

# Memorandum

Date: June 28, 2021, **Appendix updated June 1, 2022**

To: Barbara Kennedy, Parks Planner, Parks & Recreation Dept., City of Carlsbad

From: Mahdie Hasani and Katy Cole, Fehr & Peers

**Subject: Veterans Memorial Park SB 743 Vehicle Miles Traveled (VMT) Assessment**

SD21-0400

This memorandum evaluates VMT for transportation impact purposes of the proposed Veterans Memorial Park project (the "project"). The VMT analysis was conducted consistent with the methodologies described in the City of Carlsbad's *VMT Analysis Guidelines*, September 2020.

The project is located southeast of the Agua Hedionda Lagoon and bordered by Faraday Avenue on the west and south, and by Whitman Way in the north, shown in **Figure 1**. The site is 91.5 acres, of which 48 acres are developable (12 acres is a sensitive habitat that will be preserved). The remainder of the site is within the Macario Canyon/Veterans Park HMP Preserve.

The design intent is a family-oriented park with a variety of multi-generational and inclusive amenities that are incorporated into active and passive recreational elements. Park facilities and trails are interwoven with open space and park elements. The park is physically separated into two distinct areas (north and south) which transition through passive uses and natural open space to a prominent memorial element at the high point of the site (upper terrace).

Features on the north side include:

- Plaza/community gathering area with shaded pavilions (150-person capacity)
- Catering support building/restroom/storage/small office /golf cart parking (1,915 SF)
- Inclusive playground (19,295 SF)
- Family and group picnic areas
- Lawn for unstructured activities
- Parking lot
- Nature-themed playground (21,539 SF)
- Passive use areas (gardens for meditation, relaxation, sensory gardens)



Access to the south side of the park is located near the trail underpass at Faraday Avenue. The primary amenities on the south side are:

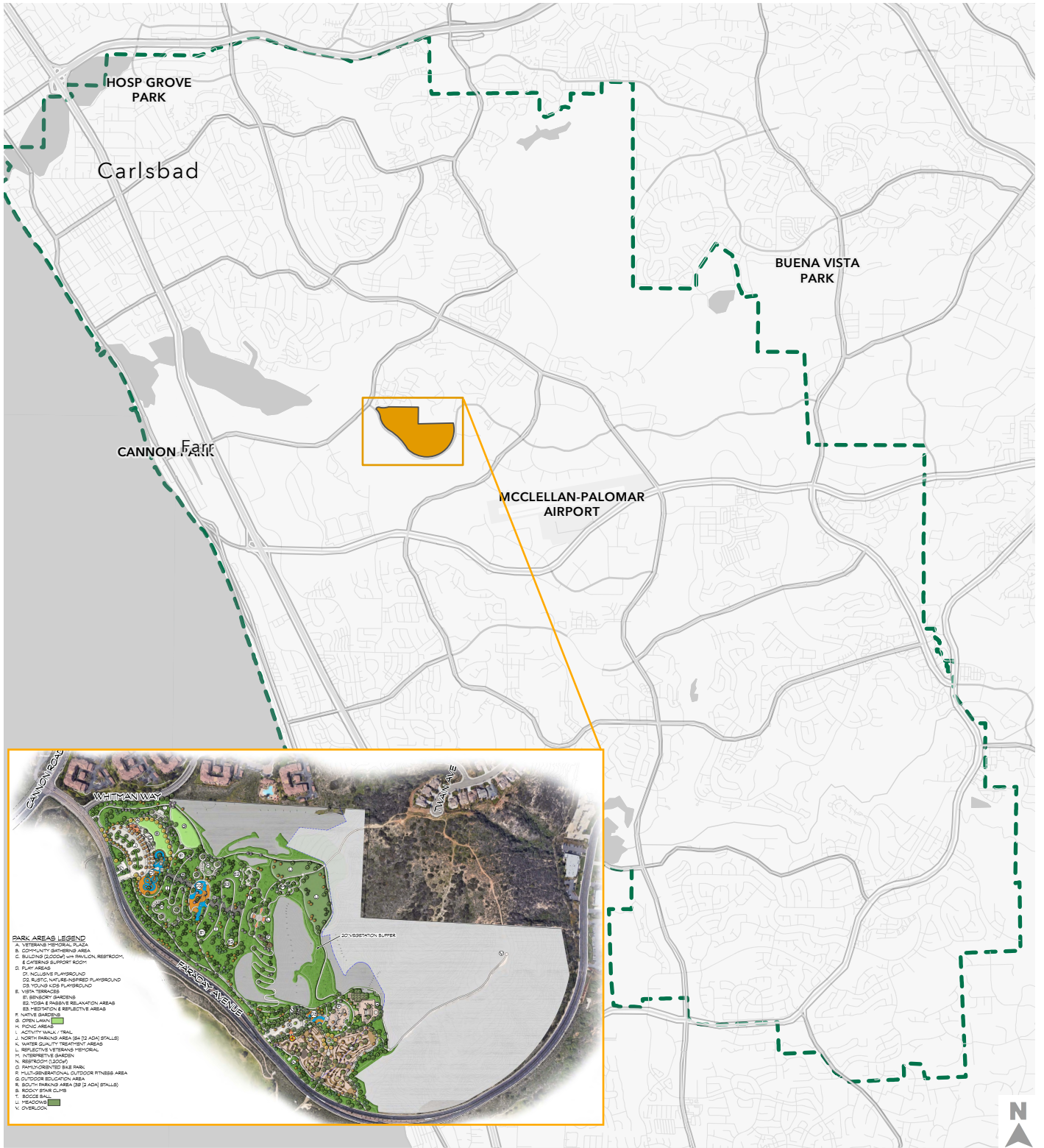
- Four-acre family-oriented bike park
- Restroom (965 SF)
- Tot lot (6,888 SF)
- Outdoor fitness area (14,579 SF)
- Outdoor education area (future development)
- Parking lot

The circulation routing (non-motorized) combines a variety of options for exploring the park:

- Accessible pathways lead from both sides of the park to the upper plateau where a prominent memorial art feature will be located. (passive use with individual seating areas to maximize views)
- Rock climb on the north slope
- Fitness run on south slope from parking lot to terrace
- Multi-use Trail - perimeter loop trail that surrounds the park is part of the citywide trail network and links with other city trails and connects to Twain Avenue.

This memorandum evaluates the effect that the proposed project would have on regional VMT to determine if the project has a significant transportation impact related to VMT. The City of Carlsbad has prepared guidelines for performing VMT analysis. As a regionally serving public facility, Veterans Memorial Park would have a significant VMT impact if the project is expected to cause a net increase in regional VMT compared to the no project condition. Also, it should be noted that most parks are considered locally serving, and would be presumed to have a less than significant impact on VMT; however, since Veteran's Memorial Park is proposed to have some unique park uses, a more detailed VMT evaluation was performed to determine its effect on regional VMT.

In general, park uses tend to redistribute existing park-related trips and do not add many new trips to the roadway network. In addition, for Veterans Memorial Park, we expect that it may reduce some vehicle trips and trip distances since the project is situated in a location that does not currently have many park facilities and some of the similar more unique facilities (such as the bike park) are currently much further away (more than 18 miles) for City residents and other North County residents. People seeking out these unique uses will have a much closer option with the implementation of Veterans Memorial Park.



- Veterans Memorial Park
- City of Carlsbad Boundary

Figure 1

## Veterans Memorial Park Location



## Step 1: Project Screening

The first step in performing transportation VMT impact analysis is to compare the project characteristics to the City of Carlsbad’s screening criteria to determine if the project can be presumed to have a less than significant impact. The screening criteria are detailed in **Table 1**.

**Table 1: Veterans Memorial Park VMT Screening Analysis**

Screening Criteria	Analysis	Is the Project Screened?
<b>Small Project</b>	<p>A small project is defined in the City of Carlsbad guidelines as generating less than 110 daily trips after applying trip-reduction strategies.</p> <p><i>The project-generated trips are greater than 110 daily trips; therefore, the project is not considered a small project.</i></p>	No
<b>Projects Located Near Transit</b>	<p>The City of Carlsbad guidelines state that projects proposed within ½ mile of the Carlsbad Village Coaster Station, the Carlsbad Poinsettia Coaster Station, or the Plaza Camino Real transit center would be presumed to have a less than significant VMT impact as long as project features do not otherwise indicate high VMT generation.</p> <p><i>The project is farther than ½ mile from each of the listed transit stops and therefore is not located near transit.</i></p>	No
<b>Local-Serving Retail</b>	<p>Local-serving retail is defined in the City of Carlsbad guidelines as retail development under 50,000 SF in size; or larger than 50,000 SF development with an approved market primarily serving local uses.</p> <p><i>The project is not retail and therefore this screening category does not apply to Veterans Memorial Park.</i></p>	No
<b>Local-Serving Public Facility</b>	<p>Local-serving public facilities are defined in the City of Carlsbad guidelines as facilities that serve the local public parks and public schools.</p> <p><i>According to the criteria of local-serving public facilities in the City of Carlsbad VMT guidelines, the project is not considered to be local-serving per Section 3.2.4 of the City guidelines. Aspects of the project are locally serving; however, since the project will serve the entire City and offers some unique park characteristics, we have determined that it is not fully locally serving and therefore this does not apply.</i></p>	No
<b>Affordable Housing</b>	<p><i>The project is not a residential development and therefore this screening category does not apply to Veterans Memorial Park.</i></p>	No





Screening Criteria	Analysis	Is the Project Screened?
<b>Redevelopment Project</b>	The City of Carlsbad guidelines state that a redevelopment project can be screened out from preparing a VMT analysis if the proposed project's total VMT is less than the existing land use's total VMT.  <i>The proposed project is not a redevelopment project; accordingly, the project does not meet the screening criterion.</i>	No

Source: Fehr & Peers, 2021.

As shown in **Table 1**, the project does not meet the City of Carlsbad's VMT screening. Therefore, a VMT analysis is necessary to determine if the project has a VMT transportation significant impact.



## Step 2: VMT Analysis

Since the project does not meet the screening criteria, a VMT analysis is performed consistent with the City of Carlsbad's *VMT Analysis Guidelines*.

For regionally serving public facility land uses, an evaluation of the effect that the project has on regional VMT is required as described in Section 3.2.4 and Appendix A of the VMT Analysis Guidelines. The project was evaluated based on the net increase in total regional VMT. As described in the Guidelines: Public facilities that *do not meet the screening criteria...are considered regional...projects and require a model*. [Note that a sketch model is appropriate for this project as described below.] *Regional...projects that result in a net increase in VMT compared to the no project condition would have a significant transportation impact*.

The VMT analysis for the project was prepared using a sketch model based on detailed information regarding the park users' types, their travel characteristics, and "big data" for other similar parks in the San Diego Region. Use of the sketch model is more accurate than using a regional travel demand model because the model assumptions are project-specific, and in our experience, the SANDAG Regional Travel Demand Model is not sensitive enough to evaluate projects that generate less than 2,400 daily trips or projects that are unique in nature. This project is a community park that has unique recreational opportunities (bike park, trails, and other park uses); and therefore, a regional travel demand model would not accurately capture the nuances of the project. Multiple data sources and approaches were utilized for the analysis described in the following sections.

### Data Sources

#### Big Data

Given the unique characteristic of the park (such as the bike park component), it is expected that some users from farther away may visit this park seeking out this amenity. We collected and analyzed data from a big data source<sup>1</sup> to understand visitor's travel patterns to similar parks in the region. This data helped us to understand the extent that park users travel to seek out park amenities. A summary of four existing parks that offer similar amenities to the project is described below.

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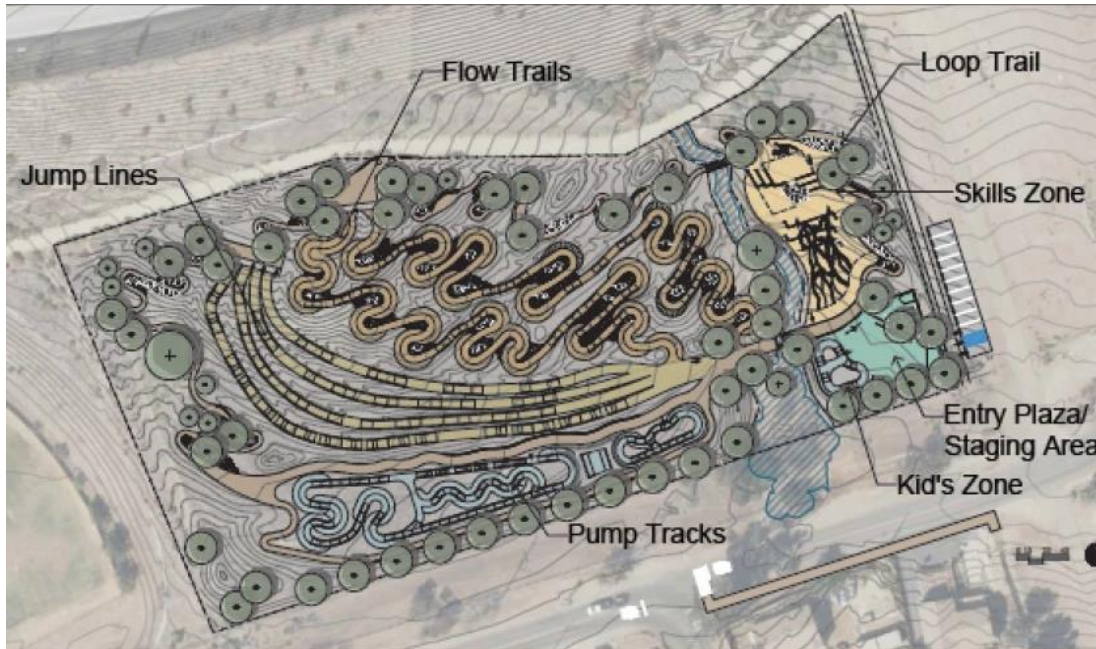
<sup>1</sup> Streetlight Data is a transportation data vendor that provides current and past transportation metrics such as trip origins and destinations derived from aggregated smartphone Global Positioning System (GPS) and sensor data.



### 1. Sweetwater Bike Park

The 4.2-acre park opened on January 4, 2020, and is operated by the County of San Diego. It provides two flow trails, three pump tracks, a wooden feature skills area, rock gardens, and three progressive jump lines. It is the first bike park in the county.

Figure 2: Sweetwater Bike Park Plan



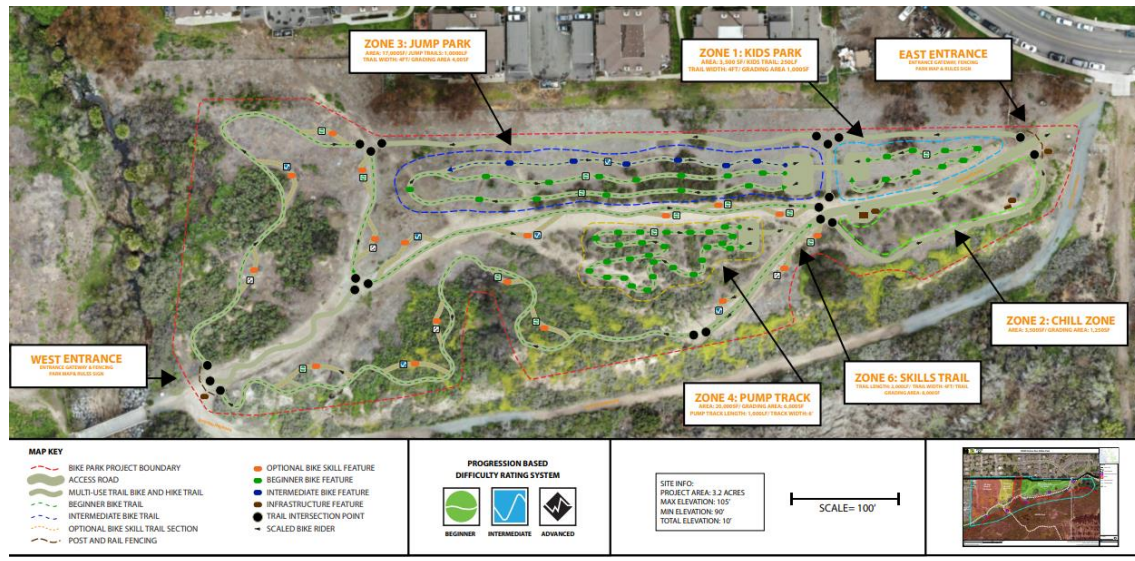
Source: [sandiegouniontribune.com](http://sandiegouniontribune.com)

### 2. Greg Cox Bike Park

This 3.2-acre park opened on April 28, 2021 and is managed by the City of Chula Vista. It provides a kid track, a modular pump track, two jump lines with wooden features leading into a wallride and one return trail, and a perimeter trail with small drops and rock gardens. It is the second bike park in the county.



Figure 3: Greg Cox Bike Park Plan



## OTAY VALLEY REGIONAL BIKE PARK – CONCEPT PLAN V2.0

Source: [sdparks.org](http://sdparks.org)

### 3. Pacific Highlands Ranch Community Park

This park opened in April 2019 and is managed by the City of San Diego. The park offers a variety of facilities including a playground, skate plaza, parkour area, fitness stations, picnic areas, a bike park, etc. The bike park is a 0.5-acre concrete surfaced facility with two progressive pump tracks that are open to bikes and skateboards.

This park is the closest bike park to the proposed project, and also offers a similar type of family-oriented facilities to visitors.





Figure 4: Pacific Highlands Ranch Community Park Plan



Source: Parksinsandiego.com

#### 4. Encinitas Community Park

This 44- acre park opened in January 2015 and is managed by the City of Encinitas. It is a family-oriented park that provides a skate park, a dog park, a kid's play area, picnic facilities, softball/baseball fields, and soccer/multi-purpose fields.

It is the closest larger scale family-oriented city park to the project with a similar type of amenities. Also, in terms of developed areas, this park is similar in size to the project. Therefore, this park was included to provide some insights on multi-use parks similar in size/character to the project.

Travel distance of park users to these four parks on weekdays and weekends are summarized in **Tables 2** and **3**, respectively. The analysis year was selected based on the park's opening year and





the availability of big data These tables show the percentage of park users that travel one-way for each travel distance range. As shown in these tables, the majority of park users travel less than 10 miles to a park.

Also, **Tables 2** and **3** demonstrate the that travel distance for park users on weekdays and weekends are similar, with the weekends having more park users that are slightly farther away. For example, on the weekdays, 81% of park users are within 10 miles of the park. On weekends, 70% of park users are within 10 miles of the park.

**Table 2: One-Way Trip Length of Park Visitors on Weekdays (Miles)**

Parks	Year	Less than 1	1 to 3	3 to 5	5 to 10	10 to 25	25 to 50	50 to 100	more than 100
Pacific Highlands Ranch	2019	22%	31%	17%	14%	10%	1%	2%	4%
Pacific Highlands Ranch	2020	18%	25%	14%	19%	17%	2%	2%	3%
Encinitas Community Park	2019	22%	30%	14%	14%	13%	2%	2%	4%
Encinitas Community Park	2020	24%	25%	15%	14%	13%	3%	2%	4%
Sweetwater Regional Park and Bike Park <sup>1</sup>	2020	7%	29%	30%	17%	11%	2%	1%	2%
Greg Cox Bike Park <sup>2</sup>	2019	17%	26%	17%	13%	17%	4%	0%	4%
Greg Cox Bike Park <sup>2</sup>	2020	14%	33%	14%	14%	19%	5%	0%	5%
<b>Average<sup>2</sup></b>		<b>19%</b>	<b>28%</b>	<b>18%</b>	<b>16%</b>	<b>13%</b>	<b>2%</b>	<b>2%</b>	<b>3%</b>

Source: StreetLight Data, 2021. Fehr & Peers, 2021.

Note:

<sup>1</sup>Sweetwater Bike Park opened in 2020. So, only 2020 data were summarized. Note that the park opened during the COVID-19 pandemic when open parks were experiencing a higher number of daily visitations than usual<sup>2</sup>. Also, Sweetwater Bike Park data includes trips to Sweetwater Valley Little League.

<sup>2</sup>Greg Cox Bike Park opened in April 2021. Big data after the park opening is not available; however, 2019 and 2020 data were available for trail use in the park area prior to opening of the bike park. Since the data does not represent an official park, the data was not included in the analysis.

<sup>2</sup> Public parks and the pandemic: How park usage has been affected by COVID-19 policies:  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251799>



**Table 3: One-Way Trip Length of Park Visitors on Weekends (Miles)**

Parks	Year	Less than 1	1 to 3	3 to 5	5 to 10	10 to 25	25 to 50	50 to 100	more than 100
Pacific Highlands Ranch	2019	16%	19%	16%	21%	18%	3%	4%	5%
Pacific Highlands Ranch	2020	14%	23%	11%	18%	21%	4%	5%	5%
Encinitas Community Park	2019	16%	24%	14%	16%	18%	6%	3%	4%
Encinitas Community Park	2020	20%	20%	14%	15%	17%	5%	4%	4%
Sweetwater Regional Park and Bike Park <sup>1</sup>	2020	6%	26%	24%	22%	12%	4%	3%	4%
Greg Cox Bike Park <sup>2</sup>	2019	17%	26%	17%	13%	17%	4%	0%	4%
Greg Cox Bike Park <sup>2</sup>	2020	14%	33%	14%	14%	19%	5%	0%	5%
<b>Average<sup>2</sup></b>		<b>14%</b>	<b>22%</b>	<b>16%</b>	<b>18%</b>	<b>17%</b>	<b>4%</b>	<b>4%</b>	<b>4%</b>

Source: StreetLight Data, 2021. Fehr & Peers, 2021.

Note:

<sup>1</sup> Sweetwater Bike Park opened in 2020. So, only 2020 data were summarized. Note that the park opened during the COVID-19 pandemic when open parks were experiencing a higher number of daily visitations than usual. Also, Sweetwater Bike Park data includes trips to Sweetwater Valley Little League.

<sup>2</sup> Greg Cox Bike Park opened in April 2021. Big data after the park opening is not available; however, 2019 and 2020 data were available for trail use in the park area prior to opening of the bike park. Since the data does not represent an official park, the data was not included in the analysis.

The overall travel distance of park visitors to these parks was summarized in **Table 4**. Based on the data, the average 85<sup>th</sup> percentile weekday one-way travel distance is approximately 16 miles and weekend one-way travel distance is 23 miles. And the average weekday one-way travel distance is approximately 8 miles and weekend one-way travel distance is 12 miles.



**Table 4: Summary of Park User’s One-Way Trip Length to Three Parks**

Day of Week	One-Way Trip Length (Miles)			
	85th Percentile		Weighted Average	
	Three Parks <sup>1</sup>	Parks with Bike Park Facility <sup>2</sup>	Three Parks <sup>1</sup>	Parks with Bike Park Facility <sup>2</sup>
Weekday	16	15	8	9
Weekend	23	22	12	12

Source: StreetLight Data, 2021. Fehr & Peers, 2021.

Note:

<sup>1</sup> Three parks are Sweetwater Bike park, Pacific Highlands Ranch Community Park, and Encinitas Community Park. Greg Cox Bike Park data was not included in the analysis.

<sup>2</sup> Parks with bike park facilities are Sweetwater Bike Park and Pacific Highlands Ranch Community Park. Note that Sweetwater Bike Park data also includes trips to Sweetwater Valley Little League.

## Park Users

To explain the effect of the project on the regional VMT, we classified the project’s users into three categories including general park users, bike park users, and curious users described as follows and in **Table 5**:

General Park Users will mostly be people who live in the City of Carlsbad. These users are usually seeking a nearby or convenient park with typical amenities and would have sought out a park regardless of the project being constructed. Users may walk, bike, or drive to the closest park to use playgrounds, trails, or picnic areas.

Bike Park Users are the users who are specifically seeking out bike park with facilities such as pump tracks, jump lines, or flow trails. Such users may choose to drive long distances to reach a bike park.

Curious Users are the group of people who are interested in visiting new parks. We expect that these users may travel a bit farther than a general park user seeking out new park amenities.



**Table 5: Veterans Memorial Park Users**

	General Park Users	Bike Park Users	Curious Park Users
<b>Visitors</b>	Primarily City of Carlsbad residents	Both residents and non-residents of the City of Carlsbad	Both residents and non-residents of the City of Carlsbad
<b>Typical Park Selection</b>	Closest park	Closest bike park	Newly constructed parks with unique amenities
<b>Motivation for Visiting a Park</b>	Seeking typical park amenities (e.g. picnic area, playground, trails, etc.)	Seeking bike park amenities (Pump tracks, flow trails, etc.)	Seeking something new and different in a park experience.

Source: Fehr & Peers, 2021.

In the following sections, we reviewed the travel purpose, behavior, and VMT effect of each type of user and use the big data to help understand that VMT characteristics for each type of user.

### General Park Users

The proposed park provides a closer park option for many of the general park users in the City of Carlsbad. Such users will likely drive shorter distances and generate less VMT compared to no project conditions.

The average travel distance of park users is 12 miles (**Table 4**). So, the majority of the park users' home locations are within the 12-mile buffer of the project site. The highlighted buffer area shown in **Figure 5** includes some park uses; however, in the immediate vicinity of the proposed project, there are not any park uses. Also, based on inspection of the map, the project would be the closest large park to many City and some north county residents.

General park users are not expected to generate new trips, but they will redistribute the trips from traveling to existing parks to the new Veterans Memorial Park assuming the proposed park is the closest location to their home. Therefore, for this group of users, the project meets the characteristics of a locally serving park and is expected to result in a reduction in VMT amongst general park users.

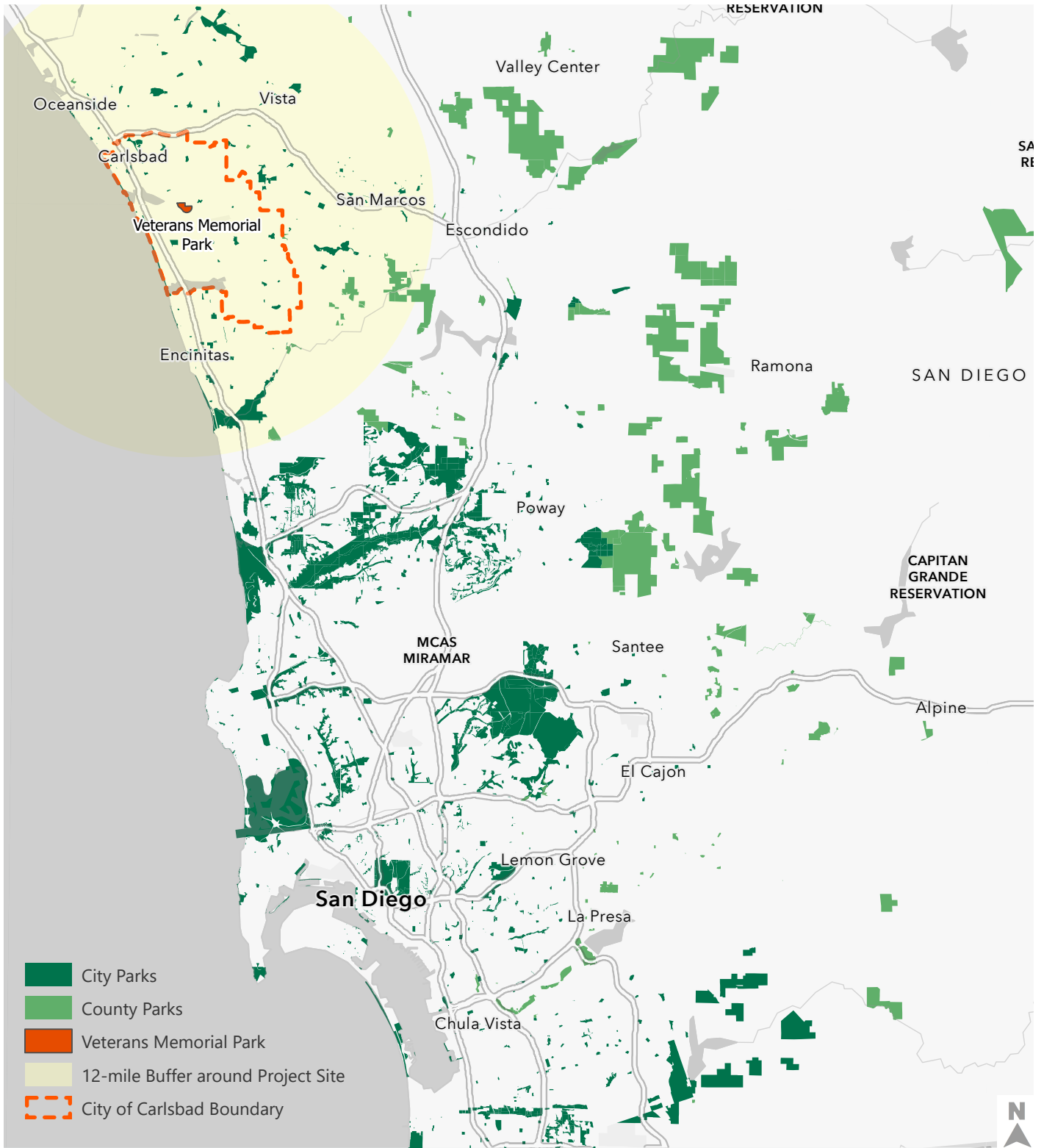


Figure 5

Location of the Existing Parks in the Vicinity of the Project







## Bike Park Users

Bike park users include City of Carlsbad residents and non-residents. Since there are limited existing bike park amenities in the region, Carlsbad residents that are specifically seeking bike park amenities would need to travel long distances.

### *City of Carlsbad Resident Bike Park Users*

Geospatial analysis was performed to determine the driving distance from the centroid of each census tract within the City of Carlsbad to the three similar bike parks described in the previous section and the comparative distance to the proposed project location (see **Appendix**). These distances were used to estimate the difference in VMT generated by Carlsbad residents making a round-trip to the bike park.

**Table 6** shows the average distance of Carlsbad residents traveling to the existing sample bike parks as compared to their distance to the project. As shown, the distance to the project is substantially less than to other available bike parks in the region.

**Table 6: Average Travel Distance of the City of Carlsbad Residents to Bike Parks**

Parks	Weighted Average Distance per Residents Round-trip <sup>1</sup>
Sweetwater Bike Park	82.62 miles
Greg Cox Bike Park	86.70 miles
Pacific Highlands Ranch Park	35.85 miles
Veterans Memorial Bike Park	11.67 miles

Source: Fehr & Peers, 2021.

Notes:

<sup>1</sup> Weighted average was calculated based on the population of the City of Carlsbad census tracts.

### *Non-Resident Bike Park Users*

Bike park users of the project are expected to also include non-residents from nearby cities. According to big data, there is no significant difference between the average travel distance of bike park users and other park users. Generally, the average travel distance of park users is approximately 12 miles (or 24 miles round-trip). Based on Tables 2 and 3 that summarize the big data, Non-residents within the 12-mile buffer of the project are shown in **Figure 6**.



A geospatial analysis was performed to calculate the average travel distance of the non-residents within 12-miles of Veterans Memorial Park to the existing three bike parks as well as the Veterans Memorial park (see **Appendix**). **Table 7** shows the average round-trip travel distance for non-residents.

Similar to residents, the round-trip travel distance of the non-residents to the project will be substantially less than no project condition.

**Table 7: Average Travel Distance of the Non-Residents to Bike Parks**

Parks	Weighted Average Distance per Non-Residents Round-trip <sup>1</sup>
Sweetwater Bike Park	92.68 miles
Greg Cox Bike Park	93.58 miles
Pacific Highlands Ranch Park	45.36 miles
Veterans Memorial Bike Park	19.25 miles

Source: Fehr & Peers, 2021.

Notes:

<sup>1</sup> Weighted average was calculated based on the population of the census tracts.

Based on this analysis of travel distance, the bike park users would not increase regional VMT, and to the extent that people are seeking out bike park uses, are expected reduce regional VMT.

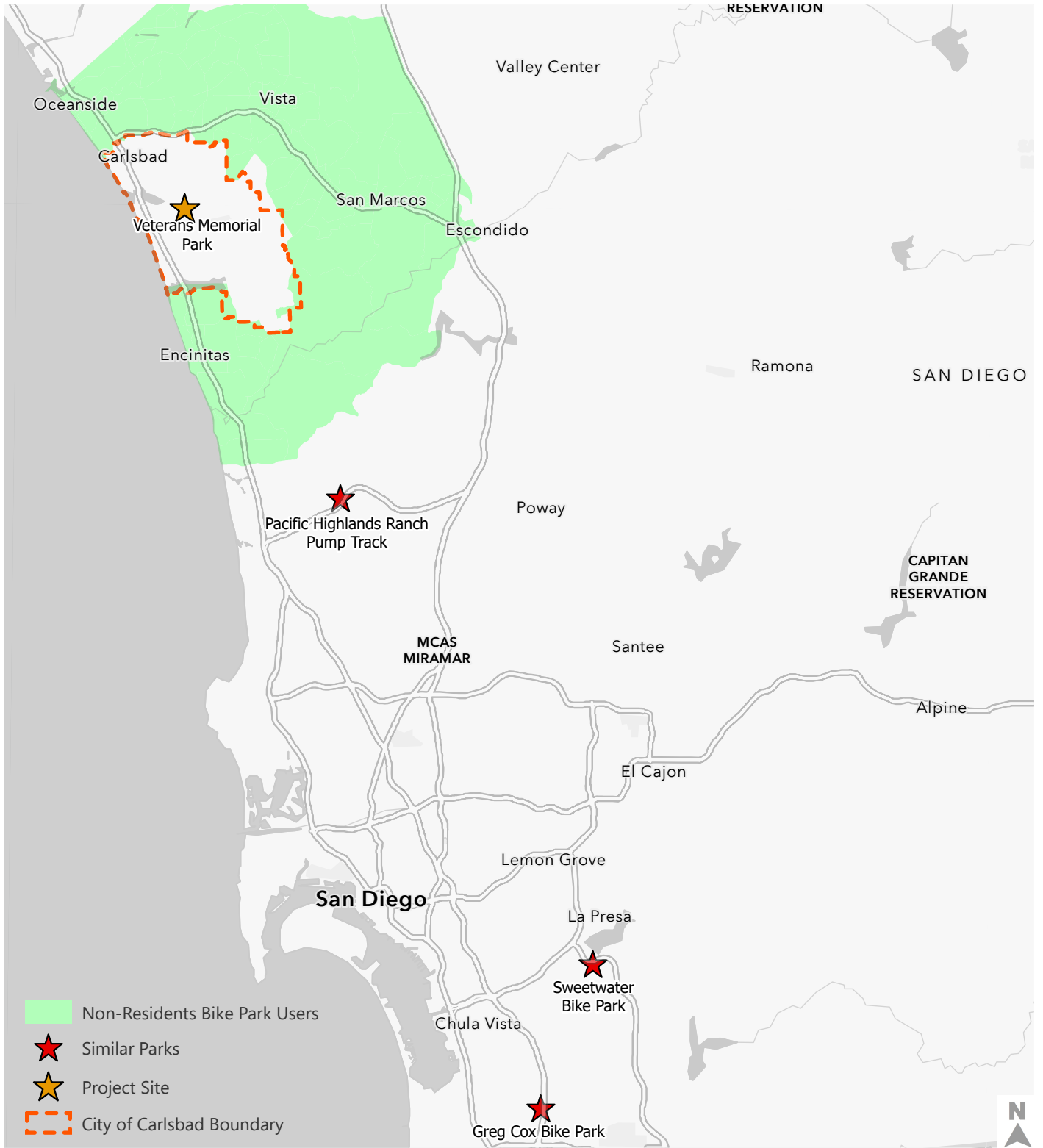


Figure 6



## Non-Resident Bike Park Users



### Curious Park Users

We expect curious users to make up the smallest proportion of overall park uses. Even though curious users will represent a small portion of park use, their trips may slightly increase regional VMT, since they are willing to drive a bit further to seek out a new, cool park, especially during the first couple years of the park opening and they may represent new trips/VMT within the region. However, based on the big data, this phenomenon does not seem to be extensive given that the brand-new Sweetwater bike park use had similar user travel distance to more established parks such as the Encinitas Community Park. However, to represent a worst-case scenario, we are considering the curious park users in our user profile.

In some cases, curious residents and non-residents visiting Veterans Memorial park may have longer trip lengths depending on their home locations, while in some other cases the trip length may be shorter. In addition, curious park users may be a combination of people who are redirecting to a different park or people who are a brand-new trip. Using the 12-miles buffer, as a proxy for where people live in relation to the project site, we performed a GIS analysis to calculate the population within this buffer around the project site as well as three existing bike parks in the county.

Based on the analysis, it is observed that it is relatively densely populated around the project within the 12-mile buffer, as summarized in **Table 8**, therefore, our expectation is that most curious users, like other park users, would primarily originate within that buffer. Therefore, the curious users that are redirecting from a different park would not increase regional VMT. Curious users that are brand new park trips may slightly increase regional VMT; however, given that this sub-group is expected to be small, the increase in VMT would be more than offset by the reduction in VMT due to general park users and bike park users.

**Table 8: Population within 12-mile Buffer Around Bike Parks**

Parks	Population within 12-mile buffer (in thousands)
Greg Cox Bike Park	330
Pacific Highlands Ranch Community Park	550
<b><i>Veterans Memorial Park</i></b>	<b>610</b>
Sweetwater Bike Park	1,050

Source: Fehr & Peers, 2021.



## Overall Change in Regional VMT

This section provides calculations of change in VMT associated with each park user group. Since it is unknown how many users will be in each user category, we have provided the calculations based on a range of different assumptions for user breakdown. This is intended to provide a range of the change in VMT and show the expected VMT trend (reduction or increase in regional VMT). **Table 9** displays the relative change for each user group based on the data presented in the previous sections.

**Table 9: Relative Change in VMT for Each User Group**

Park Users		Effect on VMT
General Park Users	Residents	Reduction
Bike Park Users	Residents	Reduction
	Non-residents	Reduction
Curious Park Users	Residents/redistributed trip	Reduction
	Residents/new trip	Increase
	Non-residents/redistributed trip	Reduction
	Non-resident/new trip	Increase

Source: Fehr & Peers, 2021.

Based on the approved scoping agreement, the project is estimated to generate 893 (447 inbound and 446 outbound) daily weekday vehicle trips and 1,099 (550 inbound/449 outbound) weekend daily vehicle trips. To provide a range in expected VMT, we estimate the total vehicle trips of each user type and their trip length before and after the project condition to calculate the overall change in VMT. We used engineering judgment and information from the big data sources to arrive at the following assumptions for two scenarios. Scenario 1 includes more conservative assumptions than scenario 2, as explained in **Table 10**. Therefore, we expect the VMT change to be somewhere in between these two scenarios.





**Table 10: Scenario Assumptions – Trip Percentages and Round-Trip Travel Distance**

Park Users		Trip Percentage (Scenario 1) <sup>1</sup>	Trip Percentage (Scenario 2) <sup>1</sup>	Average Trip Length (miles) - w/o Project	Average Trip Length (miles) - with Project
General Park Users <sup>2</sup>	Residents/Non-residents	80% (70%)	50% (45%)	16.0	11.67
Bike Park Users <sup>3</sup>	Residents	10% (10%)	15% (15%)	35.85	11.67
	Non-residents	4% (10%)	25% (30%)	45.36	19.25
Curious Park User <sup>4</sup>	New trips	3% (5%)	5% (5%)	0	24.0
	Redistributed trips	3% (5%)	5% (5%)	24.0	24.0

Source: Fehr & Peers, 2021.

Notes:

<sup>1</sup> Based on our engineering judgement.

<sup>2</sup> Without Veterans Memorial Park, the round-trip travel distance of general park users was assumed 16 miles (the average trip length of park users on weekdays based on big data). After the project is implemented, general park users travel distances were assumed to be similar to residents bike park travel distances.

<sup>3</sup> Bike park users are 50% residents and 50% non-residents. Without Veterans Memorial Park, all bike park users were assumed to go to the closest bike park (Pacific Highlands Ranch).

<sup>4</sup> Curious users are 50% new trips and 50% redistributed trips. Their round-trip travel distances before and after the project were assumed 24 miles (average trip length based on big data).

The regional change in total VMT attributed to the Veterans Memorial Park project is expected to be somewhere between scenario 1 and scenario 2, as summarized in **Tables 11 through 14**. The project is expected to generate about 3,108 to 5,514 fewer vehicle miles on weekdays and about 4,433 to 7,389 fewer vehicle miles on weekends as compared to before the project was built.



**Table 11: Change in VMT on Weekdays – Scenario 1**

Park Users		Without Project			With Project			Difference
		#Trips	Trip Length (Round-trip)	VMT	#Trips	Trip Length (Round-trip)	VMT	
General Park Users	Residents	358	16.00	5,728	358	11.67	4,178	-1,550
Bike Park Users	Residents	45	35.85	1,613	45	11.67	525	-1,088
	Non-residents	18	45.36	816	18	19.25	347	-470
Curious Park Users	New Trips	-	-	-	13	24.00	312	312
	Redistributed	26	24.00	624	13	24.00	312	-312
<b>Total</b>		<b>447</b>	<b>-</b>	<b>8,782</b>	<b>447</b>	<b>-</b>	<b>5,674</b>	<b>-3,108</b>

Source: Fehr & Peers, 2021.

**Table 12: Change in VMT on Weekends – Scenario 1**

Park Users		Without Project			With Project			Difference #Trips
		#Trips	Trip Length (Round-trip)	VMT	#Trips	Trip Length (Round-trip)	VMT	
General Park Users	Residents	385	16.00	6,160	385	11.67	4,493	-1,667
Bike Park Users	Residents	55	35.85	1,972	55	11.67	642	-1,330
	Non-residents	55	45.36	2,495	55	19.25	1,059	-1,436
Curious Park Users	New Trips	-	-	-	28	24.00	672	672
	Redistributed	55	24.00	1,320	27	24.00	648	-672
<b>Total</b>		<b>550</b>		<b>11,947</b>	<b>550</b>		<b>7,514</b>	<b>-4,433</b>

Source: Fehr & Peers, 2021.



**Table 13: Change in VMT on Weekdays – Scenario 2**

Park Users		Without Project			With Project			Difference #Trips
		#Trips	Trip Length (Round-trip)	VMT	#Trips	Trip Length (Round-trip)	VMT	
General Park Users	Residents	224	16.00	3,584	224	11.67	2,614	-970
Bike Park Users	Residents	67	35.85	2,402	67	11.67	782	-1,620
	Non-residents	112	45.36	5,080	112	19.25	2,156	-2,924
Curious Park Users	New Trips	-	-	-	22	24.00	528	528
	Redistributed	44	24.00	1,056	22	24.00	528	-528
<b>Total</b>		<b>447</b>		<b>12,122</b>	<b>447</b>		<b>6,608</b>	<b>-5,514</b>

Source: Fehr & Peers, 2021.

**Table 14: Change in VMT on Weekends – Scenario 2**

Park Users		Without Project			With Project			Difference #Trips
		#Trips	Trip Length (Round-trip)	VMT	#Trips	Trip Length (Round-trip)	VMT	
General Park Users	Residents	248	16.00	3,968	248	11.67	2,894	-1,074
Bike Park Users	Residents	83	35.85	2,976	83	11.67	969	-2,007
	Non-residents	165	45.36	7,484	165	19.25	3,176	-4,308
Curious Park Users	New Trips	-	-	-	27	24.00	648	648
	Redistributed	54	24.00	1,296	27	24.00	648	-648
<b>Total</b>		<b>550</b>		<b>15,724</b>	<b>550</b>		<b>8,335</b>	<b>-7,389</b>

Source: Fehr & Peers, 2021.



## Step 3: Compare to the Significance Threshold

As a regional public facility project, the City of Carlsbad's *VMT Analysis Guidelines* (September 2020) state that the proposed project would be considered to have a significant transportation impact if it results in a net increase in VMT compared to the no project condition. Analysis proved that the project is not expected to increase regional VMT, because it provides park amenities to the local community, that forms the majority of park users; and reduces the travel distances of general park users and bike park users. Therefore, evidence suggests the project has a less-than-significant transportation VMT impact.

# **Appendix: Bike Park Users Travel Distances to Bike Parks with and without the Project**



**Table 1: Resident Bike Park User Round-Trip Travel Distance – Without Project**

Before Study			
Zip Code Census Tracts	Parks	Population	Round Trip Length
17109	Sweetwater Bike Park	6790	37.27
17801	Sweetwater Bike Park	6776	87.14
17808	Sweetwater Bike Park	6135	78.97
17809	Sweetwater Bike Park	2483	85.39
17810	Sweetwater Bike Park	5069	86.55
17811	Sweetwater Bike Park	6815	79.51
17813	Sweetwater Bike Park	4601	78.72
17900	Sweetwater Bike Park	7411	85.53
18000	Sweetwater Bike Park	3976	85.21
19803	Sweetwater Bike Park	4782	91.84
19804	Sweetwater Bike Park	4579	88.05
19806	Sweetwater Bike Park	12080	91.78
20013	Sweetwater Bike Park	13713	80.35
20014	Sweetwater Bike Park	7636	80.62
20015	Sweetwater Bike Park	4792	77.04
20016	Sweetwater Bike Park	9460	74.12
22100	Sweetwater Bike Park	9670	82.71
17109	Greg Cox Bike Park	6790	78.62
17801	Greg Cox Bike Park	6776	91.23
17808	Greg Cox Bike Park	6135	83.05
17809	Greg Cox Bike Park	2483	89.47
17810	Greg Cox Bike Park	5069	90.63
17811	Greg Cox Bike Park	6815	83.59
17813	Greg Cox Bike Park	4601	82.81
17900	Greg Cox Bike Park	7411	89.62
18000	Greg Cox Bike Park	3976	89.30
19803	Greg Cox Bike Park	4782	95.93
19804	Greg Cox Bike Park	4579	92.13
19806	Greg Cox Bike Park	12080	95.86
20013	Greg Cox Bike Park	13713	84.43
20014	Greg Cox Bike Park	7636	84.70
20015	Greg Cox Bike Park	4792	81.13
20016	Greg Cox Bike Park	9460	78.21
22100	Greg Cox Bike Park	9670	86.79
17109	Pacific Highlands Ranch	6790	25.21
17801	Pacific Highlands Ranch	6776	41.58
17808	Pacific Highlands Ranch	6135	32.33
17809	Pacific Highlands Ranch	2483	39.83
17810	Pacific Highlands Ranch	5069	40.99
17811	Pacific Highlands Ranch	6815	33.95
17813	Pacific Highlands Ranch	4601	33.17
17900	Pacific Highlands Ranch	7411	39.97
18000	Pacific Highlands Ranch	3976	39.65
19803	Pacific Highlands Ranch	4782	45.55
19804	Pacific Highlands Ranch	4579	42.40

Before Study			
<b>Zip-Code</b> Census Tracts	Parks	Population	Round Trip Length
19806	Pacific Highlands Ranch	12080	43.69
20013	Pacific Highlands Ranch	13713	33.71
20014	Pacific Highlands Ranch	7636	33.98
20015	Pacific Highlands Ranch	4792	27.72
20016	Pacific Highlands Ranch	9460	26.15
22100	Pacific Highlands Ranch	9670	36.07
Overall Weighted Average			
<b>Sweetwater Bike Park</b>			<b>80.45</b>
<b>Greg Cox Bike Park</b>			<b>86.70</b>
<b>Pacific Highlands Ranch</b>			<b>35.85</b>

**Table 2: Resident Bike Park User Round-Trip Travel Distance – With Project**

Before Study			
<b>Zip-Code</b> Census Tracts	Parks	Population	Round Trip Length
17109	Veterans Memorial Park	6790	18.41
17801	Veterans Memorial Park	6776	10.03
17808	Veterans Memorial Park	6135	11.56
17809	Veterans Memorial Park	2483	8.22
17810	Veterans Memorial Park	5069	7.30
17811	Veterans Memorial Park	6815	7.52
17813	Veterans Memorial Park	4601	9.17
17900	Veterans Memorial Park	7411	10.42
18000	Veterans Memorial Park	3976	10.47
19803	Veterans Memorial Park	4782	11.12
19804	Veterans Memorial Park	4579	7.97
19806	Veterans Memorial Park	12080	17.04
20013	Veterans Memorial Park	13713	9.21
20014	Veterans Memorial Park	7636	13.80
20015	Veterans Memorial Park	4792	16.76
20016	Veterans Memorial Park	9460	15.50
22100	Veterans Memorial Park	9670	7.74
<b>Weighted Average</b>			<b>11.67</b>

**Table 3: Non-Resident Bike Park User Round-Trip Travel Distance – Without Project**

Before Study			
Zip Code Census Tracts	Parks	Population	Round Trip Length
17104	Pacific Highlands Ranch	3937	24.08
17106	Pacific Highlands Ranch	5227	18.71
17107	Pacific Highlands Ranch	2860	26.08
17108	Pacific Highlands Ranch	4646	24.95
17110	Pacific Highlands Ranch	11866	27.64
17303	Pacific Highlands Ranch	3073	16.76
17304	Pacific Highlands Ranch	5884	14.35
17305	Pacific Highlands Ranch	3104	16.83
17401	Pacific Highlands Ranch	5888	19.82
17403	Pacific Highlands Ranch	4997	21.72
17404	Pacific Highlands Ranch	6586	20.61
17501	Pacific Highlands Ranch	2970	22.76
17502	Pacific Highlands Ranch	3447	21.84
17601	Pacific Highlands Ranch	5131	27.83
17603	Pacific Highlands Ranch	2597	24.99
17604	Pacific Highlands Ranch	7450	25.22
17701	Pacific Highlands Ranch	5740	27.77
17702	Pacific Highlands Ranch	3032	24.76
18100	Pacific Highlands Ranch	6432	43.08
18200	Pacific Highlands Ranch	7374	45.24
18300	Pacific Highlands Ranch	2989	47.28
18400	Pacific Highlands Ranch	4089	46.79
18504	Pacific Highlands Ranch	7020	45.48
18507	Pacific Highlands Ranch	9076	54.93
18509	Pacific Highlands Ranch	5001	47.45
18510	Pacific Highlands Ranch	2801	49.61
18511	Pacific Highlands Ranch	5225	48.25
18512	Pacific Highlands Ranch	4446	51.33
18513	Pacific Highlands Ranch	9817	52.34
18514	Pacific Highlands Ranch	8254	56.22
18515	Pacific Highlands Ranch	5105	47.71
18516	Pacific Highlands Ranch	3978	52.11
18517	Pacific Highlands Ranch	4855	48.66
18518	Pacific Highlands Ranch	2941	50.45
18519	Pacific Highlands Ranch	5263	51.76
18601	Pacific Highlands Ranch	4668	51.44
18603	Pacific Highlands Ranch	6865	50.64
18608	Pacific Highlands Ranch	3224	55.83
18609	Pacific Highlands Ranch	5918	56.16
18610	Pacific Highlands Ranch	6851	58.57
18612	Pacific Highlands Ranch	3537	61.06
18613	Pacific Highlands Ranch	3773	53.93
18614	Pacific Highlands Ranch	6988	52.23
19203	Pacific Highlands Ranch	2836	60.62
19205	Pacific Highlands Ranch	6281	57.78
19206	Pacific Highlands Ranch	5236	56.79
19207	Pacific Highlands Ranch	8858	59.54
19208	Pacific Highlands Ranch	3291	57.32
19301	Pacific Highlands Ranch	6805	57.13
19302	Pacific Highlands Ranch	7965	55.35
19303	Pacific Highlands Ranch	7669	60.43
19403	Pacific Highlands Ranch	6280	54.90
19404	Pacific Highlands Ranch	3411	57.09
19405	Pacific Highlands Ranch	3969	52.57
19406	Pacific Highlands Ranch	4847	54.18

**Before Study**

<b>Zip Code Census Tracts</b>	<b>Parks</b>	<b>Population</b>	<b>Round Trip Length</b>
19501	Pacific Highlands Ranch	3843	55.83
19502	Pacific Highlands Ranch	5702	55.64
19503	Pacific Highlands Ranch	5087	52.63
19601	Pacific Highlands Ranch	6514	56.08
19602	Pacific Highlands Ranch	5452	53.04
19701	Pacific Highlands Ranch	6945	52.52
19702	Pacific Highlands Ranch	5128	51.21
19805	Pacific Highlands Ranch	4523	47.31
19808	Pacific Highlands Ranch	5759	49.03
19809	Pacific Highlands Ranch	4328	50.43
19902	Pacific Highlands Ranch	4160	48.76
19903	Pacific Highlands Ranch	4292	51.32
19904	Pacific Highlands Ranch	7763	48.24
19905	Pacific Highlands Ranch	5123	47.50
20017	Pacific Highlands Ranch	3635	46.54
20018	Pacific Highlands Ranch	7664	45.05
20019	Pacific Highlands Ranch	7071	42.46
20020	Pacific Highlands Ranch	7480	49.48
20021	Pacific Highlands Ranch	6284	49.45
20022	Pacific Highlands Ranch	7587	48.44
20023	Pacific Highlands Ranch	3840	45.68
20024	Pacific Highlands Ranch	4095	44.44
20025	Pacific Highlands Ranch	5208	43.35
20026	Pacific Highlands Ranch	4482	44.63
20027	Pacific Highlands Ranch	17006	43.41
20028	Pacific Highlands Ranch	4022	47.47
20029	Pacific Highlands Ranch	7440	45.24
20304	Pacific Highlands Ranch	6451	50.75
20305	Pacific Highlands Ranch	6246	43.33
20306	Pacific Highlands Ranch	10952	48.60
20307	Pacific Highlands Ranch	7558	40.88
20309	Pacific Highlands Ranch	4178	41.78
17306	Pacific Highlands Ranch	3078	15.74
17104	Greg Cox Bike Park	3937	74.71
17106	Greg Cox Bike Park	5227	72.45
17107	Greg Cox Bike Park	2860	75.74
17108	Greg Cox Bike Park	4646	74.60
17110	Greg Cox Bike Park	11866	81.39
17303	Greg Cox Bike Park	3073	66.42
17304	Greg Cox Bike Park	5884	64.00
17305	Greg Cox Bike Park	3104	66.60
17401	Greg Cox Bike Park	5888	69.48
17403	Greg Cox Bike Park	4997	71.37
17404	Greg Cox Bike Park	6586	70.27
17501	Greg Cox Bike Park	2970	72.41
17502	Greg Cox Bike Park	3447	71.49
17601	Greg Cox Bike Park	5131	77.48
17603	Greg Cox Bike Park	2597	74.64
17604	Greg Cox Bike Park	7450	74.88
17701	Greg Cox Bike Park	5740	77.42
17702	Greg Cox Bike Park	3032	74.41
18100	Greg Cox Bike Park	6432	92.74
18200	Greg Cox Bike Park	7374	94.90
18300	Greg Cox Bike Park	2989	96.94
18400	Greg Cox Bike Park	4089	96.45
18504	Greg Cox Bike Park	7020	95.13
18507	Greg Cox Bike Park	9076	104.58

**Before Study**

<b>Zip Code Census Tracts</b>	<b>Parks</b>	<b>Population</b>	<b>Round Trip Length</b>
18509	Greg Cox Bike Park	5001	97.11
18510	Greg Cox Bike Park	2801	99.26
18511	Greg Cox Bike Park	5225	97.90
18512	Greg Cox Bike Park	4446	100.99
18513	Greg Cox Bike Park	9817	101.99
18514	Greg Cox Bike Park	8254	105.87
18515	Greg Cox Bike Park	5105	97.36
18516	Greg Cox Bike Park	3978	101.76
18517	Greg Cox Bike Park	4855	98.31
18518	Greg Cox Bike Park	2941	100.10
18519	Greg Cox Bike Park	5263	101.41
18601	Greg Cox Bike Park	4668	101.09
18603	Greg Cox Bike Park	6865	100.29
18608	Greg Cox Bike Park	3224	105.48
18609	Greg Cox Bike Park	5918	105.81
18610	Greg Cox Bike Park	6851	108.22
18612	Greg Cox Bike Park	3537	110.71
18613	Greg Cox Bike Park	3773	103.58
18614	Greg Cox Bike Park	6988	101.89
19203	Greg Cox Bike Park	2836	108.52
19205	Greg Cox Bike Park	6281	105.68
19206	Greg Cox Bike Park	5236	104.69
19207	Greg Cox Bike Park	8858	107.44
19208	Greg Cox Bike Park	3291	98.67
19301	Greg Cox Bike Park	6805	106.78
19302	Greg Cox Bike Park	7965	105.00
19303	Greg Cox Bike Park	7669	108.33
19403	Greg Cox Bike Park	6280	104.56
19404	Greg Cox Bike Park	3411	104.99
19405	Greg Cox Bike Park	3969	102.22
19406	Greg Cox Bike Park	4847	103.84
19501	Greg Cox Bike Park	3843	103.74
19502	Greg Cox Bike Park	5702	103.55
19503	Greg Cox Bike Park	5087	102.28
19601	Greg Cox Bike Park	6514	103.99
19602	Greg Cox Bike Park	5452	100.95
19701	Greg Cox Bike Park	6945	102.17
19702	Greg Cox Bike Park	5128	100.28
19805	Greg Cox Bike Park	4523	96.96
19808	Greg Cox Bike Park	5759	98.68
19809	Greg Cox Bike Park	4328	100.08
19902	Greg Cox Bike Park	4160	96.66
19903	Greg Cox Bike Park	4292	99.23
19904	Greg Cox Bike Park	7763	97.90
19905	Greg Cox Bike Park	5123	97.16
20017	Greg Cox Bike Park	3635	96.19
20018	Greg Cox Bike Park	7664	93.35
20019	Greg Cox Bike Park	7071	92.12
20020	Greg Cox Bike Park	7480	92.80
20021	Greg Cox Bike Park	6284	90.80
20022	Greg Cox Bike Park	7587	89.79
20023	Greg Cox Bike Park	3840	87.03
20024	Greg Cox Bike Park	4095	85.80
20025	Greg Cox Bike Park	5208	84.70
20026	Greg Cox Bike Park	4482	91.59
20027	Greg Cox Bike Park	17006	93.06
20028	Greg Cox Bike Park	4022	89.49

## Before Study

Zip Code Census Tracts	Parks	Population	Round Trip Length
20029	Greg Cox Bike Park	7440	91.57
20304	Greg Cox Bike Park	6451	92.10
20305	Greg Cox Bike Park	6246	84.69
20306	Greg Cox Bike Park	10952	89.95
20307	Greg Cox Bike Park	7558	83.16
20309	Greg Cox Bike Park	4178	83.14
17306	Greg Cox Bike Park	3078	65.39
17104	Sweetwater Bike Park	3937	73.81
17106	Sweetwater Bike Park	5227	71.56
17107	Sweetwater Bike Park	2860	74.84
17108	Sweetwater Bike Park	4646	73.71
17110	Sweetwater Bike Park	11866	80.49
17303	Sweetwater Bike Park	3073	65.52
17304	Sweetwater Bike Park	5884	63.11
17305	Sweetwater Bike Park	3104	65.70
17401	Sweetwater Bike Park	5888	68.58
17403	Sweetwater Bike Park	4997	70.47
17404	Sweetwater Bike Park	6586	69.37
17501	Sweetwater Bike Park	2970	71.52
17502	Sweetwater Bike Park	3447	70.59
17601	Sweetwater Bike Park	5131	76.58
17603	Sweetwater Bike Park	2597	73.74
17604	Sweetwater Bike Park	7450	73.98
17701	Sweetwater Bike Park	5740	76.53
17702	Sweetwater Bike Park	3032	73.51
18100	Sweetwater Bike Park	6432	91.84
18200	Sweetwater Bike Park	7374	94.00
18300	Sweetwater Bike Park	2989	96.04
18400	Sweetwater Bike Park	4089	95.55
18504	Sweetwater Bike Park	7020	94.24
18507	Sweetwater Bike Park	9076	103.68
18509	Sweetwater Bike Park	5001	96.21
18510	Sweetwater Bike Park	2801	98.36
18511	Sweetwater Bike Park	5225	97.00
18512	Sweetwater Bike Park	4446	100.09
18513	Sweetwater Bike Park	9817	101.09
18514	Sweetwater Bike Park	8254	104.97
18515	Sweetwater Bike Park	5105	96.46
18516	Sweetwater Bike Park	3978	100.86
18517	Sweetwater Bike Park	4855	97.41
18518	Sweetwater Bike Park	2941	99.20
18519	Sweetwater Bike Park	5263	100.51
18601	Sweetwater Bike Park	4668	100.20
18603	Sweetwater Bike Park	6865	99.39
18608	Sweetwater Bike Park	3224	104.59
18609	Sweetwater Bike Park	5918	104.92
18610	Sweetwater Bike Park	6851	107.32
18612	Sweetwater Bike Park	3537	109.81
18613	Sweetwater Bike Park	3773	102.68
18614	Sweetwater Bike Park	6988	100.99
19203	Sweetwater Bike Park	2836	107.62
19205	Sweetwater Bike Park	6281	104.79
19206	Sweetwater Bike Park	5236	103.79
19207	Sweetwater Bike Park	8858	106.54
19208	Sweetwater Bike Park	3291	97.78
19301	Sweetwater Bike Park	6805	105.88
19302	Sweetwater Bike Park	7965	104.10

Before Study			
Zip Code Census Tracts	Parks	Population	Round Trip Length
19303	Sweetwater Bike Park	7669	107.43
19403	Sweetwater Bike Park	6280	103.66
19404	Sweetwater Bike Park	3411	104.09
19405	Sweetwater Bike Park	3969	101.32
19406	Sweetwater Bike Park	4847	102.94
19501	Sweetwater Bike Park	3843	102.84
19502	Sweetwater Bike Park	5702	102.65
19503	Sweetwater Bike Park	5087	101.38
19601	Sweetwater Bike Park	6514	103.09
19602	Sweetwater Bike Park	5452	100.05
19701	Sweetwater Bike Park	6945	101.27
19702	Sweetwater Bike Park	5128	99.39
19805	Sweetwater Bike Park	4523	96.06
19808	Sweetwater Bike Park	5759	97.79
19809	Sweetwater Bike Park	4328	99.19
19902	Sweetwater Bike Park	4160	95.76
19903	Sweetwater Bike Park	4292	98.33
19904	Sweetwater Bike Park	7763	97.00
19905	Sweetwater Bike Park	5123	96.26
20017	Sweetwater Bike Park	3635	95.30
20018	Sweetwater Bike Park	7664	92.45
20019	Sweetwater Bike Park	7071	91.22
20020	Sweetwater Bike Park	7480	91.91
20021	Sweetwater Bike Park	6284	89.90
20022	Sweetwater Bike Park	7587	88.90
20023	Sweetwater Bike Park	3840	86.13
20024	Sweetwater Bike Park	4095	84.90
20025	Sweetwater Bike Park	5208	83.80
20026	Sweetwater Bike Park	4482	90.69
20027	Sweetwater Bike Park	17006	92.17
20028	Sweetwater Bike Park	4022	88.60
20029	Sweetwater Bike Park	7440	90.67
20304	Sweetwater Bike Park	6451	91.20
20305	Sweetwater Bike Park	6246	83.79
20306	Sweetwater Bike Park	10952	89.05
20307	Sweetwater Bike Park	7558	82.26
20309	Sweetwater Bike Park	4178	82.24
17306	Sweetwater Bike Park	3078	64.50
<b>Overall Weighted Average</b>			
<b>Sweetwater Bike Park</b>			<b>45.36</b>
<b>Greg Cox Bike Park</b>			<b>93.58</b>
<b>Pacific Highlands Ranch</b>			<b>92.68</b>

**Table 4: Non-Resident Bike Park User Round-Trip Travel Distance – With Project**

After Study		
Parks	Population	Round Trip Length
Veterans Memorial Park	491269	<b>19.25</b>