FWS can also reduce the impacts that these vehicles have upon natural resources. Vehicular resource impacts include wildlife collisions, invasive species, noise pollution, particulate and greenhouse gas emissions, erosion, and pollutants that can enter the soil or water. Over the long term, increasing ATS for stations with increasing visitation can minimize the need for new roads or parking, thus preserving more area for wildlife habitat. Furthermore, ATS is a critical visitor management tool for station staff facing increasing visitor demands and limited resources, especially through partnerships with the local transit agency or friends group. The use of transit enhances visitors' understanding of the station's natural resources by facilitating interpretive tours or directing visitors for special events. ATS can provide access and mobility to portions of the populations who do or choose not to own a vehicle or are disabled. Finally, ATS reduces the Service's carbon

footprint, reduces the use of carbon-based fuels, enhances accessibility, and reduces air pollutants emitted from vehicles.

The RATE is comprised of two main data collection components: a web-based survey and in-person site visits. In late 2013, CFLHD staff administered a survey that included alternative transportation questions to all Region 8 stations. Based on the response provided in the survey, Volpe Center, CFLHD, and FWS Region 8 staff conducted site visits in July 2014 at Desert National Wildlife Refuge (NWR) in Nevada and Stone Lakes NWR, Sacramento NWR Complex, Coleman National Fish Hatchery, Humboldt Bay NWR, and Don Edwards San Francisco Bay NWR in California. Additionally, San Diego NWR Complex participated in an in-depth phone interview. Ultimately, the RATE provided lessons on and opportunities for how ATS may be instituted more broadly across Region 8.

Section 2: Region 8 Background and Trends

Region 8, the Pacific Southwest region, was established in 1998 to better address the unique natural resource challenges experienced in California, Nevada, and the Klamath Basin in southern Oregon. The region includes 45 NWRs, four Wetland Management Areas, three National Fish Hatcheries (NFHs), a research facility, and several other Fisheries facilities. Due to the variety of landscapes covered, Region 8 encounters many unique transportation challenges in both rural and urban settings. From beaches to mountains to deserts, Region 8 covers several biologically sensitive landscapes, some of which are particularly impacted by climate change elevating the importance of the FWS’s natural resource protection mission in this region. As briefly mentioned in the Introduction, ATS can help support the sustainability needs of the area as well as address the other trends occurring in the region. From population growth to expanding urban areas, it will be important for refuges’ transportation systems to be able to adapt to these changing surroundings and ATS can provide several solutions.

Regional Population Growth

The States in Region 8 are experiencing significant population growth. Table 1 shows that just between 2000 and 2010; Region 8 states have experienced a total of 11 percent growth in population. With expanding populations, rural and suburban areas are growing closer to FWS station locations. While population growth can sometimes compromise the natural resource protection mission of the FWS, it can also provide opportunities for interpretation and environmental education to new audiences. By bringing in new audiences, it can sometimes put once low visitation refuges in states of overcapacity and therefore require alternative transportation solutions.

Table 1 Population Change by Region 8 State Source: U.S. Census Bureau

State	2000	2010	% Change
California	33,871,648	37,253,956	10.0%
Nevada	1,998,257	2,700,551	35.1%
Region 8	39,291,304	43,785,581	11%

Proximity to Urban Areas

Region 8 includes many urban wildlife refuges, refuges located within close proximity to America’s most populous urban areas. The Urban Wildlife Refuge Program’s goal is “... to engage urban communities in wildlife conservation in partnership with the Service.”¹ As of 2015, the following Region 8 refuges are included in the Urban Wildlife Refuge Program:

¹ [Draft Urban Standards of Excellence](#), FWS 2013.

- Don Edwards San Francisco Bay NWR
- Desert NWR
- San Diego Bay NWR (winner of Urban Refuge Program funding)
- Tijuana Slough NWR
- San Joaquin River NWR
- Stone Lakes NWR
- San Pablo Bay NWR
- Coachella Valley NWR
- San Diego NWR

With interest in the Urban Wildlife Refuge Program growing, Region 8 has the opportunity to use this momentum to expand transportation partnerships. Urban areas, similar to areas with growing populations, present opportunities for stations to engage with local communities and spread the FWS mission. ATS can provide integral connections to these communities.

Limited and Declining Staff Resources

As with the rest of FWS and other Federal agencies, Region 8 is experiencing declining staff resources. Limited funding allows little flexibility in hiring more staff or filling vacancies. With staff often taking on several roles and responsibilities at a unit, little time is left for anything beyond the daily operations and management of the site. With increasing visitation occurring at many stations, stations are challenged to provide enough educational and recreational programs. Building meaningful transportation partnerships, developing alternative transportation solutions, and implementing new programs around alternative transportation is often a low priority for many stations.

Partnerships and Outreach

Even with strained staff resources, many stations in Region 8 appear to be strong participants in their local communities. Nineteen of the 38 stations open to the public host special events with relatively high visitation. Additionally, 28 of the 38 refuges remarked that either friends groups or school groups provide transportation to the station when visiting. During the site visits, several of the stations visited appeared to work closely with local universities on research and host hundreds of school children for educational field trips. Additionally, many of the stations noted having strong and supportive volunteer groups. With the recent changes in the Friends Group policy², it is important that stations maintain a strong relationship with community members and various volunteer groups. Most of the stations in Region 8 are engaged with the local community and are building reputations for being educational, recreational, and economic assets to the community. Building on these partnerships can be important if stations wish to explore ATS options within and to their land.

² In April 2014, FWS added four chapters to its Friends Groups policy to provide further guidance on working with Friends Groups. Friends Groups must be nonprofit status under Section 501(c)3 Title 6 of the Internal Revenue Service code and must be established under the mission of support the purposes and objectives of a Service site or program with which they are affiliated. More updates can be read here: <http://www.fws.gov/policy/633fw1.html>

Section 3: Region 8 Strategies for ATS

There are several strategies Region 8 regional and unit staff could implement to further ATS internal use and connections. This section outlines general examples of ATS uses and improvements for regional and station staff to consider for implementing or improving their ATS.

Promotion

Several units in Region 8 have existing internal ATS or connections to ATS. These existing systems can always benefit from greater promotion and encouragement by station staff for visitors to take advantage of the ATS options within, to, and surrounding a unit. Visitors may not be aware of a station's proximity to a particular bus stop, train station, or regional trail. Posting this information on City and County tourism websites as well as the official FWS website, social media pages, and station brochures will help increase visitors' knowledge of these ATS opportunities and disprove the perception that stations can only be reached by private vehicle.

Use of Transit

There are many ways transit can be used within, to, and surrounding a station. This section briefly explains types of transit systems that can be set up at a site according to its needs. As examples, several types of transit vehicles exist and are in use at FWS stations across the country. From trams to buses, stations can select the best type of vehicle for their situation and budget. FWS purchased six electric trams and golf carts for use around stations. FWS partnered with the Department of Energy (DOE) in their Clean Cities program which seeks to expand the use of electric vehicles. Section 4 provides an analysis of existing transit connections and internal transit systems in Region 8.

Internal Transit: Year Round, Seasonal, and Special Events

Internal transit systems provide easy access, interpretive opportunities, and mobility within stations. Transit service can be created for year round, seasonal, or special events, depending on the need of the station. Establishing transit during special events is typically an informative and low-cost first step for stations wanting to understand how a shuttle system could work on their land. It can help initiate transit partnerships and provide some insight on visitor preference. If a station experiences high visitation during a particular season—in Region 8 this may be particularly applicable in the fall during prime birding season—seasonal transit services can help ease congestion and over-crowding in parking lots and on auto tour routes. Not only do internal transit systems allow stress-free mobility around units, but it also offers an opportunity for interpretation. Shuttle rides can act as guided tours with recordings or staff giving brief talks about the station and any points of interest. Setting up a transit service does require a certain level of funding depending on the involvement of volunteers and the type and frequency of service arranged. This report provides a more in-depth look at ATS funding opportunities in Section 6.

Transit Connections

In addition to internal transit as an alternative to personal vehicle use within stations, identifying or establishing a transit connection for visitors can reduce the need for visitors to rely on using personal vehicles to reach the station. This is particularly important when thinking about providing access for underserved populations and those without personal vehicles. Transit connections typically require collaborating with a local partner to share costs and increase usage. Local transit agencies can be contacted to see if an extension to existing service is an option or if a special new route can be created. Several stations within Region 8 have transit stops nearby and could work further with transit service providers to establish more direct transit connections.

Use of Non-motorized Transportation

Non-motorized transportation includes bicycling, walking, and water-based transportation such as kayaking and canoeing. While there are some resource questions that arise with regard to the use of bicycling on FWS lands, bicycling is still a great way for visitors to access stations because it is healthy and generally reduces the impact of people on the environment.

Internal Trails and Other Multi-Use Infrastructure

Stations can provide educational and recreational opportunities through internal trails and multi-use infrastructure. Allowing visitors to walk around and explore the surroundings, as permitted by biological restrictions, lets visitors connect with nature. Where resource impacts are not a concern, mobility within stations should accommodate the safe travel of visitors with bicycle lanes or wide sidewalks or aggregate paths. Unlike in other regions in the country, Region 8 is well-suited to promote non-motorized uses in stations year-round as snowy and icy weather is rarely a concern. The Region 8 stations visited all mentioned an increase in active recreation within stations. The increase in bicycling or walking groups passing through as well as the public's growing interest in finding more bicycling and walking opportunities within close proximity to their homes is a trend FWS should accommodate when possible. Expanding and improving dedicated internal pedestrian, bicycling, and water-based infrastructure can help reduce unsafe vehicle interactions and other vehicle-related impacts, such as pollution and erosion. Additionally, formal infrastructure can make visitors mindful of the sensitive environment they are entering and help ensure they stay on designated paths and trails.

Trail Connections

Ensuring a safe and smooth connection from nearby trails is an easy way to encourage visitors to use active transportation modes to access stations. Several stations in Region 8 noted close proximities to local and regional trails. By working with partners, stations can create a connection and increase awareness of the FWS land nearby. This will be talked about further in Section 6, but a new funding program authorized in the most recent transportation funding bill directly addresses this need for improved access to public lands. The Federal Lands Access Program (FLAP) offers a unique opportunity for public land agencies to work closely with local and State transportation stakeholders to fund better and safer multimodal connections to stations.

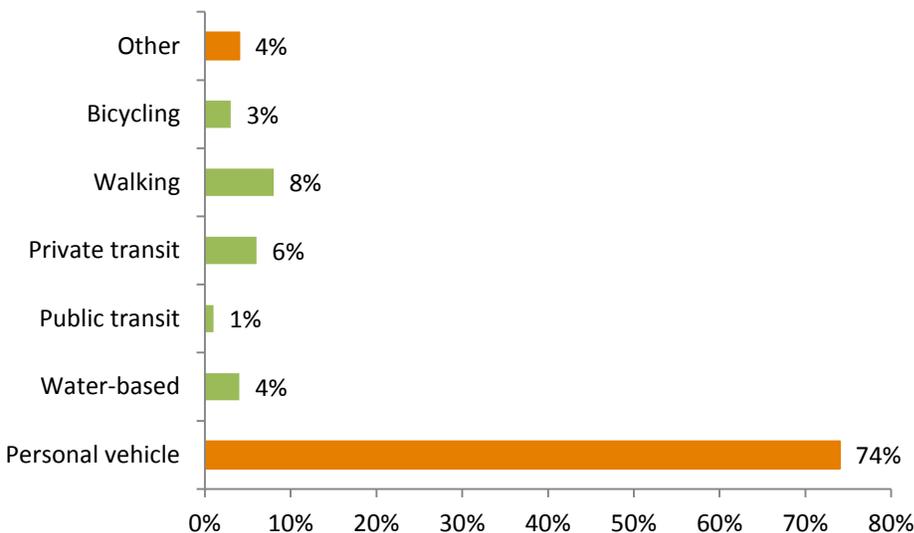
Section 4: ATS Questionnaire Analysis

The RATE survey was administered April to May 2014 to Region 8 station managers as part of the larger Regional Inventory Program (RIP) survey. This was the first time these surveys were combined. The Pacific Southwest Region includes 53 stations, of which 38 are open to the public. All stations responded to the questionnaire, thereby providing a thorough look at the entire region and its alternative transportation opportunities.

Visitation Background

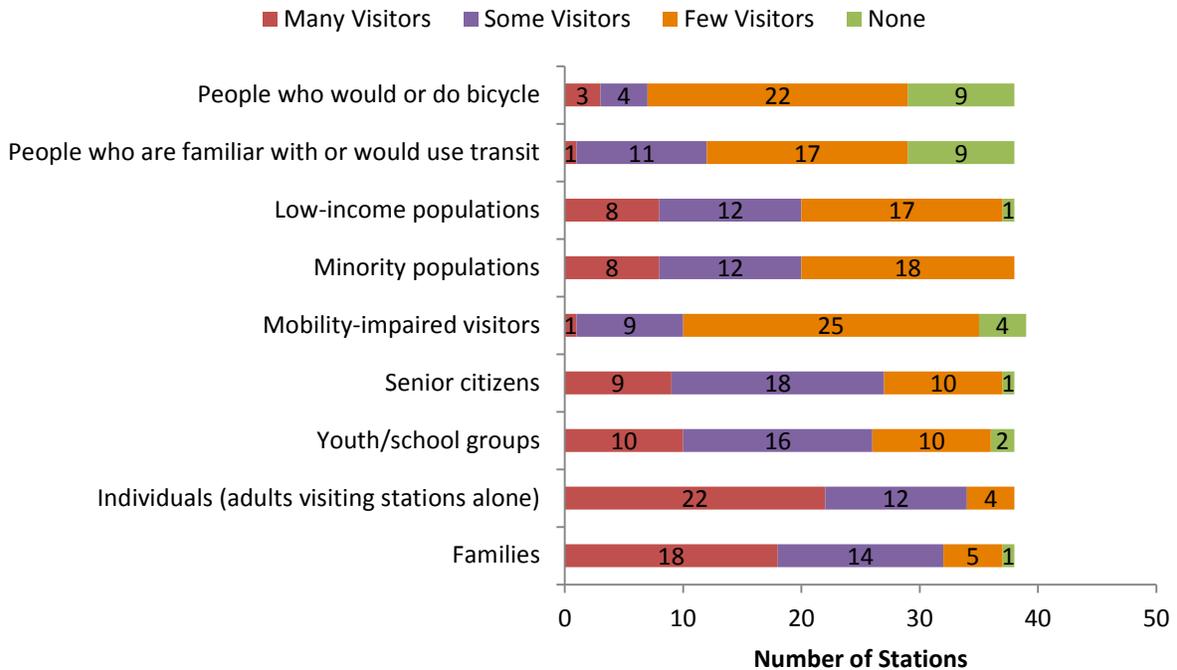
The questionnaire asked stations to estimate how visitors accessed each unit. Figure 2 shows the average percentages of all the responses for each transportation mode. Personal vehicles compose the majority (74 percent) of the way in which visitors' access stations. Walking, private transit, water-based, and other modes are the next most popular modes, with each averaging eight percent, six percent, and four percent respectively. Only 31 percent of stations allow water-based activities such as canoeing and kayaking and 51 percent of stations allow either unrestricted bicycling within the unit or in designated areas. Private transit includes school bus and other types of group transportation. Answers included in the other category primarily referenced horseback riding as a popular mode. The modes used by visitors are telling not only of the visiting population, but also of the region's unique environment. Alternative transportation activities such as horseback riding may not be an approved or feasible activity in other regions.

Figure 2 Visitor Transportation Mode (average percent, green represents alternative transportation modes) (N=38)



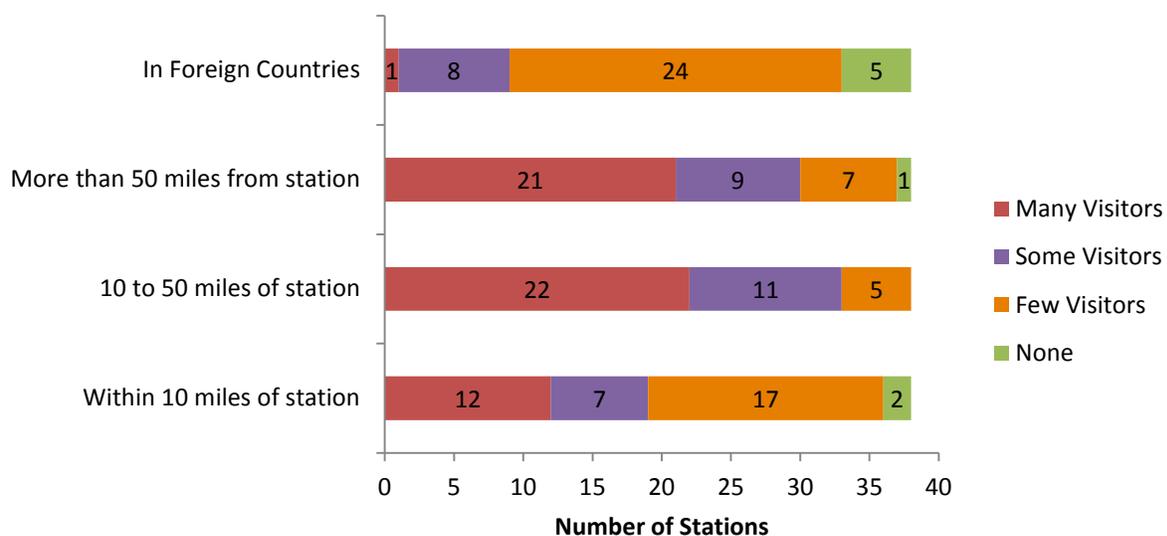
The visitor demographics, as shown in Figure 3 and Figure 4, provide insight on the type of user of the region's transportation system. 22 of 38 stations (58 percent) responded that many of their visitors are individuals, adults visiting alone. Families are the next largest portion of the visitors, with 18 of the 38 stations (47 percent) reporting that many families visit. Following individuals and families are youth/school groups and senior citizens with 9 and 10 stations noting many of those groups visit. Most youth/school groups and senior citizens use private transit. People who are familiar with transit and people who would or do bicycle comprise the smallest amount of the visiting groups.

Figure 3 Visitor Demographics (N=38)



Additionally, stations were asked to estimate how far visitors traveled to come to the station. A majority of stations indicated that visitors were coming from 10 to 50 miles away and more than 50 miles away (54 and 57 percent respectively). This large traveling distance influences the mode choice of visitors and may also explain the high percentage of personal vehicles used to access stations. Local visitation, i.e., visitors who live within 10 miles of the station, is important for almost one third of the stations, but it appears it could be improved at many of the units. ATS could provide an easy connection for local visitors and encourage more local visitation.

Figure 4 Distance Traveled to Reach Station (N=38)

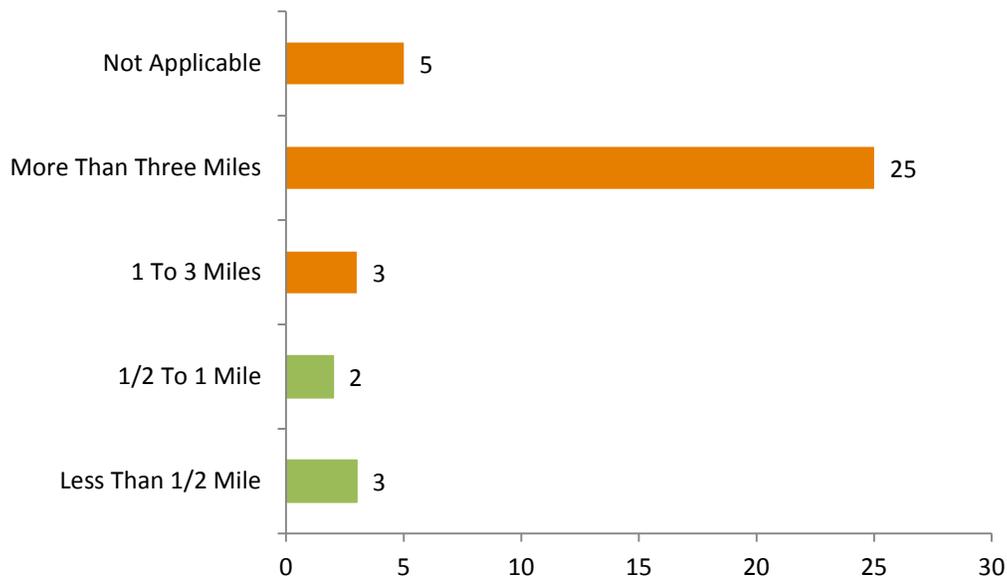


Transit and Trail Connections

Distance from Transit

The station managers were also asked to estimate the distance from external transit services, such as local or inter-city bus stops or Amtrak stations (Figure 5). Twenty-five of the 38 stations open to the public (66 percent) reported being more than three miles away from a transit connection. This distance from a transit connection helps support the notion that visitors may feel their only option of accessing a refuge is by personal vehicle. Five stations (13 percent) noted that they are one mile or less away from a transit station. These stations have an opportunity to connect to the nearby stops through greater coordination with their local transit agency and other transportation partners. By making the public transportation connection easier to the stations, this would reduce the need for and potentially the use of personal vehicles.

Figure 5 Station Distance from Transit Service (N=38) (green represents close proximity to transit service)



In addition to asking about connections to transit, the questionnaire asked about transit within stations (Table 2). Transit service within stations not only reduces personal vehicle use and promotes ATS but also offers relatively inexpensive interpretive opportunities for visitors and may encourage increased visitation. One station has transit services year-round, provided by the local community; two provide seasonal service; and seven stations provide transit services during special events. Nineteen of the 38 stations (50 percent) have special events. Special events are good opportunities to apply ATS solutions to help manage the heavy visitation for the event. Transit service during special events can potentially be done through partnerships within the local community.

Table 2 Transit Services within Stations

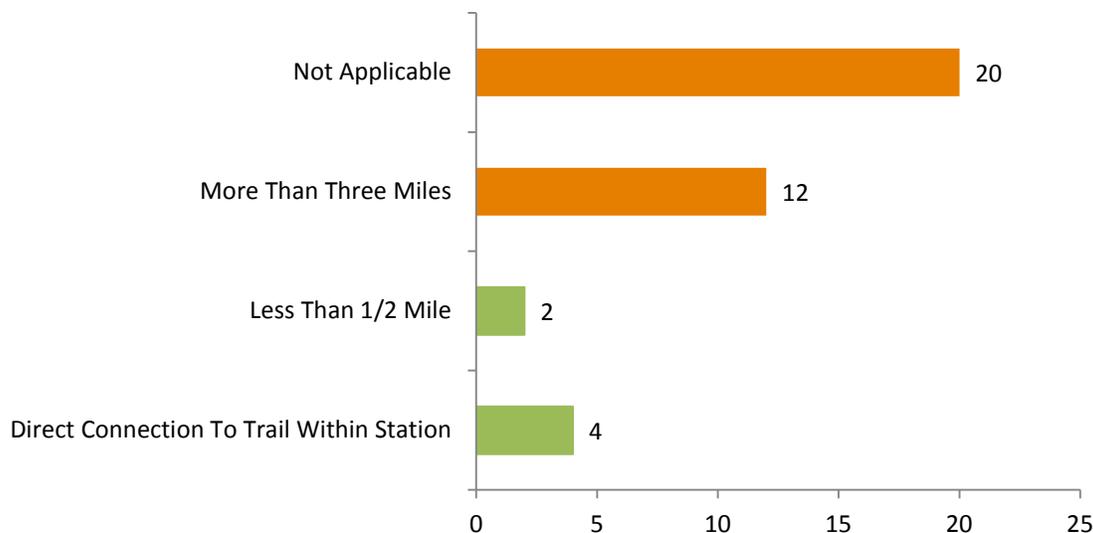
Transit Services within Stations	Type of Transit Service
Year-Round Service	
San Diego Bay NWR	Shuttle Bus
Seasonal Service	
Sacramento NWR	Refuge Tram Tours
Special Events Service	

Transit Services within Stations	Type of Transit Service
Lower Klamath National Wildlife Refuge	Bus Tours (rented bus)
Merced National Wildlife Refuge	Van Tours
San Joaquin River National Wildlife Refuge	Van Tours
San Luis National Wildlife Refuge	Van Tours
Seal Beach National Wildlife Refuge	Monthly Tour Access and Special Van Tours
Tijuana Slough National Wildlife Refuge	Van Tours
Tule Lake National Wildlife Refuge	Bus Tours

Distance from Regional Trails

External trail connections are also an important component of encouraging and promoting ATS surrounding and within stations. Regional trails provide safe routes to stations as they are often located off-street and with paved or gravel surfaces for easy pedestrian and bicycle recreation and travel. Figure 6 shows Region 8 stations' approximate distance from regional trails. For 20 of the 38 stations, the refuge staff indicated this was not an applicable connection. It is possible that some stations did not understand this question or know the location of the nearest regional trail, in which case there is a need to better provide that information to stations. However, it should also be noted that due to a more rural nature of several stations located in the valley and desert of California, regional trails to those locations may not be an option. Four stations are directly connected to a regional trail through a trail within the station and two stations are less than half a mile away from a regional trail. Those six stations do or have an opportunity to provide easy and convenient pedestrian and bicycle access with the proper infrastructure and signage.

Figure 6 Station Distance from Regional Trail (N=38) (green represents close or direct proximity to regional trail)

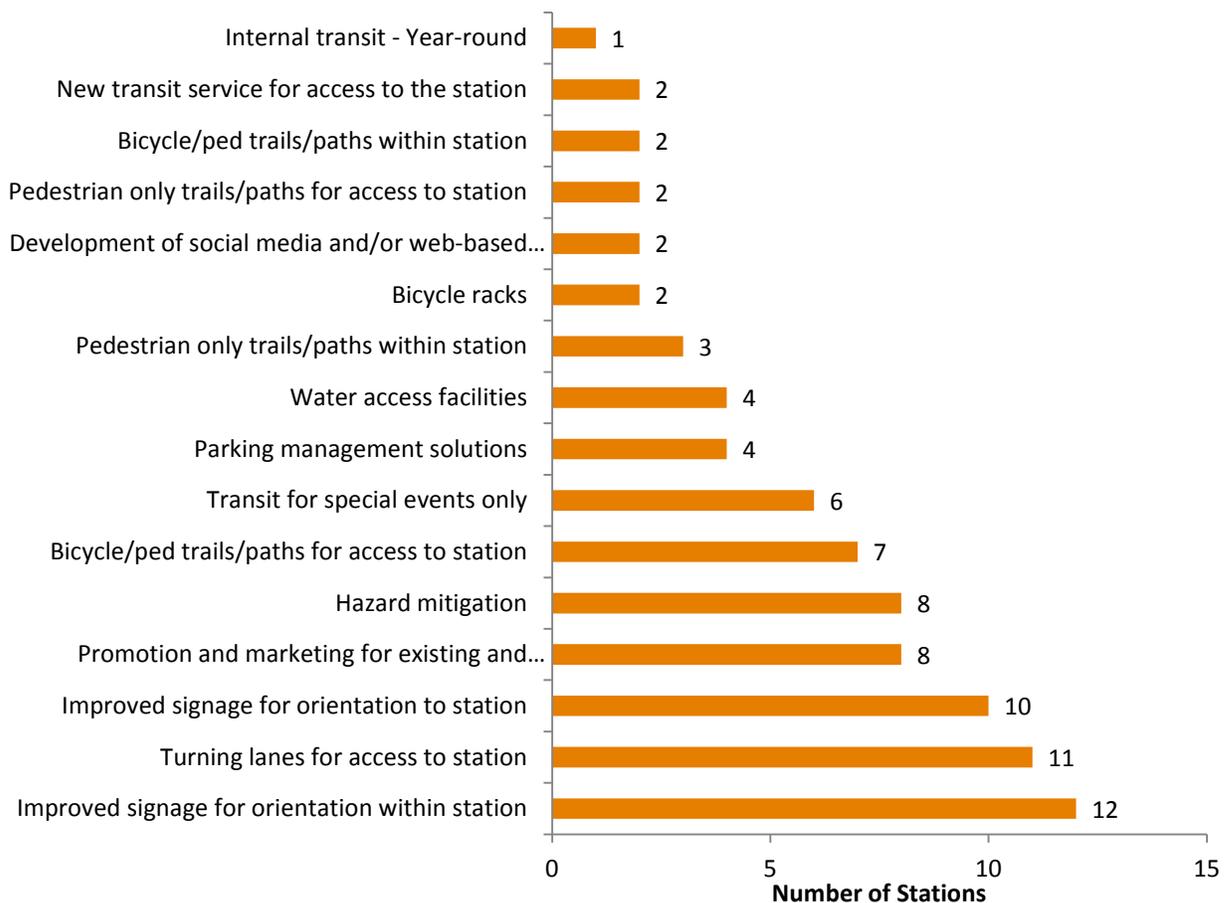


Transportation Improvements

Respondents were asked to select the transportation improvements that might improve current or planned visitor and/or natural resource/cultural resource programs. Figure 7 depicts the selections made by the station managers. Stations were most interested in improved signage to orient visitors to and within the station as well as turning lanes for access to the station. Better signage can help improve

the visitor experience and bring greater awareness of the National Wildlife Refuge System. Of the ATS-related transportation improvements, bicycle/pedestrian trails and paths for access to the station received the most interest (by seven stations). Those seven stations should be more closely examined to identify specific opportunities the stations could act upon. With more attention, the improvements in which the stations expressed interest could be implemented. Making these improvements could increase the awareness and use of ATS to and within stations. Transit for special events was the second most selected ATS-related improvement. Often stations can implement transit service during special events at minimal cost by working with partners. If stations are interested in pursuing this, staff can reach out to Friends Groups and local partners as well as other stations that have special event transit services to understand best ways to move forward.

Figure 7 Potential Transportation Improvements to Improve Visitor Programs (N=31)



Conclusion

The stations in Region 8 offer a variety of opportunities to improve ATS. While some stations are more isolated in rural areas and others are closer to dense population centers, ATS can be improved and expanded across the region. It is just as important to for rural stations to partner with nearby transit systems, especially for special events or peak visitation days, as they are often small and could use extra support. From adopting a transit system for special events to improving connections to regional trails to providing safe bicycle/pedestrian mobility within a unit, ATS can serve many purposes and solve an array of problems for stations within Region 8.

Section 5: Underserved Populations Analysis

A high priority for FWS and Region 8 is to make refuges and hatcheries accessible to all populations and to encourage and increase the visitation of populations that currently do not visit stations. Due to the often remote nature of FWS stations, it can be challenging for underserved populations to easily access stations as they are less likely to own a personal vehicle. In many cases, expansion of ATS can improve a station's accessibility to low-income, low-car ownership, and minority populations by increasing the number of transportation modes available. As previously mentioned, Region 8 has several stations located near highly urbanized and diverse areas; therefore there is significant potential to examine how ATS can improve several stations' accessibility.

The Region 8 RATE team selected three metropolitan areas to study for the underserved populations analysis. Las Vegas, Nevada; San Diego, California; and San Francisco, California were selected due to their high concentrations of low-income, minority, and carless populations as well as for their proximity to FWS units. By closely examining the ATS opportunities available in these areas, FWS can better understand how to improve these connections for underserved populations.

The Volpe Center overlaid demographic data with transportation networks and refuge locations to create a "need index" map for each region that shows the location of refuges in relation to underserved populations and to show how alternative transportation can be used to reach these groups. The index scores in these maps are derived from the process used for CAR-LESS California. Similar to the purpose of RATE's underserved analyses performed in other FWS Regions across the country, the Pacific Southwest Region of the U.S. Forest Service initiated CAR-LESS California in 2010 and worked with multiple Federal and State partners (including the FWS) to identify underserved populations and connect them via alternative transportation to Federal land destinations.³ The scores and weighting (in parentheses) of demographic factors used by CAR-LESS California as well as this effort are listed below.

- Median household income (35 percent):⁴
 - Less than \$22,314 = 4
 - \$22,314 to \$39,556 = 3
 - \$39,556 to \$49,445 = 2
 - Greater than \$49,445 = 1
- Percentage of nonwhite households (25 percent):
 - Greater than 67% = 4
 - 49% to 67% = 3
 - 34% to 49% = 2
 - 19% to 34% = 1
 - Less than 19% = 0
- Number of vehicles per household (20 percent):
 - Fewer than 1 = 4
 - 1 to 1.5 = 3

³ More information on CAR-LESS California can be found here: [USFS CAR-LESS Website](#)

⁴ Median Household Income population segments are based on the following thresholds: \$22,314, the 2011 National Poverty Level for a family of four; \$39,556, 80% of the 2008-2012 U.S. Median Household Income; and \$49,445, the 2008-2012 U.S. Median Household Income.

- 1.5 to 2 = 2
- More than 2 = 1
- Food stamp recipients (20 percent):
 - Greater than 25% = 4
 - 15% to 25% = 3
 - 9% to 15% = 2
 - 4% to 9% = 1
 - Less than 4% = 0

The Volpe Center selected the 2012 American Community Survey at the block group level to best balance timeliness of data with high geographic resolution; CAR-LESS California also used data at the block group level but used data from 2010. The demographic data is displayed on maps beneath layers showing refuge locations, interstates and major highways, bicycle and multi-use trails, transit, and major bodies of water. These layers are available online or by request from a variety of academic and non-profit organizations and local governments.

Las Vegas, Nevada

Nevada has experienced a 35 percent growth in population from 2000 to 2010 (Table 1). Looking specifically at the Las Vegas-Henderson-Paradise metropolitan area, there was a 41.8 percent growth during the same time period.⁵ With a population approaching two million in 2010, the national wildlife refuges surrounding the Las Vegas area have to consider what implications this significant local population growth has and will have on station management. Desert NWR Complex, comprised of Desert, Ash Meadows, Pahrnagat, and Moapa NWRs, has an opportunity to reach a growing and diverse audience but easy and convenient alternative transportation to the stations is currently a barrier.

In looking at the “Need Index” maps in Figure 8 and Figure 9, it is clear that no direct transit link exists near any of the three refuges in the complex. Transit service in Las Vegas is primarily focused around the downtown and bus routes are dense in the city center, which is also around the city’s highest “need” populations. While the refuges may be located too far away from the city center to establish a transit route with an existing service, outreach to school groups and other nature education organizations may increase group visitation for some underserved populations.

There are direct bicycle links to Desert NWR’s southern boundary; however, there is no internal refuge trail connection to those links nor is there a visitor contact station near that edge of the boundary. The refuge may want to explore options to add a trail and entry way connecting to those bicycle paths near the refuge boundary. Additionally, interpretive and boundary signs along the path will spread awareness about the refuge and the surrounding sensitive environment. The maps make it clear that the “high need” populations in Las Vegas would experience difficulty in trying to access the refuges without a car. Desert NWR has an opportunity with active transportation and may want to explore options there by working with bicycling and education groups. More specific station recommendations are made in the case study section for Desert and Ash Meadows NWRs.

⁵ [U.S. 2010 Census Data](#)

Figure 8 High need index populations in the greater Las Vegas-Henderson-Paradise region

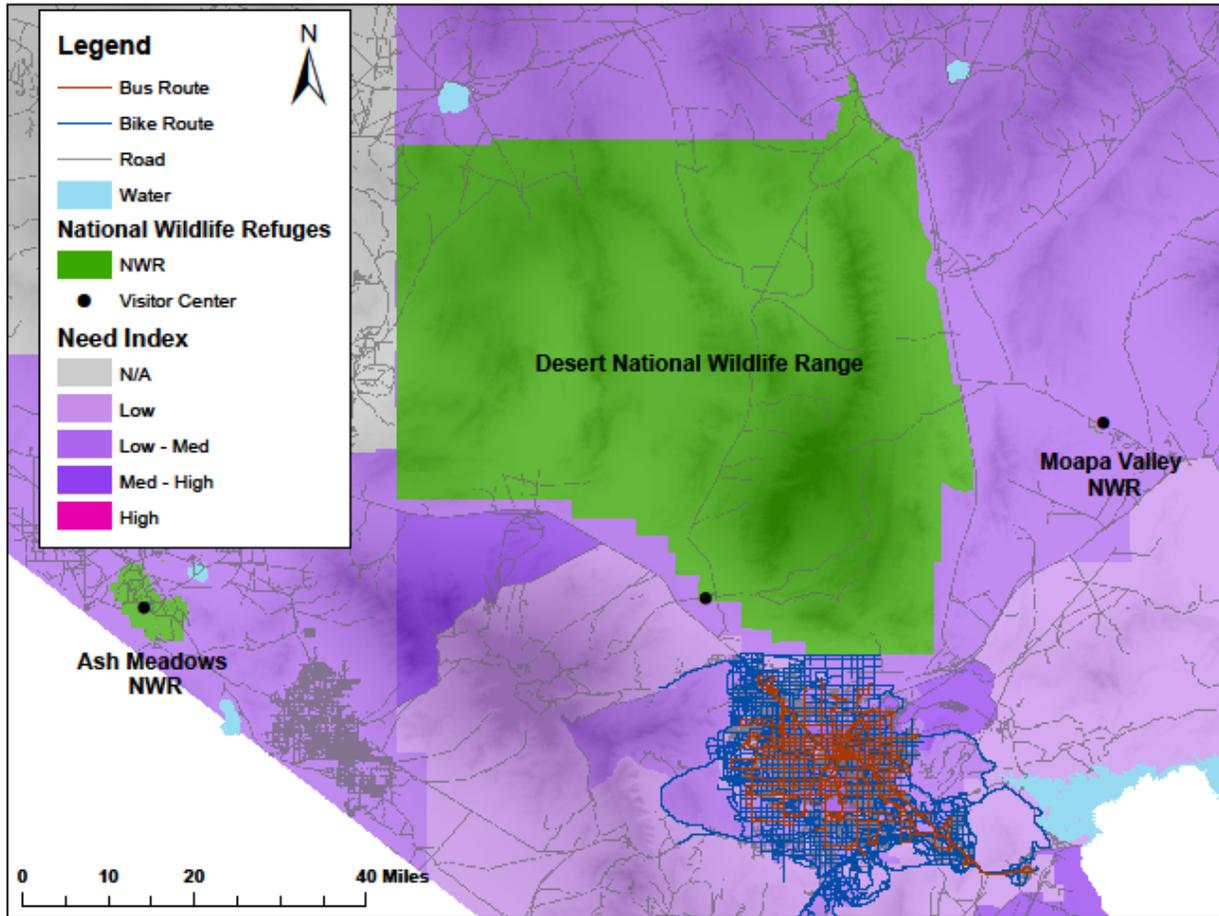
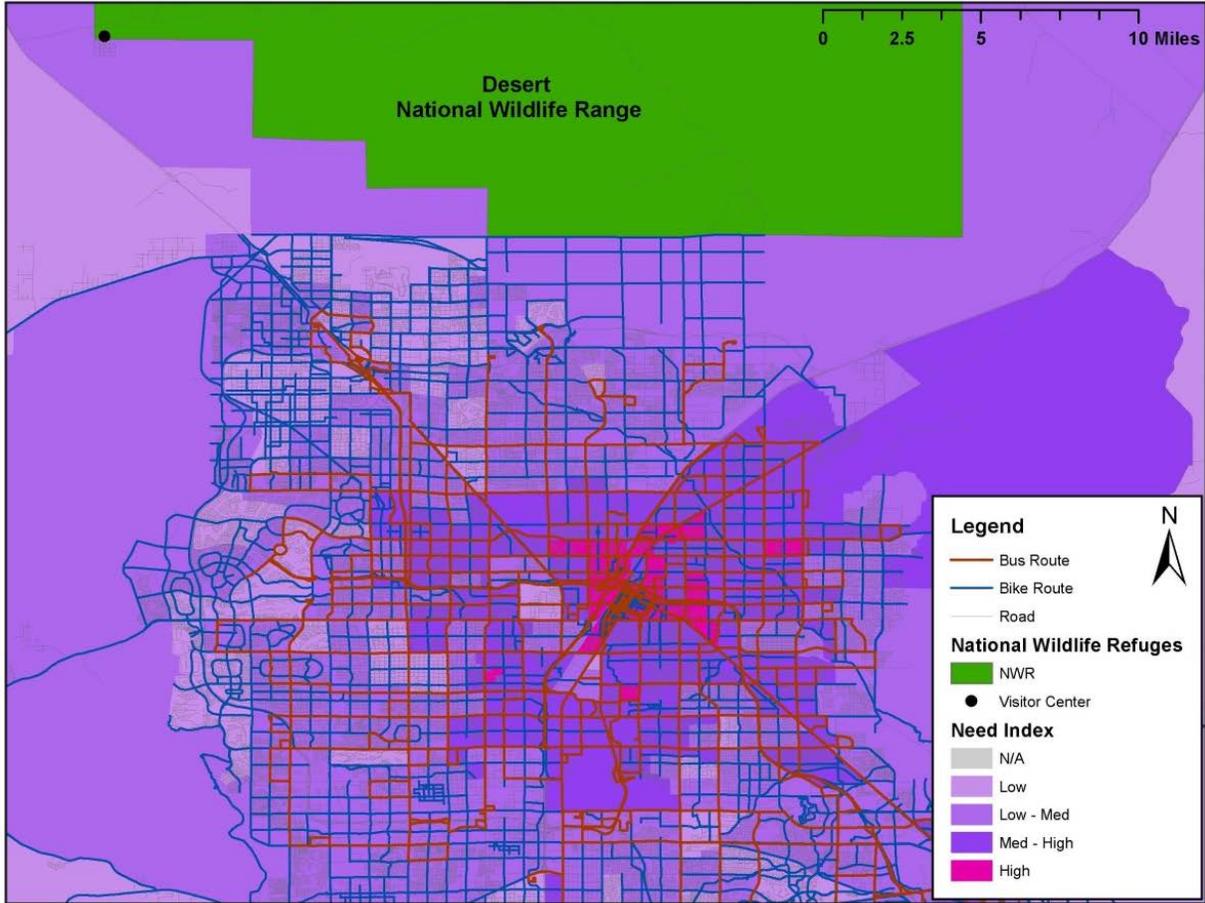


Figure 9 High need index populations focused on the Las Vegas metropolitan area



San Diego, California

San Diego metropolitan area has experienced significant growth in the 2000s. In 2000, the Census Bureau reported that San Diego-Carlsbad area had a population of 2.8 million and by 2010 it grew 10 percent to 3.1 million.⁶ With a large and growing neighboring population, the San Diego NWR Complex (NWRComplex), which includes San Diego Bay, Tijuana Slough, San Diego, and Seal Beach NWRs, has many opportunities to expand ATS to address underserved populations access. Since it is not located in San Diego County, Seal Beach NWR is not included in this analysis. Looking at the maps below (Figure 10 and Figure 11), it is clear that large “high need” populations live close to San Diego Bay NWR and Tijuana Slough NWR. Even more interestingly, there are viable ATS connections for each of the three stations within the complex being analyzed.

San Diego Bay NWR is comprised of two units, Sweetwater Marsh in the northern part of the refuge and South San Diego Bay unit in the southern part. The Sweetwater Marsh unit is situated in close proximity to the local light rail service known as the San Diego Trolley. The Sweetwater Marsh unit is in a unique situation in which private vehicle and non-motorized entrance is prohibited along the main entrance road and therefore a shuttle run by the Living Coast Discovery Center is the only way for visitors to access the refuge directly. Unfortunately, there is no visitor center at this location, but there is an environmental education classroom, plenty of interpretive signs, and some small trails for visitors to explore. The Living Coast shuttle pick up location is a short walking distance (less than 0.5 mile) from the E Street Blue Line stop. With this connection already established, spreading awareness to nearby underserved populations of the proximity to transit service should be a high priority. Just as there is already nearby transit access, a regional bicycle trail runs along the South San Diego Bay and Sweetwater Marsh units. The Bayshore Bikeway is a 24-mile popular biking trail, with 13 miles off-street, that runs from Coronado down through Imperial Beach and Chula Vista and back to downtown San Diego. Both Sweetwater Marsh and South San Diego Bay units in San Diego Bay NWR have bus routes than run nearby. Three different bus lines stop at the Blue Line trolley stop near the Sweetwater March unit: 704, 705, and 932. While bus access to the South Bay unit requires a longer walk or bicycle ride from the nearest bus stops, the closest lines are the 701, 704, and 712.

Underserved populations in the area can easily and conveniently access Tijuana Slough NWR, which also houses the refuge’s visitor center and trail connections. Tijuana Slough is directly connected to the California Coastal Trail and the City of Imperial Beach’s Ecoroute Bikeway, both of which connect to the Bayshore Bikeway. The refuge has bus transit close-by but it is not close enough from which to walk or, for many, to bike. From the Iris Avenue Trolley Station, which is on the Blue Line, it is 3.9 miles to the refuge visitor center. Bus lines 933 and 934 run very close to the entrance of the refuge, requiring only a 0.2 mile walk after the closest stop. Additionally, the 933 and 934 lines do stop at the Palm Avenue Trolley Station on the Blue Line, which could pick up visitors coming from further north in the city. The 901 bus line stops just under a mile from the refuge entrance. With these many bus options coming so close to the refuge, it is important for refuge staff to inform potential visitors of these options. Refuge staff has already begun to increase the visibility of these options for visitors planning trips the refuge by creating a brochure that highlights opportunities to access the refuge via transit.

Of the three stations being analyzed in the complex, San Diego NWR is situated a greater distance from underserved populations and has the fewest ATS options available within close proximity. Although there is no visitor contact station at the refuge, which hinders interpretation at the site, underserved populations can still enjoy the serenity of the refuge’s unique environment. The San Diego NWR has well-established regional trail connections with the Sweetwater River and Loop Trail. Many different

⁶ [U.S. 2010 Census Data](#)

local user groups enjoy these trails, such as mountain bikers, on-leash dog walkers, birders, and horseback riders to name a few. Currently no public transit access exists, but the refuge recently received Federal Lands Access Program funding to develop an access point off of State Route 94 at Millar Ranch Road. This access point will not only provide parking for vehicles, it will also provide a safe way for pedestrians and bicyclists to connect from nearby sidewalks, trails, and bus stops (for Route 94) to the refuge. In the future, the site may also have a visitor contact station. Other than this connection, the San Diego light rail system does not run far enough east to be close to the refuge, but there is a bus route along Interstate 94 that could potentially serve as an access mode. This possibility and others are discussed in greater detail in the Case Study section below. Additionally, in 2014 San Diego NWRC had a transportation scholar, a fellowship program for recent masters' graduates in a transportation field, who focused on exploring ATS connections and developed a multi-modal transportation plan for San Diego Bay, Tijuana Slough, and San Diego NWRs.

Figure 10 High need index populations in the greater San Diego-Carlsbad region

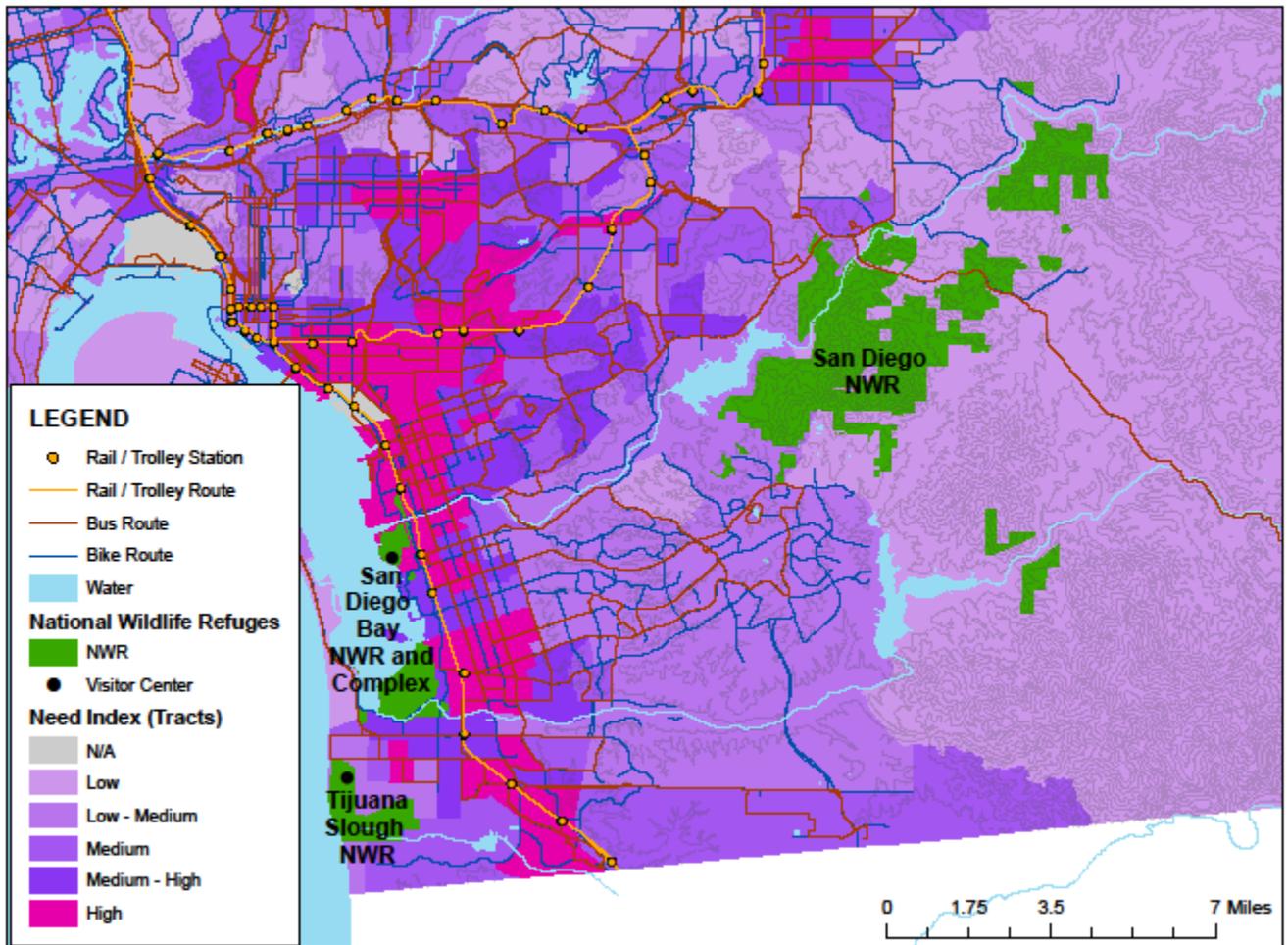
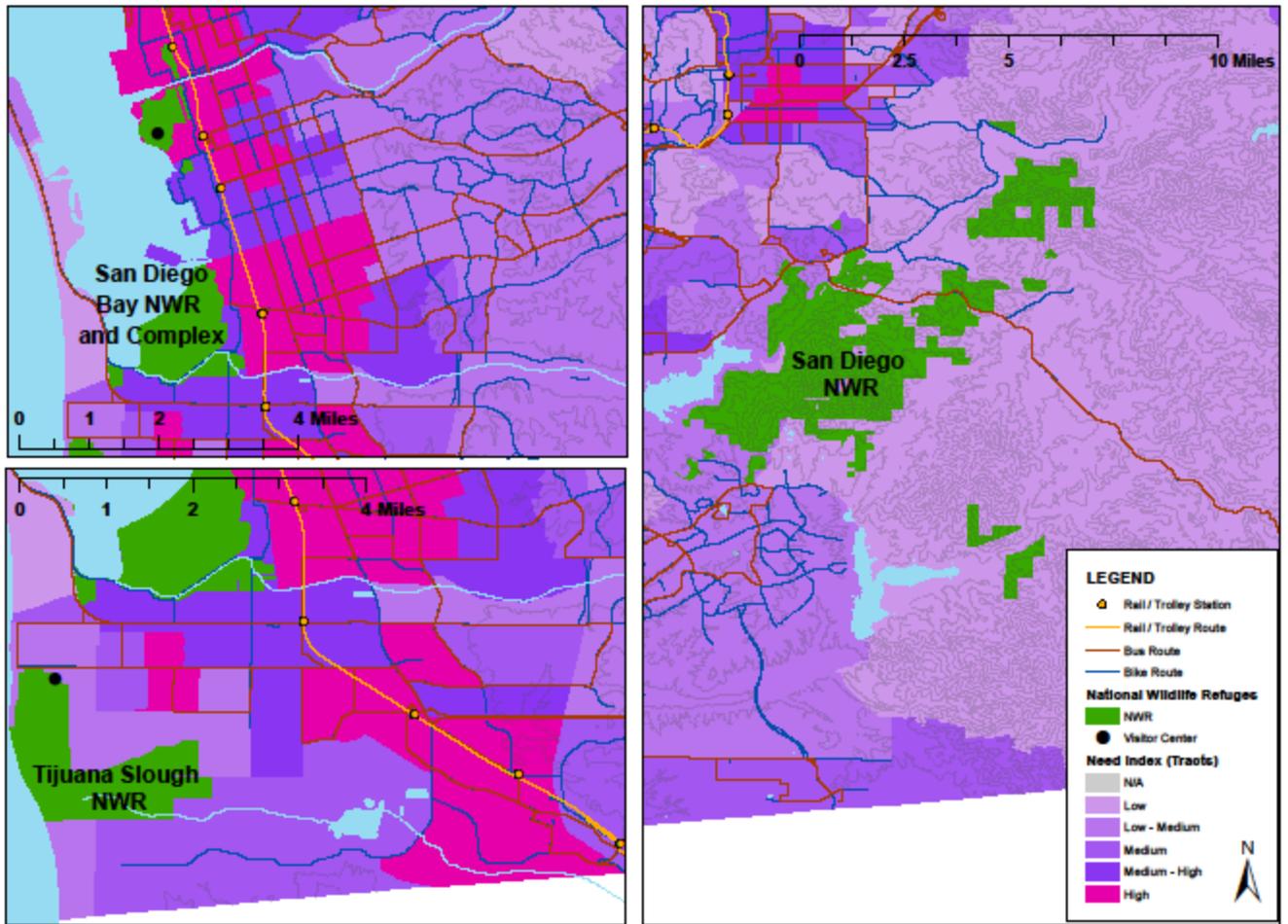


Figure 11 High need index populations zoomed to closer proximity to refuges



San Francisco, California

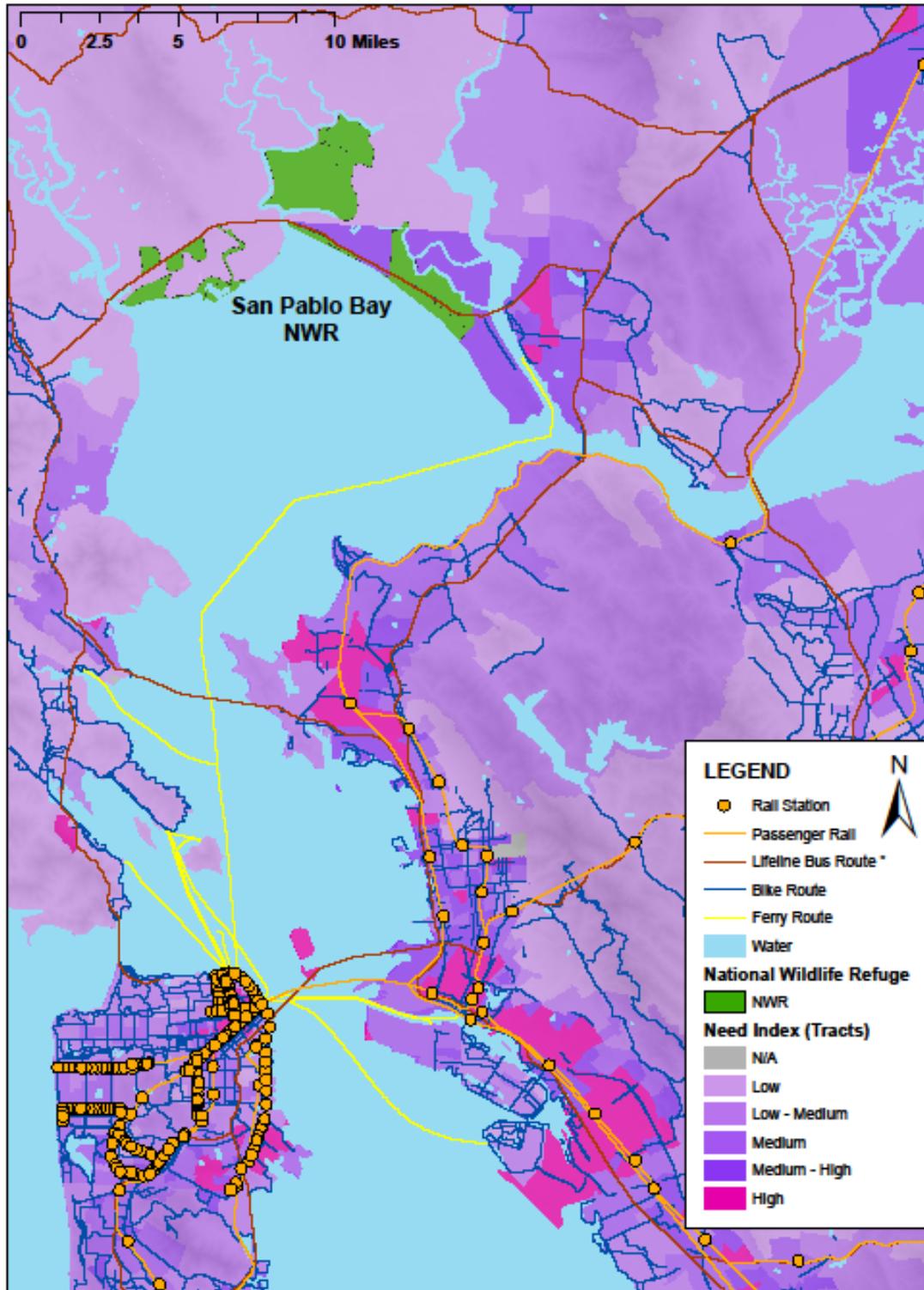
As one of the largest metropolitan areas in the country with 4.3 million residents, the San Francisco-Oakland-Hayward area has a large underserved population. With rising housing costs, many low-income residents have been forced to move outside of the city center. Looking at the maps below (Figure 12 and Figure 13), there are still some “high need” populations located within downtown San Francisco. However, high concentrations of “high need” populations are located throughout the bay area. San Francisco Bay NWR Complex has two units, Don Edwards San Francisco Bay NWR and San Pablo Bay NWR that are located close to some of these underserved populations. Figure 13 show the large extent of public transit available in the San Francisco Bay Area. With the Bay Area Rapid Transit (BART) light rail, San Francisco Bay ferry, and a Lifeline bus route run by San Francisco’s Metropolitan Planning Organization, Metropolitan Transportation Commission (MTC), the area provides many options and modes for underserved populations.

San Pablo Bay NWR is too far north of the city to be serviced by light rail; however, the MTC runs a Lifeline bus route through the refuge along Sears Point Road. It may be worth the refuge staff investigating this route and potentially propose adding a stop for the refuge. The Lifeline Transportation Program run by the MTC focuses on providing equitable access and expanding mobility for low-income communities⁷. According to the website, the Lifeline funding program selected projects from local transit authority submissions. Don Edwards San Francisco Bay NWR is also located near a Lifeline route. This may be an opportunity for the complex staff to reach out to the Sonoma County Transportation Authority to establish a Lifeline bus stop along the existing route at the refuge’s entrance or potentially even to the visitor center. San Pablo Bay NWR offers beautiful bicycling trails and is located near local bicycle paths. Those bicycle paths meet with Sears Point Road (Interstate 37) that runs through refuge land. Sears Point Road has bicycle lanes along the shoulder that are not well-protected. The refuge would benefit from further examination of this path and bicycle access.

Safely accessing Don Edwards San Francisco Bay NWR via public transit is a challenge but is easier by bicycle. The closest BART stop, the Fremont station on the Fremont-Richmond line, is five miles away from the refuge visitor center. From the station, a carless visitor would have to either walk or bike or use the 200 bus. Part of the non-motorized route is unprotected, meaning that there is no sidewalk for a mile of this walk. The 200 bus route takes visitors only within a mile of the visitor center, but still requires the visitor to walk on a section of the road that does not provide a sidewalk. Don Edwards San Francisco Bay NWR had a transportation scholar in 2012 and 2013 who explored options of extending a bus line to the refuge entrance. It is difficult for transit agencies to expand service, particularly on a route that may be used primarily for commuting rather than for recreation access. The refuge may want to explore other ways of partnering to add or extend a bus line into the refuge only on weekends. Don Edwards is connected to many bicycle paths. As discussed further in the Case Study section, Don Edwards experiences high commuter traffic on the Bay Trail, a regional trail that runs through refuge land. In order to increase underserved population use of this trail, refuge staff should work with the region and the State department of transportation to increase the safety of this regional trail.

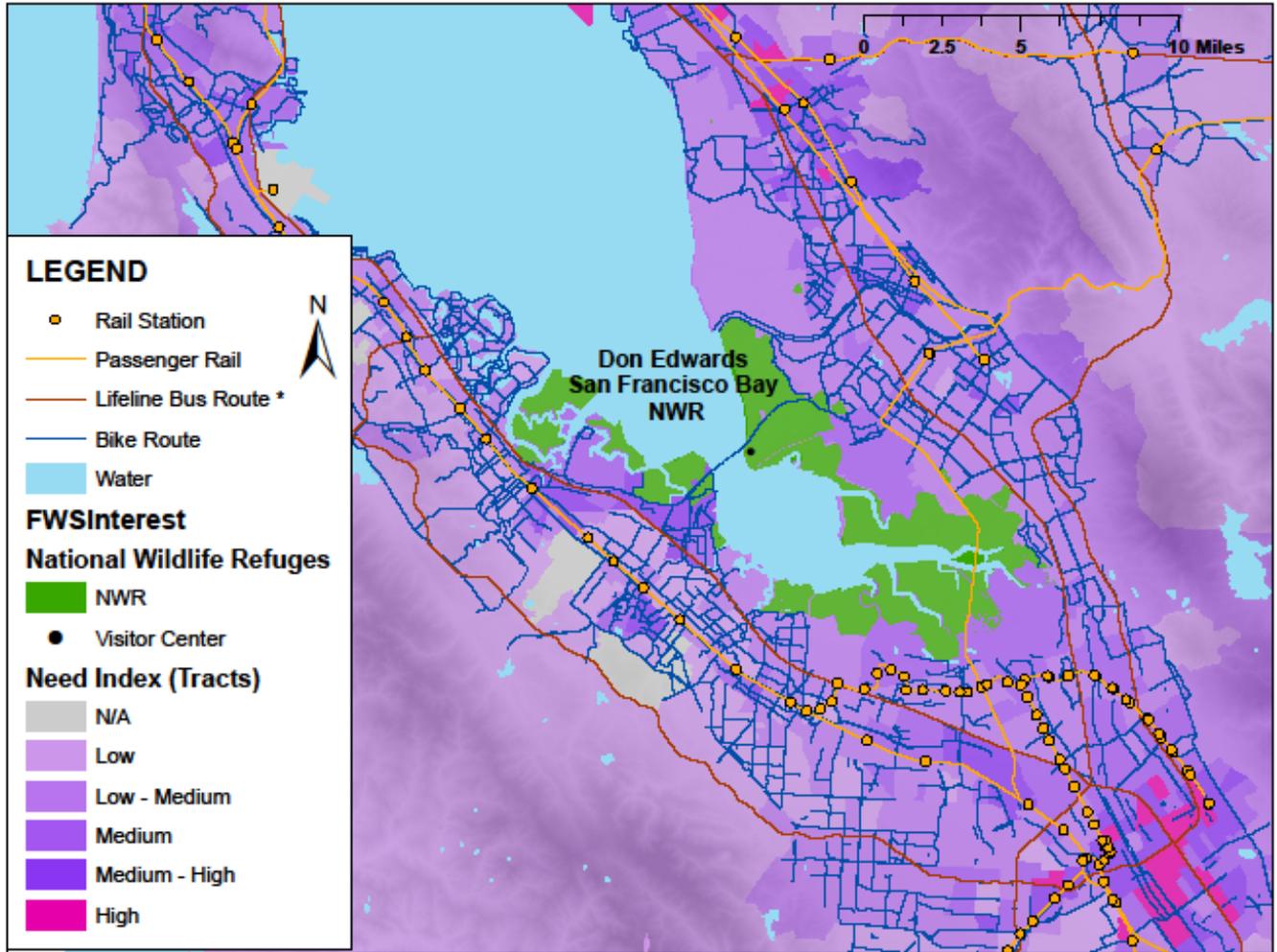
⁷ [MTC Lifeline Website](#)

Figure 12 High needs population index near San Pablo Bay NWR



* MTC's Lifeline Bus Routes "address mobility and accessibility needs in low-income communities."
 (Source: www.mtc.ca.gov/planning/lifeline/)

Figure 13 High needs population index focused on Don Edwards San Francisco Bay NWR

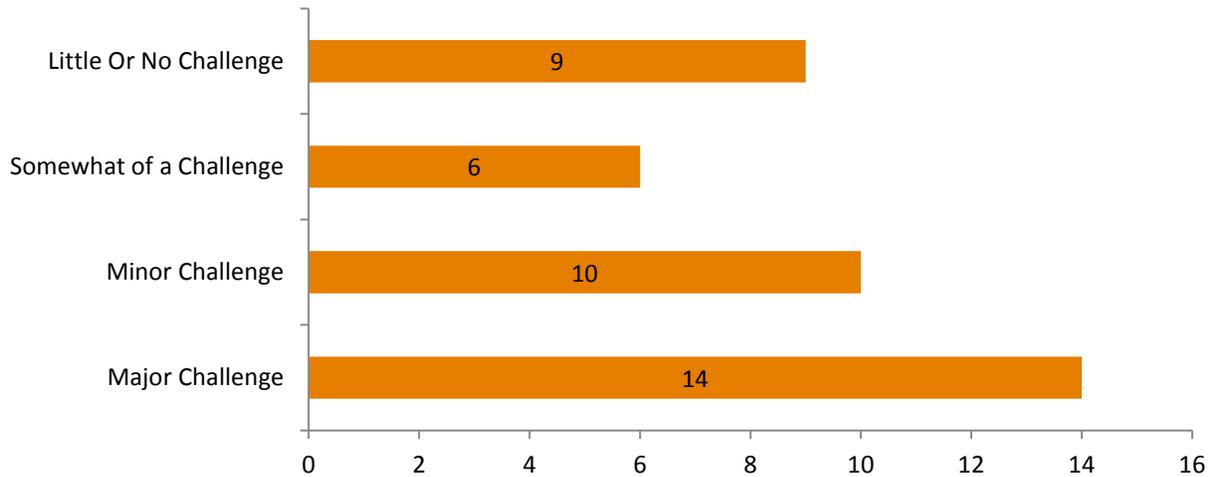


* MTC's Lifeline Bus Routes "address mobility and accessibility needs in low-income communities."
 (Source: www.mtc.ca.gov/planning/lifeline/)

Section 6: Funding Sources for ATS

One primary obstacle to integrating ATS, and more generally any transportation project, on public lands is the lack of funding. The questionnaire asked respondents to rate a list of transportation issues that affect their station. 36 percent of respondents (14 out of 39, as shown in Figure 14, below) said funding shortages were a major challenge for their station.

Figure 14 Rating of Funding Shortages as a Transportation Issue for the Stations (N=39)



With funding being a serious barrier for most stations, it is important to keep units informed of the funding opportunities available for ATS projects. The primary source of funding for transportation projects in Region 8 is the Federal Lands Transportation Program (FLTP). The Moving Ahead for Progress in the Twenty-First Century Act (MAP-21) was passed in 2012 and established FLTP as the main source of transportation funding for Federal public lands. Each region within FWS is allocated a small amount of FLTP funds and the regions typically allocate the funding by regional priorities. While ATS projects, such as transit capital costs, trail construction, and bicycle and pedestrian enhancements, are eligible for FLTP funds, higher priority road projects typically receive a high proportion of funding. Some road projects may be able to enhance ATS by including bicycle and pedestrian features alongside the road project. This aligns with the Complete Streets concept being supported by the Federal Highway Administration and, in some cases, States may have special funding allocations for Complete Streets projects. While dedicated Complete Streets funding does not exist, the California Department of Transportation (CalTrans) adopted a Complete Streets Implementation Plan and prioritizes projects that achieve Complete Streets goals. A similar initiative has occurred in Nevada with one of its metropolitan planning organizations (MPOs), Southern Nevada Regional Transportation Commission, adopting a Complete Streets Initiative in 2012. Additionally, some transit and trail projects may be a high regional priority and score higher in the regional project selection process, as depicted in Section 7.

MAP-21 authorized a second funding source that can be used for ATS projects. The Federal Lands Access Program (FLAP) provides funds to projects on routes owned or maintained by State or local governments that provide access to Federal lands. Administered jointly by FLH, State DOTs, and local governments, FLAP is a competitive funding program that requires the submittal of an application and a thorough review process. The specific application requirements and processes vary by State; more information can be found on the CFLHD website ([CLFHD FLAP webpage](#)). Due to the uncertainty of receiving FLAP funds annually, FLAP is not recommended to supplement transit operations and

maintenance costs, but rather to cover transit capital costs, trail improvements, and other one-time costs. Some of the transportation improvement-related responses noted in the questionnaire, such as turning lanes for access, bicycle and pedestrian trails and paths for access, transit access, and water access projects would be eligible for FLAP funds if the stations and local partners work together to submit applications.

In addition to the two Federal programs mentioned above, there are some State-administered funding programs that may assist in meeting ATS needs. Table 3 outlines the discretionary and grant programs that California, Nevada, and Oregon administer to recreation, environmental, and natural resource protection agencies. Working with local and State partners is critical for many of the State-administered programs, therefore it is important that stations continue to build relationships with other organizations and agencies to take advantage of these funding opportunities.

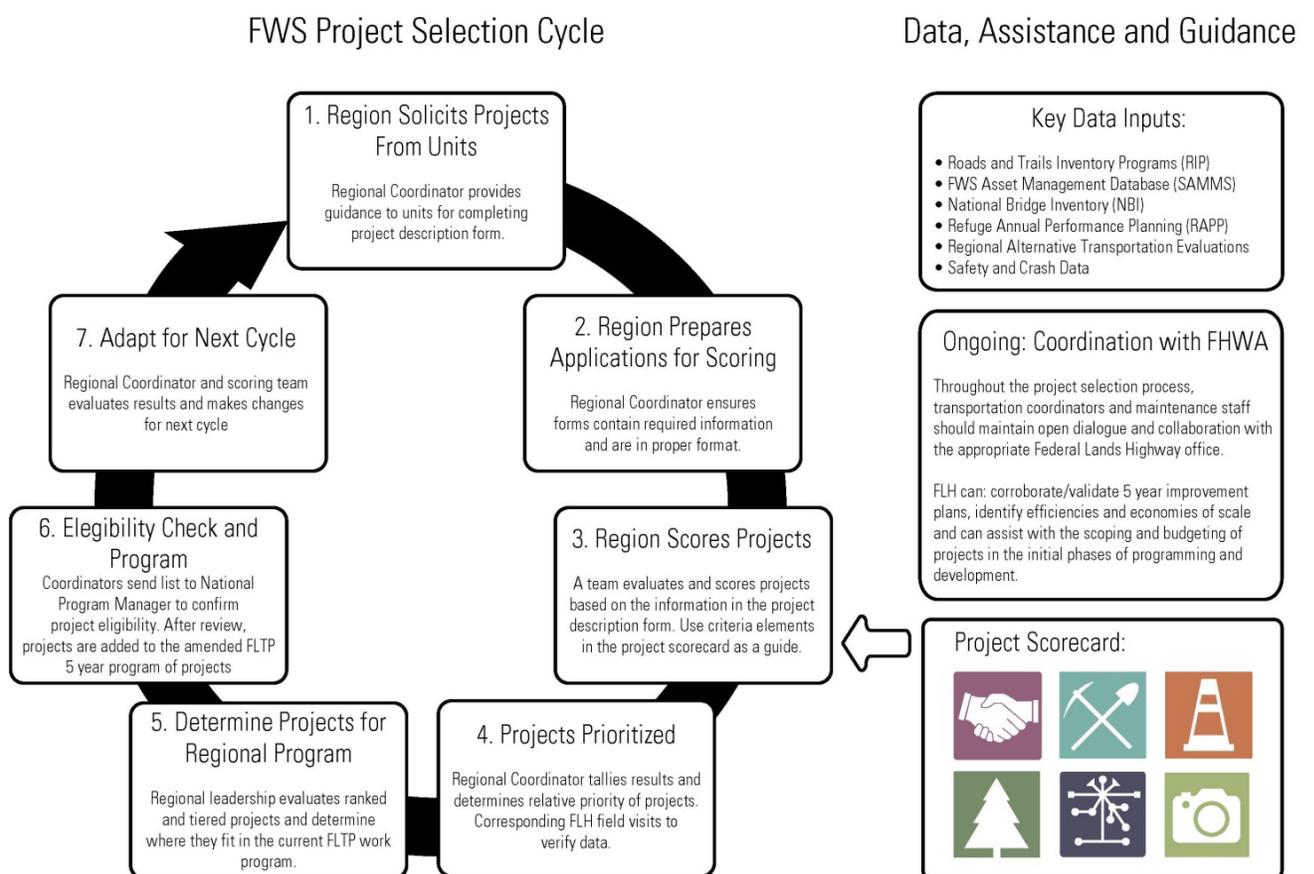
Table 3 State ATS Funding Opportunities

State	ATS Funding Sources	Transportation Alternatives Program Link
California	Environmental Enhancement and Mitigation Program Transportation Enhancement Program	Active Transportation Program (consolidates TAP and Bicycle Transportation Account programs)
Nevada	Funding Opportunities and Contacts (of relevance: Transportation Enhancements, Transit Programs, Recreational Trails Program, Bicycle and Pedestrian Programs)	Nevada DOT TAP webpage
Oregon	Transportation Enhancement Program Bicycle and Pedestrian Program Grants	Oregon DOT TAP Webpage

Section 7: Project Selection

As part of its National Long-Range Transportation Plan, the FWS is adopting a standard set of project selection criteria for FLTP funds to be adapted for use in each region. The standardized criteria and process are meant to link project selection to program goals, use data to drive decision-making, and contribute to a stable and predictable program of projects across the Service. The National plan outlines a seven-step project selection process that can be used and adapted at the regional level, as shown in Figure 15. While these steps may not display exactly how each region currently selects projects, within these steps there is room for the region to exercise flexibility, such as the format for submitting project ideas, the types of data submitted, the composition and methods of the team to score projects, and the management of the project selection process.

Figure 15 FWS Project Selection Process Outlined in the National LRTP (source: PLAN 2035)



The National LRTP outlines six strategic goal areas that will be used to score and select projects. Each region can adapt the scoring criteria within each goal area to serve the specific needs of the region. Each strategic goal area has linkages to ATS projects, as noted below:

1. **Coordinated Opportunities:** The Transportation Program will seek joint transportation opportunities that support the Service missions, maximize the utility of Service resources, and provide mutual benefits to the Service and external partners.
 - a. **ATS link:** Partnerships and multiple funding sources are especially critical for ATS projects, which often involve multiple types of stakeholders.
2. **Asset Management:** The program will operate and maintain a functional, financially sustainable and resilient transportation network to satisfy current and future land management needs in the face of a changing climate.
 - a. **ATS link:** The criterion signifies the priority on repairing existing trails, transit, and other ATS infrastructure before building new capacity.
3. **Safety:** The Service's transportation network will provide a superior level of safety for all users and all modes of transportation to and within FWS lands.
 - a. **ATS link:** This goal area mentions multimodal transportation safety, ensuring that projects offer safety for all users, this would include vulnerable users of pedestrians or bicycle modes.
4. **Environmental:** Transportation infrastructure will be landscape appropriate and play a key role in the improvement of environmental conditions in and around Service lands.
 - a. **ATS link:** ATS can enhance environmental conditions by removing vehicles and their potentially negative environmental impacts from roadways.
5. **Access, Mobility and Connectivity:** The Transportation Program will ensure that units open to the public have adequate transportation options for all users including underserved, underrepresented, and mobility limited populations.
 - a. **ATS link:** This goal area has the most direct connection to ATS by calling for more mode choice in station access, noting that alternative modes should be available to many users, effective, and high in quality.
6. **Visitor Experience:** The program will enhance the visitation experience through improvement and investment in the transportation network.
 - a. **ATS link:** This goal area focuses on programmatic objectives, such as environmental education and interpretation, which can be easily incorporated into transit and non-motorized projects with interpretive signage or tours.

Section 8: Case Studies

Desert National Wildlife Range

Station Background

Desert National Wildlife Range (Desert NWR) is located approximately 20 miles north of the edge of Las Vegas, Nevada, and adjacent to the National Parks Service's Tule Springs Fossil Beds National Monument. The station is located between two major US Highway Routes, 93 and 95, with access to the Visitor Center almost exclusively from multi-divided freeway US 95, which lacks turn lanes and acceleration/deceleration lanes to and from the refuge's entrance road. Desert NWR is the largest refuge outside of Alaska and is one of four refuges in the Desert NWR Complex. Due to its proximity to Las Vegas, Desert NWR is included in the Urban Refuge Program. The 1.6 million acre refuge was established in 1936 to provide and protect habitat for the desert bighorn sheep. In addition to housing diverse wildlife, Desert NWR was previously the home to Native American tribes and ranch homesteaders. With rich cultural and natural attractions, Desert NWR attracted 47,500 of visitors in 2015. The paving of the entrance road was completed in November 2015 and it is anticipated that, due to improved ease of access, visitation will noticeably increase.

Visitors are allowed to hike, camp, hunt, and observe wildlife, particularly the wide array of birds, on the refuge. Visitation peaks in the spring and fall for birding. A new visitor center, opened in December 2013, welcomes and orients visitors to the refuge Friday through Sunday. Additionally, one and a half miles of new accessible walking trails with interpretive panels were added. The trail system begins at the visitor center and provides many opportunities for visitors to learn more about the refuge, wildlife, and the history of the site. The refuge's [Comprehensive Conservation Plan \(CCP\)](#) was completed in 2009 and primarily focused on the construction of the new visitor center and the opportunities that will arise once it is finished.

Figure 16 Desert NWR's visitor center opened in December 2013
Source: Volpe Center



Highlighted RATE Questionnaire Responses

- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Paving Corn Creek Road will provide opportunities for many travelers to visit the refuge (RVs, motorcycles, bicycles, buses) that are unable or unwilling to travel on gravel road. *(Note: this was completed in November 2015)*
- What are the most significant transportation problems or needs currently facing your station? (Name up to three)

- Lack of staff (specifically wage-grade employees) to maintain roads for visitors and staff, and lack of visitor services staff to interact with the public
- Lack of connectivity for public transportation to/from Las Vegas
- Which of the following options may improve your current or planned visitor and/or natural resource/cultural resource programs (out of 16)?
 - Transit for special events only
 - Bicycle/pedestrian trails/paths for access to station
 - Turning lanes for access to station

Existing Alternative Transportation

Transit

Currently Desert NWR does not operate any alternative transportation systems. Most visitors visit Desert NWR with a personal private vehicle. The refuge staff noted that a very small percentage of visitors come in private transit such as school buses and other educational groups, such as home-schoolers. Beyond the main entrance road to the visitor center, interior roads on the refuge are native surface and primarily high clearance or 4-wheel drive accessible. The refuge staff expressed interest in establishing greater connectivity to Las Vegas. Public transit connections could be established from Las Vegas or private partnerships could bring tour groups onto the refuge from Las Vegas. Funding and staffing limitations would make it difficult for the refuge to establish its own transit system.

Non-Motorized Trails

There is limited non-motorized transportation access to and within the refuge. There are easy walking trails behind the visitor center and several hiking trails further in the interior of the refuge. Bicycle access into Desert NWR is limited strictly to mountain bikes on the existing roads. Corn Creek Road, the main entrance road to the refuge, was paved in 2015 and now includes wider shoulders for safer bicycle access. While refuge staff noted some ambitious bicyclists come to the refuge, they turn around once they reach the visitor center due to the inhospitable conditions of Mormon Well Road. With the greatly improved road conditions and wider shoulders, refuge staff have noted that bicyclists are using the road.

Partnerships

The refuge would like to expand awareness and connectivity to downtown Las Vegas. With only one visitor services staff for the entire four-refuge complex, it is challenging to accommodate many school groups. Desert NWR has a Friends Group as well as a group of volunteers who lead several educational programs and assist with staffing the visitor center on the weekends. The refuge works with several education groups such as Afternoon All-Stars and Families in Nature to bring children and parents to the refuge. In the past, Pink Jeep tours had a tour that included Desert NWR; however, this was discontinued. With the paving of Corn Creek Road, there may be increased interest in re-establishing this or other partnerships.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Bicycle Lane on Corn Creek Road	
Project Description	During the paving and striping of Corn Creek Road in 2015, add bicycle lanes or expand the width of the should to accommodate cyclists (<i>Note: completed widening of shoulders during 2015 paving project</i>)
Refuge Priority	Medium
Time Frame	Short term

Bicycle Lane on Corn Creek Road	
Dependencies	Funding availability; relatively inexpensive, but not part of original expenses of paving project
Potential Funding Sources	Federal Lands Transportation Program (FLTP) Federal Lands Access Program (FLAP) Refuge Operations and Maintenance budget
Partners	Nevada Department of Transportation (DOT)

Transit for Special Events	
Project Description	Transit for special events (Refuge Week events)
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability Volunteer and partner support
Potential Funding Sources	Concessionaire Friends Group donations Refuge Operations and Maintenance budget
Partners	Friends Group Private bus company Regional Transportation Commission of Southern Nevada (RTC)

Longer-Term (5 to 10 years)

Transit Connection to/from Las Vegas	
Project Description	Public and/or private transit connections to and from Las Vegas should be explored and implemented if found feasible and agreeable by partners.
Refuge Priority	High
Time Frame	Long term
Dependencies	Willingness of local transit agency (nearest transit service station is approximately 16 miles at the Centennial Hills Transit Center) Availability of funding Feasibility study – measuring demand for service
Potential Funding Sources	FLAP Transit agency funding Rider fees
Partners	Regional Transportation Commission of Southern Nevada (RTC)

Ash Meadows National Wildlife Refuge

Station Background

Ash Meadows NWR is also included in the Desert National Wildlife Refuge Complex. Located approximately 90 miles northwest of Las Vegas, Ash Meadows is located just along the Nevada-California border, near the city of Pahrump (population 36,441 as of the 2010 Census), NV, and Death Valley National Park. Ash Meadows NWR is a desert oasis and, due to its uniqueness, is recognized as a wetland of international importance. The refuge experiences higher levels of visitation during the summer and winter months for a total annual visitation in 2014 of 72,508. It shares many of its visitors with Death Valley National Park. A new visitor center opened in January 2015, and annual visitation rose the following year by over 70 percent to 125,163 total visitors in 2015. It is expected that visitation will further increase as the new visitor center attracts more environmental education groups. Unfortunately, limited staffing as well as the rural location of the refuge restricts the amount of outreach to local community groups.

The refuge's CCP did not include any alternative transportation recommendations as most of it focused on the implications of the new visitor center. Parsons Brinckerhoff performed a transportation study in 2010 and primarily examined road safety. The study recommended road infrastructure improvements that would increase motorized vehicle safety within the refuge. The refuge marked at-grade railroad crossings as a major challenge on-site as well.

Highlighted RATE Questionnaire Responses

- Please rate how the following transportation issues affect your station:
 - Staffing capacity shortages to deal with transportation issues – major challenge
 - Funding shortages (including fee collection) – major challenge
 - Condition of existing roads (internal) – major challenge
 - At-grade railroad crossings (interactions with other travel modes) – major challenge
- Which of the following may improve your current or planned visitor and/or natural resource and/or cultural resource programs?
 - Bicycle/pedestrian trails/paths within station
 - Turning lanes for access to station
 - Hazard mitigation
- Are you anticipating major changes that will affect your visitation and access?
 - Yes; new visitor center

Existing Alternative Transportation

Transit

Currently, the refuge does not have any close transit station or stop or provide any internal transit opportunities. Due to its rural location, transit connection options are limited. Some private tour groups visit the refuge as part of a Death Valley tour package and, according to refuge staff, more frequently tour group participants are requesting a stop at Ash Meadows. The refuge is interested in expanding these private services and working more closely with tour groups to increase service to the station from Las Vegas and Pahrump. The refuge did express interest in an internal van service during special events and peak visitation days to take visitors around the refuge with the visitor center being the starting point. Refuge staff mentioned that trailheads are too far apart to walk to and therefore a van service to the different trailheads would ease congestion on the road as well as degradation of the condition of the road.

Non-Motorized Transportation

Ash Meadows NWR has approximately 1.7 miles worth of boardwalks within the refuge. While bicycling is allowed on refuge roads, the station is looking to improve bicyclist amenities such as providing more bicycle racks at various stopping points within the refuge. The refuge is located away from a population center so visitors are not able to easily access the refuge by walking or bicycling, therefore the refuge is concentrating on accommodating visitors who want to come to the refuge and bicycle. This effort may encourage more frequent visitors from the local community.

Partnerships

The refuge has established several partnerships, one of the most significant being with the Death Valley Natural History Association (DVNHA). Through this partnership, the refuge has expanded its outreach and marketing to visitors at Death Valley National Park. Additionally, the refuge, DVNHA, and the Southern Nye County Conservation District worked together to help bring third grader school groups to the refuge through an environmental education program called Ed-Ventures. Refuge staff is currently working to find stable funding sources for bussing. The refuge also has a relationship with the Amargosa Tourism Authority, a neighboring city, and the organization approached the refuge to improve road infrastructure leading to the refuge as well as other areas in Nye County. This could be a potential Federal Lands Access Program (FLAP) application, which allows States or localities to apply for transportation project funding for facilities it owns or maintains that provide access to Federal lands.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Add Bicycle Racks to Trailheads	
Project Description	Bicycle racks can be added to trailheads and other visitor destination locations to accommodate the use of bicycles on the refuge.
Refuge Priority	High
Time Frame	Short term
Dependencies	
Potential Funding Sources	Refuge Operations and Maintenance budget Donations
Partners	Friends Group

Re-pave State Route 373 to Visitor Center Road FLAP Application	
Project Description	With the construction of the new visitor center, the refuge is looking to re-pave the access road. Nevada DOT maintains this route and therefore it is eligible to apply for FLAP funding.
Refuge Priority	High
Time Frame	Short term
Dependencies	Application pool
Potential Funding Sources	N/A
Partners	Nevada Department of Transportation (DOT)

Transit for Special Events and Peak Weekends	
Project Description	Refuge staff expressed interest in a van or small shuttle to take visitors around the refuge during peak weekends and/or special events. This would alleviate some degradation and congestion on the roads.

Transit for Special Events and Peak Weekends	
Refuge Priority	Medium
Time Frame	Short term
Dependencies	Funding availability; staff time
Potential Funding Sources	Federal Lands Transportation Program (FLTP) Refuge Operations and Maintenance budget
Partners	Friends Group DVNHA

Tour Connection from Las Vegas	
Project Description	Private tour companies can run a day-long tour to Ash Meadows NWR and Death Valley National Park from Las Vegas.
Refuge Priority	Medium
Time Frame	Medium term
Dependencies	Funding availability; partnerships
Potential Funding Sources	Federal Lands Transportation Program (FLTP) Donations
Partners	Local tour companies Environmental groups

Stone Lakes National Wildlife Refuge

Station Background

2014 is the 20-year anniversary of Stone Lakes National Wildlife Refuge (Stone Lakes NWR). The refuge began as a grassroots effort to preserve the land between South and North Lakes to protect native grassland and to act a floodplain for the neighboring areas. For this reason, the Stone Lakes NWR has diverse land ownership with only 36 percent on the land within the refuge boundary owned and maintained by the Fish and Wildlife Service. Although a young refuge, it has become an educational and recreational asset for the surrounding community. Stone Lakes NWR is located near Elk Grove (population approximately 160,000 in 2014), California, and meets the Urban Refuge Program requirements.

In 2011 the refuge opened a visitor contact station that is open Monday through Friday from 7:30 AM to 4:00 PM year round. Surrounding the visitor contact station is a “Blue Heron” system of 1-mile paved and handicap-accessible trails that includes a large amphitheater and interpretive signage. While the refuge is not entirely open to the public, visitor services staff and volunteers run popular interpretive and recreational programs around the refuge such as birding, canoeing, and kayaking tours. These tours are very well-attended throughout the year.

Due to the refuge’s location along Interstate 5, the visitor contact station parking lot is often used as a rest area as it has public restroom facilities. While the refuge’s [CCP](#), published in 2007, recommends expanding public access opportunities, the refuge does not have law enforcement staff or the visitor services staffing capacity to accommodate increased visitation.

Figure 17 Trail in Stone Lakes NWR Source: Volpe Center



Highlighted RATE Questionnaire Responses

- How far from your station is the nearest transit service, such as a local or inter-city bus stop or Amtrak station?
 - 1 to 3 miles
- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Increased funding for buses for school children
- Which of the following may improve your current or planned visitor and/or natural resource/cultural resource programs?
 - Pedestrian only trails/paths within station
 - Bicycle/pedestrian trails/paths for access to station
 - Water access facilities
 - Turning lanes for access to station

Existing Alternative Transportation

Transit

The refuge does not operate any transit systems nor is it connected to public transit. A City of Elk Grove E-Tran bus stop and Amtrak station are located on the other side of I-5 on Franklin Boulevard less than

three miles from the visitor contact station. This proximity represents an opportunity to establish a public transit connection to the refuge. Refuge staff expressed interest in acquiring a small shuttle to provide interpretive tours for administrative reasons. Additionally, staff noted wanting to expand water access and the potential for interpretive boat tours within the refuge.

Non-Motorized Trails

The Blue Heron trails next to the visitor contact station are the only trails open to the public on the refuge. Due to the sensitive landscape and lack of law enforcement, other trails are not open except during hunting season or during guided tours. Bicyclist groups ride on the road (Hood Franklin Road) around the refuge on weekends. Bicyclist safety is an issue for the refuge due to the high speeds of trucks and other traffic off I-5. Refuge staff has advocated for lowering the speed limit and adding bike lanes or expanded shoulder space to accommodate bicyclists on Hood Franklin Road, which serves as the entrance road to the visitor contact station and parking lot. The refuge has an opportunity to expand bicycle access with the City of Elk Grove’s Bicycle Plan, which includes a bicycle trail that reaches the refuge border.

Partnerships

The refuge maintains a robust school group program, with approximately 2,000-3,000 students visiting annually between November and May. Unfortunately, the Ride to Refuge funding program that provided financial assistance to school districts for bus fees ended after fiscal year 2014 due to budget cuts. However, the refuge friends group established an agreement with the Elk Grove Unified School district that provides teachers with grant funds to pay for transportation to the refuge. The average cost for a bus ranges from \$200-500 depending on the length and duration of the trip.

The Friends of Stone Lakes NWR is currently trying to fundraise for a variety of programs and needs, including the Ride to the Refuge program. It is a well-funded organization and assists with several events on the refuge, such as the Nature Bowl, Walk on the Wildside Outdoor Festival, and kayaking and canoeing tours.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Expansion of Safe Bicycle Access	
Project Description	Addition of bike lanes or expanded shoulder on Hood Franklin Road.
Refuge Priority	High
Time Frame	Short term, depending on funding
Dependencies	Funding availability Partner support
Potential Funding Sources	FLAP
Partners	City of Elk Grove

Boat Tours	
Project Description	A flat-bottomed boat, such as a pontoon, could be used to give interpretive water tours of the refuge to visitors.
Refuge Priority	High
Time Frame	Short term, depending on funding
Dependencies	Funding availability Partner and volunteer support Purchase or concession of boat services

Boat Tours	
Potential Funding Sources	Rider fee Concessionaire
Partners	Friends group Concessionaire

Long-Term (5-10 years)

Public Transit Connection	
Project Description	Establish a public transit connection with local transit service at Franklin Boulevard
Refuge Priority	Medium
Time Frame	Long term
Dependencies	Expanding public access of refuge Funding availability
Potential Funding Sources	FLAP Transit agency funding
Partners	E-Tran (City of Elk Grove transit service)

Sacramento National Wildlife Refuge Complex

Complex Background

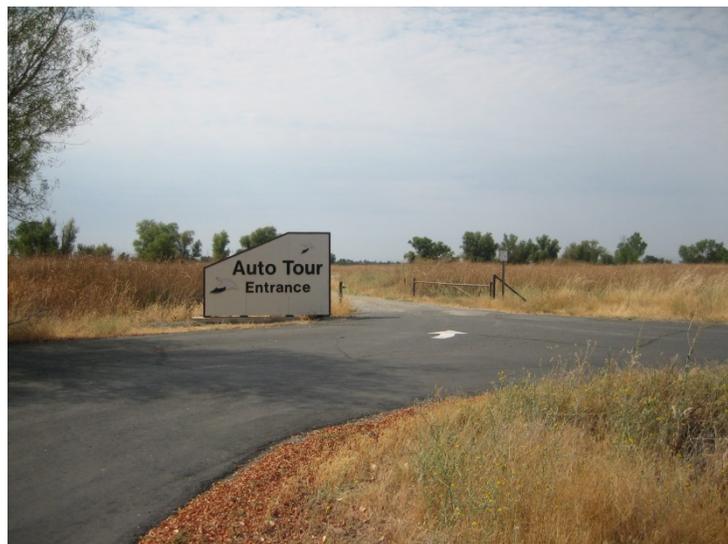
The Sacramento National Wildlife Refuge Complex (Sacramento NWRC) is comprised of Sacramento, Delevan, Colusa, Sutter, and Sacramento River National Wildlife Refuges (NWRs) and three wildlife management areas. For the purpose of the RATE, Sacramento and Colusa NWRs are the primary focus of the case study. The Sacramento, Delevan, Colusa, and Sutter NWRs are included in the complex's [CCP](#), which was released in 2009 with little mention of transportation except for the expansion of bicycle access.

Sacramento NWR

The Sacramento NWR is where the complex's headquarters and visitor center are currently located. Its visitation was 73,759 in 2015. The refuge is located about 70 miles north of Sacramento (population estimated to be 485,199 within the city proper in 2014, and 2.4 million in the Sacramento metropolitan area), 38 miles south of Chico (population 86,187 during the 2010 Census) and six miles south of Willows (population 6,166 during the 2010 Census), CA. FWS established Sacramento NWR in 1937 to provide and manage habitat for migratory birds as well as other wildlife. The visitor center, which primarily functions as administrative offices with a small visitor contact area, is open daily from 9 AM to 4 PM November through February and only on weekdays the rest of the year. A new visitor center at Sacramento NWR is a top priority for Region 8 and a high priority nationally.

A popular six-mile auto tour route takes visitors around the wetlands where up to 750,000 ducks and 200,000 geese may be seen between November and January. Waterfowl viewing is good from October to March with highest numbers typically November through January. Due to the wintering birds, visitation is very high in the winter months (from November to February). The Snow Goose Festival is a large refuge event that brings many visitors in January. Local groups plan other special events involving Sacramento NWR, as well as other stations, that attract visitors, but are typically during the same winter months. The refuge would like to try to increase visitation during other seasons.

Figure 18 Sacramento NWR's entrance to the Auto Tour Route
Source: Volpe Center



Colusa NWR

FWS established Colusa NWR in 1945 to serve as a breeding area for migratory birds as well as to mitigate the damage to surrounding agricultural crops by the migrating waterfowl. The refuge received 36,724 visitors in 2015. It is a well-liked birding spot, but does not have a visitor contact station. The refuge has a small parking lot, auto tour route, and birding overlook. Although there are limited facilities, the station is growing in popularity. With its main entrance located off of Highway 20 (which is two lanes with very limited shoulder room atop a levee), there are safety issues turning in and out of the refuge due to the high speeds of trucks and commuter traffic.

Highlighted RATE Questionnaire Responses

Sacramento NWR

- How far (in miles) is the nearest transportation hub? A transportation hub is a town or other populated area that provides basic services (such as a gas station/service center, restaurant, and/or inter-city bus stop).
 - 6 miles
- Which of the following may improve your current or planned visitor and/or natural resource/cultural resource programs?
 - Internal transit – seasonal
 - New transit service for access to station
 - Bicycle/pedestrian trails/paths for access to station
 - Promotion and marketing for existing and potential alternative transportation system
 - Turning lanes for access to station
 - Parking management solutions
 - Hazard mitigation (highest priority)

Colusa NWR

- How far (in miles) is the nearest transportation hub? A transportation hub is a town or other populated area that provides basic services (such as a gas station/service center, restaurant, and/or inter-city bus stop).
 - 2 miles
- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Bikes
- Please rate how the following transportation issues affect your station:
 - Funding shortages (including fee collection) – Major Challenge
 - Unsafe road conditions surrounding station – Major Challenge
- What are the most significant transportation problems or needs currently facing your station? (name up to three)
 - Ingress from Highway 20 to O’Hair Road
 - Single lane bridge auto tour route at 2047 Drain Bridge
 - Narrow two-way traffic portion of auto tour route

Existing Alternative Transportation

Transit

In 2013, the Sacramento NWR received a six-passenger open-air electric tram as part of a FWS national clean energy pilot project. The refuge seasonally offers two-hour long tram tours one to two times a week led by volunteers. The tours have proven to be very popular. Refuge staff also led photography tours along the auto tour route as well as around different units in a 12-passenger van. The refuge staff noted that visitors enjoy the open-air aspect of the tram and would like to expand the tours. Additionally, a street legal vehicle that has greater window space or is open-air would greatly improve the photography tour experience. With the many separate refuge units in the area, a street legal shuttle is required to transport visitors around the area for more inclusive tours.

Figure 19 FWS van used for Sacramento NWR photography tours Source: Volpe Center



Non-Motorized Trails

Sacramento NWR has two walking trails (Wetland Walk is two miles long and Logan Creek Trail is six miles long) that allow visitors access to the marshes and riparian lands. Bicycling is allowed in a few designated areas within the entire complex. Colusa NWR allows bicycling on the Auto Tour route from May through August. Due to safety issues, including high traffic speeds, and the lack of designated bike lanes along Highway 20 leading to the refuge entrance, it is currently difficult to bicycle to the refuge.

Partnerships

The Complex has well-established partnerships with the surrounding communities. Over 2,000 students, elementary school to university aged, come to visit refuge units in a given year. There are three neighboring school districts and several nearby universities that participate in environmental education programs at the refuge. Unfortunately, funding is limited for schools to come out to the stations and some school groups that are interested cannot afford the cost of transportation required to make the field trip.

Sacramento NWR's Friends Group is now considered a Cooperative Association under recently enacted Friends rules. Many of the members are from Chico, which limits their consistent involvement on the refuge due to the 45 minute-long drive. The refuge said there is interest in trying to get more local involvement from Willows and establishing a visitor contact station at the Pine Creek unit of Sacramento River NWR since it is much closer to Chico. Other local partners include the Northern California Water Association and Butte County Chamber of Commerce, both of which hold events that bring tours to different Complex units.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Electric Tram Expansion	
Project Description	Either an additional electric tram or an attachment to the current electric tram will allow the refuge to expand the number and size of its tours.
Refuge Priority	High
Time Frame	Short-term
Dependencies	Continuation of national pilot program with Clean Cities and Department of Energy Funding availability Volunteer time available
Potential Funding Sources	Recreation fee revenue FLTP
Partners	Clean Cities Friends Group

Shuttle for Birding Tours	
Project Description	With an expansive list of units in the area, a street legal shuttle is required to transport visitors around the area for wildlife viewing opportunities and more inclusive photography tours. The refuge could potentially partner with local birding and wildlife viewing groups.
Refuge Priority	Medium
Time Frame	Short term
Dependencies	Funding availability Staffing or volunteer availability
Potential Funding Sources	Recreation fee revenue FLTP Friends fundraising Private donations Partners
Partners	Friend group Local birding and wildlife viewing groups

Turning Lanes to Colusa NWR	
Project Description	The addition of turning lanes would increase the safety of entering and exiting vehicles to Colusa NWR. This project was scoped by engineers at FLH and a project to raise the road and increase visibility has been programmed by the FWS regional office.
Refuge Priority	High
Time Frame	Short-term
Dependencies	Funding availability Partner coordination
Potential Funding Sources	FLAP FLTP

Turning Lanes to Colusa NWR	
	Highway Safety Improvement Program (HSIP)
Partners	CalTrans Colusa County

Long-Term (5-10 years)

Pine Creek Unit Bicycle Connection to Chico	
Project Description	Pine Creek Unit of Sacramento River National Wildlife Refuge is located closer to Chico, CA and presents an opportunity to connect to bicyclists in the city. The refuge can work with local entities to determine road ownership and best routes.
Refuge Priority	Medium
Time Frame	Long-term
Dependencies	Safety on HWY 32 Construction of a visitor contact station at Pine Creek Unit Partner support
Potential Funding Sources	FLAP FLTP
Partners	CalTrans City of Chico Friends group

Coleman National Fish Hatchery

Station Background

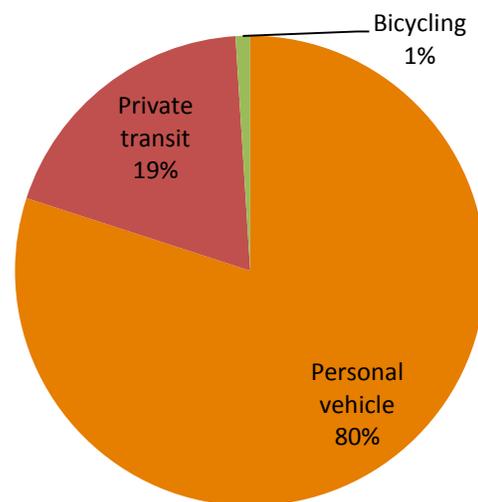
Located on Battle Creek three miles east of the Sacramento River in Shasta County (population estimated to be 179,804 in 2014), California, the FWS established Coleman National Fish Hatchery (NFH) in 1942 to protect and breed Chinook salmon and steelhead trout. Coleman NFH is the largest hatchery in California, releasing over 13 million salmon in 2015. The hatchery releases salmon into Battle Creek so the fish can begin their Pacific Ocean journey.

The hatchery estimates 50,000 visitors annually, with an average of 1,000 visitors per weekend day during spawning season. Spawning season is typically October thru November. Additionally, the hatchery hosts a Return of the Salmon, a one day festival that attracts up to 6,000 visitors. To accommodate such high visitation during the special event, the hatchery has overflow parking in front of the entrance gates and works with neighbors to provide room for parking. Moreover, the hatchery pays for buses that run from the local Wal-Mart to mitigate further overcrowding of parking lots.

Highlighted RATE Questionnaire Responses

- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Create a bike path from the Hatchery to either Balls or Jelly Ferry Bridges
- What are the most significant transportation problems or needs currently facing your station? (name up to three)
 - Bus unloading zone at Hatchery
 - Bike access via road/trail
 - Narrow and curvy entrance road
- Which of the following may improve your current or planned visitor and/or natural resource/cultural resource programs?
 - Transit for special events only
 - Bicycle/pedestrian trails/paths for access to station

Figure 20 Coleman NFH's RATE Response Estimating Percent of Visitor Access Modes



Existing Alternative Transportation

Transit

During the Return of the Salmon day, the hatchery uses a portion of their annual operations and maintenance budget to rent four buses and four shuttles (ABA accessible) from a local touring company. The buses run every half hour from 9:00 AM to 4:00 PM from the local Wal-Mart located approximately 10 miles away. The buses provide an alternative option for getting to the hatchery and are well-used by visitors during the event.

Non-Motorized Trails

The hatchery recently built a two-mile walking trail that connects the Coleman NFH to the surrounding Bureau of Land Management (BLM) and state park lands. The hatchery is still completing the last section of the trail to provide a more seamless connection to the hatchery’s viewing deck along Battle Creek. Additionally, the hatchery has plans to build a bird-watching platform for visitors and hikers to enjoy.

Figure 21 Coleman NFH trailhead with interpretive sign Source: Volpe Center



The hatchery is interested in expanding bicycle access to the station. Shasta County submitted a FLAP application in 2013 to improve the road condition of Jelly Ferry’s Road, but it was not selected. The application also included plans to potentially add a bicycle lane for safer biking in the area. There are 18 miles of mountain biking trails in the surrounding public lands, but safety improvements are needed for continued and increased use.

Partnerships

The hatchery is actively engaged with the local community. The hatchery’s Friends group is very active and helped develop the trail that connects to BLM and state park lands. The Friends Group assists in the maintenance and placing the interpretive signs along the trail.

With no visitor services staff, the hatchery relies heavily on volunteer assistance in engaging with the public. Twenty-four dedicated volunteers rotate coming to the hatchery five to six hours a day in October and November to lead tours for school groups. These school group tours fill up quickly with schools contacting the hatchery in August to reserve their spot. In addition to on-site environmental education and interpretation activities, the hatchery attends local events such as the Sport and Boat show in Anderson, CA, to further promote visitation and support for the hatchery.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Traffic Counters at Entrance Gate	
Project Description	The installation of an infrared traffic counter will help the refuge more accurately count the number of visitors to the hatchery.
Refuge Priority	High
Time Frame	Short term

Traffic Counters at Entrance Gate	
Dependencies	
Potential Funding Sources	Regional transportation program
Partners	

Traffic Flow Study during Return of the Salmon Festival	
Project Description	During the special event, the hatchery staff has noticed problems with traffic flow getting in and out of the overflow parking areas and issues with vendors who are stuck in their spots. A study would help the hatchery move forward on funding the paving of the dirt overflow lots and inform the striping patterns of the lot for better organization. <i>(Note: A study has been funded through FLTP for completion in 2016 along with a project to construct an overflow parking lot.)</i>
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding Staff availability during the special event to observe and record traffic flow issues
Potential Funding Sources	FLAP, FLTP Hatchery Operations and Maintenance Budget
Partners	Shasta County Neighboring land owners FLH

Improve the Condition of Jelly's Ferry Road	
Project Description	Currently Jelly's Ferry Road is in poor condition, leading to safety issues and deterring bicycle access to the hatchery. A FLAP application was already submitted, but did not make it to the short-list. The refuge and partners should be prepared to re-submit the application when the FLAP period re-opens.
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability
Potential Funding Sources	FLAP
Partners	Shasta County BLM California State Parks

Fix Bus Loading/Un-loading Curb	
Project Description	The curb where school buses unload and load is uneven and not safe for students to walk over or around. Fixing the curb will better accommodate students and other visiting groups.
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability

Fix Bus Loading/Un-loading Curb

Potential Funding Sources	FLTP, Visitor Facility Enhancement or Deferred Maintenance funding
Partners	

Humboldt Bay National Wildlife Refuge

Station Background

Consisting of Lanphere Dunes, Ma-le'l Dunes, Hookton Slough, and Salmon Creek units, the Humboldt Bay National Wildlife Refuge (Humboldt Bay NWR) offers many recreational opportunities for visitors such as hunting, boating, hiking, and wildlife viewing. The units are located off of scenic Highway 101 near the cities of Arcata and Eureka, California. The visitor center for the refuge is located at the Salmon Creek unit and includes an observation deck as well as a connection to a 1.7 mile trail through wetlands. The refuge's [CCP](#), published in 2009, minimally mentions transportation as an issue. The plan primarily focuses on issues associated in the future with sea level and how the refuge can best prepare for those environmental challenges.

The refuge experiences a fairly constant visitation throughout the year, about 900 to 1,000 per month at the visitor center, with peaks on weekends and during July and August. They also have a special event called the Sunrise at the Refuge during the first full weekend in March. Each day during the event, approximately 300-500 visitors come to the Humboldt Bay NWR visitor center and observation decks to watch the wild geese fly-off and to participate in various fun, family-friendly, and educational activities throughout the day. Now in its thirteenth year, the community members are aware of over-crowding in the parking lot and adjust their plans accordingly. A shuttle ran from the College of the Redwoods one year in the past, but that service is no longer provided and visitors are encouraged to carpool.

Highlighted RATE Questionnaire Responses

- How far away from your station is the nearest transit service, such as a local or inter-city bus stop or Amtrak station?
 - ½ to 1 mile (county bus line service)
- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Regional bike trail system
- Which of the following may improve your current or planned visitor and/or natural resource/cultural resource programs?
 - New transit service for access to the station
 - Promotion and marketing for existing and potential alternative transportation system
 - Hazard mitigation
 - Pedestrian only trails/paths for access to station
 - Bicycle/pedestrian trails/paths for access to station
 - Development of social media and/or web-based materials for transportation and access issues

Existing Alternative Transportation

Transit

Currently there are no transit services that serve the units within Humboldt Bay NWR. Refuge staff expressed interest in a bus for the Friends group that leads tours in the Lanphere Dunes unit. A transit opportunity also exists with the Sunrise at the Refuge event. While local residents are able to carpool and understand the parking logistics, out of town and new visitors may not be aware of the limited parking capacity during the event. As the event becomes more popular, a shuttle service might assist with transporting event participants. Additionally, with transit stops so close to the refuge, further outreach and analysis is necessary to understand the feasibility of establishing a transit connection to the Humboldt Bay NWR visitor center.

Non-Motorized Trails

There are several existing popular bicycling and pedestrian trails in the complex’s units. The Salmon Creek unit has a scenic 1.7 mile pedestrian trail adjacent to the visitor center and the dune units have approximately five miles of trails that connect to Bureau of Land Management (BLM) lands.

During the site visit, the refuge and partners presented two different non-motorized trail opportunities. A relevant regional project that has required FWS involvement is the Humboldt Bay Trail. This project affects FWS land and therefore the refuge has been assisting community partners in its development. It is a project that would serve as a continuous and safe regional bicycle and pedestrian connection to the bay and throughout Humboldt County.

A second upcoming project with potential for accommodating bicycle access in the area is the South Spit road enhancements on the Hookton Slough unit. The road is in need of repair and initial plans show there may be room for the addition of a bicycle lane as long as it is compatible with the threatened and sensitive species in the area.

Partnerships

As mentioned, the refuge is involved in the development and implementation process of the Humboldt Bay Trail which brings together many community groups such as the local tribes, the city governments of Eureka and Arcata, and the Humboldt County Association of Governments. Humboldt Bay NWR also partners closely with the Bureau of Land Management (BLM) due to the close proximity of their land units as well as through the cooperative management agreement area (CMA) at Ma-le’l Dunes. In 2010, the two agencies along with the State Coastal Conservancy published a [Public Access Plan](#) to provide a coordinated development plan for the area. With many different land uses and restrictions throughout the CMA, the plan provides recommendations for the installation or improvement of roads, parking areas, trails, and interpretive signs.

Figure 22 Railroad tracks part of the proposed Humboldt Bay Trail Source: Volpe Center



Friends of the Dunes, a volunteer group, leads visits and guided walks at least two times a month in the dune units. Lanphere Dunes is accessed by guided walk or permit only. Permits are issued to those who have been oriented to the access guidelines and to the site by attending a free guided walk. There is limited parking at the Lanphere Dunes site and the Friends group instructs walk participants to park at a neighboring school and then carpool. The refuge staff noted that a small shuttle would be useful for the Friends to use when transporting visitors.

Opportunities and Needs

Shorter-Term (1 to 5 years)

Shuttle for the Complex	
Project Description	A shuttle could be a versatile commodity for the complex. It could be used to transport visitors during the Goose Festival in March and the Friends of the Dunes could utilize a shuttle when transporting tour

Shuttle for the Complex	
	participants.
Refuge Priority	High
Time Frame	Short-term
Dependencies	Funding availability
Potential Funding Sources	FLTP Friends group fundraising
Partners	Friends group

Bike Lane on South Spit Road	
Project Description	A bicycle lane could be constructed during the enhancement of South Spit road and would provide non-motorized access on the Hookton Slough unit.
Refuge Priority	Medium
Time Frame	Short term
Dependencies	Compatibility assessment
Potential Funding Sources	FLTP
Partners	FLH

Humboldt Bay Trail FLAP Application	
Project Description	Humboldt Bay NWR staff can write a letter of support for a FLAP application submitted by a city or county entity to raise money for certain portions of the Humboldt Bay Trail that access the refuge.
Refuge Priority	High
Time Frame	Short term
Dependencies	Staff time; application pool
Potential Funding Sources	N/A
Partners	County of Humboldt City of Arcata City of Eureka Humboldt County Association of Governments

Long-Term (5-10 years)

Public Transit Connection	
Project Description	The nearest local transit stop is 2 miles away from the entrance to Humboldt Bay NWR Salmon Creek Unit, which houses the refuge's visitor center. Establishing a connection to this transit line would increase access for a more diverse audience.
Refuge Priority	Medium
Time Frame	Long term
Dependencies	Funding availability Partner support
Potential Funding Sources	FLAP (for initial planning, not recommended to be used to transit O&M because not guaranteed annually) FLTP

Public Transit Connection	
	Transit agency funding
Partners	Humboldt Transit Authority County of Humboldt

Don Edwards San Francisco Bay National Wildlife Refuge

Station Background

Don Edwards San Francisco Bay National Wildlife Refuge (Don Edwards NWR) is one of seven refuges that comprise the large and diverse San Francisco Bay National Wildlife Refuge Complex (NWRC). Don Edwards NWR is located in the heart of northern California's tech industry on the southern end of the San Francisco Bay and is the nation's first urban refuge. Established in 1972 largely from a grassroots effort and the support of Bay Area Congressman Don Edwards, the refuge restores and preserves wildlife habitat for migrating birds and threatened or endangered species.

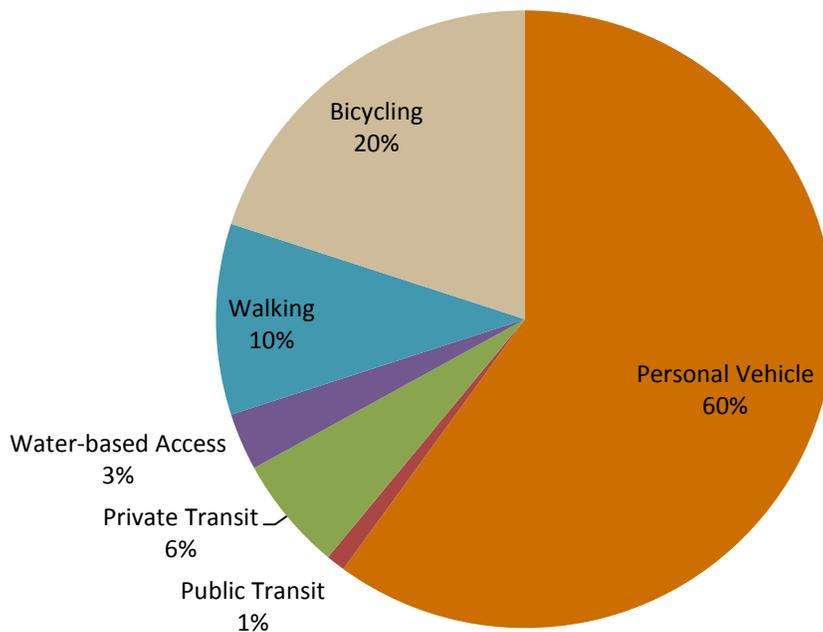
The refuge offers many different recreational and interpretive activities for visitors and has a visitor center near the main entrance along Marshlands Road. Marshlands Road itself terminates at what is now a public fishing pier but was previously the Dumbarton Bridge, one of only two bridges crossing the South San Francisco Bay. A new Dumbarton Bridge was constructed and opened alongside the previous one in 1982, and Marshlands Road ceased to provide vehicular access to the bridge. However, due to the road's previous purpose, its easement is held by the California Department of Transportation ("Caltrans"), and the road is still important for alternate transportation as it provides the only bicycle and pedestrian access to the current bridge and passage across the bay, although the road is in poor condition. In 2013 the refuge received 685,400 visitors. The refuge experiences peak visitation during commuting hours on weekday mornings and evenings from bicyclists crossing the bridge, as well as pre- and post-work or during lunchtime looking for a quick exercise opportunity. On the weekends, there are many cycling groups, families, independent organized groups, and other members of the general public that come to the refuge. With the growth of the tech industries surrounding Don Edwards NWR and many smaller entrance points, refuge staff must determine what the refuge's role is in providing commuter access and how can they draw people into interpretive opportunities?

The refuge is aware of its transportation challenges and is taking active roles in finding solutions. In the refuge's [CCP](#), completed in 2012, provided recommendations for moving school groups within the refuge and mentioned the regional bus connection that once existed. Unfortunately, the service no longer exists due to funding issues. The refuge supported CalTrans in submitting a FLAP application for Marshland Road safety improvements in 2013. The project was awarded and intends to replace the bridge and enhance the bridge approach from Thornton Road. Additionally, San Francisco Bay NWRC submitted an Urban Refuge Program proposal in 2014 that addressed several public access concerns at Don Edwards NWR. Unfortunately, its application was not successful, but it may reapply in the future.

San Francisco Bay NWRC had a Transportation Scholar for two years from 2012 to 2014. The scholar primarily focused on transit, bicycle, and pedestrian access at the different stations. The scholar's research led to a Road Safety Audit (RSA) on the roads surrounding the refuge and the coming together of many transportation stakeholders in the area. The scholar generated two final reports with the 2013 report serving as a general evaluation of transportation for the entire complex and the 2014 report detailing the RSA process and outcomes ([Final Report 2013](#), [Final Report 2014](#)). The refuge expressed interest in building upon the momentum the transportation scholar started and would like to address the identified alternative transportation challenges facing the refuge. In FY15 the refuge wrote an application for and was awarded an \$80,000 grant from the Association of Bay Area Governments (ABAG) to fund a bike/ped improvements feasibility study for the area covered by the RSA and the entirety of Marshlands Road.

Highlighted RATE Questionnaire Responses

Figure 23 Don Edwards San Francisco Bay NWR's RATE Response Estimating Percent of Visitor Access Modes



- How far from your station is the nearest transit service, such as local or inter-city bus stop or Amtrak station?
 - 1-3 miles (Bay Area Rapid Transit – BART)
- What are the greatest opportunities for new or improved alternative transportation at your station?
 - Bus route
- Please rate how the following transportation issues affect your station:
 - Staff capacity shortages to deal with transportation issues – Major Challenge
 - Funding shortages (including fee collection) – Major Challenge
 - Lack of safe bicycle access to or within the station – Major Challenge
 - Lack of safe pedestrian access to or within the station – Major Challenge
 - Condition of existing roads (internal) – Major challenge
 - Condition of existing trails (internal) – Major Challenge

Existing Alternative Transportation

Transit

In the past, Alameda-Contra Costa Transit used to serve the refuge near its entrance but the connection was no longer economically feasible. The refuge has expressed great interest in trying to find a solution to re-start a direct transit connection. The Urban Refuge Program proposal included strategies to work with partners to establish better public transit access.

Within the refuge, the staff uses 11-passenger vans to take small tours around the different units. Don Edwards NWR did have an electric tram for a few months, but it could not be used readily because it is

not a street legal vehicle and could not reach the high speeds necessary to move around the refuge on county roads. The refuge staff acknowledged there is a growing interest in motorized tours and with so many different units spread out around the Bay, the refuge could use a street legal shuttle to provide interpretive tours to visitors.

Non-Motorized Transportation

As seen in Figure 23, the refuge estimates 20 percent of its visitors access the refuge by bicycle, 10 percent by walking, and three percent via water-based transportation. Compared to other refuges, this is a fair amount of non-motorized transportation access. The refuge expressed safety concerns for bicyclists and pedestrians. On Thornton Avenue approaching the main entrance of the refuge, there is little room for bicyclists and pedestrians on the shoulder. Additionally, the nearby and crowded intersection of Thornton Avenue and Gateway Boulevard does not include a pedestrian crosswalk, which is confusing and challenging for visitors who are walking to the refuge. Within the refuge, there are still safety issues due to the condition of Marshlands Road and the limited barrier between bicyclists and Highway 84, which parallels it. The highway runs through refuge land and only a chain link fence separates it from the refuge road. Refuge staff mentioned that cars come through the fencing at least once a month. While the FLAP application with CalTrans was meant to address these issues on Marshlands Road, the FLAP award primarily addressed the bridge replacement and paving rather than the barriers.

The refuge has over 30 miles of walking trails, some permit bicycling, and is connected to Coyote Hills Regional Park via a regional hiking trail. A new campground is being built at the park, located less than a quarter-mile from the refuge boundary. This campground will likely increase pedestrian visitors. In regards to water-based access, the refuge staff noted that there are opportunities to improve and add connections to a regional water trail, the San Francisco Bay Area Water Trail. The refuge does not have many official boat launches and the refuge has not identified specific access points yet.

Partnerships

The refuge was surprised at the amount of community support that came forward during the RSA. The partnerships established during that process will be important in the future and the refuge noted that its relationship with the City of Newark improved following the RSA. The refuge staff has relations with the area's regional planning organization, the Association of Bay Area Council of Governments, after working on the Bay Trail together. Additionally, the refuge worked with the Coastal Conservancy on establishing a connection to the San Francisco Bay Area Water Trail.

The refuge's education staff coordinates with many school districts in the surrounding area to host field trips. Staff will occasionally visit schools, but the priority is on bringing students to the refuge. Funding for the transportation of school groups was a challenge, but with financial support from the refuge's Friends Group and Connecting People with Nature grant, the refuge established a Yellow School Bus Transportation Fund. Schools in the area can apply to receive \$450 to pay for field trip transportation. In fiscal year 2014, the Fund was able to serve six schools. This novel idea could be replicated at other stations or at the regional level. The Friends group is very involved at the refuge and many of their members volunteer to staff the visitor center.

While the refuge has well-established and productive partnerships, it is noted that the refuge does not have a relationship with the neighboring transit agencies: Alameda-Contra Costa Transit or Santa Clara Valley Transportation Authority. Moreover, Bay Area Rapid Transit (BART) and the community are interested in creating a commuter rail connection using the old Dumbarton rail corridor that passes through the refuge and sensitive marsh habitat. While it is unclear if this project will move ahead, establishing a relationship early will help with future communications. There are many benefits that

could come from reaching out to the transit agencies and understanding ways the two organizations could work together.

Given its unique location next to the largest high-tech hub in the country, refuge staff expressed interest in establishing better private partnerships with nearby businesses such as Google, Facebook, and eBay. With many of the private company employees using the refuge as a commuter trail, there is mutual benefit for the refuge and the tech companies to work together on improvements. In fact, Google provided funding for the Yellow School Bus Transportation Fund.

Opportunities and Needs

Short-Term (1-5 years)

Alternative Transportation Feasibility Study	
Project Description	An in-depth and comprehensive study of alternative transportation opportunities would assist the refuge in prioritizing and implementing different transportation solutions. The refuge not only expressed interest in examining transit connectivity, but also bicycle/pedestrian and water-based access. <i>(Note: the refuge was awarded a grant to complete a feasibility study of bike/ped improvements)</i>
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability
Potential Funding Sources	FLTP FLAP
Partners	Association of Bay Area Council of Governments City of Newark City of Fremont

Long-Range Transportation Plan at the Complex Level	
Project Description	Staff mentioned concerns about lacking a long-range transportation vision for the complex. Short-term projects have been identified; however, cohesive mission and goals would assist the complex in the future as it works to adapt and improve its transportation system.
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability
Potential Funding Sources	FLTP, other transportation or Urban Refuges grant
Partners	FLH

Boat Launches	
Project Description	More boat launches will increase water-based activity, connections to the water trail, and access at the refuge.
Refuge Priority	Medium
Time Frame	Short term
Dependencies	Funding availability Acquisition of land Compatibility assessment

Boat Launches	
Potential Funding Sources	FLTP, station's operational budget FLAP
Partners	Coastal Conservancy

Shuttle for Refuge Tours	
Project Description	A shuttle will move visitors around more seamlessly internally and between the various and sprawling units.
Refuge Priority	Medium
Time Frame	Long term
Dependencies	Findings in feasibility study Visitor demand
Potential Funding Sources	FLTP Partner fundraising
Partners	Friends group

Long-Term (5-10 years)

Establish Public Transit Connection	
Project Description	A public transit connection will help increase awareness of and access to the refuge for a broader audience coming from the city of San Francisco. Public transit can be in the form of bus or rail.
Refuge Priority	High
Time Frame	Long term
Dependencies	Funding availability Partner support Findings in feasibility study
Potential Funding Sources	FLAP (for initial planning, not recommended to be used to transit O&M because not guaranteed annually) Partner fundraising FTA
Partners	Friends group Neighborhood associations Alameda-Contra Costa Transit Bay Area Rapid Transit

San Diego National Wildlife Refuge Complex

Station Background

San Diego National Wildlife Refuge Complex is comprised of four refuges: San Diego NWR, San Diego Bay NWR, Tijuana Slough NWR, and Seal Beach NWR. This case study focuses on the first three refuges listed as they are located in San Diego County. The complex experiences steady visitation, with some peaks in the fall, winter, and early spring when birds are flying through. The Complex was awarded \$1 million as part of the FWS's first Urban Wildlife Refuge Project. The Complex is using the funding to better reach and engage its surrounding urban audience, including researching and developing programs that bring underserved communities to the refuge.

San Diego Bay NWR

San Diego Bay NWR is located within the south bay and is comprised of sensitive salt marsh and mudflat habitats. Surrounded by a highly urbanized area, San Diego Bay NWR protects many endangered and threatened migratory and native wildlife. Two units make up the refuge, Sweetwater Marsh and South San Diego Bay. The Sweetwater Marsh Unit is where the complex's headquarters are located as well as an environmental education classroom. Additionally, the non-profit Living Coast Discovery Center has an education and interpretation center located there. With these attractions, many school groups and visitors come to this location. The South San Diego Bay unit sees high visitation to trailheads as well, particularly with personal vehicles and bicyclists.

The refuge's CCP was published in 2006 and included discussions about visitor access and connections to regional trails. Access to the Sweetwater Marsh Unit is available via a shuttle bus that picks visitors up in a parking lot located off Interstate 5 at E Street in Chula Vista. This parking lot is also accessible from the nearby E Street Trolley Stop. The Living Coast Discovery Center runs the shuttle, which provides access to their facilities as well as the interpretive information and trail system provided on refuge lands. Currently no refuge information is provided at the shuttle parking lot. The Port of San Diego plans to relocate the parking lot in the near future at which time refuge staff would be interested in incorporating interpretation of refuge resources at the new site. Interpretive signage is present along the southern edge of San Diego Bay within the South San Diego Bay Unit.

San Diego NWR

San Diego NWR is made up of land in the San Miguel and McGinty Mountains, stretching from Jamul to Spring Valley and eastern Chula Vista. The grassland and wooded habitats have suffered from wildfires and prior agricultural uses. The refuge's CCP, which is nearing completion, will address access to and from the refuge, as well as public access within the refuge in the form of multiple use trails. The main transportation issues addressed in the CCP include legal access to refuge lands via public lands, public rights-of-way, and authorized trails; access points for parking and trail staging; and the identification of a designated trail system within the refuge. San Diego NWR has three main trailheads that act as access points to the refuge. Parking is limited at these locations. The refuge experiences peak visitation on weekends for all recreational uses such as hiking and cycling. A new visitor contact facility is desired at the Millar Ranch Road location and will likely increase visitation. Presently, the refuge is undergoing a transportation study to examine public transit options at the Miller Ranch facility.

Tijuana Slough NWR

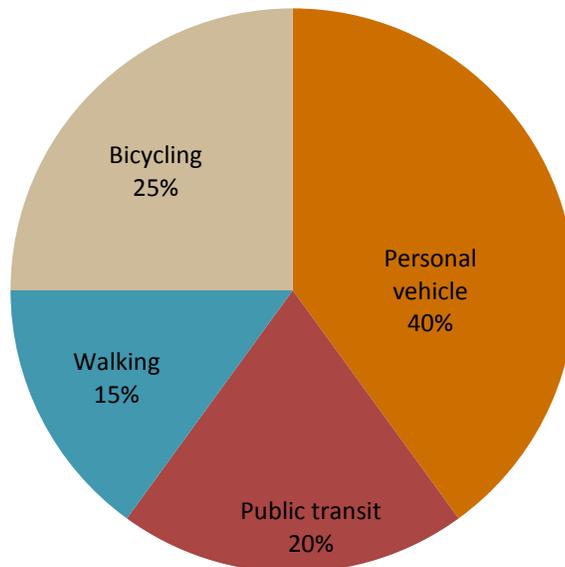
Located at the intersection of the Tijuana River and Pacific Ocean, Tijuana Slough NWR was established in 1980 and is part of the Tijuana River National Estuarine Research Reserve. This area is listed as a wetland of international importance. A visitor center and native plant gardens host hundreds of school groups throughout the year and provide an interactive educational experience. A Comprehensive Management Plan (CMP), the predecessor of CCPs, was approved for the Refuge in 1999. Updates to the

CMP to address the larger Tijuana River National Estuarine Research Reserve have been prepared in subsequent years and address public access, interpretation, and environmental education. The complex had a transportation scholar for the 2014-2015 cycle. While the scholar worked on issues in all of the complex's refuges, one of the main focuses was to identify opportunities to connect the public to the estuary via regional trails and public transportation.

Highlighted RATE Questionnaire Responses

San Diego Bay NWR

Figure 24 San Diego Bay NWR's RATE Response Estimating Percent of Visitor Access Modes



- How far from your station is the nearest transit service, such as a local or inter-city bus stop or Amtrak station?
 - Less than ½ mile
- Which of the following may improve your current or planned visitor and/or natural resource/cultural resource program?
 - Improved signage for orientation within station

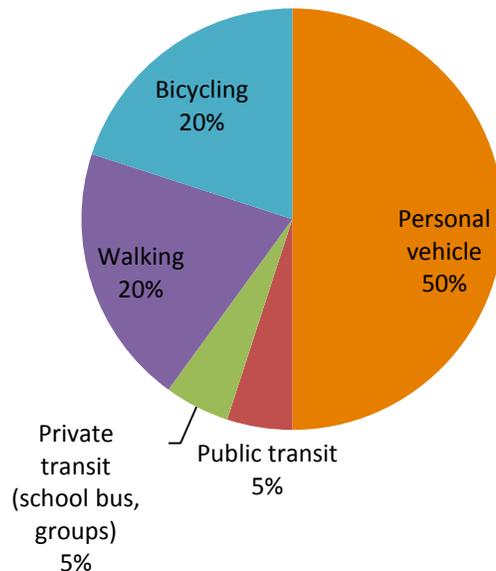
San Diego NWR

- How far from your station is the nearest transit service, such as a local or inter-city bus stop or Amtrak station?
 - ½ to 1 mile
- How far from your station is the nearest bicycle and pedestrian regional trail? A regional trail is one that offers connections to local or regional amenities, such as neighboring communities, residential neighborhoods, parks and recreational areas, etc.
 - Direct connection to trail within station
- Please rate how the following transportation issues affect your station:
 - Bus/larger vehicle parking (on-site) – major challenge
 - Lack of safe pedestrian access to or within the station – major challenge
 - Management of roadside invasive plant species (on-site) – major challenge
- How much of a concern is transportation with respect to changing visitation levels?

- Highest concern

Tijuana Slough NWR

Figure 25 Tijuana Slough NWR's RATE Response Estimating Percent of Visitor Access Modes



- How far from your station is the nearest transit service, such as a local or inter-city bus stop or Amtrak station?
 - Less than ½ mile
- How far from your station is the nearest bicycle and pedestrian regional trail? A regional trail is one that offers connections to local or regional amenities, such as neighboring communities, residential neighborhoods, parks and recreational areas, etc.
 - Direct connection to trail within station

Existing Alternative Transportation

Transit

As mentioned previously, San Diego Bay NWR has a shuttle run by its partner, the Living Coast Discovery Center. San Diego and Tijuana Slough NWRs do not have internal transit services. There are few internal vehicular opportunities due to the limited number of roads within the refuges and the intention of the refuge to encourage non-motorized activities. San Diego Bay NWR does own a tram that is used occasionally for special occasions and visitors. Although internal transit is limited, there are several opportunities for each of the refuges to better connect to neighboring transit services. San Diego Bay and Tijuana Slough NWRs responded that the nearest transit station is located less than half a mile away. With these resources so close to the refuge boundary, it is essential that refuge and complex staff continue outreach to the local transit agency, San Diego Metropolitan Transit System (MTS), to increase awareness of how transit users and the surrounding urban population can access the refuge via public transportation.

As refuge staff explained, the refuges in the San Diego Complex suffer from the “last mile” problem. Although the refuges are near densely populated locations and close to bus and trolley stops, that last mile and lack of awareness that the refuge is located close by acts a barrier to visitors accessing the refuge. Further coordination with partners and transit agencies can help solve this issue. Less resource

intensive solutions include improving signage and outreach materials at surrounding transit stops as well as including refuge information on transit maps. FWS conducted a conceptual engineering study at San Diego NWR for the Millar Ranch entrance on the feasibility of transit and non-motorized connections and other improvements to alleviate the “last mile” problem. This study led to a successful FLAP grant with the County of San Diego and CalTrans. Additionally, the transportation scholar at the complex worked on understanding the feasibility of changing bus routes that run nearby to better accommodate accessing the refuges that the refuge staff may pursue in the future.

Additionally, the refuges specifically stated they would like to address improving access for underserved populations. As shown in Section 5, San Diego Bay and Tijuana Slough NWRs are situated close to “high need” populations. Both have transit connections of which the refuges can improve the awareness.

Non-Motorized Transportation

Based on the three refuges responses to the question of how visitors access the station, it appears that walking and bicycling are two fairly well-used modes of access compared to other stations in the region. Refuge staff also noted that active transportation is very popular in the area. Several regional trails directly connect to the refuges. Tijuana Slough NWR is directly connected to the California Coastal Trail and the Imperial Beach Ecoroute Bikeway. San Diego NWR is connected to the 7.8-mile Sweetwater River and Loop Trail. And San Diego Bay NWR is connected to the 24-mile Bayshore Bikeway. Each of the three refuges has opportunities to improve signage, boundary markings, and interpretive information to better assist hikers and bicyclists identify refuge land. While some of these trail connections are seamless, there are a few that require some maintenance. For example, refuge staff mentioned the Sweetwater River Bikeway switches from paved to unpaved, proving difficult for some bicyclists and hikers unprepared for poorly maintained dirt trails. If improved, this bikeway could provide access between the San Diego Bay and San Diego NWRs.

Partnerships

The complex and individual refuges have several strong partnerships. The complex’s friends group, the Friends of San Diego Wildlife Refuges, assists with staffing the visitor center at Tijuana Slough and is involved in other complex activities. The Tijuana Slough NWR visitor center is a shared educational center with the other partners of the Tijuana River National Estuarine Research Reserve, California State Parks, and the National Oceanic and Atmospheric Administration. As discussed previously, San Diego Bay NWR works closely with the Living Coast. The San Diego Complex received funding in FY15 to purchase a 15 passenger van, which will be used to provide tours of the Salt Works that portions of the San Diego Bay Refuge overlays.

Looking ahead, refuge staff can improve their coordination with MTS on signage and marketing. Additionally, the refuge mentioned problems finding sufficient and stable school bus funding. The Earth Discovery Institute used grant money from the San Diego Association of Governments’ Transnet program for school buses to provide access to environmental programs. Tijuana Slough and California State Parks partnered with the Redlands Interpretive Association to reimburse schools for busing. This grant was not extended in 2014 and Tijuana Slough is now indirectly funding school buses through the Southwest Wetlands Interpretive Association, a non-profit organization that provides school bus funding through a grant program. Another potential partner refuge staff mentioned is Ocean Connectors. This organization is looking to buy a 15-passenger van in the near future to give environmental tours around the area.

Opportunities and Needs

Short-Term (1-5 years)

Coordinate Marketing with MTS	
Project Description	The entire complex will benefit from including refuge information and directions at MTS stops, brochures, and maps.
Refuge Priority	High
Time Frame	Short term
Dependencies	Partner support Staff time
Potential Funding Sources	Refuge operations budget
Partners	MTS

Improve Signage on Regional Trails	
Project Description	On each of the regional trails directly connected to the refuges, directional signage is needed to make visitors aware they are near and/or entering a National Wildlife Refuge.
Refuge Priority	High
Time Frame	Short term
Dependencies	Funding availability Partner support
Potential Funding Sources	Refuge operations budget Donations
Partners	Friends group Regional trail owners

Purchase Van or Expand Tram Service	
Project Description	The refuge could look into purchasing a van or expanding the use of its electric tram for internal mobility purposes.
Refuge Priority	Medium
Time Frame	Short term
Dependencies	Staff time
Potential Funding Sources	Refuge operations budget
Partners	N/A

Long-Term (5-10 years)

Realign Bus Routes for Direct Connection to Tijuana Slough and San Diego Bay NWR	
Project Description	Tijuana Slough and San Diego Bay NWRs are located close enough to bus stops that a slight realignment in service could fix the last mile problem these refuges face.
Refuge Priority	High
Time Frame	Long term
Dependencies	Funding availability Partner support
Potential Funding Sources	FLAP (for initial planning, not recommended to be used to transit O&M)

Realign Bus Routes for Direct Connection to Tijuana Slough and San Diego Bay NWR

	because not guaranteed annually) Partner fundraising FTA
Partners	MTS