Appendix A: Data Analysis

Introduction

This appendix summarizes the methodology and results of the SANDAG regional-scale existing conditions safety analysis. First, a summary of data collection, preparation, and processing is provided. Methodologies and results for four main analyses are presented in the following sections: Safety Focus Network (SFN), Descriptive and Systemic Analysis, Crash Profiles and Risk Factors, and Equity Analysis. Outputs from this analysis were used in prioritization efforts described in Appendix B.

The following analysis is based on a law enforcement assessment of the crash as observed and documented at the time of the incident. Reported fatal and serious injury crashes are referred to using the acronym "KA" to collectively refer to fatal (K) and suspected serious injury (A) crashes, based on the KABCO scale acronyms. The KABCO scale is an injury classification created by the Federal Highway Administration.

Safety Focus Network

Methodology

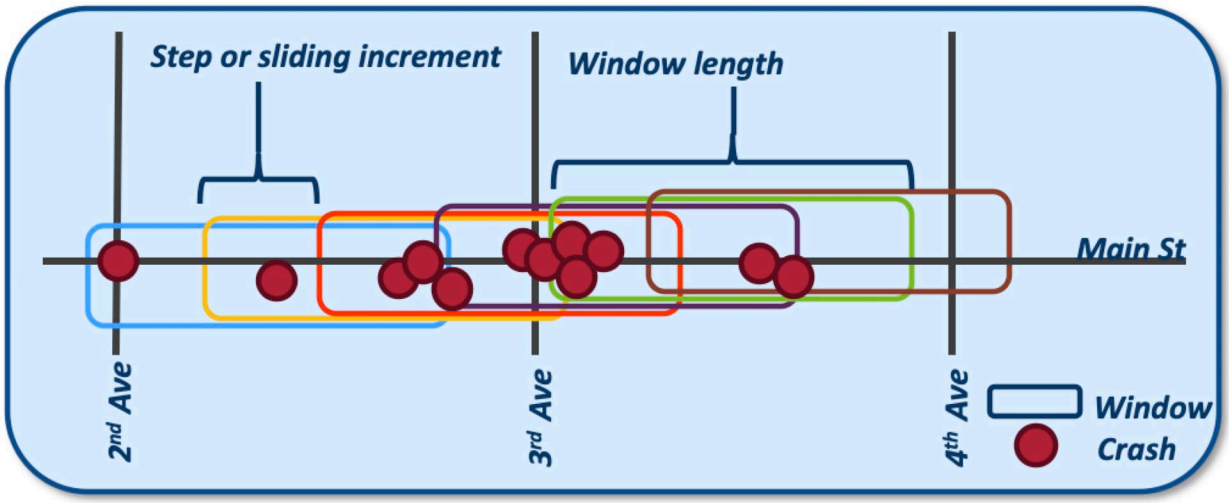
The SANDAG SFN was developed to identify spatial clusters of fatal and injury crashes based on crash history. The SFN prioritizes areas where the greatest concentrations of fatal and serious injury crashes happen, in line with the Safe System Approach. This network was developed using a methodology typically referred to as a High Injury Network. This type of analysis is semi-reactive since it is based primarily on crash history. However, the process of identifying entire corridors allows for some proactive or systemic recommendations to emerge.

The primary input in the development of the SFN was a database containing the five most recent years of crash reports. Refer to the Data Sources and Preparation section for more information about crash report data, including the mode and severity variables that were used to build the SFN. The SFN is primarily informed by fatal and serious injury crashes (also referred to as KA crashes) for all modes. As is common with this type of analysis, minor injury crashes were also included for pedestrians, bicyclists, and motorcyclists because these crashes are relatively fewer in number than motorist-only crashes and yet are much more severe on average than motorist-only crashes. Minor injury crashes were weighted less than fatal and serious injury crashes with a 3:1 ratio. This is consistent with how many Vision Zero safety analyses weight crashes for SFN development.[1]

[1] Example HIN methodologies that used a 3:1 ratio:
Minnesota Department of Transportation: **https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/download?docId=37004664**;
Oakland, California: **https://www.oaklandca.gov/resources/high-injury-network-2024**;
Milwaukee, Wisconsin: **https://www.milwaukee.gov/MKECrashAnalysisReport2022.pdf**;
Alameda, California: **https://www.alamedaca.gov/files/assets/public/v/2/departments/alameda/transportation/vision-zero/appendixf_detailedcrashdataanalysis.pdf**;
Northwest Arkansas Regional Planning Commission: **https://www.nwarpc.org/wp-content/uploads/2023/07/NW-Arkansas-Vision-Zero-Plan_APPENDIX_A_Final_web.pdf**;
Mid-Ohio Regional Planning Commission: **https://www.morpc.org/2023/wp-content/uploads/2024/05/3Regional_Safety_Priorities-Update.pdf**

The SANDAG SFN was built using a process called sliding windows analysis. This analysis helps detect patterns of crashes happening in sequence. First, the analysis calculates the weighted score for crashes happening along a short virtual "window" of the road network (e.g., a 1-mile segment). Then, the window is moved a small distance (e.g., 1/10 of a mile), and the score is calculated again. See Figure 1 for an illustration of this virtual window stepping along a street with crash scores calculated at each step. This is repeated across all the street network for each mode separately. Restricted access freeways were excluded from the analysis.

Figure 1: Sliding windows process to measure crashes in window segments along a network



The resulting output was a linear density of fatal and injury crashes (per the weighting above) for each mode. The sliding windows parameters used in this analysis are summarized in Table 1.

Table 1: Sliding Windows Parameters for Urbanized and Rural Geography Types in the SANDAG Region

Geography Type	Window Segment Size	Step Size
Urbanized	1 Mile	1/10 Mile
Rural	2 Miles	1/4 Mile

Once the sliding windows analysis had been run for the entire road network (excluding restricted-access freeways) and all four modes, the weighted crash scores on the network were analyzed by mode. Thresholds were chosen for each mode to categorize the network into higher-scoring segments that are on the SFN and lower-scoring segments that are not on the SFN. Threshold selection was informed by SFN performance metrics, desired SFN size (i.e., how many miles), geography type (i.e., urban vs. rural), agency goals, and professional judgment. This process of setting a threshold and categorizing the granular scores into a binary on-SFN/off-SFN variable allowed for applying a prioritization methodology to the SFN segments in a subsequent analysis. Refer to Appendix B for more information about how the SFN was used in prioritization.

Results

Table 2 lists the thresholds used for each mode in urbanized and rural areas to define the Safety Focus Network.

Overall, 54% of the region's fatal and serious injury crashes are happening on just 6% of the region's streets and roads (excluding freeways), or about 653 miles of roadway. Nearly half of each mode's fatal and serious injury crashes are captured by the regional SFN, ranging from 49% of severe motorist crashes to nearly 59% of severe pedestrian crashes. A map of the SFN is available online in the SANDAG Traffic Safety Dashboard.

Table 2: Summary of SFN Thresholds, Mileage, and Fatal and Serious Injury Crashes (KA)

Mode[2]	Threshold in Urban Areas	Threshold in Rural Areas	Miles[3]	% of Regional Network (excl. freeways)[3]	No. of KA Injury Crashes on SFN	% of KA Crashes on SFN	Density of KA Crashes Per Mile on SFN
Pedestrian	13	7	177	2%	544	59%	0.8
Bicyclist	7	5	203	2%	203	54%	0.3
Motorcyclist	9	9	238	2%	613	58%	0.9
Motorist	12	15	325	3%	791	49%	1.2
Composite	N/A	N/A	653	6%	2,160	54%	3.3

[2] Crash mode is assigned hierarchically by road user vulnerability. There are a small number of crashes (n=9) where the most vulnerable road user was not the most seriously injured road user. These crashes are not reflected in the mode-specific rows below but are included in the Composite row. Therefore, the sum of the mode-specific number of fatal and serious injury crashes on the SFN rows does not match the composite row.

[3] A portion of segments identified for one mode are also identified for other modes. As a result the Composite Miles and Percent of the Regional Network will not equal the sum of the columns.

Descriptive and Systemic Analysis

Methodology

SANDAG analyzed crash report data and related roadway and contextual data to understand patterns of crashes and common systemic factors. This included victim characteristics, trends over time, severity, pre-crash movements and actions, crash types or profiles, underlying roadway and facility spatial centerline data, land use, and more. The data used for this analysis are described in the last section of this appendix, Data Sources and Preparation. The results from descriptive and systemic analysis were used to develop crash profiles, identify common risk factors for fatal and serious injury crashes, and inform strategies to address those risk factors via engineering and other strategies consistent with a Safe System Approach.

The team followed an exploratory approach to this analysis for the SANDAG region, starting with an initial list of variables of interest and then adding variables or looking at combinations of variables based on initial findings. Most variables were analyzed stratified by mode to understand mode-specific needs and patterns.

The analysis looked at the following variables:

- Crash characteristics and behavior
    - Crash mode
    - Crash year / trends over time
    - Driving under the influence
    - Pre-crash movements and actions (e.g., crossing the street, turning, etc.)
    - Vehicle type, including sport utility vehicles (SUVs) and pickup trucks
- Roadway characteristics
    - Level of Traffic Stress
    - Lighting conditions
    - Location type (intersection vs. midblock)
        - For intersection crashes only:
            - Intersection control
            - Specific intersection type (freeway ramp-end intersections)
    - Motorist annual average daily traffic (AADT)
    - Number of through lanes
    - Posted speed limit
    - Roadway functional classification
- Location characteristics
    - Geography type (urbanized vs. rural)
    - Land use, including commercial and multi-family land use, schools, and transit stops and stations

Results

The following sections and tables document the key findings from the descriptive and systemic safety analysis.

Crashes by Mode

- Motorists accounted for a majority of crashes (81%) and a plurality of KA crashes (40%) (Table 3).
- Pedestrians, bicyclists, and motorcyclists are all vastly overrepresented among fatal and serious injury crashes relative to motorists and to their share of all travel.
  - Pedestrians accounted for 7% of all crashes but 23% of fatal and serious injury crashes.
  - Motorcyclists accounted for 7% of all crashes but 27% of fatal and serious injury crashes.
  - Bicyclists were involved in 5% of all crashes but 10% of fatal and serious injury crashes.
- Only 3% of motorist crashes resulted in a fatal or serious injury outcome, which is substantially lower than all other modes: pedestrians (18%), motorcyclists (21%), and bicyclists (12%).
- While these statistics reflect the vulnerability of bicyclists, pedestrians, and motorcyclists, the raw number of motorist fatal and serious injury crashes should not be ignored: 1,611 motorist fatal and serious injury crashes occurred throughout the region between 2018 and 2022.

Table 3: Summary of Crashes by Mode and Injury Severity, 2018-2022 (excluding freeways), Urban and Rural

Crash Mode	Total Crashes	% of Total Crashes	No. of KA Crashes	% of KA Crashes	% of Crashes That Are KA	% of EPDO[4]	Average EPDO
Pedestrian	4,489	6.8%	932	23.4%	20.8%	18.0%	39.4
Bicyclist	3,274	4.9%	379	9.5%	11.6%	8.8%	26.3
Motorcyclist	4,606	6.9%	1,061	26.6%	23.0%	20.6%	44.0
Motorist	54,109	81.4%	1,611	40.4%	3.0%	52.6%	9.5
Total	**66,478**	**100.0%**	**3,983**	**100.0%**	**6.0%**	**100.0%**	**14.8**

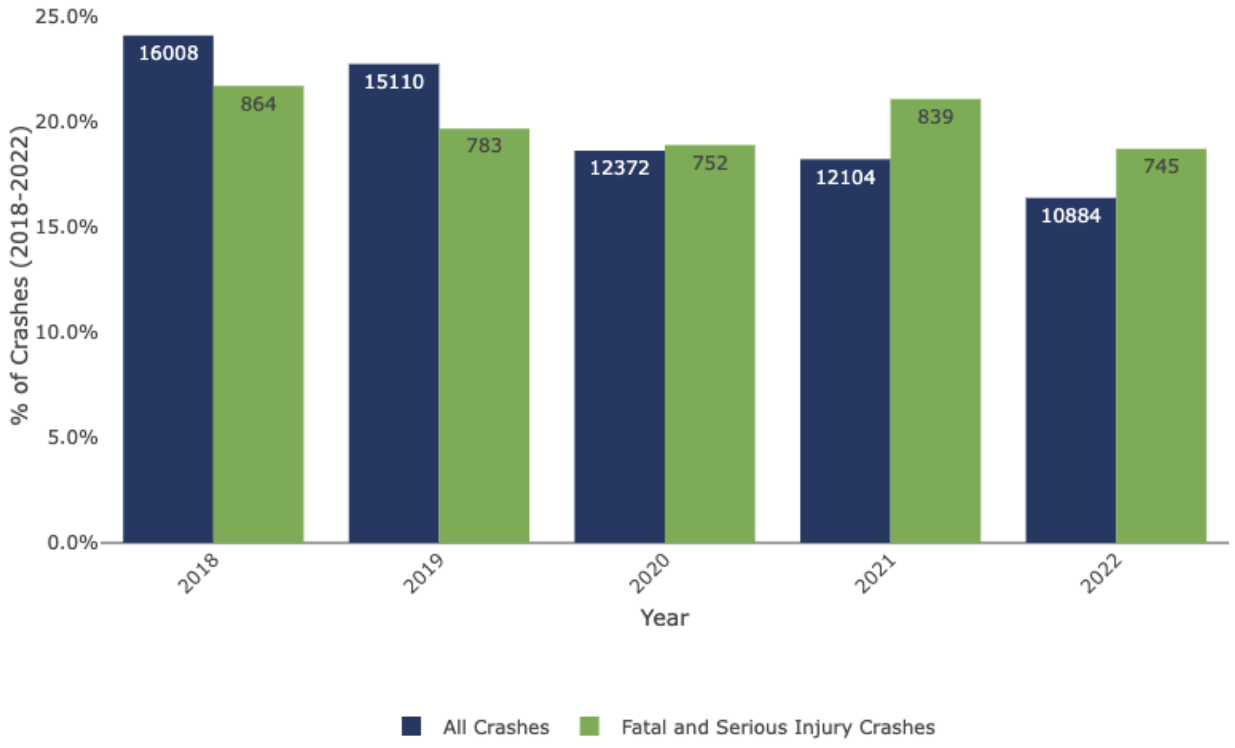
[4] Equivalent Property Damage Only (EPDO) is a normalization process to calculate the societal cost of all crash severities by the amount of property damage only crashes.

Crashes by Year

- In general, crashes appeared to be slowly decreasing from 2018 to 2019 but decreased substantially at the start of the pandemic in 2020 (Figure 2).
- Despite the decrease in crashes overall, there was a marked increase in fatal and serious injury crashes in year two of the pandemic (2021).
- In any given year, pedestrians and motorcyclists appear to be uniquely vulnerable and experience the greatest likelihood that a crash will result in death or serious injury. Pedestrian severity rates range from 18.9 to 24.5% over this time period, and motorcyclist severity rates range from 20.4 to 24.8.
- Bicyclists also experience much higher severity rates than motorists (10.5–12.9% vs. 2.4–3.8%).

The following figure shows the distribution of crashes and fatal and serious injury crashes by year. The height of the bars indicates what percentage of crashes or fatal and serious injury crashes happened within that particular year of the five-year study period. The numbers inside each bar refer to the actual number of crashes or fatal and serious injury crashes that happened. Figure 2 shows a decline in the percentage of all crashes over time, with a large drop from 2019 to 2020. In contrast, fatal and serious injury crashes initially decreased, but rise sharply in 2021.

Figure 2: Distribution of Crashes and KA Crashes by Year, All Modes, 2018-2022 (excluding freeways), Urban and Rural



Number of Lanes

Unmarked two-lane roads (without a dividing centerline) generally make up the majority of the transportation network for both urban and rural areas. The prevalence of multilane roads differs by geography type, so urbanized and rural areas were analyzed separately.

Urbanized Areas

- 62% of fatal and serious injury crashes in urban areas occurred along streets with four or more through lanes (Table 4).
- Across all modes, the concentration of crashes and fatal and serious injury crashes per 100 miles increases drastically for roads with three or more lanes, with four lanes consistently having both the highest concentrations and the greatest proportions.
- This analysis was repeated for each mode. Four-lane roads are uniquely important for all road users' safety: 47% of severe pedestrian crashes, 42% of severe bicyclist crashes, 46% of severe motorcyclist crashes, and 42% of severe motorist-only crashes occurred on 4-lane roads (not shown in the table).

Table 4: Summary of Crashes for All Modes by Number of Lanes, 2018-2022 (excluding freeways), Urban

No. of Lanes	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA Crashes per 100 Miles	Approx. No. of Centerline Miles	Approx. % of Centerline Miles[5]
1	94	0.2%	7	0.2%	7.4%	183.6	13.7	51	0.7%
2	21,016	36.4%	1,028	33.3%	4.9%	330.9	16.2	6,350	84.9%
3	2,368	4.1%	131	4.2%	5.5%	2,909.1	160.9	81	1.1%
4+	33,853	58.7%	1,901	61.6%	5.6%	3,410.2	191.5	993	13.3%
N/A	347	0.6%	17	0.6%	4.9%	N/A	N/A	N/A	N/A
Urban Total	**57,678**	**100.0%**	**3,084**	**100.0%**	**5.3%**	**771.5**	**41.3**	**7,476[6]**	**100.0%**

[5] Totals may not sum to 100% due to rounding.

[6] Column does not add up to 7,476 due to rounding.

Rural Areas

- Eight percent of fatal and serious injury crashes in rural areas occurred along streets with four or more lanes. The concentration of fatal and serious injury crashes per mile on four or more lanes is approximately five time greater than that of two-lane streets in rural areas (Table 5).

Table 5: Summary of Crashes for All Modes by Number of Lanes, 2018-2022 (excluding freeways), Rural

No. of Lanes	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA Crashes per 100 Miles	Approx. No. of Miles	Approx. % of Miles[5]
1	11	0.1%	2	0.2%	18.2%	1,100.0	200.0	1	0.0%
2	7,355	83.6%	803	89.3%	10.9%	254.2	27.7	2,894	97.8%
3	209	2.4%	18	2.0%	8.6%	2,488.1	214.3	8	0.3%
4+	1,137	12.9%	68	7.6%	6.0%	2,097.8	125.5	54	1.8%
N/A	88	1.0%	8	0.9%	9.1%	N/A	N/A	N/A	N/A
Rural Total	**8,800**	**100.0%**	**899**	**100.0%**	**10.2%**	**297.6**	**30.4**	**2,957**	**100.0%**

Crash Location

- Overall, about 61% of crashes occurred at intersection locations (Table 6).
- Fatal and serious injury crashes were roughly split between intersection and midblock locations (about 51% at intersections).
- Pedestrian and bicyclist crashes and fatal and serious injury crashes are more concentrated at intersections than motorist and motorcyclist crashes.
- For all modes, the percentage of all crashes at intersections is higher than the percentage of fatal and serious injury crashes at intersections. The opposite is true for midblock crashes (percentage of fatal and serious injury crashes exceeds percentage of all crashes). In other words, when a crash occurs, crashes at midblock locations are more likely to result in death or serious injury than crashes at intersections.

Table 6: Percentage of Crashes and Fatal and Serious Injury Crashes Occurring at Intersection versus Midblock Locations, by Mode, 2018-2022 (excluding freeways), Urban and Rural

Mode	All Crashes – Intersection	KA Crashes – Intersection	All Crashes – Midblock	KA Crashes - Midblock
Pedestrian	75%	61%	25%	39%
Bicyclist	72%	58%	28%	42%
Motorcyclist	54%	48%	46%	52%
Motorist-only	59%	46%	41%	54%
Total	**61%**	**51%**	**39%**	**49%**

Intersection Control

Table 7 summarizes the percentage of severe intersection crashes by mode and by intersection control. Table 8 summarizes the prevalence of each type of intersection control on the network, along with the density of overall severe intersection crashes (all modes) per 1,000 intersections.

The "Two-way/Partial Stop Signs and Unknown Control" category includes two different kinds of intersections that are indistinguishable in the data. These may be uncontrolled arterial or collector intersections where the cross street is stop-controlled. They also may be two-way stop-controlled intersections between quiet residential streets. The data available at the time of the analysis did not differentiate between the two.

- A majority of severe pedestrian, bicyclist, and motorist-only crashes at intersections occur at signal-controlled intersections (51-54%). However, partial stop-controlled intersections are still important for these modes (41-47%). Further, a majority of severe motorcyclist crashes occur at these intersections (Table 7).
- Because there are about ten times as many two-way stop intersections as signal-controlled intersections, the density of fatal and serious injury crashes per 1,000 intersections is much higher for signal-controlled intersections.

Table 7: Percentage of Fatal and Serious Injury Crashes at Intersections by Mode and by Intersection Control, 2018-2022 (excluding freeways), Urban and Rural

Mode	Signalized Intersection	All-way Stop Signs	Two-way/Partial Stop Signs and Unknown Control
Pedestrian	54%	5%	41%
Bicyclist	51%	2%	47%
Motorcyclist	43%	2%	54%
Motorist-only	54%	4%	42%
Total[7]	**51%**	**4%**	**45%**

[7] Row percentages may not sum to 100% due to rounding.

Table 8: Density of Severe Intersection Crashes per 1,000 Intersections by Intersection Control Type

Metric	Signalized Intersections	All-way Stop Signs	Two-way/Partial Stop Signs and Unknown Control
Approximate Number of Intersections	3,903	1,409	38,039
Percentage of Intersections	9%	3%	88%
KA Crashes per 1,000 Intersections	77.4	21.3	6.1

Functional Classification

Table 9 summarizes the percentage of fatal and serious injury crashes by mode and by functional classification. Table 10 summarizes the prevalence of each type of functional class on the network, along with the density of overall fatal and serious injury crashes (all modes) per 100 miles.

- Major arterials stand out as the single most important category for all road users' safety, with more than half of all fatal and serious injury crashes happening on this facility type. When normalized by miles, the density of fatal and serious injury crashes per 100 miles is highest on major arterials (about 190), followed by collectors (94) (Table 9 & Table 10).
- Freeways are excluded from these analyses but were examined separately. Twenty three percent of severe pedestrian crashes happened on restricted access freeways. These crashes included a mix of circumstances, such as people living on Department of Transportation (DOT) right-of-way, people crossing freeways and ramps, and stranded or unintended pedestrians (i.e., people walking along the freeway after leaving a disabled vehicle). Subsequent analyses examined freeway ramp-end intersections as a risk factor variable (see the section about Crash Profiles and Risk Factor Network Screening).
- Subsequent analysis of functional class and intersection control for pedestrians (not shown in the table) showed that the majority of severe pedestrian crashes at intersections with two-way or partial stop control happened at intersections between a major arterial and a lower functional class. In other words, these crashes are heavily concentrated at intersections where a pedestrian needed to cross the uncontrolled major street, while the side street was stop-controlled. The overwhelming majority of the 38,039 two-way or partial stop intersections are between two local streets. Understanding this functional class pattern helps filter within this category to target proactive treatments more effectively.
- Subsequent analysis of functional class and other variables (speed and lanes) for bicyclists (not shown in the table) showed that speeds of 35+ miles per hour (mph) on four-lane arterials and speeds of 40+ mph on two-lane arterials were particularly problematic.

Table 9: Percentage of Fatal and Serious Injury Crashes by Mode and by Functional Class, 2018-2022 (excluding freeways), Urban and Rural

Mode	Highway (excluding freeway)	Major Arterial	Collector	Local Collector	Rural Collector	Local
Pedestrian	3%	62%	15%	12%	1%	6%
Bicyclist	1%	54%	16%	18%	1%	10%
Motorcyclist	3%	50%	19%	12%	12%	4%
Motorist-only	3%	55%	18%	13%	5%	5%
Total[7]	**3%**	**55%**	**18%**	**13%**	**5%**	**9%**

Table 10: Density of Fatal and Serious Injury Crashes per 100 Miles by Functional Class

Metric	Highway (excluding freeway)	Major Arterial	Collector	Local Collector	Rural Collector	Local
Approximate Number of Miles	577	1,157	760	1,971	309	6,237
Percentage of Miles[7]**Error! Bookmark not defined.**	5%	10%	7%	18%	3%	55%
KA Crashes per 100 Miles	20.1	190.1	94.4	26.2	69.8	3.1

Level of Traffic Stress

Level of traffic stress (LTS) is a type of analysis used to classify the network based on expected stress or discomfort a person may experience while biking or walking. A high LTS score (e.g. 3 and 4) represent both barriers to people wanting to walk or bike and safety risks for people already biking or walking. This section summarizes crashes by bicyclist LTS scores and pedestrian crossing stress scores. The variables that feed into these LTS scores cover many of the risk factors that have been analyzed during the development of this plan, such as posted speed limit, number of travel lanes, traffic volumes, intersection control, bike facility type, and presence of parking (assumed parking presence along striped bike lanes). These variables were generated as part of a separate effort. The methodology is briefly summarized in the Data Sources and Preparation section.

Pedestrians

Only intersection crashes are represented in Table 11, as the pedestrian crossing LTS is calculated at every crossing at intersections. There are no midblock pedestrian LTS scores.

Key Findings

- Pedestrian fatal and serious injury crashes at intersections occurred most frequently at intersections with a crossing LTS of four (35%) (Table 11).
- The proportion of crashes resulting in a fatal or serious injury outcome was highest at LTS four locations (24%).

Table 11: Summary of Pedestrian Intersection Crashes by Pedestrian Crossing LTS, 2018-2022 (excluding freeways), Urban and Rural

Pedestrian Crossing LTS	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are Severe
1	613	18.3%	88	15.6%	14.4%
2	1,267	37.8%	161	28.6%	12.7%
3	659	19.7%	119	21.1%	18.1%
4	810	24.2%	195	34.6%	24.1%
Total	**3,349**	**100.0%**	**563**	**100.0%**	**16.8%**

Bicyclists

Key Findings

- Across the region, over 70% of bicyclist crashes and fatal and serious injury crashes were associated with an LTS score of four (Table 12).
- The concentration of crashes (85.0) and fatal and serious crashes (9.7) per 100 miles is substantially higher along LTS four segments than all other LTS scores.
- Low stress scores (LTS 1 and 2) accounted for the lowest share of crashes and fatal and serious injury crashes, supporting our understanding that these LTS score reflect more comfortable facilities to ride a bike along but also have lower crash risk.

Table 12: Summary of Bicyclist Crashes by Bicyclist LTS, 2018-2022 (excluding freeways), Urban and Rural

Bike LTS	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA Crashes per 100 Miles	Approx. No. of Miles	Approx. % of Miles[5]
1	309	9.4%	41	10.9%	13.3%	4.5	0.6	6,874	60.9%
2	168	5.1%	25	6.6%	14.9%	22.6	3.4	744	6.6%
3	463	14.1%	44	11.7%	9.5%	50.7	4.8	914	8.1%
4	2,334	71.3%	267	70.8%	11.4%	85.0	9.7	2,747	24.4%
Total	**3,274**	**100.0%**	**377**	**100.0%**	**11.5%**	**29.0**	**3.3**	**11,278**	**100.0%**

Land Use

Multi-family and commercial land use were explored for all road users, with the most noteworthy findings presented here for pedestrian crashes. While these land use types do not have inherent risk, they are associated with higher pedestrian activity levels. The co-location of these pedestrian generators and attractors with fast or wide streets is associated with severe pedestrian crashes.

Pedestrians: Commercial Land Use (250ft) + 35 mph Posted Speed Limit

Key Findings

- Proximity to commercial land uses is a good proxy for pedestrian exposure and is reflected in the crash data, with the majority of crashes and fatal and serious injury crashes in urban areas having occurred near commercial land uses regardless of posted speed limit (Table 13).
- Seventy-one percent of all pedestrian crashes and 75% of pedestrian fatal and serious injury crashes on a 35-mph road occurred near a commercial land use.
- Accounting for network mileage helps illustrate pedestrian exposure: crashes along 35 mph roads near commercial land uses have roughly 6 times the rate of all crashes and 7.5 times the fatal and serious injury crashes on a per mile basis compared to roadways not near commercial land uses.

Table 13: Summary of Pedestrian Crashes by Proximity to Commercial Land Uses, 2018-2022 (excluding freeways), Along 35 mph streets, Urban

Near Commercial Land Use	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA per 100 Miles	Approx. No. of Miles	Approx. % of Mles[5]
No	424	29.0%	76	25.4%	17.9%	63.2	11.3	671	72.1%
Yes	1,036	71.0%	223	74.6%	21.5%	398.5	85.8	260	27.9%
Total	**1,460**	**100.0%**	**299**	**100.0%**	**20.5%**	**156.8**	**32.1**	**931**	**100.0%**

Pedestrians: Multi-Family Housing (250ft) + Four-lane Roads

Key Findings

- Nearly two-thirds of pedestrian crashes and fatal and serious injury crashes along four-lane roads occurred within 250 feet multi-family housing (Table 14).
- The proportions of crashes resulting in fatal and serious injury between locations near and not near multi-family residential land uses are similar.
- The rate of pedestrian crashes and fatal and serious injury crashes per 100 miles is two times higher along four-lane streets near multi-family residential land uses than those roadways not near multi-family housing. These findings underscore the need to proactively protect pedestrians along higher-risk roadways, particularly near pedestrian attractors like housing.

Table 14: Summary of Pedestrian Crashes Along Four-lane Arterials by Proximity to Multi-Family Land Uses, 2018-2022 (excluding freeways), Urban and Rural

Near Multi-Family Land Use	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA Crashes per 100 Miles	Approx. No. of Miles	Approx. % of Miles[5]
No	761	38.3%	158	37.6%	20.8%	156.2	32.4	487	59.3%
Yes	1,224	61.7%	262	62.4%	21.4%	366.7	78.5	334	40.7%
Total	**1,985**	**100.0%**	**420**	**100.0%**	**21.2%**	**241.8**	**51.2**	**821**	**100.0%**

Pedestrians: Multi-Family Land Use (250ft) + 35mph Speed Limit

Key Findings

- Two-thirds of pedestrian crashes and fatal and serious injury crashes that occurred on 35 mph streets were also within 250 feet multi-family land uses (Table 15).
- The proportions of crashes that resulted in a KA between locations near and not near multi-family residential land uses are similar.
- These findings underscore 35 mph as a risk factor for pedestrians everywhere, but the density of crashes supports the need to prioritize locations where pedestrians are expected, such as near high-density housing.

Table 15: Summary of Pedestrian Crashes Along 35 mph Streets by Proximity to Multi-family Land Uses, 2018-2022 (excluding freeways), Urban and Rural

Near Multi-Family Land Use	Total Crashes	% of Total Crashes[5]	No. of KA	% of KA Crashes[5]	% of Crashes That Are KA	Total Crashes per 100 Miles	KA Crashes per 100 Miles	Approx. NO. of Miles	Approx. % of Miles[5]
No	545	37.3%	104	34.8%	19.1%	82.2	15.7	663	71.2%
Yes	915	62.7%	195	65.2%	21.3%	341.4	72.8	268	28.8%
Total	**1,460**	**100.0%**	**299**	**100.0%**	**20.5%**	**156.8**	**32.1**	**931**	**100.0%**

Vehicle Type

Pedestrians: Sports Utility Vehicle Involved

Key Findings

- Pedestrians are at substantially higher risk of severe or fatal crash outcomes when involved in a crash with a SUV compared to other modes (Table 16).
- On average (between 2018-2022), 21% of pedestrian-motorist crashes resulted in a fatal and serious injury outcome. When that motorist was operating a SUV, however, 30% of crashes resulted in a fatal or serious injury.
- There are several factors that contribute to this large share of pedestrian crashes resulting in a fatal and serious injury outcome, including:
    - SUVs are heavier on average, which translates to greater kinetic energy (controlling for speed).
    - SUVs have a blunt front end that can lead to greater upper body trauma for pedestrians and make pedestrians more likely to be pushed under the car.
    - SUV design and shape can limit the driver's ability to see other road users and react in time to prevent a serious crash.

Table 16: Summary of Pedestrian Crashes by SUV Involvement, 2018-2022 (excluding freeways), Urban and Rural

SUV Involved	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA
No	4,019	89.5%	786	84.9%	19.6%
Yes	470	10.5%	140	15.1%	29.8%
Total	**4,489**	**100.0%**	**926**	**100.0%**	**20.6%**

Pedestrians: Pickup Trucks Involved

Key Findings

- Similar to the SUV findings, crashes that involved a motorist driving a pickup truck were disproportionately severe compared to crashes involving other vehicle types. Thirty-one percent of pedestrian crashes where the motorist was driving a pickup truck resulted in a fatal or serious injury outcome, compared to 20% of non-pickup truck crashes (Table 17).

Table 17: Summary of Pedestrian Crashes by Pickup Truck Involvement, 2018-2022 (excluding freeways), Urban and Rural

Pickup Truck Involved	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA
No	4,096	91.2%	806	87.0%	19.7%
Yes	393	8.8%	120	13.0%	30.5%
Total	**4,489**	**100.0%**	**926**	**100.0%**	**20.6%**

Lighting Conditions

- The reported lighting conditions have been grouped into “dark”, “low light”, “light”, and “not stated” categories.
    - Dark includes: “Dark - No Street Lights”, “Dark - Street Lights”, and “Dark - Street Lights Not Functioning”
    - Low Light includes: “Dusk - Dawn”
    - Light includes: “Daylight”
- The percentage of fatal and serious injury crashes happening in darkness varied by mode and by expected exposure patterns for that mode.
    - Most pedestrian crashes occurred during light conditions (52%; not shown in the table). This result is expected, given that most trips are made during the day and under daylight conditions. And yet, 64%% of pedestrian fatal and serious injury crashes occurred in dark conditions, compared to only 32% in daylight (Table 18).
    - Bicyclist crashes and fatal and serious injury crashes are far more likely to occur in daylight conditions than dark conditions, which likely corresponds to bicyclist exposure.
    - Over 70% of all motorcyclist crashes and nearly 68% of fatal and serious injury crashes occurred during light conditions.
    - About half of severe motorist crashes occur in dark conditions and half occur in light, suggesting risk factors for motorists throughout the day.

- When a crash does occur in darkness, the outcome is more likely to be severe than if the crash occurred during daylight (Table 19Table 19).
    - Pedestrian crashes were much more likely to be severe if they occurred during darkness (31%) than low light conditions (23%) or daylight (13%).
    - Bicyclist crashes tend to be slightly more severe on average during dark lighting conditions compared to daylight conditions and are the most severe on average, in low light conditions.
    - Like pedestrian and bicyclist crashes, motorcyclist crashes that occurred during dark lighting conditions were disproportionately severe, with 25% of crashes resulting in a fatal or serious injury crash compared to 22% of crashes during light conditions.
    - Motorist crashes that occur in darkness are disproportionately severe: while 35% of all crashes occur in darkness, 46% of fatal and serious injury crashes during dark lighting conditions.

Table 18: Percentage of Fatal and Serious Injury Crashes by Mode and by Lighting Status, 2018-2022 (excluding freeways), Urban and Rural

Mode[2]	Dark	Low Light	Light	Not Stated
Pedestrian	64%	5%	32%	<1%
Bicyclist	23%	6%	71%	<1%
Motorcyclist	26%	6%	68%	0%
Motorist-only	46%	5%	49%	<1%

Table 19: Percentage of Crashes that Result in a Severe Outcome (Severity Rate) by Mode and by Lighting Status, 2018-2022 (excluding freeways), Urban and Rural

Mode[2]	Dark	Low Light	Light	Not Stated
Pedestrian	31%	23%	13%	2%
Bicyclist	14%	16%	11%	3%
Motorcyclist	25%	28%	22%	0%
Motorist-only	4%	4%	2%	2%

Pedestrians: Lighting + Posted Speed Limit

Further analysis of lighting conditions and other roadway variables was completed. A noteworthy finding was that pedestrian crash patterns in darkness varied by posted speed limit (Table 20). On major arterials with a posted speed limit of 25 or 30 mph, 22% of crashes occurring in dark or low light conditions resulted in a death or serious injury, followed non-linearly by 29% at 35 mph and 42-43% at 40+ mph.

Table 20: Summary of Pedestrian Crashes by Speed Limit and Crashes during Dark or Lowlight Conditions, 2018-2022 (excluding freeways), Urban and Rural

Posted Speed Limit	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA
25-30 mph	223	18.8%	50	12.5%	22.4%
35 mph	446	37.5%	130	32.4%	29.1%
40 mph	230	19.4%	96	23.9%	41.7%
45+ mph	289	24.3%	125	31.2%	43.3%
Total	**1,188**	**100.0%**	**401**	**100.0%**	**33.8%**

Traffic Volume

Table 21 shows the percentage of fatal and serious injury crashes, by mode, that happen on roadways with a range of AADT conditions. Table 22 shows the density of fatal and serious injury crashes per mile.

- Two-thirds of pedestrian fatal and serious injury crashes occur along streets with an AADT less than 20,000.
- Streets with moderate to high volume (10,000-30,000 AADT) accounted for most crashes, while streets with an AADT over 15,000 had the highest rates of fatal and serious injury crashes per 100 miles.
- The percentage of fatal and serious injury crashes for all modes has a notable increase once AADT exceeds 10,000 vehicles per day (VPD).
- As expected, a greater share of motorcyclist crashes and fatal and serious injury crashes occurred along moderate- to high-volume roadways, related both to higher exposure (higher volumes often result in higher frequencies of crashes) and risk factors associated with higher-volume roadway design.
- The rate of crashes and fatal and serious injury crashes on a per 100 miles basis increases as the AADT increases.
- A key difference between results for each mode is that the largest share of motorcyclist crashes occurred on roadways with 10,000 - 20,000 AADT, whereas motorist crash frequencies remained high from 10,000 through 30,000+ AADT.

Table 21: Percentage of Fatal and Serious Injury Crashes by Mode and by AADT, 2018-2022 (excluding freeways), Urban and Rural

AADT[5]	Pedestrian	Bicyclist	Motorcyclist	Motorist
0 to 1,000	7.6%	12.5%	10.7%	8.5%
1,001 to 3,000	3.0%	7.2%	9.5%	7.2%
3,001 to 5,000	5.3%	6.6%	11.8%	9.2%
5,001 to 7,500	7.3%	8.5%	8.4%	9.6%
7,501 to 10,000	8.1%	6.4%	8.7%	6.7%
10,001 to 15,000	16.3%	14.6%	14.5%	13.8%
15,001 to 20,000	19.3%	16.4%	13.7%	14.0%
20,001 to 25,000	13.3%	11.1%	8.6%	11.7%
25,001 to 30,000	6.2%	5.3%	4.2%	6.0%
30,001+	13.4%	11.4%	9.3%	12.5%
N/A	0.2%	0.0%	0.7%	1.0%

Table 22: Density of Fatal and Serious Injury Crashes per 100 Miles by AADT, 2018-2022 (excluding freeways), Urban and Rural

AADT	Pedestrian	Bicyclist	Motorcyclist	Motorist
0 to 1,000	1.0	0.7	1.6	1.9
1,001 to 3,000	3.2	3.1	11.5	13.1
3,001 to 5,000	9.1	4.6	23.1	27.4
5,001 to 7,500	15.9	7.5	20.8	35.9
7,501 to 10,000	25.2	8.1	30.9	36.0
10,001 to 15,000	38.7	14.1	39.5	56.6
15,001 to 20,000	60.1	20.8	48.7	75.2
20,001 to 25,000	67.2	23.0	49.7	102.2
25,001 to 30,000	62.6	22.0	49.4	106.5
30,001+	69.8	24.2	55.7	112.5
N/A	N/A	N/A	N/A	N/A

Posted Speed Limit

In general, 25 mph streets make up the vast majority of the transportation network for both urban and rural areas. This is common across the county, as local (or residential) streets are often assigned a speed limit of 25 mph either via signage or via statutory speed limits. Streets with a speed limit of 35 mph had the second highest share of network mileage in urban areas, whereas streets in rural areas with a speed limit of 45+ mph had the second highest share of network mileage.

Table 23 summarizes the percentage of fatal and serious injury crashes by mode and by posted speed limit.

Table 24 summarizes the density of fatal and serious injury crashes per 100 miles by mode and by posted speed limit.

- For pedestrians, streets with a posted speed limit of 35 mph had the largest share of fatal and serious injury crashes (33%), followed by 45 mph (23%).
    - The density or concentration per mile of fatal and serious injury crashes was highest along 40 mph streets (33.1) followed by 35 mph streets (32.4).
    - 73% of fatal and serious injury pedestrian crashes happened on streets with speed limits of 35 mph or greater (calculated from the 35, 40, and 45+ rows in the table).
- For bicyclists, streets with posted speed limits of 35 mph and 45+ mph had approximately equal percentages of fatal and serious injury crashes (28%).
    - Like pedestrian crashes, the highest density of fatal and serious injury bicyclist crashes per 100 miles occurred at 40 mph (13.4).
- The largest percentages of motorcyclist and motorist crashes happened on 45+ mph (41% and 48%, respectively), followed by 35 mph.
    - For both modes, the density of fatal and serious injury crashes per mile increased with the speed limit, with the greatest concentration occurring along 45+ mph roads.
- Across all modes, 25 and 30 mph streets had fewer fatal and serious injury crashes in nearly all cases.
    - The lowest percentage of fatal and serious injury crashes for all modes happened on 30 mph. 25 mph streets had the second-lowest percentage for pedestrians, motorcyclists, and motorists.
    - For each mode, the density of fatal and serious injury crashes per mile at these speeds is much lower than the densities at 35 mph and higher.
    - A separate analysis (not shown in these tables) found that the severity rate (percent of all crashes that result in a death or serious injury) for these lower speed roads is also lower than higher speed roads in nearly all cases. (The only exception was motorist-only crashes, for which the severity rates for 30 and 35 mph were the same.)
    - These findings suggest that lower speeds (25 to 30 mph) help limit the potential for a severe crash to occur.
- A separate analysis was done focusing only on pedestrian midblock crashes happening outside of a crosswalk (not shown in the tables). For this particular crash type, nearly 40% of fatal and serious injury crashes happened on 35 mph streets, followed by 45+ mph streets (24%). This reinforces the finding that moderate (35 mph) and higher speed roadways are a safety priority for pedestrians.

Table 23: Percentage of Fatal and Serious Injury Crashes by Posted Speed Limit, 2018-2022 (excluding freeways), Urban and Rural

Posted Speed Limit[5]	Pedestrian	Bicyclist	Motorcyclist	Motorist
25 mph	15%	20%	11%	10%
30 mph	12%	8%	9%	7%
35 mph	33%	28%	25%	19%
40 mph	17%	17%	15%	15%
45+ mph	23%	28%	41%	48%
N/A	<1%	0%	1%	1%
Total[7]	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 24: Density of Fatal and Serious Injury Crashes per 100 Miles by Posted Speed Limit, 2018-2022 (excluding freeways), Urban and Rural

Posted Speed Limit	Pedestrian	Bicyclist	Motorcyclist	Motorist
25 mph	1.9	1.0	1.5	2.2
30 mph	16.4	4.3	13.9	16.6
35 mph	32.4	11.2	28.2	33.2
40 mph	33.1	13.4	32.3	51.1
45+ mph	21.1	10.3	41.9	74.2
N/A	N/A	N/A	N/A	N/A
Total[7]	**8.9**	**3.6**	**10.2**	**15.4**

Violations

Pedestrian Violation Category

The "Primary Collision Factor Violation Category" is the officer's reported violation for the crash. Responding officers attempt to assign each crash a primary collision violation based on the crash investigation and information provided from the parties (and/or witnesses) involved. Since vulnerable road users are more likely to be killed or seriously injured in the crash, the responding officer may not hear their side of the story in fatal and serious injury crashes involving a vulnerable road user. Results from this variable should be interpreted with caution.

Table 25 lists the top ten violation categories for pedestrian crashes, sorted by percent of fatal and serious injury crashes.

- The most common violation type[8] for pedestrian crashes is failure to yield to a pedestrian at an intersection (35% of all crashes; 25% of fatal and serious injury crashes), followed by pedestrian failed to yield to right of way (20% of all crashes; 36% of fatal and serious injury crashes) and inappropriate turn (6% of all crashes; 5% of fatal and serious injury crashes).

Table 25: Summary of Top 10 Reported Violations for Pedestrian Crashes, 2018-2022 (excluding freeways), Urban and Rural

Violation Type[8]	Total Crashes	% of Total Crashes[5]	No. of KA Crashes	% of KA Crashes[5]	% of Crashes That Are KA
Pedestrian Failed to Yield Right-of-Way	882	20%	336	36%	38%
Failure To Yield to Pedestrian at Intersection	1,560	35%	229	25%	15%
Inappropriate Turn	286	6%	50	5%	18%
Too Fast for Conditions	228	5%	49	5%	22%
Peds Yield to Drivers Already in An Intersection	178	4%	45	5%	25%
Illegal Midblock Crossing	156	4%	41	4%	26%
Unknown	281	6%	34	4%	12%
Disregarded Signal	116	3%	25	3%	22%
Pedestrians Must Walk Near the Edge of The Road	46	1%	18	2%	39%
Driving While Under the Influence of Alcohol	41	1%	16	2%	39%

Motorcyclist and Motorist-only Driving Under the Influence (DUI)

Table 26 summarizes the percentage of fatal and serious injury crashes that involve a DUI as well as the severity rates for DUI-related and non-DUI crashes for motorcyclist and motorist-only crashes.

- 10% of severe motorcyclist crashes and 27% of severe motorist-only crashes involve a DUI.
- For both modes, the severity rate for DUI crashes is much higher than for non-DUI crashes.

Table 26: Summary of Crash Severity by DUI status for Motorcyclist and Motorist-Only Crashes

Mode	% of KA Crashes	Severity Rate - DUI	Severity Rate – non-DUI
Motorcyclist	10%	37%	22%
Motorist-only	27%	6%	3%

[8] Violation types are based on a law enforcement assessment of the crash as observed and documented at the time of responding to the incident.

Crash Profiles and Risk Factor Network Screening

Crash Profiles

After conducting an exploratory descriptive and systemic analysis, we identified nine crash profiles based on the modes involved, the location type, and the pre-crash movements and actions of each party. These profiles were selected due to their prevalence and severity among crashes in the region both overall and for each mode. These crash profiles represent types of crashes frequently associated with fatal and serious injury crashes; however, theses profiles do not account for all crashes in the region and there are additional crashes that do not fall under any of the nine identified profiles. Table 27 describes the nine profiles.

Table 27: Summary of Crash Profiles

Crash Profile Name	Description	Definition
Pedestrian Broadside	Pedestrian crossing at an intersection hit by motorist going straight.	Intersection + motor vehicle (mv) straight + pedestrian crossing
Pedestrian Crossing at Intersection, Motorist Turning Left or Right	Pedestrian crossing at an intersection hit by motorist turning left or right.	Intersection + (mv left or mv right) + pedestrian crossing
Pedestrian Midblock	Pedestrian crossing midblock hit by motorist going straight.	Segment/midblock + mv straight + pedestrian crossing
Pedestrian Sideswipe	Pedestrian in the roadway or on the shoulder at a segment/midblock location hit by a motorist going straight.	Segment/midblock + mv straight + pedestrian in road including shoulder
Left Turn Crashes[9]	Intersection crashes involving at least one motorist in which one party is turning left and one party is going straight.	Intersection location + ONE OF (MV left + MV/motorcycle (MC)/Bike straight; MV/MC/Bike left + MV straight). Excludes a near-zero number of Bike+MC, Bike+Bike, MC+MC crashes since motorist involvement is a fundamental defining factor.
Broadside Crashes	Broadside crash between a motorist and another motorist, motorcyclist, or bicyclist at an intersection.	Intersection location + mv straight + mv/mc/bike straight + officer-coded broadside

[9] Within the left turn crashes profile, it is much more common for the motorist to be the one turning left into or in front of the bicyclist or motorcyclist going straight. For motorcyclist crashes, the opposite (i.e., motorcyclist turning into a motorist) almost never happens. Bicyclist left turn crashes are a bit more evenly split, though the numbers are very small.

Crash Profile Name	Description	Definition
Head-on Crashes	Head-on crashes along segments	Segment/ midblock location + officer-coded head-on
Bicyclist Right Hook[10]	Intersection crashes involving a motorist and a bicyclist in which one party is turning right and one party is going straight.	Intersection location + ONE OF (MV right + Bike straight; MV straight + Bike right).
Solo Crashes	Solo crash	Any crash involving only one MV or one MC or one bicyclist and no other parties.

Key Findings

Table 28 summarizes the number of all crashes and fatal and serious injury crashes by each of the nine crash profiles.

- These nine profiles describe nearly half of all crashes in the region and about two thirds of all fatal and serious injury crashes in the region.
- The severity rates for each of these nine profiles, ranging from 4% to 42%, are higher than the severity rate for all other crashes not represented by a profile (4%).
- Solo crashes were the most prevalent crash type, comprising nearly 22% of all crashes and 29% of fatal and serious injury crashes.
- The three profiles with the greatest severity rate (KA crashes / total crashes) were all pedestrian crashes with a motorist going straight. Pedestrian crossing crashes at midblock locations in which the motorist was going straight had the highest severity rate (nearly 42%).
- After the pedestrian + motorist going straight profiles, head-on crashes were the next most severe (19%).
- A separate analysis (not shown in the table) stratified these data by mode. The left turn, broadside, and solo crash profiles were broadly applicable to bicyclists, motorcyclists, and motorists, though with some modal variation.
    - Motorcyclists were the most affected by left turn crashes (18% for motorcyclists vs. 11% for motorist-only and bicyclist crashes).
    - Broadside crashes were slightly more common among severe bicyclist crashes (9%) than motorist-only (6%) or motorcyclist (5%).
    - About 39% of motorcyclist and motorist-only fatal and serious injury crashes were solo crashes. 25% of bicyclist fatal and serious injury crashes were solo crashes, though only solo bicyclist crashes on public roads are reported in the crash database, so this may not be representative of off-street paths and trails.
    - Head-on crashes had larger differences between the modes. Nearly 13% of motorist-only crashes were head-on, compared to 2-4% for bicyclists and motorcyclists.

[10] Within the bicyclist-involved right hook crash with motorist at intersection profile, the vast majority of fatal and serious injury crashes involve a driver turning right into a bicyclist going straight. The opposite scenario (bicyclist turning right and motorist going straight) is much less common.

Table 28: Summary of Crashes by Crash Profile, 2018-2022 (excluding freeways), Urban and Rural

Crash Profile	Total Crashes	% of Total Crashes	No. of KA Crashes	% of KA Crashes	% of Crashes That Are Severe
Pedestrian Crossing at Intersection, Motorist Going Straight	1,048	2%	289	7%	28%
Pedestrian Crossing at Intersection, Motorist Turning Left or Right	1,256	2%	120	3%	10%
Pedestrian Crossing at Midblock, Motorist Going Straight	469	1%	196	5%	42%
Pedestrian-Involved Crash on Roadway Segment, Motorist Going Straight	230	<1%	85	2%	37%
Left Turn Crashes	7,337	11%	397	10%	5%
Broadside Crashes	4,221	6%	181	5%	4%
Head-on Crashes	1,295	2%	246	6%	19%
Bicyclist-Involved Right Hook Crash with Motorist at Intersection	403	1%	23	1%	5.7%
Solo Crashes	14,341	22%	1,139	29%	8%
All Other Crashes Not Represented by a Profile	35,878	54%	1,307	33%	4%
Total	66,478	100%	3,983	100%	6%

Crash Profiles in Urban and Rural Areas

Table 29 summarizes the percentage of fatal and serious injury crashes for each crash profile within urbanized and rural areas separately. These data show notable differences between the most prevalent crash types in urbanized and rural areas.

- While solo crashes were the single most prevalent crash type in urban and rural areas alike, solo crashes were relatively more common in rural areas (53%) than urban areas (22%).
- Head-on crashes were more common in rural areas than urban areas (16% versus 3% of fatal and serious injury crashes, respectively).
- Left turn crashes were more common in urban areas than rural areas (12% versus 4% of fatal and serious injury crashes, respectively).

- All four pedestrian crash types were more common in urban areas (ranging from 2% to 9% of fatal and serious injury crashes) than rural areas (ranging from nearly 0% to about 2%). The bicyclist-involved right hook profile was also largely absent from rural areas.

Table 29: Percentage of Fatal and Serious Injury Crashes by Crash Profile in Urbanized and Rural Areas, 2018-2022 (excluding freeways)

Crash Profile	% of KA Crashes in Urbanized Areas	% of KA Crashes in Rural Areas
Pedestrian Crossing at Intersection, Motorist Going Straight	9%	<1%
Pedestrian Crossing at Intersection, Motorist Turning Left or Right	4%	<1%
Pedestrian Crossing at Midblock, Motorist Going Straight	6%	1%
Pedestrian-Involved Crash on Roadway Segment, Motorist Going Straight	2%	2%
Left Turn Crashes	12%	4%
Broadside Crashes	6%	1%
Head-on Crashes	3%	16%
Bicyclist-Involved Right Hook Crash with Motorist at Intersection	1%	0%
Solo Crashes	22%	53%
All Other Crashes Not Represented by a Profile	36%	23%
Total[5]	100%	100%

Risk Factors

After conducting an exploratory descriptive and systemic analysis, the team identified ten risk factors based on roadway attributes and exposure variables. These are described in Table 30. Four of these risk factors are defined for intersection locations only. Three of them are defined for segment or midblock locations. Three exposure-related risk factors are defined for both intersection and segment or midblock location types. Risk factors were selected on a combination of overrepresentation of these features in fatal and serious injury, prevalence on the SFN, and other features.

Table 30: Summary of Risk Factors

Risk Factors	Segment Level	Intersection Level	Rationale
Freeway ramp-end intersections		1	Prevalent on the SFN. Crash analysis showed importance. Promotes multi-agency coordination.
2-way stop or unknown control intersection WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on the uncontrolled street		1	Systemic findings for all modes.
Traffic signal WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on at least one approach		1	Systemic findings for all modes.
4+ lanes (two-way) or 3+ lanes (one-way) in urban areas OR 2 lanes in rural areas	1		Systemic findings for all modes.
Posted speed limit 35+ mph	1		Systemic findings for all modes.
Segment LTS[11] of 4	1		Systemic findings for all modes.
Intersection/crossing LTS[11] of 4		1	Systemic findings for all modes.
Proximity to commercial land use or multi-family housing	1	1	Systemic findings, especially for pedestrians.
Proximity to transit stop	1	1	Systemic findings, especially for pedestrians.
Proximity to school	1	1	Accounts for exposure of vulnerable population.
Maximum possible score (count of risk factors)	6	7	

Risk factors can be used to proactively screen the network for areas with several risk factors. Because these risk factors are associated with fatal and serious injury crashes, locations with multiple risk factors present may benefit from proactive treatments to remove or mitigate the risk factors.

Key Findings

Intersection Risk Factors

Table 31 summarizes some severity metrics for intersection crashes and intersection risk factors. The columns do not sum to 100% because many intersections and many crashes have more than one risk factor present. Table 32 stratifies the severity rate metric by mode, since the overall rate masks considerable variation.

- The most common risk factor for severe intersection crashes is proximity to multifamily housing or commercial land use. These land uses are not inherently risky, but they represent areas where exposure for people walking and biking may be higher.

- Signalized intersections in which at least one street has multiple lanes of travel and/or a 35+ mph speed limit comprise 48% of all severe intersection crashes. This risk factor also has the highest density of fatal and serious injury crashes per 1,000 intersections with that risk factor present.
- Unsignalized intersections in which at least one street has multiple lanes of travel and/or a 35+ mph speed limit have the highest severity rate, with 6% of crashes under these conditions resulting in death or serious injury.
- Freeway ramp-end intersections represent only a small share of severe intersection crashes and intersections overall, but earlier findings about the percentage of pedestrian fatal and serious injury crashes happening on freeways along with the moderately high density of fatal and serious injury crashes per 1,000 ramp-end intersections led to the inclusion of this risk factor.
    - Freeway ramp-end intersections, two-way stop control intersections with multiple lanes and/or 35+ mph, and intersection crossing LTS of four are tied for the highest severity rate for pedestrians (24%).
- The severity rate column in Table 31 masks considerable variation by mode, as shown in Table 32. For all intersection risk factors, the percentage of intersection crashes that result in a severe outcome, ranges from 3-6%, driven largely by the low and stable severity rate for motorist intersection crashes (2-3%). However, the severity rates for other modes are higher and vary more between risk factors.
- Two-way stop control intersections also have the highest severity rates for motorcyclists (27%) and motorists (3%).
- Signalized intersections are tied with proximity to schools for the lowest severity rate for pedestrians (16%).
- In contrast with pedestrians, signalized intersections for bicyclists have the highest severity rate among bicyclist intersection crashes (10%).

[11] LTS serves as a type of composite risk factor, given that it considers number of lanes, AADT, prevailing speed, bike lane width and level of separation (if any), presence of parking and width of lane.

Table 31: Summary of Intersection Crashes by Intersection Risk Factors, 2018-2022 (excluding freeways)

Risk Factors	% of KA Crashes	Severity Rate	KA Crashes per 1,000 Intersections
Freeway ramp-end intersections	6%	3.4%	129.8
2-way stop or unknown control intersection WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on the uncontrolled street	33%	6.4%	82.3
Traffic signal WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on at least one approach	48%	4.6%	277.0
Intersection/crossing LTS[11] of 4	34%	5.3%	171.8
Proximity to commercial land use or multi-family housing	63%	4.9%	104.5
Proximity to transit stop	45%	5.1%	168.8
Proximity to school	21%	4.7%	51.3

Table 32: Severity Rate (KA Crashes/All Crashes) for Intersection Crashes by Mode and Intersection Risk Factors, 2018-2022 (excluding freeways)

Risk Factors	Pedestrian	Bicyclist	Motorcyclist	Motorist-only	All Modes
Freeway ramp-end intersections	24%	5%	17%	2%	3%
2-way stop or unknown control intersection WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on the uncontrolled street	24%	9%	27%	3%	6%
Traffic signal WITH 4+ lanes (two-way) OR 3+ lanes (one-way) OR speed limit 35+ MPH on at least one approach	16%	10%	17%	2%	5%
Intersection/crossing LTS[11] of 4	24%	9%	22%	2%	5%
Proximity to commercial land use or multi-family housing	17%	9%	18%	2%	5%
Proximity to transit stop	17%	8%	19%	2%	5%
Proximity to school	16%	7%	20%	2%	5%

Segment/Midblock Risk Factors

Table 33 summarizes some severity metrics for segment crashes and segment risk factors. The columns do not sum to 100% because many segments and many crashes have more than one risk factor present. Table 34 stratifies the severity rate metric by mode, since the overall rate masks considerable variation.

- About 81% of severe midblock crashes happen on streets with posted speed limits of 35+ mph. This risk factor also has the highest severity rate and second-highest density per 100 miles.

- Segment LTS of 4 (which includes speed limit as a component) has the second-largest percentage of fatal and serious injury crashes, with 74%. Crashes on LTS 4 streets have almost as high of a severity rate as 35+ mph streets, and they have an even greater density per 100 miles.
- The severity rate column in Table 33 masks considerable variation by mode, as shown in Table 34. For all segment risk factors, the percentage of segment crashes that result in a severe outcome, ranges from 6-8%, driven largely by the low and stable severity rate for motorist segment crashes (3-5%). However, the severity rates for other modes are higher and vary more between risk factors.
    - High speed streets (posted speed limit of 35+ mph) have the highest severity rate across all modes, though the *modes are not equally affected*. Nearly 40% of pedestrian segment crashes on 35+ mph streets result in the pedestrian's death or serious injury, followed by motorcyclists (28%) and bicyclists (19%). For motorist-only crashes, the severity rate is 5%.
    - The severity rates for commercial land use, multifamily housing, transit stops, and schools are consistently lower than most of the other risk factors for each mode. The land uses themselves are not intrinsically problematic since the severity rate is lower than average. However, these represent places where people are more likely to be walking or bicycling, so exposure is higher.

Table 33: Summary of Segment/Midblock Crashes by Segment Risk Factors, 2018-2022 (excluding freeways)

Risk Factors	% of KA Crashes	Severity Rate	KA Crashes per 100 Miles
4+ lanes (two-way) or 3+ lanes (one-way) in urban areas OR 2 lanes in rural areas	35%	7.2%	24.5
Posted speed limit 35+ mph	81%	8.3%	64.5
Segment LTS[11] of 4	74%	8.0%	66.1
Proximity to commercial land use or multi-family housing	42%	6.0%	30.2
Proximity to transit stop	36%	6.9%	44.9
Proximity to school	18%	6.5%	18.2

Table 34: Severity Rate (KA Crashes/All Crashes) for Segment Crashes by Mode and Segment Risk Factors, 2018-2022 (excluding freeways)

Risk Factors	Pedestrian	Bicyclist	Motorcyclist	Motorist-only	All Modes
4+ lanes (two-way) or 3+ lanes (one-way) in urban areas OR 2 lanes in rural areas	37%	15%	21%	3%	7%
Posted speed limit 35+ mph	39%	19%	28%	5%	8%
Segment LTS[11] of 4	37%	18%	27%	5%	8%
Proximity to commercial land use or multi-family housing	31%	13%	20%	3%	6%
Proximity to transit stop	33%	14%	23%	3%	7%
Proximity to school	31%	12%	21%	3%	7%

Crash Profile and Risk Factor Combinations

Many different crash profiles share common risk factors. This section includes a cross-tabulation of the crash profiles and risk factors that illustrates how the various factors are distributed across the profiles and vice versa.

Combinations were flagged as particularly meaningful if a specific risk factor was present for at least 30% of a specific profile's fatal and serious injury crashes. This threshold was selected based on professional judgment and industry best practice. Additionally, the school risk factor was flagged for all four pedestrian profiles given the fundamental relationship between pedestrian activity and schools (e.g., Safe Routes to School). Combinations that are not flagged are not necessarily unimportant, but they do not exhibit as much clustering between the profile and risk factor as other combinations.

Key Findings

This section shows patterns of risk factors within each crash profile.

Intersection Crash Profiles

Table 35 shows the percentage of fatal and serious injury crashes within each crash profile that have each risk factor present. For example, the first cell with a percentage value in it indicates that 4% of crashes in the "Pedestrian Crossing Motorist going straight" profile happen at ramp-end intersections.

- Nearly all intersection risk factors are well represented across several crash profiles.
    - No single profile exceeds 30% of fatal and serious injury crashes occurring on freeway ramp-end intersections. This is unsurprising, given that this risk factor was chosen for its relative severity rather than overall numbers.

- Half to two thirds of fatal and serious injury crashes within the pedestrian crossing profiles, left turn profile, broadside profile, and right hook profile happened at a signalized intersection with at least one leg having high speed (35+ mph) and/or multiple lanes (4+ for urban two-way streets, 3+ for urban one-way streets, and 2+ with centerline for rural streets).
- Over 80% of fatal and serious injury crashes in which the pedestrian was crossing and the motorist was going straight happened near commercial or multifamily residential land uses.

Table 35: Percentage of Crash Profile Severe Intersection Crashes by Risk Factor Involvement, 2018-2022 (excluding freeways), Urban and Rural[12]

Risk Factor	Pedestrian Crossing at Intersection, Motorist Going Straight	Pedestrian Crossing at Intersection, Motorist Turning Left or Right	Left Turn Crashes	Broadside	Bicyclist-Involved Right Hook Crash with Motorist at Intersection	Solo Crashes (intersection solo crashes only)	All Other Intersection Crashes	Total Intersection Crashes
Freeway ramp-end intersection	4%	6%	4%	2%	13%	8%	7%	6%
Two-way stop with 35+ mph or 4+ lanes	**36%**	9%	**36%**	22%	**35%**	**37%**	**33%**	**33%**
Signal with 35+ mph or 4+ lanes	**50%**	**69%**	**51%**	**62%**	**65%**	**39%**	**43%**	**48%**
Crossing LTS of 4	**41%**	28%	**40%**	**33%**	**35%**	28%	**31%**	**34%**
Commercial or multifamily housing	**81%**	**86%**	**62%**	**69%**	**52%**	**44%**	**61%**	**63%**
Transit stop or station	**58%**	**57%**	**45%**	**49%**	26%	**32%**	**43%**	**45%**
School	**24%**	**19%**	23%	**24%**	17%	16%	21%	21%
Total KA Crashes	**289**	**120**	**397**	**181**	**23**	**360**	**661**	**2031**

[12] **Boldface** indicates 30% or more of a profile's fatal and serious injury crashes involve a particular risk factor. Combinations of profiles and risk factors are emphasized in **boldface** if 30% or more of a profile's fatal and serious injury crashes involve a particular risk factor. The school proximity risk factor has been highlighted for all pedestrian crossing profiles, even if the percentage was less than 30%, per the explanation above.

Midblock Crash Profiles

Table 36 shows the percentage of fatal and serious injury crashes within each crash profile that have each risk factor present. For example, the first cell with a percentage value in it indicates that 66% of crashes in the "Pedestrian Crossing at Midblock, Motorist going straight" profile happen along streets with four+ lanes (two-way) or three+ lanes (one-way) in urban areas or two+ lanes in rural areas.

- All of the segment risk factors are well represented across several crash profiles.
- The posted speed limit of 35+ mph and segment LTS of 4 risk factors are noted in bold for every single crash profile and for all segment crashes overall. For solo crashes, these are the only two risk factors that are flagged.
- The two pedestrian crossing profiles are associated with all six of the segment risk factors.
- Over 80% of fatal and serious injury crashes in which the pedestrian was crossing midblock and the motorist was going straight happened near commercial or multifamily residential land uses.

Table 36: Percentage of Crash Profile Severe Segment Crashes by Risk Factor Involvement, 2018-2022 (excluding freeways), Urban and Rural[12]

Risk Factor	Pedestrian Crossing at Midblock, Motorist Going Straight	Pedestrian-Involved Crash on Roadway Segment, Motorist Going Straight	Head-on Crashes	Solo Crashes (segment solo crashes only)	All Other Segment Crashes	Total Segment Crashes
4+ lanes (two-way) or 3+ lanes (one-way) streets in urban areas or 2+ lanes in rural areas	**66%**	**42%**	18%	25%	**42%**	**35%**
Posted speed limit 35+ mph	**79%**	**71%**	**87%**	**80%**	**81%**	**81%**
Segment LTS of 4	**76%**	**68%**	**82%**	**73%**	**73%**	**74%**
Commercial or multifamily housing	**84%**	**64%**	**31%**	24%	**51%**	**42%**
Transit stop or station	**70%**	**54%**	**31%**	22%	**42%**	**36%**
School	**38%**	**26%**	15%	12%	18%	18%
Total KA Crashes	**196**	**85**	**246**	**779**	**646**	**1952**

Equity Analysis

Methodology

Reported crash data, the Safety Focus Network (SFN), demographic data, and equity data were analyzed throughout the region to evaluate the inequitable burden of severe traffic crashes in the San Diego region. For this analysis, the US Department of Transportation (USDOT) Equitable Transportation Community (ECT) definition of disadvantaged communities was used to define equity areas throughout the San Diego Region.[13] This analysis looks at safety through two lenses: spatially, and at the crash party level.

Spatial Analysis

A spatial analysis examined the relationship between fatal and serious injury crashes (also abbreviated as KA in this memo) and the SFN by disadvantaged community status to understand if underserved and overburdened communities experience a disproportionate share of traffic-related safety issues.

The analysis looked at the severe crash rate and miles of SFN normalized in two different ways: by population, and by area.

- Normalization by area was done using a hexagon surface for the entire region, with ETC and other data joined to hexagon cells. This surface was developed for the prioritization process and is documented in Appendix B. The resulting metrics are expressed with the units of fatal and serious injury crashes or SFN miles per 100 hexagon cells.
- Normalization by population was done using population data that had been joined to the hexagon surface. The resulting metrics are expressed with the units of fatal and serious injury crashes or SFN miles per 100,000 residents.

Party-level Analysis

Individual race and ethnicity of the parties involved in each crash are analyzed to understand if there are populations that are overrepresented in fatal and serious injury crashes for each mode, relative to the general population distribution across the region. Patterns over- or underrepresentation may speak to relative risks faced by different populations, though it may also be attributable to underreporting of crash data and other limitations in how the race of crash parties and victims is collected.

Individual race data are limited in several ways. Party race is collected by the reporting officer, based on the officer's visual impression of the person's race classified into five categories: Asian, Black, Hispanic, Other, and White. The variable contains many records with "unknown" values for party race. The officer's visual impression may be faulty or limited, resulting in miscoding of people's races. The race variable treats Hispanic as a race and not as an ethnicity, so coding of Hispanic or Latino people of different races may be particularly flawed. Nonetheless, these data are the best available for understanding whether certain populations are overrepresented among crash victims.

[13] More information about the measurement of the USDOT ETC disadvantaged community indicator variable can be found here: **https://www.transportation.gov/priorities/equity/justice40/etc-explorer**

This section reports on the number of parties involved in crashes – the main road users/vehicles involved in the crash, such as drivers, pedestrians, and bicyclists. Most crash records, excluding solo crashes, have more than one party (e.g., two drivers, or one driver and one pedestrian). Because of this, numbers from this party-level analysis should not be directly compared to numbers from crash-level analysis, as was done throughout the rest of this appendix. This analysis compared the distribution of parties involved in crashes by race and ethnicity (subject to the limitations previously described) to the population distribution of the San Diego region. Values greater than one suggest that a certain segment of the population is overrepresented on a per capita basis, while values less than one suggest that that segment of the population is underrepresented on the same basis. It's important to note that this comparison is imperfect in several ways.

- First, for most crashes, party race is based on an officer's assumption or visual impression, which can be problematic and inaccurate. The accuracy of their assumptions can also vary by crash severity. Low severity crashes are more likely to have "unknown" listed as the party race. Categorization for fatal crashes may be more accurate because federal reporting requirements base the race and ethnicity variable on the victim's death certificate rather than officer impression. Additionally, there are only five racial categories (excluding "Not Stated" or "Unknown") within the crash data, in contrast to the US Census, which has nearly twice as many race and ethnicity categories. Sources usually find that Native American and Black victims are the most over-represented among traffic deaths, but the party race variable does not include a value for Native American. Therefore, party representation and comparison made to the San Diego regional population should be interpreted with caution given these reporting shortcomings.
- Second, if more or fewer people from a segment of the population bicycle, walk, roll, or drive, we would expect that to be reflected in crash rates, all else equal – and this proportion of people who bicycle, walk, roll, or drive may not reflect their per capita proportion. We likely see this, for example, in trends related to age and sex, and potentially related to race. In the absence of more nuanced exposure data, however, a per capita understanding is still valuable to help us understand how crashes are distributed among various segments of the population. Further, the goal of Vision Zero is to eliminate traffic deaths and serious injuries. If one demographic's higher rate of fatal and serious injury crashes can be attributed to increased walking and bicycling activity, that still speaks to a need for more equitable investments in safe facilities for people outside the vehicle.
- Finally, the home zip code is not readily available for all parties involved in the crash, so we cannot rule out that some people riding a bicycle or driving a motor vehicle live outside of the San Diego region. To the extent that the demographic makeup of visitors to the region might differ from the demographics of residents, it is possible that including non-resident parties in a per-capita analysis could *marginally* skew the accuracy of the party-to-population ratio. Of all the limitations of this analysis, this caveat is expected to be the least impactful.

Results

Spatial Analysis

- All the metrics examined in this analysis showed an overrepresentation of traffic safety problems in disadvantaged communities. Figure 3 and Figure 4 illustrate the output metrics.
- While disadvantaged communities had a smaller percentage of fatal and serious injury crashes and SFN mileage than non-disadvantaged communities, normalizing by both area and population showed that the burden was disproportionate.
- Stratifying the analysis by geography type showed that these inequities persist in both urbanized and rural areas, though the two geography types had widely divergent values for the two normalization methods.
    - Rural areas, having lower populations spread across much larger areas, had a much higher crash rate and SFN mileage when normalized by 100,000 residents.
    - Urbanized areas, conversely, had a much higher density of fatal and serious injury crashes and SFN mileage by area.

Figure 3: Comparison of Severe Crash Rate by Disadvantaged Community Status and Geography Type, 2018-2022 (excluding freeways). Normalized by Population (left) and Area (right)

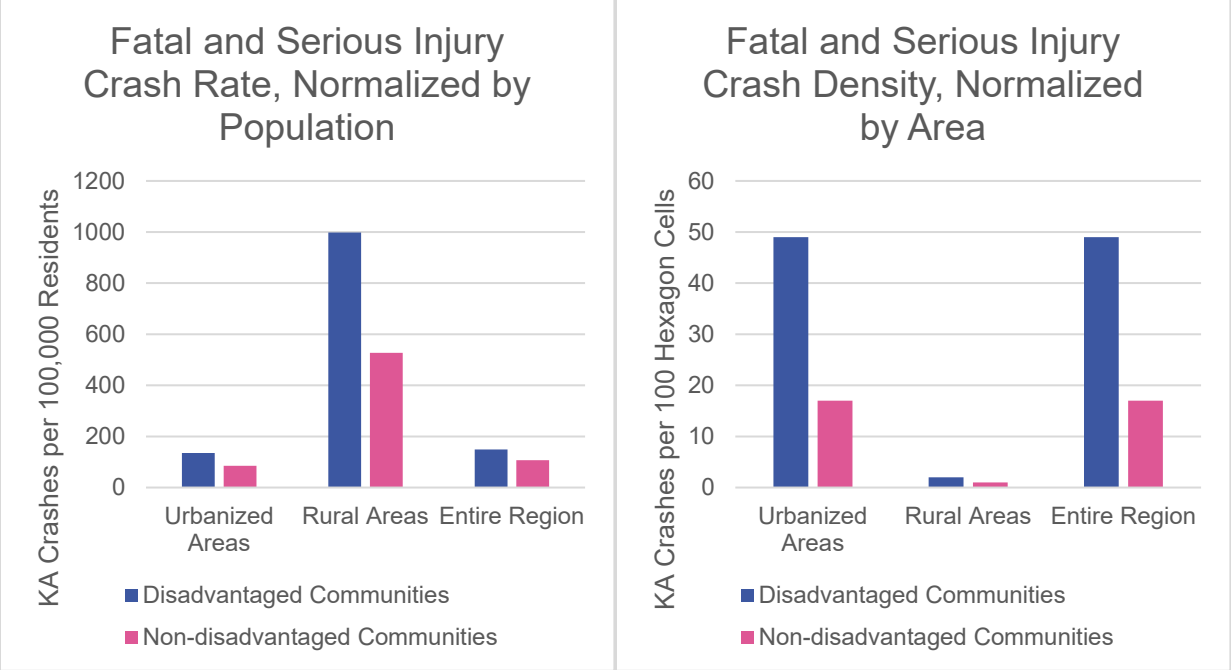
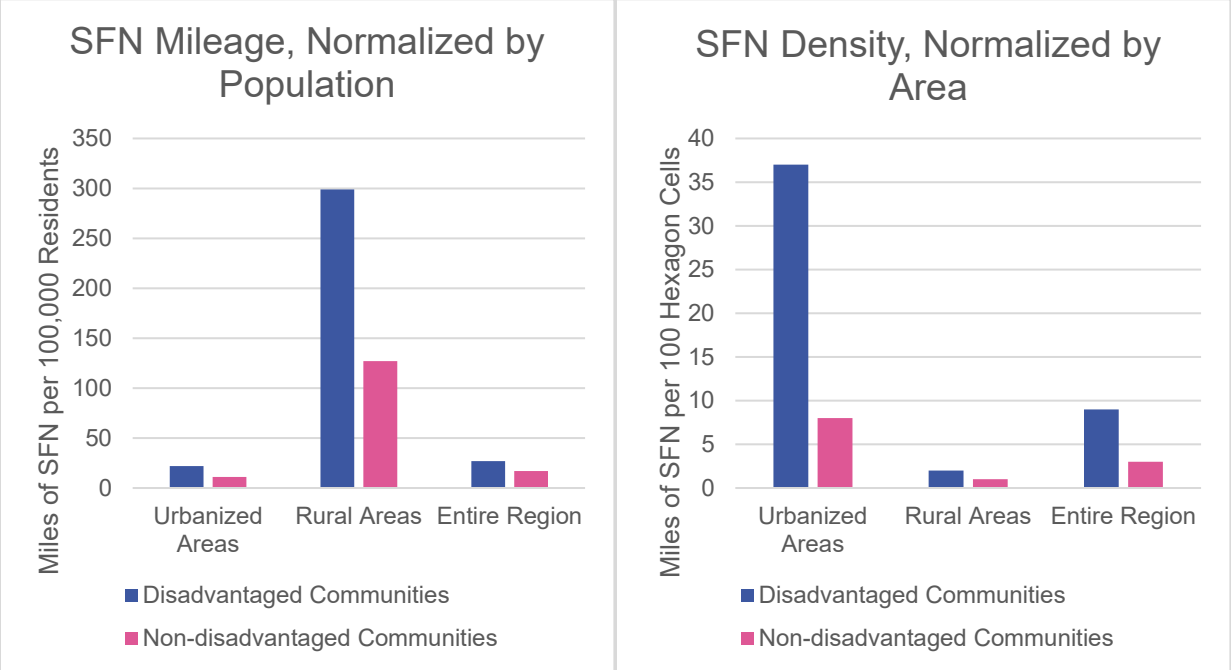


Figure 4: Comparison of SFN Mileage by Disadvantaged Community Status and Geography Type, 2018-2022 (excluding freeways). Normalized by Population (left) and Area (right)



Party Race and Ethnicity

The results in Table 37 summarize the distribution of killed or seriously injured parties and the population by officer-coded race for all modes. The "Parties to Population Ratio" column indicates whether severe crashes are proportionately over- or under-represented based on the demographic makeup of the region. Table 38 shows the "Parties to Population Ratio" stratified by mode.

Table 37: Parties Killed or Seriously Injured by Officer-Reported Race Relative to the Racial Distribution of the Region

Party Race	# Parties	% Parties	No. Population	% Population	Parties to Population Ratio
White	2,046	52%	1,422,205	43%	1.2
Hispanic	1,129	29%	1,119,629	34%	0.8
Black	269	7%	145,014	4%	1.6
Asian	133	3%	400,589	12%	0.3
Other	136	4%	211,197	6%	0.5
Unknown	205	5%	N/A	N/A	N/A
Party Total	**3,918**	**100%**	**3,298,634**	**100%**	**1.0**

Table 38: Ratio of Killed or Seriously Injured Parties to Population by Party Mode and Officer-Reported Race, Excluding Unknown

Party Race	Pedestrian	Bicyclist	Motorcyclist	Motorist
White	1.1	1.5	1.5	1.1
Hispanic	0.9	0.7	0.7	1.0
Black	2.1	0.8	1.3	1.7
Asian	0.3	0.2	0.5	0.3
Other	0.3	0.3	0.2	0.8
Party Total	**1.0**	**1.0**	**1.0**	**1.0**

White parties accounted for the largest share of road users involved in a fatal or serious injury crash (52%), followed by Hispanic parties (29%). White parties were slightly overrepresented overall and for each mode (parties to population ratios greater than 1), and Asian parties were the most underrepresented. The data also show a possible underrepresentation of Hispanic people among crash victims, which contradicts national trends. This may be attributable to a combination of the aforementioned data flaws in the race variable and underreporting of crashes.

Black parties had the highest level of overrepresentation relative to their share of the population across all modes (1.6). By mode, Black parties are overrepresented among severe pedestrian crashes (2.1), motorcyclist crashes (1.3), and motorist-only crashes (1.7). For each of these modes, Black parties have the highest ratio, indicating the greatest overrepresentation. As previously noted, this analysis cannot account for exposure. It is possible that certain demographics have greater exposure to traffic risk - for example, by having relatively higher rates of walking. However, even if this is the case, an inequitable distribution of traffic deaths represents a significant equity problem. Previous research has repeatedly shown the burden of severe traffic crashes to be borne disproportionately by Black and Native American victims, so these findings are consistent.[14] Even where local data are unclear or subject to data quality limitations, the need for equitable and restorative traffic safety investments is clear.

Data Sources and Preparation

This section describes the data sources and preparation methods used to build a consolidated dataset for analysis. Data collection and consolidation bring together crashes, roadway characteristics, land use context, demographic data, health indicators, and other datasets spatially so that variables can be analyzed across datasets. Data sources for this effort included the following:

- Crash data (including complete relational database with crash, victim, and party tables)
- Roadway and active transportation facility geometries

[14] E.g., Smart Growth America's 2022 report **Dangerous By Design** and Sanders & Schneider's 2022 article **An exploration of pedestrian fatalities by race in the United States**.

- Roadway and intersection attributes (facilities and operations)
- Active transportation network attributes (e.g., facility type)
- Demographic, socioeconomic, health, and equity-related data (e.g., from Census/American Community Survey, Environmental Protection Agency (EPA) Smart Location Database, CalEnviroScreen, Healthy Places Index, Center for Disease Control and Prevention (CDC) Places, US Department of Transportation (DOT) Equitable Transportation Community Explorer, Bureau of Transportation Statistics, Cal EPA, and others)
- Traffic and active transportation volumes or exposure (measured and/or modeled)
- Land Use and Context (e.g., SR15 Existing Land Use, Caltrans Smart Mobility Framework)
- Public transit facilities and service General Transit Feed Specification (GTFS)

Crash Data

Crash, party, and victim data provided to the consultant team include reported crashes from 2006 through 2022 for all modes (pedestrians, bicyclists, motorcyclists, and motorists). These data originally came from California's Statewide Integrated Traffic Records System (SWITRS) database and have been processed by SANDAG to improve geo-location accuracy. Where geo-location data were missing or incomplete, supplemental location data were retrieved from UC Berkeley's Transportation Injury Mapping System (TIMS).

This analysis uses the most recent five years of crash data (2018—2022). Pooling data across crash years is standard to help avoid "regression to the mean": - a pattern wherein individual crash locations may move around over time quasi-randomly, but aggregated patterns over time help reveal persistent trends. Using three to five years of data is a standard approach, and five years of data are often needed when working with pedestrian and bicyclist crash data or stratifying across crash types or geographies, as in this analysis, due to smaller sample sizes.

All crash data were processed and loaded into a PostgreSQL database for analysis. The crash, party, and vehicle tables have a relational structure, which is typical for storing crash data. For every reported crash, there is one crash record. The party and vehicle tables contain information for all the primary "actors" and their respective "vehicles" (where applicable) involved in the crash and have a many-to-one relationship – i.e., all relevant party records are matched via a case identification number to the one crash record. The party and vehicle tables contain information for each primary person and their "vehicle," such as age, sex, pre-crash action, injury severity, and vehicle characteristics. This structure is shown in Figure 5. The project team processed the crash data used in this analysis to restructure the data, create and assign new variables, and assess data quality.

Figure 5: Relational Structure of Collision Data

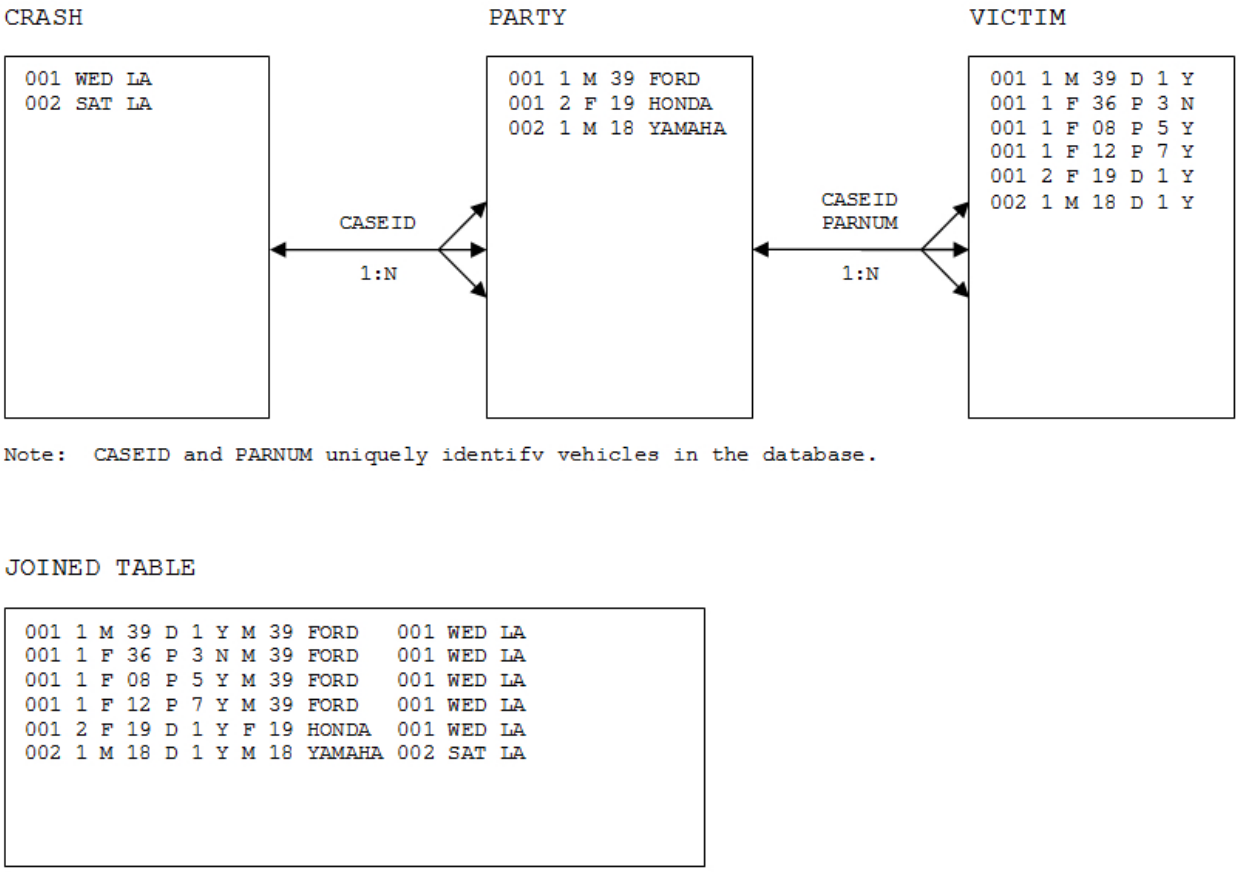


Image Source: UC Berkeley TIMS.

Crash data represent only crashes that were reported to police and for which a crash report was filed. Crashes are oftentimes under-reported – especially for lower severity pedestrian and bicyclist crashes and for crashes in communities where trust in police is low.

Mode Assignment

Crashes were assigned a single mode based on the most vulnerable party involved according to the following hierarchy:

1. Pedestrian
2. Bicyclist
3. Motorcyclist
4. Motorist

If a crash included a pedestrian and any other road user, it was classified as a pedestrian crash. Likewise, if a crash did not include a pedestrian but did include a bicyclist, it was classified as a bicyclist crash. This process was repeated throughout the hierarchy until all crashes were classified by their most vulnerable mode. This hierarchically assigned mode is used for analyses comparing crashes by crash mode. The team also created indicator flags for each type of road user involved in the crash. For mode-specific subset analyses (e.g., looking only at the subset of bicyclist crashes), these indicator flags were used so that crashes involving both pedestrians and bicyclists would be included in bicyclist subset analyses.

By definition, nearly all crashes in the SWITRS database involve a motorist. The label "motorist crash" as used throughout this report is based on this modal assignment hierarchy and refers to crashes involving *only* motorists and no pedestrians, bicyclists, or motorcyclists.

Collectively, pedestrian and bicyclist crashes are sometimes referred to throughout this appendix as vulnerable road user (VRU) crashes. This nomenclature is consistent with the U.S. Infrastructure Investment and Job Act, which set a new requirement for state departments of transportation to conduct a Vulnerable Road User Safety Assessment (VRUSA). While it is true that people are vulnerable while walking and bicycling, their vulnerability is mainly due to sharing facilities with larger, faster vehicles like cars and trucks - not to intrinsic qualities of these modes themselves.

Injury Severity Assignment

Crash-level records include the severity of the most seriously injured road user involved in the crash. Each victim involved in the crash is also assigned an individual injury severity level. In most cases, the most vulnerable road user is also the most severely injured victim involved in the crash. However, in some cases, a driver may sustain a more severe injury than a pedestrian or bicyclist. Using individual victim-level severity helps improve the accuracy of summarizing injury severities by mode.

The injury severities recorded in the crash data and summarized in this analysis are defined in the California Highway Patrol Collision Investigation Manual 555 using the KABCO scale. The acronym KABCO refers to five severity levels, as follows:

- K – Killed
- A – Suspected Serious Injury (sometimes called "Injury A")
- B – Suspected Minor Injury (sometimes called "Injury B")
- C – Possible Injury or Complaints of Pain (sometimes called "Injury C")
- O – Property Damage Only

Note that some crash severity descriptions have changed over time.[15] This report uses the acronym KA to collectively refer to fatal (K) and suspected serious injury (A) crashes, based on the KABCO acronym. Collectively, KA or fatal and serious injury crashes are also referred to throughout this report. Note that separate classification by modal involvement and mode-specific injury severity means that crashes may occasionally fit within multiple subsets of the data.

[15] **https://tims.berkeley.edu/help/SWITRS.php#Injury_Level**

Roadway Facility and Contextual Data

Data Sources

Numerous data sources were collected to build a comprehensive transportation network dataset that served as the base for completing a Safety Focus Network (SFN) analysis, descriptive and systemic crash analyses, and a Level of Traffic Stress (LTS) analysis for this project.

Primary segment and intersection datasets have been developed and contextualized for this analysis. For both datasets, SANDAG's AT Network (links and nodes) served as the base network data to which other roadway data are joined. Other data provided by SANDAG and OpenStreetMap were joined to this base dataset to fill in data gaps.

The final segment and intersection dataset used for analysis represents the best source data available for each key variable. Source data may nonetheless contain underlying errors – facility data are an abstraction or an imperfect representation of real-world conditions. Further, the network consolidation/conflation process is also imperfect; it relies on spatial proximity, bearing, and fuzzy attribute matching to bring together disparate datasets that do not always have join identifiers attached to them. This multi-pronged analysis approach is resilient to some types of data gaps and errors, and areas of uncertainty are described later to ensure that the results are used in ways that are consistent with and appropriate for the data quality.

Table 39 lists names and brief descriptions of the roadway data layers provided to or collected by the team for this analysis, with notes about the variables used in the data consolidation/conflation process. This table focuses on variables relevant to the safety analysis, including level of traffic stress for systemic safety network screening.

Table 39: Roadway and Contextual Data Sources

Dataset Name	Purpose	Source	Geometry Feature Type
AT Network Segments	Primary Segment Dataset: This dataset served as the base network segments for all analyses. It includes all street, road, freeway, and active transportation facility segments in the region. Other network characteristics were joined to this dataset.	SANDAG	Lines/Segments
AT Network Nodes	Primary Intersection Dataset: This dataset served as the base network intersections for all analyses. Other network characteristics were joined to this dataset.	SANDAG	Points/Intersections
Highway Load	Network attributes like functional class, speed limit, lanes, and motorist volumes from this table were joined to the primary segment dataset.	SANDAG	Lines/Segments
Highway Cov Segments	N/A - Attributes from Highway Load were used instead.	SANDAG	Lines/Segments
Highway Cov Nodes	Intersection control attributes were joined from this dataset to the primary intersection dataset.	SANDAG	Points/Intersections
OSM Nodes	Intersection control attributes from OpenStreetMap were joined to the primary intersection dataset where intersection control data from AT Network Nodes and Highway Cov Nodes were not already present.	OpenStreetMap	Points/Intersections
All Roads	One way street status attributes were joined to the primary segment dataset from this layer.	SANDAG Open Data Portal	Lines/Segments
Land Use	Land use types, including commercial and multi-family residential, were joined to segments, intersections, and crashes.	SanGIS Data Warehouse	Polygons
Equity	The USDOT ETC Disadvantaged Community Indicator was joined to segments, intersections, and crashes.	USDOT[16]	Census Tracts

Roadway and AT Facility Data Gaps – Applied Assumptions

Data were combined across multiple sources to calculate key variables. The combination of data sources described covers many, but not all, segments in the region on key variables used throughout the safety analysis. Where missing values or incomplete information were still present after combining sources, the team used the following default assumptions to impute values for the analysis.

Bike Lane Width

Bike lane width was used for bike segment LTS calculations. Bike lane width data were unavailable for the existing network in the source data provided. If a simple, non-separated striped bike lane exists, the width was assumed to be 5 feet. This assumption applied to traditional and buffered bike lanes (classified as Class II facilities in SANDAG's data) but not separated bike facilities (Class IV facilities). The LTS framework handles separated facilities in a different way that does not rely on facility width.

On-Street Parking Presence and Width

Parking presence and width were inputs for bike segment LTS calculations along streets with a striped, non-separated bike lane (Class II facility). Parking presence and width data were unavailable from the sources provided at the time of this analysis. After conducting a visual review of a sample of existing striped, non-separated bike lanes in the region, most facilities appeared to have existing on-street parking. For the purposes of this analysis, striped, non-separated bike lanes (Class II facilities) were assumed to be alongside an 8-foot-wide parking lane.

Separated/Protected Bike Lane Level of Separation

The level of separation for separated bikeways (e.g., flexpost, curb, parking, or raised; Class IV facilities) was not available at the time of this analysis. After conducting a visual review of a sample of separated/protected bike lanes in the region, the team observed the following patterns:

- Parking-separated bike lanes appeared to be installed in more urbanized areas of the region near commercial areas. These streets tended to have lower posted speed limits.
- Many flexpost-separated bike lanes were installed in more suburban areas along higher-speed roads.

In the LTS criteria described in a subsequent section, flexpost-separated bike lanes and more substantially separated bike lanes (e.g., parking, curb, or raised) both have an LTS of 1 on lower-speed, narrower streets. On wider, faster arterials, flexpost-separated bike lanes tend to have higher LTS scores. Therefore, in the absence of more precise data and to reflect a more cautious approach, separated or protected bike lanes were assumed to be separated by flexposts in this LTS analysis.

[16] More information about the measurement of the USDOT ETC Disadvantaged Community Indicator variable can be found here: **https://www.transportation.gov/priorities/equity/justice40/etc-explorer**

This assumption is *not* expected to impact parking-separated facilities negatively, as those appeared to be installed along slower-speed streets and, in some cases, along streets with fewer lanes. Because the LTS outputs under those conditions (slower speeds, fewer lanes) are identical between flexpost-separated and other types of separated bike lanes, the scoring result for these segments is the same.

Posted Speed Limits

Posted speed limit data were available for many, but not all, segments. Where posted speed limits were not available, the following data gap-filling schema using functional classification was applied:

- Prime Arterial: 40 mph
- Major Arterial 35 mph
- Rural Collector: 40 mph
- Collector: 30 mph
- Local Collector: 25 mph
- Residential/Local: 25 mph

Centerline Presence

The bicyclist segment LTS criteria used the presence of a striped centerline as a comfort differentiator on two-way roads. This attribute was used for mixed traffic, striped bike lanes and shoulders not adjacent to parking, and striped bike lanes alongside parking criteria. Given that centerline presence data were unavailable at the time of this analysis, functional classification was used as an indicator of centerlines. Anything designated a local collector or higher was assumed to have a striped centerline. Residential/local streets were assumed not to have a striped centerline.

Number of Lanes

Data on the number of lanes were available for many, but not all, segments. If the number of lanes was unavailable for a segment, the following data gap-filling schema based on functional class and directionality was used.

- Prime Arterial: 3 lanes per direction
- Major Arterial 2 lanes per direction
- Rural Collector: 1 lane per direction
- Collector: 2 lanes per direction
- Local Collector: 1 lane per direction
- Residential/Local: No lanes (no centerline)

Traffic Volumes

AADT data were only available along major streets (local collectors and higher) where the hwyLoad_189 data were present. This means most local/residential streets did not have traffic volume estimates.

Given the absence of volume estimates along local/residential streets, a flat estimate of 500 vehicles per day was assigned. This was set intentionally low to ensure a blanket AADT assignment did not negatively impact LTS scoring due to missing data.

The median AADT for each functional classification group was calculated from streets with AADT data for all other roads. These functional class-specific medians were used as an assumed volume for streets of the same functional class where AADT data were unavailable.

Spatial Integration of Crashes, Roadways, Sliding Windows, and Other Data Sources

This section describes how the different datasets described in Table 37 were joined together spatially.

Roadway conflation

The AT Network segment dataset served as the primary segment dataset used in this analysis because it included all street and road segments in the region as well as many regionally significant separated active transportation facility segments. Attributes like speed limit, number of lanes, and functional class were joined to the AT Network dataset using a spatial conflation procedure. This procedure matches segments based on spatial proximity of the segment itself, spatial proximity of start and end points, azimuth between segments, and geometric similarity (Hausdorff distance). This procedure was repeated iteratively by functional class to reduce false positive joins (i.e., close proximity streets that should not be matched). Freeway, “paper streets”, undocumented, private, alley, greenfield streets, and military streets were flagged as invalid at this stage and excluded throughout the analysis.

Intersection (AT Network Nodes) Variables Assignment

The AT Network Nodes dataset served as the primary intersection dataset used in this analysis. Intersections were processed and filtered to remove pseudo intersections (nodes at links that are not intersections in the real world) based on functional class/ramp status of joined segments, z-levels[17], and number of legs.

Roadway variables (posted speed limit, number of lanes, functional classification, and AADT) were then coded to the valid intersections by selecting the highest and lowest values from intersecting valid segments.

Crash Location Definition

Crashes were assigned a location type of either intersection or midblock. Crashes were coded as having occurred at an intersection if the geocoded data point was within 100 ft of an intersection centroid (AT Network Node). All other crashes were coded as midblock. The team performed a sensitivity analysis to inform this threshold by comparing the spatial location of several samples of crashes and whether each crash was coded as an intersection crash. Intersection crashes were reviewed with aerial imagery to ensure the results were intuitive. CHP’s current approach for assigning crash locations is to assign each crash one of the following values: ‘intersection ≤ 20 ft’, ‘intersection rear end ≤ 150 ft’, or ‘midblock > 20 ft’. Caltrans’ Highway Safety Improvement Program uses 250 ft as the threshold to define intersection crashes. For the purposes of this analysis, a distance threshold of 100 ft was used to define intersection crashes to help the team better understand risk factors and behavioral patterns associated with crashes and crash locations. All other crashes that occurred more than 100 feet from an intersection were coded as midblock.

[17] Z-level refers to the relative vertical position of a road or node in relation to "0". It is used to indicate when a feature crosses over or under each other, e.g. a roadway below an underpass.

Location Variables Joined to Crashes

Intersection crashes were assigned the intersection's unique ID and mid-block crashes were assigned the segment's unique ID. This assignment is to facilitate roadway variable joins and aggregation. Roadway characteristics, land use, and demographic data were processed and joined to a master intersection (AT Network Nodes) and centerline (AT Network) dataset. The crashes were joined to the intersection and centerline data to contextualize the crash data and to aggregate the crash data to the network data to allow for a systemic safety analysis to be conducted.

Sliding Windows Generation

The sliding windows analysis consists of a virtual window of a predetermined length that is moved along the street network at predetermined step lengths and aggregates crashes that are within each window. For the SANDAG region, the team performed a sliding windows analysis on the road network using 1-mile windows with 0.1-mile steps in urbanized areas and 2-mile windows with 0.25-mile steps in rural areas. The sliding window analysis and Safety Focus Network methodology are discussed in more detail in the methodology section of this appendix. The sliding window segments were produced using SANDAG's Roads All dataset. The following steps were used to produce the network data used in the sliding window analysis:

- Segments that are coded as freeways, "paper streets", undocumented, private, alley, greenfield streets, or military streets were excluded.
- Segments with a street name as "Alley" or "alley" were excluded.
- Several segments have a street name ("rd20full") as "CONTINUE". These are primarily short segments between intersections. The "CONTINUE" street name was changed to the appropriate street name (e.g., CONTINUE -> University Ave). These changes ensure that the window segment generation is not inappropriately split at these locations given that the street name is an input to the data processing algorithm.
- Cardinal direction prefix or suffix were removed from the street name. This ensures that the window segment generation is not split when a street changes from N Main Street to S Main Street.
- Segments throughout the region by geography type (urban v. rural) were then dissolved/unioned using the processed street name produced from the steps outlined above.
- Using this dissolved network, the overlapping 1-mile windows with 0.1-mile steps and the 2-mile windows with 0.25-mile steps were produced.
- Crashes by mode and injury severity were spatially aggregated to these window networks using a 100-foot search distance. Crashes that were coded as having occurred along a freeway, but not at intersections between freeway ramp and a surface/local street, were excluded.

- Using the same dissolved network, a non-overlapping network was produced with each segment having the length of the corresponding overlapping window step (0.1-mile or 0.25-mile). The aggregated crash counts from the overlapping windows were then joined to this non-overlapping network by selecting the highest crash count from the overlapping windows. This process flattens the overlapping network to improve network statistics and cartography. This network serves as the final sliding window analysis output from which the HIN thresholds are determined.

Caltrans Jurisdiction

In an effort to examine safety throughout the region and by roadway jurisdiction, the team spatially processed the primary segment dataset to code segments that are potentially under Caltrans jurisdiction using Caltrans right-of-way data (polygon) provided by SANDAG staff. Street segments throughout the region were coded as one of the following classifications:

- *Likely Caltrans Freeway or Ramp Segment*: Mainline freeway segments or freeway on/off ramps.
- *Likely Caltrans Highway/Arterial/Non-Freeway Segment*: Segments that are not freeway segments or ramps but are within the Caltrans right-of-way. These are often "main streets" or non-limited access highways.
- *Likely Local Over/Underpass with Caltrans Influence (Between Ramps)*: Local segments that are not freeway segments or ramps but are between on/off ramps. These are commonly streets that are overpasses or underpasses.
- *Not Caltrans*: Segments that are most likely not under Caltrans jurisdiction.
- *Invalid/Exclude*: Segments that coded as freeways, "paper streets", undocumented, private, alley, greenfield streets, or military streets or have a street name as "Alley" or "alley."

Generation of Level of Traffic Stress Variable

As part of a separate project, the team used roadway attributes to calculate each segment's and each intersection's Level of Traffic Stress (LTS).

LTS is a type of analysis used to classify the network based on expected stress or discomfort a person may experience while biking along a street or walking, biking, or rolling across a street. Many variables that define traffic stress levels are also well-known systemic safety risk factors (e.g., number of lanes, speed, motorist volumes). In effect, LTS is a de facto "network screen" on commonly recognized systemic risk factors like speed, number of lanes, and motorist volumes.

LTS depends heavily on geospatial data quality. It is intended to be a high-level screening and prioritization tool. Engineering decisions should be made based on site-specific evaluation. For bicyclists, stress is measured for biking along segments and at crossings. For pedestrians, stress is only measured for crossings since sidewalk data are not readily available.

The LTS calculation uses the following variables (Table 40).

Table 40: Variables Used to Define Bicyclist Segment LTS and Bicyclist/Pedestrian Crossing LTS

Variable	Bicyclist Segment LTS	Bicyclist and Pedestrian Crossing LTS
AADT	Yes	Yes
Posted speed limit	Yes	Yes
Number of lanes	Yes – Number of Lanes Per Direction	Yes – Total number of lanes
Directionality (one-way vs. two-way)	Yes	Yes
Presence of centerline	Yes	No
On-street parking	Yes – Presence and Width	No
Dedicated facilities	Yes – Bicycle Facility Type and Width	Yes – Presence of Crossing Island
Intersection control	No	Yes – Type

SANDAG

Regional Vision Zero Action Plan Technical Appendix

Appendix B: Prioritization

Introduction

This appendix documents the SANDAG Regional Vision Zero Action Plan (VZAP) safety location prioritization approach. This appendix provides the prioritization metrics and data used to assign priority scores for roadway segments on the Safety Focus Network (SFN) and roadway segments and intersections on the Systemic Safety Network (SSN).

Prioritization assists SANDAG, local governments, federally recognized tribal governments, and partners in focusing safety investments in areas where they are most needed. Developing a prioritization approach for identifying top safety locations for project implementation is a required component of a Comprehensive Safety Action Plan, as per guidance developed by the US Department of Transportation (USDOT), the grant provider for the VZAP.

Prioritization Metrics

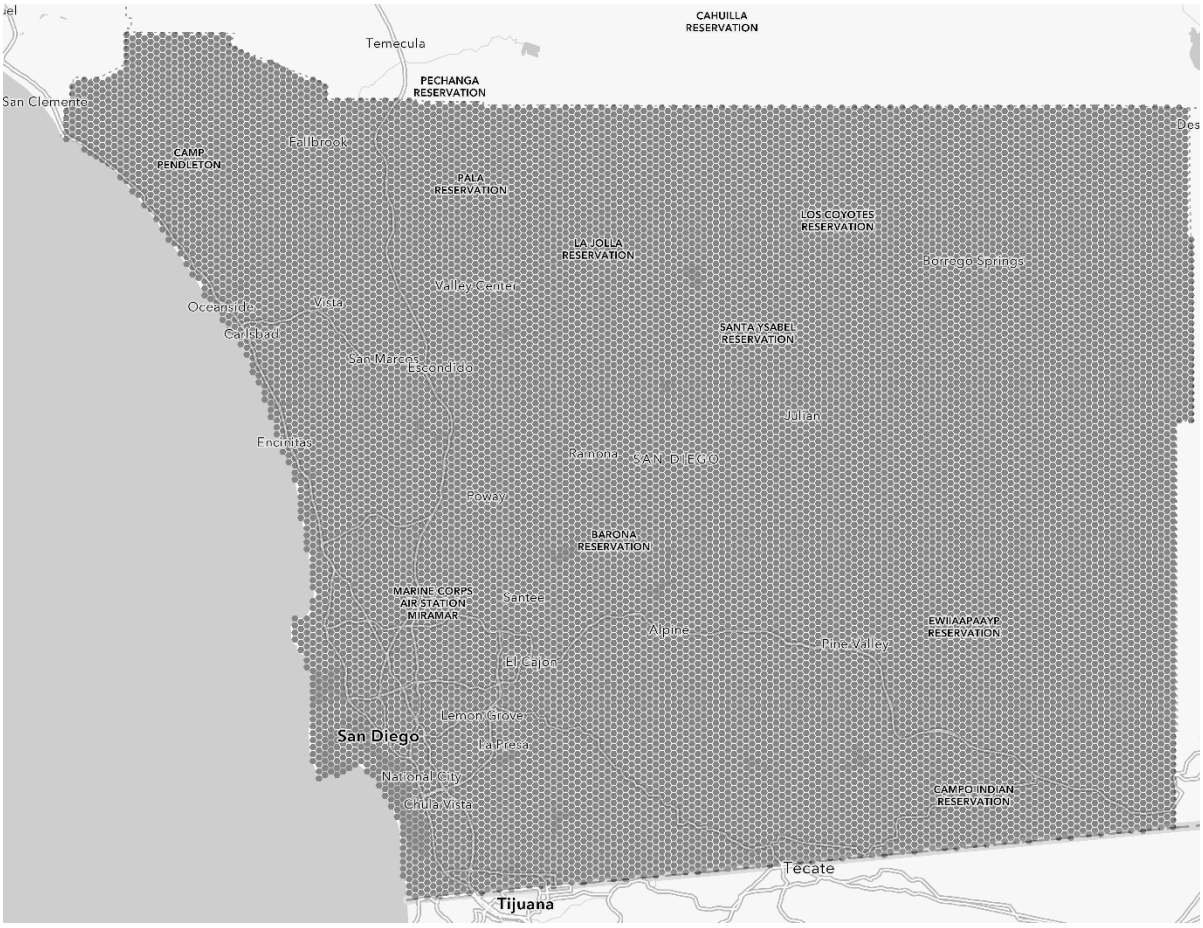
This section provides a detailed summary of the metrics used for the safety location prioritization on the SFN and SSN. Table 1 includes the three primary metric types used for prioritization along with their data sources and geographic units.

Table 1: Primary Metrics Used for Safety Location Prioritization

Metric	Data Source	Geographic Unit
Social Equity Prioritization Metrics	USDOT's Equitable Transportation Community (ETC), US Census Minority Population	Census Tracts
Trip Activity Prioritization Metrics	2020 Census Redistricting data, 2021 Longitudinal Employer-Household Dynamics (LEHD) data & SafeGraph Points of Interest (POIs)	Census Blocks & Points
Safety Need Prioritization Metrics	Safety Focus Network & Systemic Safety Network	Road Segments & Intersection Points

The Social Equity and Trip Activity Prioritization Metrics are comprised of local, federal, and big data sources. These metrics required additional processing because their raw geographic unit is not uniform (e.g. census tracts, census blocks, points). To address this, a tessellation layer was created to provide uniform geographies across the region. Tessellation layers, or hexagonal bins (hex bins), is a data visualization process that aggregates and displays data into a grid (See Figure 1). This layer includes many hex bins that collect and summarize data points of geographic units. This process is an especially useful visualization tool when combining data with different geographic units. The tessellation layer used for this analysis included 0.25 square-mile hex bins.

Figure 1: Hex Bin Tessellation Layer



Safety Need Prioritization Metrics included both the SFN and SSN. The SFN is 6% of the regional roadway network and identifies roads with the highest concentration of fatal and serious injury crashes in the region. The SSN identifies roadways with a combination of contextual or land-use characteristics common at locations where fatal and serious injury crashes have occurred. These contextual and land-land use characteristics are summarized as "risk factors." The SSN is comprised of 4% of the regional network, and, of that, 4% overlaps with the SFN. The SSN includes roadway segments and intersections with a concentration of risk factors present. More detailed information on risk factors is included below. For more information on the SFN and SSN analysis methodologies, see Appendix A.

All analyses and methodologies described were applied separately to urban and rural areas. The process to separate the urban and rural areas was developed as part of the SFN phase, due to the differences in fatal and serious injury crash density and land use characteristics of the urban and rural environments in the SANDAG region. Urban areas were defined using 2020 Census Urban Areas, while rural areas were defined as everything outside of defined urbanized areas.

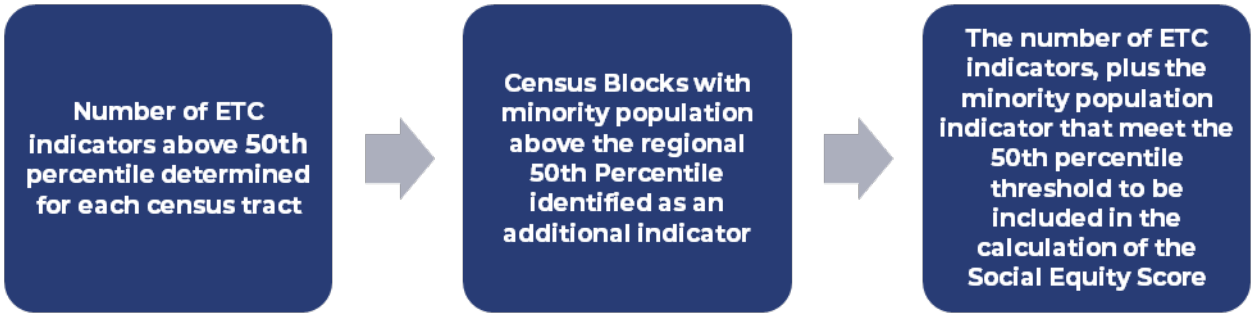
The following section provides detailed information regarding the data used for each prioritization metric and how scores were calculated. Figure 2 below provides a summary of the methodology used to calculate each score.

Figure 2: Methodology Process Used to Evaluate Each Prioritization Metric

Social Equity Prioritization Metrics

Equity priority was defined using the USDOT's ETC data, combined with minority population data. Equity data sources and the final equity score are described in Figure 3 below.

Figure 3: Social Equity Score Assignment Process



Social Equity Prioritization Data

USDOT's Equitable Transportation Community

ETC[1] data are endorsed by USDOT for use in a Safe Streets and Roads for All (SS4A) funded Comprehensive Safety Action Plan. The ETC index computes cumulative disadvantage by normalizing 50 indicators in the following five indicator categories:

- Climate and Disaster Risk Burden
- Health Vulnerability
- Transportation Insecurity
- Social Vulnerability
- Environmental Burden

[1] USDOT ETC data explorer: https://www.transportation.gov/priorities/equity/justice40/etc-explorer

The ETC data were analyzed at the census tract level, using 2020 census tract geographies. For this analysis, 46 ETC indicators were selected eliminating four indicators that did not apply to the region (e.g. coal mine proximity), had insufficient data (e.g. frequency of transit service), or were included in other datasets used in prioritization (e.g. total population is available as an ETC indicator, but is included within the trip activity metric for the prioritization analysis). To determine if a census tract has a high ETC score, first, the 50th percentile value for each indicator was identified across the region. Individual indicators for each census tract were then compared to the 50th percentile threshold identified in the previous step. For each census tract, the number of indicators that were above the 50th percentile threshold of the region was calculated. The result was combined with the minority population data to determine each census tracts equity score.

Minority Population

Minority population was calculated as a percentage of the total population for each census block in the region, where minority was defined as Hispanic, Black, American Indian Alaskan Native, Asian, Native Hawaiian Pacific Islander, population with two or more races, and other races (excluding the white population). A census block was determined as having a high minority population if the geography was equal to or greater than the regional 50th percentile of minority population. Since the minority population has one indicator, the outcome for a census block where the minority population was above the threshold is assigned as one indicator meeting the criteria.

Developing the Social Equity Score

As described previously, the ETC data were analyzed at the census tract level. The minority population data were analyzed on the census block level. To consolidate outcomes from both data sources into a single analysis layer, all census blocks within a tract were assigned the same number of ETC indicators associated with that census tract. For instance, if for a census tract, 20 indicators were identified to be above the 50th percentile threshold for the region, all census blocks within that tract are also assumed to have the same number of ETC indicators meeting the threshold.

Finally, composite social equity scores were calculated by summing the number of indicators identified for each census block (including 46 potential ETC indicators and 1 minority populations indicator). Census blocks with a higher combined indicator count were assigned a higher social equity score. Table 2 illustrates the score assignments based on percent of census tract equity indicators**.**

Table 2: Social Equity Score

Percent of Equity Indicators	Score
High (80% to 100% of indicators)	10
Medium-High (60% to 80% of indicators)	8
Medium (40% to 60% of indicators)	5
Low-Medium (20% to 40% of indicators)	2
Low (fewer than 20% indicators)	0

The social equity score of each census block was applied to the hex bin layer(s) within which the census block was located (see Figure 4 and Figure 5). For hex bins containing multiple census blocks, the maximum social equity score was assigned to the hex bin layer.

Figure 4: Social Equity Score of Hex Bins in Urban Land Use

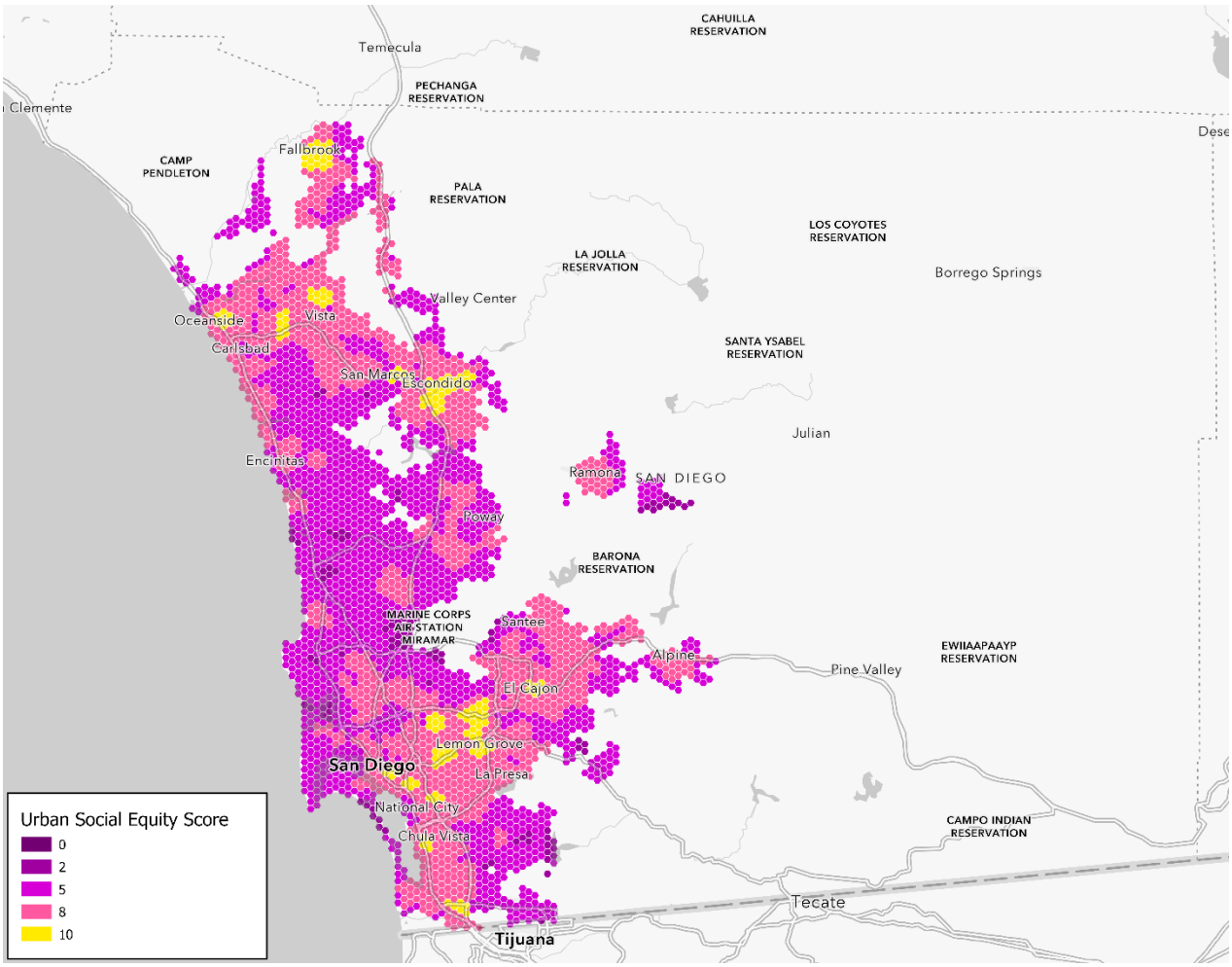
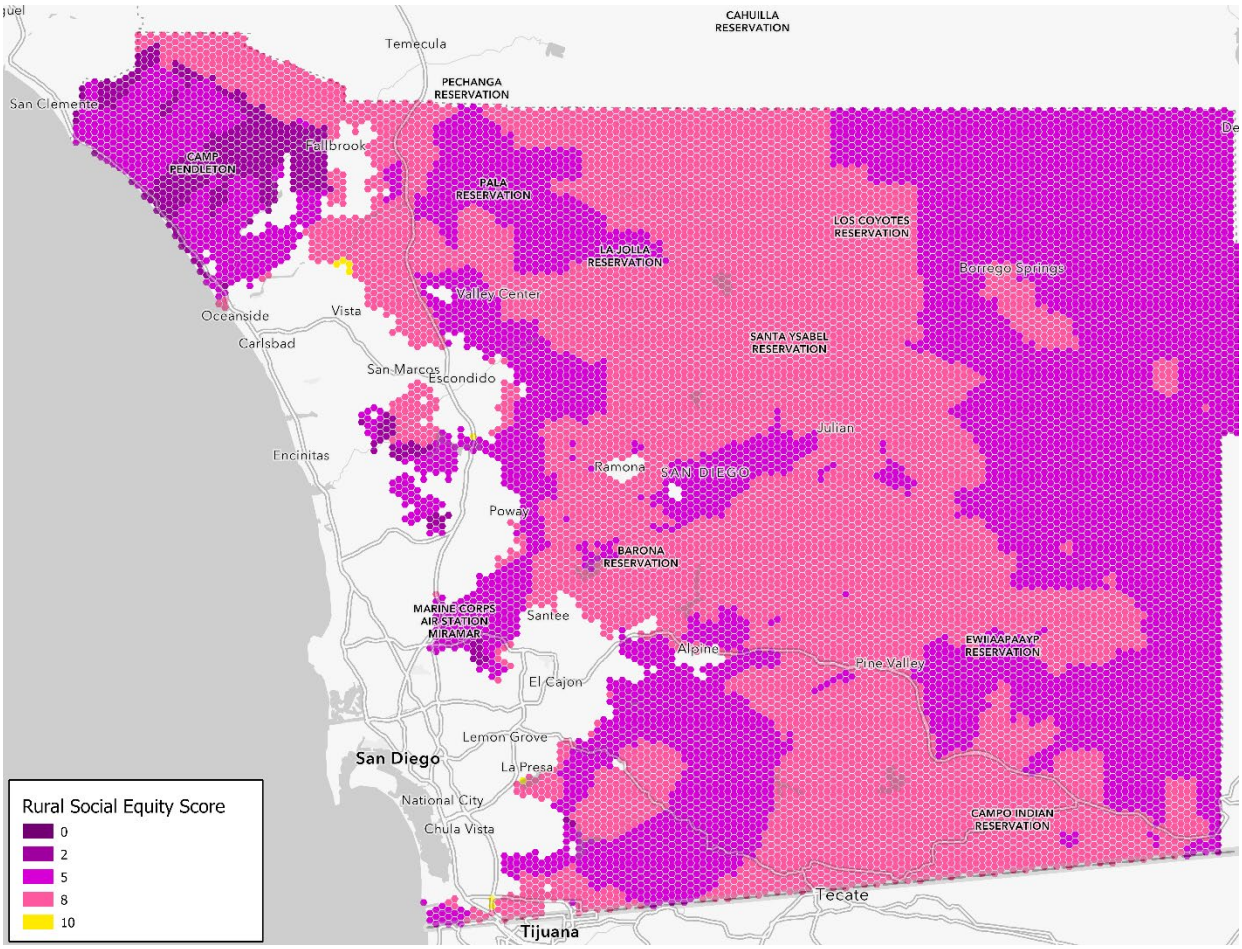


Figure 5: Social Equity Score of Hex Bins in Rural Land Use



Trip Activity Prioritization Metrics

Trip activity metrics were used to identify areas with the highest concentrations of trip generators likely to generate trips for all modes. These metrics combine census population and employment density data with SafeGraph POIs data.[2]

Trip Activity Data

The following section describes the data used to calculate trip activity.

Population and Employment Density Data

Census population and employment density data describe where people live and work. The census data used identifies areas with the highest density of populations and employment centers across the region.

[2] SafeGraph data provided by Fehr & Peers (Downloaded October 2023), https://www.safegraph.com/

Population density data are defined by an individual's primary residence. The population data were developed based on the 2020 Census Redistricting data (PL94-171). Employment density data are defined by an individual's primary public and private sector employment and do not account for individuals with two jobs. The employee data were developed based on the 2021 LEHD data.

Population and employment data are estimated for each hex bin by overlaying the hex bin layer with the census block layer. The population and employment numbers are proportionally assigned to the hex bin layer based on the intersecting areas between hex bins and census blocks. The population and employee density on each hex bin were then calculated by dividing the population and employee numbers by the hex bin area. A hex bin with higher density numbers indicates a higher concentration of residents and employees that live or work within that hex bin.

Population and employment density scores were calculated for each hex bin based on the scoring criteria detailed in Table 3.

Table 3: Population and Employment Density Score

Density Level	Threshold	Population Density Score	Employment Density Score
High	90th Percentile	10	10
Medium-High	80th Percentile	8	8
Medium	70th Percentile	5	5
Low-Medium	60th Percentile	2	2
Low	Below 60th Percentile	0	0

SafeGraph Data

SafeGraph is a comprehensive database that identifies POIs and categorizes these by land use type. SafeGraph data are highly accurate and frequently updated, offering detailed information on a wide range of POIs. It provides extensive geographic coverage and diverse POI categories, making it ideal for comprehensive and advanced spatial analyses. The POI data were used to identify locations with high concentrations of trip generators, indicating locations where trips are likely to occur. SafeGraph data are updated monthly; the data used in this analysis was downloaded in October 2023. A summary of the SafeGraph land use types used in the analysis is included below, and a full list is detailed in Attachment 1**.**

SafeGraph Land Use Types Used in Trip Activity Score:

- Accommodation and food services: Includes bars, restaurants, other eating places, and special food services.
- Arts, entertainment, and recreation: Includes amusement parks, arcades, and performing arts venues.
- Educational services: Includes elementary to high schools, community colleges, universities, and professional schools.
- Health care and social assistance: Includes hospitals, physician offices, health care offices, and social assistance offices.
- Retail trade: Includes clothing stores, bookstores, news dealers, furniture stores, and grocery stores.

POIs within the SafeGraph data are categorized by land use types and are represented by a single point. SafeGraph POIs located within a 0.5-mile radius of each hex bin are counted. This count is then divided by the area of a hex bin to determine the density of POIs for each hex bin area. Figure 6 visualizes points of interest densities in the hex bin layer.

A SafeGraph POIs score was calculated for each hex bin using the scoring criteria provided in Table 4. A higher SafeGraph score indicated a higher number of activity centers in a hex bin.

Figure 6: SafeGraph's Points of Interest Densities in the Hex Bins Layer

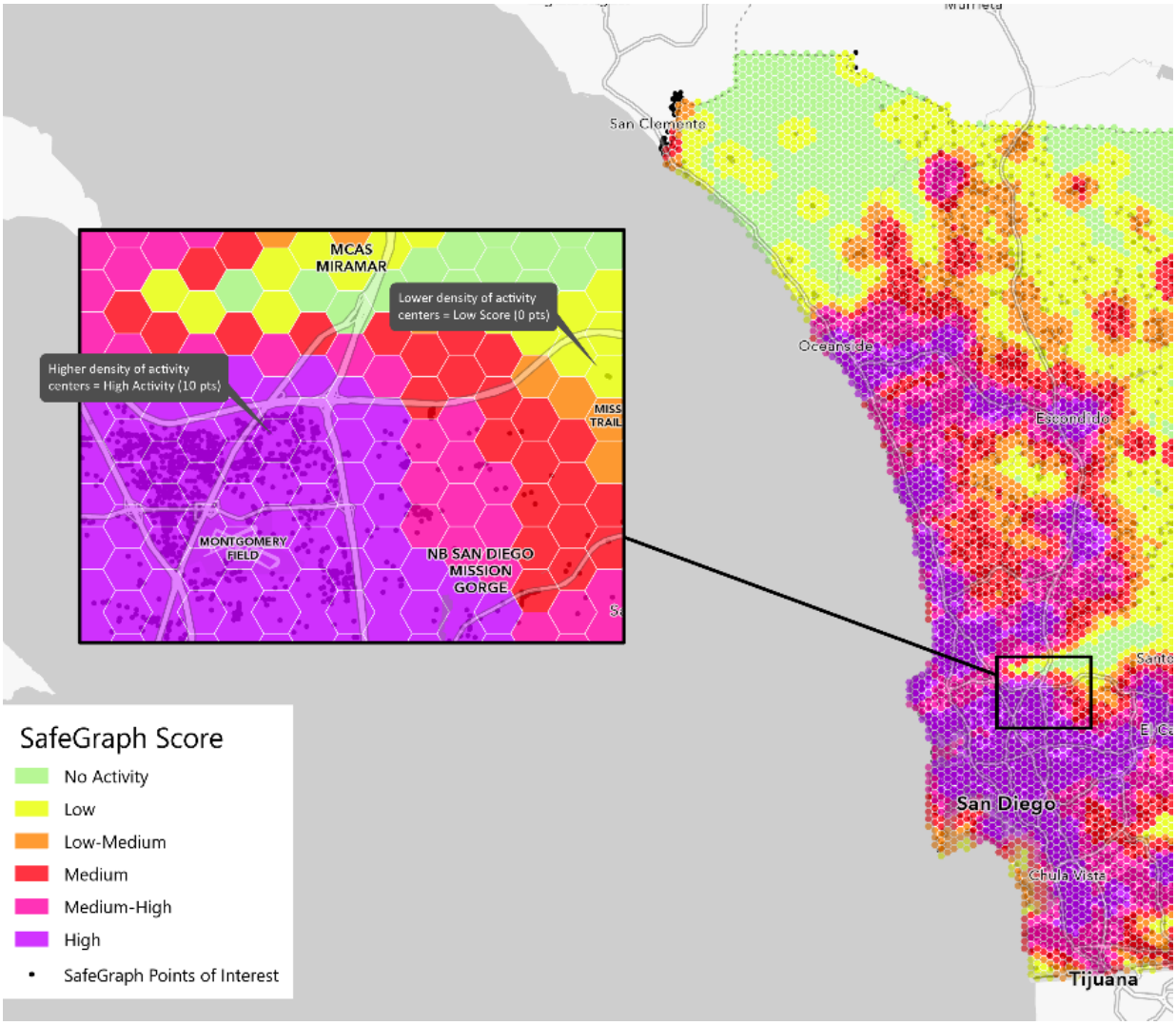


Table 4: SafeGraph Points of Interest Score

Locations of Interest Density	Threshold	Score
High	90th Percentile	10
Medium-High	80th Percentile	8
Medium	70th Percentile	5
Low-Medium	60th Percentile	2
Low	Below 60th Percentile	0

Developing Trip Activity Score

The trip activity score is calculated by averaging the hex bin score of each of the three datasets: population density, employment density, and SafeGraph POI. Because it is an average, each of the three datasets has an equal influence on the score.

Safety Need Prioritization Metrics

Prioritization based on safety needs considered historical crashes using prevalence of modal SFN and the number of risk factors present.

Safety Focus Network Score

The SFN identifies roadway segments with the highest concentration of fatal and serious injury crashes. Modal SFNs were developed for the following four transportation modes: motor vehicle, motorcycle, bicycle, and pedestrian. A composite SFN was created as the combination of all four modal SFNs.

Roadway segments on the composite SFN were assigned points based on which modal SFN(s) a segment appears on, as described in Table 5. This scoring framework prioritizes locations with an observed concentration of fatal and serious injury crashes involving vulnerable road users (bicycle, pedestrian, and motorcycle) and prioritizes segments with safety challenges across multiple modes. For segments intersecting multiple modal SFNs, the points are summed to reflect their combined importance. The maximum score assigned for a segment that falls on multiple modal SFNs is 10 – the sum of all rows.

Table 5: Safety Focus Network Scoring

Mode	Score
Motor Vehicle	1
Motorcycle	2
Bicycle	3.5
Pedestrian	3.5

Systemic Safety Network Score

Locations where fatal and serious injury crashes occur tend to have common contextual or land-use characteristics, or risk factors, present. The risk factors identified in the VZAP analysis are outlined in Table 6.

Table 6: Systemic Safety Network Risk Factor Indicators

Risk Factors	Segment Level	Intersection Level
Freeway ramp-end intersections	-	1
Two-way stop or unknown control intersection with: • Four+ lanes; or • speed limit 35+ miles per hour (MPH)on the uncontrolled street	-	1
Traffic signal with: • Four+ lanes; or • speed limit 35+ MPH on at least one approach	-	1
• Four+ lanes (two-way) or three+ lanes (one-way) in urban areas; or • Two lanes in rural areas	1	-
Posted speed limit 35+ mph	1	-
Segment level traffic stress (LTS)* of four	1	-
Intersection/crossing LTS* of four		1
Proximity to commercial land use or multi-family housing	1	1
Proximity to a transit stop	1	1
Proximity to school	1	1
Maximum possible score (count of risk factors)	**6**	**7**

*Note: *LTS is a rating given to a road segment or street crossing that indicates the level of stress it imposes on bicyclists or pedestrians. LTS can range from one to four. LTS four typically involves interactions with higher speed traffic. More information regarding LTS can be found at:* ***https://peterfurth.sites.northeastern.edu/level-of-traffic-stress/***

The region's systemic safety network is composed of both segment and intersection features. Most features in the region exhibit at least one of the identified risk factors, prioritization focused on the subset of segments and intersections with the highest number of risk factors. Once selected, these segments and intersections made up the region's SSN.

The segments included in SSN is comprised of local roads and rural state highways with at least five risk factors in urban areas (approximately 6% of all urban roadway network miles) and four risk factors in rural areas (approximately 1% of all rural roadway network miles). The intersections included in SSN are local roads and rural state highways with at least four risk factors in urban areas (approximately 8% of all intersections in urban areas) and three risk factors in rural areas (approximately 7% of all intersections in rural areas). Segments and intersections exclude freeways and other controlled access roads.

Roadway segments and intersections that met the minimum threshold for risk factors were included on the SSN and prioritized based on the following scoring system (Table 7), which assigned a higher prioritization score to SSN segments/intersections with a higher number of risk factors present.

Table 7: Systemic Safety Network Scoring by Number of Risk Factor Indicators

Number of Risk Factor Indicators	SSN Score
3	0
4	1
5	2
6*	5

** Although the maximum risk factor sum for an intersection is seven, the highest calculated score in the region is six. No intersection in the SANDAG region has all seven* risk factor indicators present.

Developing the Prioritization Networks

Assigning Social Equity and Trip Activity Scores to the SFN and SSN Roadway Network

As described above, trip activity and social equity prioritization scores were calculated at the geographic level of the hex bin. The trip activity and social equity prioritization scores were assigned to the SFN and SSN segments and intersections that fell within their hex bins. In cases where a SFN or SSN segment or intersection fell within two or more hex bins, the SFN or SSN feature received the prioritization score of the hex bin with the highest score. Assigning Trip activity and social equity scores from the hex bin layer to the SFN and SSN network was conducted in separate steps. Therefore, in instances where one hex bin had a higher trip activity score and another intersecting hex bin had a higher equity score, the segment is assigned the highest score from each intersecting hex bin. Figure 7 illustrates an example where SFN or SSN features fall within multiple hex bins.

Figure 7: Example of SFN Features Spanning Multiple Hex Bins and Score Assignments

Final Composite Safety Focus Network Prioritization Score

A final composite SFN score was calculated for each segment within the network as an average of the social equity score, trip activity score, and the SFN score.

Table 8 provides the distribution of prioritization scores along the SFN.

Table 8: Composite Safety Focus Network Prioritization Score Distribution

Score Range	Urban Miles	Percent	Score Range	Rural Miles	Percent
8 ≤ Score ≤ 10	45.7	10%	6.5 ≤ Score ≤ 10	21.1	10%
6 ≤ Score < 8	180.7	40%	4 ≤ Score < 6.5	153.2	75%
0 < Score < 6	221.6	49%	0 < Score < 4	30.3	15%
Total Miles	**448.0**	**100%**	**Total Miles**	**204.6**	**100%**

Top priority SFN locations are segments scoring among approximately the top 10% of the SFN roadway miles. This captures urban roadway segments with prioritization scores of 8 or above and rural roadway segments with prioritization scores of 6.5 or above. As a final step, the top priority SFN locations were smoothed to fill gaps between top priority segments that were smaller than one mile in urban areas or two miles in rural areas.

Final Composite Systemic Safety Network Prioritization Score

Similar to the SFN, a final composite SSN score was calculated for each segment and intersection on the SSN as an average of the Social Equity Score, Trip Activity Score, and the SSN score. **Table 9** provides the distribution of prioritization scores for SSN segments, and **Table 10** provides the distribution of prioritization scores for SSN intersections.

Table 9: Composite Systemic Safety Network Prioritization Score Distribution (Segments)

Score Range	Urban Miles	Percent	Score Range	Rural Miles	Percent
7 ≤ Score	35.8	9%	6.5 ≤ Score	2.5	9%
5 ≤ Score < 7	218.8	52%	5 ≤ Score < 6.5	20.8	72%
Score < 5	166.0	39%	Score < 5	5.8	20%
Total Miles	**420.6**	**100%**	**Total Miles**	**29.0**	**100%**

Table 10: Composite Systemic Safety Network Distribution (Intersections)

Score Range	Urban Miles	Percent	Score Range	Rural Miles	Percent
6.5 ≤ Score	117	7%	6.25 ≤ Score	13	14%
4 ≤ Score < 6.5	1330	78%	4 ≤ Score < 6.25	75	81%
Score < 4	250	15%	Score < 4	5	5%
Total Intersections	**1697**	**100%**	**Total Intersections**	**93**	**100%**

Top priority SSN segments are defined as those with a composite scores of 7 or above in urban areas and 6.5 or above in rural areas, representing approximately 9% of urban and rural roadway segments within the network.

Top priority SSN intersections are defined as those with composite scores of 6.5 or above in urban areas and 6.25 or above in rural areas, representing approximately 7% of urban and 14% of rural intersections within the network.

Attachment 1

List of SafeGraph Land Use types used in the prioritization process.

Accommodation and Food Service:

- Restaurants and Other Eating Places
- Traveler Accommodation
- Drinking Places (Alcoholic Beverages)
- RV (Recreational Vehicle) Parks and Recreational Camps
- Special Food Services
- Food Services and Drinking Places

Arts, Entertainment, and Recreation:

- Museums, Historical Sites, and Similar Institutions
- Other Amusement and Recreation Industries
- Gambling Industries
- Promoters of Performing Arts, Sports, and Similar Events
- Amusement Parks and Arcades
- Spectator Sports
- Performing Arts Companies
- Amusement, Gambling, and Recreation Industries
- Independent Artists, Writers, and Performers
- Arts, Entertainment, and Recreation

Educational Services:

- Other Schools and Instruction
- Elementary and Secondary Schools
- Colleges, Universities, and Professional Schools
- Technical and Trade Schools
- Business Schools and Computer and Management Training
- Educational Support Services
- Junior Colleges
- Educational Services

Health Care and Social Assistance:

- Offices of Other Health Practitioners
- Offices of Physicians
- Outpatient Care Centers
- Offices of Dentists
- Community Food and Housing, and Emergency and Other Relief Services
- Social Assistance
- Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly
- Medical and Diagnostic Laboratories
- Specialty (except Psychiatric and Substance Abuse) Hospitals
- Nursing and Residential Care Facilities
- Child Day Care Services
- General Medical and Surgical Hospitals
- Health Care and Social Assistance
- Ambulatory Health Care Services
- Individual and Family Services
- Home Health Care Services
- Other Ambulatory Health Care Services
- Psychiatric and Substance Abuse Hospitals
- Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities
- Nursing Care Facilities (Skilled Nursing Facilities)
- Hospitals

Retail Trade:

- Vending Machine Operators
- Electronics and Appliance Stores
- Clothing Stores
- Building Material and Supplies Dealers
- Beer, Wine, and Liquor Stores
- Other Motor Vehicle Dealers
- Automobile Dealers
- Used Merchandise Stores
- Automotive Parts, Accessories, and Tire Stores
- Gasoline Stations
- Health and Personal Care Stores
- Furniture Stores
- Other Miscellaneous Store Retailers
- Home Furnishings Stores
- Grocery Stores
- Specialty Food Stores
- Shoe Stores
- Sporting Goods, Hobby, and Musical Instrument Stores
- Florists
- Jewelry, Luggage, and Leather Goods Stores
- General Merchandise Stores, including Warehouse Clubs and Supercenters
- Lawn and Garden Equipment and Supplies Stores
- Office Supplies, Stationery, and Gift Stores
- Book Stores and News Dealers
- Clothing and Clothing Accessories Stores
- Retail Trade
- Department Stores
- Furniture and Home Furnishings Stores
- Miscellaneous Store Retailers
- Direct Selling Establishments

Appendix C: Benchmarking and Implementation Actions

Introduction

This appendix outlines an assessment of region-wide safety policies, plans, guidelines, and standards performed by SANDAG. This benchmarking assessment was conducted to satisfy the requirements set by the US Department of Transportation (USDOT) for a Safe Streets and Roads for All (SS4A) compliant Comprehensive Safety Action Plan (CSAP). The goals of the benchmarking assessment are to obtain a thorough understanding of the current safety efforts within the region, determine successes to build upon, and identify challenges to address in the development of the Regional Vision Zero Action Plan (VZAP).

The assessment was completed in three steps:

1. **Program and Policy Review:** Examined transportation and safety plans in the region to understand SANDAG's existing safety efforts and provide a snapshot of current safety practices and efforts led by local government partners.
2. **Benchmarking Assessment:** Identified successes, challenges, and opportunities with SANDAG existing safety efforts, and those in place by local government partners, to determine which safe system approaches are already an institutionalized practice and which present opportunities to be incorporated or bolstered in the VZAP.
3. **Implementation Actions:** Identified opportunities for SANDAG to institutionalize the Safe System Approach and developed implementation strategies to achieve the goal of reducing all fatal and serious injury crashes to zero by 2050.

Program and Policy Review

The first assessment step involved documenting the San Diego region's existing safety efforts by identifying all pertinent regional and local policies, plans, programs, and projects, followed by a review. The selected documents were chosen for their relevance to the VZAP.

Documents selected for this program and policy review included:

- Regional Transportation Plans
- Regional Transportation Improvement Programs
- Local Road Safety Plans
- Local Active Transportation Plans
- Local Vision Zero Action Plans
- Tribal Transportation Plans

Information that was documented from these plans is summarized in Table 1.

Table 1: Information Summarized for Each Plan

Agency/ Plan Name	Safety Goals	Engagement	Data	Policies	Programs	Projects
Name of agency who produced the plan, the document's name, and the year the plan was published	Highlight safety priority areas	Noted engagement techniques used to identify safety specific needs	Noted relevant data and analysis techniques used to identify safety challenges	Noted existing safety policies (i.e., complete streets, speed)	Noted existing safety programs (i.e., safety campaigns, education, enforcement)	Noted proven safety counter-measures recommend-ded or used for projects

Table 2 lists the 39 transportation documents reviewed for this assessment and the document publication/adoption year. A full review of each document is provided in Attachment 1. SANDAG aimed to review at least one document from all local government agency partners, and review transportation safety related plans from federally recognized tribal governments as available.

Table 2: Regional Safety Document Review List

Agency	Document	Year
Barona Band of Mission Indians	Tribal Transportation Safety Plan	2017
Carlsbad	Safer Streets Together	2022
Chula Vista	Active Transportation Plan	2020
Chula Vista	Local Road Safety Plan	2022
Coronado	Active Transportation Master Plan	2018
County of San Diego	Active Transportation Plan	2018
County of San Diego	Local Roadway Safety Plan	2020
Del Mar	Complete Streets Policy	2017
El Cajon	Systemic Safety Analysis Report	2019
El Cajon	Draft Active Transportation Plan	2022
Encinitas	Active Transportation Plan	2018
Encinitas	Local Roadway Safety Plan	2022
Escondido	Local Roadway Safety Plan	2022
Imperial Beach	Local Roadway Safety Plan	2021
Jamul Indian Village of California	Strategic Transportation Safety Plan	2019
La Jolla Band of Luiseno Indians	Strategic Transportation Safety Plan	2014
La Mesa	Local Road Safety Plan	2020
Lemon Grove	Systemic Safety Analysis Report	2017
Metropolitan Transit System	Transit System Rail Safety Plan	2023
Metropolitan Transit System/ First Transit	Bus Safety Plan MTS Contract-Operator at Copley Park Maintenance Facility	2023

Agency	Document	Year
Metropolitan Transit System/ Transdev	Bus Safety Plan MTS Contract-Operator at South Bay Maintenance Facility and East County Maintenance Facility	2023
National City	Bicycle Master Plan	2023
National City	Local Roadway Safety Plan and Systemic Safety Analysis Report	2021
North County Transit District	Transit Safety Action Plan	2023
Poway	Local Roadway Safety Plan	2022
San Diego	Systemic Safety Data Driven Path to Vision Zero	2019
San Diego	Vision Zero Strategic Plan	2020
San Pasqual Band of Diegueno Indians	Strategic Transportation Safety Plan	2017
SANDAG	Regional Plan	2021
SANDAG	Regional Transportation Improvement Program	2023
SANDAG	Triennial Performance Audit	2021
SANDAG	Vision Zero Policy Two Pager	2021
SANDAG	MPO Best Practices for Vision Zero	2022
SANDAG	Intraregional Tribal Transportation Strategy	2021
Santee	Sustainable Santee Plan	2019
Santee	Active Santee Plan	2021
Santee	Local Roadway Safety Plan	2021
Viejas Band of Kumeyaay Indians	Tribal Strategic Transportation Safety Plan	2021
Vista	Local Roadway Safety Plan	2021

Key Takeaways from the Document Review

The following section outlines the key takeaways from the document review process. Table 3 provides a summary of the observations for each critical information category and the key takeaways that helped inform the VZAP.

Table 3: Document Review Key Takeaways

Topic	Observation	Key Takeaways
Safety Goals and Objectives	Nearly all the plans include safety goals and/or objectives. Common language across the documents includes a focus on all road users, zero traffic fatalities and serious injuries, a focus on high crash locations, and preventing future crashes. Documents cite multidisciplinary approaches, addressing topics like sustainability, accessibility, and mobility in tandem with safety, and implementing proven solutions.	• Create consensus and buy-in on a shared regional safety goal and supporting objectives. • Adopt the Safe System Approach at the regional level to support partner agencies further institutionalize safety.
Safety Engagement	The use of a stakeholder working group was the most frequently cited method to collaborate on safety and active transportation efforts. Other engagement activities include sharing information on a website/social media, surveys, public meetings, and walking audits.	• Create and sustain safety working groups. • Share best practices related to stakeholders and public engagement.
Safety Data and Analysis	Most plans utilized collision data from SWITRS and TIMS to determine crash trends, contributing factors, and crash locations in their jurisdiction, primarily focusing on hot spots. Additionally, other types of data used to inform decision-making include the level of traffic and bicycle stress, bicycle and pedestrian exposure, roadway data, vehicle miles traveled, active transportation infrastructure (e.g. # of bike lane miles), public input, land uses, and analysis results from other plans. However, few plans incorporated systemic analysis or equity analysis to determine locations with safety needs.	• Crash data is good and is being utilized to inform decision-making. • Other data is effectively being incorporated into analysis and decision making. • Training or resource sharing on systemic and equity analysis.
Safety Policies	Policy references in plans were relatively vague. There was commentary on complete streets, road design, and speed-related policies, but no references to formal documentation.	• Highlight relevant state and regional safety-related policies. • Highlight any local practices for safety-related policies. • Discuss implementation opportunities for safety-related policies.
Safety Programs	Several education and enforcement programs are referenced in plans and most frequently include collaborations with schools (especially Safe Routes to School), bicycle and pedestrian focused education (youth and adults), enforcement (saturation patrols or high visibility), and other safety education campaigns (impairment and speed).	• Determine which programs have been successful and effective in the region to build upon and continue moving forward.
Safety Projects	Nearly all the plans list proven safety projects to address engineering needs. Implementation of the countermeasures was frequently vague or not included. Implementation evaluation and effectiveness were largely non-existent.	• Determine which projects have been successful and effective to build upon and continue moving forward.

Benchmark Assessment

The reviewed safety policies, plans, programs, and projects were then evaluated against the following six elements to determine what existing strategies are most effective to reduce fatal and serious injury crashes and where the gaps are in the existing regional safety efforts:

1. Leadership and Commitment
2. Safety Culture
3. Data Collection and Analysis
4. Planning and Policy
5. Project Delivery
6. Safe System Framework

These six elements were developed as best practices determined by the Federal Highway Administration's (FHWA) Safe System Approach for pedestrians and bicyclists.[1] Table 4 provides an assessment of the SANDAG regional safety efforts for each of the above categories. This table incorporates information found in regional and local transportation and safety plans and input received from SANDAG staff across various departments, who shared institutional knowledge on the regional safety efforts. Staff provided additional context for the challenges and opportunities for each benchmark and answered the following questions during an interactive virtual session held on December 19, 2023:

- Is the assessed level for each benchmark, correct?
- What are other opportunities/successes we did not see in the plan review?
- What are other challenges we did not uncover in the plan review?
- Is this benchmark a priority to continue building upon/identify a solution?
- "If SANDAG could just do something about (x), we would make further progress to reduce severe crashes." What is (x) and how can SANDAG or partners implement on this?

Benchmarks noted with the letter "X" in the Priority column in Table 4 represent the benchmarks SANDAG staff noted as a priority in developing the VZAP.

[1] FHWA (2021) *Primer on Safe System Approach for Pedestrians and Bicyclists.* **https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa21065.pdf**

Table 4: Benchmarking Assessment

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Leadership and Commitment						
Key elected officials and agency leaders are champions for safety and have made a public commitment to the goal of eliminating fatal and serious injury crashes.		x		Local agencies and SANDAG include safety considerations in their safety or other related plans. Several have safety goals or vision zero concepts.	Support and engagement of elected officials and agency leaders is unclear. Concerns about increasing traffic congestion are still causing elected officials and agency leaders to hesitate on full endorsement.	x
Key elected officials and agency leaders are made aware of regional safety efforts regularly.		x		SANDAG currently manages several working groups to develop transportation plans. SANDAG regularly engages with and provides executive level safety briefings.	Unclear if or how often local agency leaders or elected officials are made aware of safety efforts or engage in stakeholder groups. Committee presentations rarely discuss the projects, programs, and policies being implemented/ programmed to advance safety. Safety is often siloed and is not brought up in the context of other transportation projects.	x

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
A safety working group regularly coordinates and includes (or updates) elected officials and agency leaders on progress.		x		SANDAG currently manages several working groups/task forces to develop transportation plans. The VZAP Project Development Team regularly makes safety-related presentations to SANDAG committees and working groups. Mobility Working Group may function as the closest organized group to address safety; however, previous groups like San Diego Traffic Engineers' Council (SANTEC)[2] and City/County Transportation Advisory Committee (CTAC)[3] were tasked more with a safety purpose. Consider engaging elected officials through these discussions, particularly when the emphasis is on funding infrastructure projects.	Unclear if elected officials or agency leaders are in stakeholder groups. There currently isn't a forum (for elected officials and agency leaders) to share successes and challenges of implementing safety projects. Need stakeholders to prioritize safety over vehicle level of service.	x

[2] SANTEC – No longer an active council committee.

[3] CTAC – No longer an active committee.

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Culture						
Transportation staff prioritize safety in their job responsibilities.		x		Plans support safety priorities and improving streets for all modes and abilities.	Unclear the extent to which transportation staff integrate safety into their daily responsibilities. New projects are built to safety standards but typically use less innovative designs. Projects are not evaluated to measure safety improvements.	
Transportation agencies in the region have a dedicated safety champion.		x		Safety champions were likely formed through the development of safety plans. SANDAG was able to receive more FTE (through SS4A grant) to support safety efforts, although no dedicated position exists.	Unclear who they are, what they do, and their specific roles. Partner agencies are unlikely to have safety champions; engineers with safety responsibilities are unlikely to also be advocates.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
All transportation agencies in the region coordinate regularly on safety needs.	x			Several stakeholder groups develop transportation and/or safety plans. The Regional VZAP will convene local interests into a strategic regional approach. Opportunities for AB43 Task Force to evolve and expand.	Local agency stakeholder group assembled for Regional VZAP, but unclear if the group will continue meeting after as a forum for local agencies to share successes and challenges of implementing safety projects.	
All transportation agencies in the region have committed to the same safety goal(s) and integrate these into plans, programs, and projects.			x	Safety goals, strategies and actions have been developed across the region. Need to incorporate safety goals to decision-making and identify funding.	There is not a shared regional goal or supporting objectives to align safety needs and cohesive efforts. Safety goals are not tied to funding opportunities.	
Agencies have implemented accountability measures for safe driving of fleet vehicles.		x		SANDAG has a policy for safe operation of fleet vehicles; drivers who speed can lose their privileges to fleet vehicles. Local jurisdictions likely have similar policies but are assumably documented in HR or other workplace policy documents.	Employee safety and personal responsibility while traveling for work is unclear.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Safety-related training and education are in place to help agencies implement safety policies and programs.		x		NCTD and MTS require all staff to complete safety-related training and education. Additional training is mandatory for specific roles, such as bus operators, foremen, and maintenance workers, with certification required in some cases. SANDAG staff attend webinars and participate in formal safety trainings and informal training/ knowledge sharing occurs (e.g. sharing safety articles, webinars, and other miscellaneous safety trainings).	Unclear if staff at all agencies have access to safety training and education opportunities. SANDAG includes budgets for safety-related opportunities, but staff workload and capacity can interfere with attendance	
Data Collection and Analysis						
Crash data are collected regularly and used to inform safety decisions.			x	TIMS and SWITRS are utilized by local agencies for crash trends analysis. SANDAG Traffic Safety Dashboard can help streamline data collection.	Crash trend analysis and update frequency vary across agencies. While data is collected, its use in safety decisions is unclear, as is the consistency of analysis outputs among local agencies.	x

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Crash data are augmented with data from other sources, such as hospitals, roadway data, other.		x		Several agencies are using other data sets to identify safety challenges and priorities.	Use of other data types is inconsistent across agencies; many only focus on crash data. Gaps include exposure data, bike/pedestrian counts, turning movements, and key roadway features like intersection control types, roundabouts, and speed data.	x
Equity is considered in analysis and the decision-making for safety improvements.		x		A limited number of agencies are incorporating equity into the decision-making process for safety improvements. SANDAG can support local agencies with methods of integrating equity analyses into projects.	Equity was primarily discussed as part of many plan's goals and objectives, but not analyzed, mapped, or incorporated as criteria into project decision-making.	x
Safety analysis considers other system-level needs such as existing land use, future development, multimodal priorities, other.		x		Several agencies are using other types of analyses to identify safety challenges and priorities.	Use of other data types is inconsistent across agencies; many only focus on crash data. Gaps include existing and future land use, future development, multimodal priorities.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Locations for hot spot and systemic safety improvements are identified and a plan to update the information regularly exists.		x		Several agencies are identifying hot spot locations and, to a lesser extent, systemic solutions.	It is unclear how frequently the hot spot locations are being updated. Systemic analysis and solutions are not as common.	x
Planning and Policy						
The public is aware of/engaged in transportation safety efforts.		x		Stakeholder and public engagement efforts are identified in several plans. Public awareness/ engagement has increased through the development of both the Regional Plan and Regional VZAP.	Stakeholder engagement remains a key focus, but opportunities for public engagement with safety initiatives is limited. Local agencies appear to be reluctant to provide safety education and public engagement, deferring these responsibilities to state authorities.	
There are near-term and interim goals for achieving zero traffic fatalities			x	Safety targets are supported and in place. The monitoring and evaluation process outlined in the Regional VZAP will help move this forward and potentially exceed standard targets.	There is not a shared regional goal or supporting objectives to align safety needs and cohesive efforts.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
There are clear and proven safety policies, programs, and projects in place to achieve each goal.		x		Several plans discuss safety programs and projects. The TransNet Ordinance presents an opportunity to push in the right direction.	The existence of safety-related policies (i.e., complete streets, speed, road design) are not frequently cited.	
An agency lead, and supporting partners, are identified to complete safety programs and projects.		x		Some plans assign tasks to specific responsible parties in their action plans.	Unclear how frequently leaders and partners discuss safety efforts.	
Maintenance policies that integrate safety considerations are in place and followed.		x		The City of San Diego uses resurfacing as an opportunity to implement active transportation improvements during resurfacing projects. Consider highlighting this as a regional best practice for others in the region, as long as safety is simultaneously addressed. The City of Carlsbad declared a state of emergency on traffic-related fatalities and series injuries, this made funding readily available for staff to implement safety projects (e.g. bike lanes)	Many local agencies use AASHTO Guidance and are more conservative with design. Implementation of safer road features which require special maintenance are uncommon.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Complete streets or other safety-related design policies are in place and followed.		x		Policies are referenced in some plans. There is an opportunity to encourage safety countermeasures and vision zero goals on TransNet funded projects across the region.	Difficult to tell if the policies are operationalized into implementation and project decision-making. SANDAG has a regional complete streets document; however, local governments prefer to use their own policies in general plans and street design guidelines.	
Data and information from other plans, like future land uses, health considerations, and development priorities are being considered in coordination with safety plans and policies.		x		Several agencies are using other data sets to identify safety challenges and priorities.	Use of other types of data is not consistent across agencies with several still focusing on crash information only. See Data Collection and Analysis row above.	
Transportation safety information is being communicated to a wider audience through a website, social media, safety campaigns, or similar methods.		x		Stakeholder and public engagement efforts are identified in several plans, including these methods of delivery.	Unclear what is effective or a best practice in terms of communication methods and outcomes in the region. Effective communication strategy should lead folks without overwhelming them.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Project Delivery						
Metropolitan Transportation Plan (MTP)[4] and Transportation Improvement Program (TIP) projects prioritize transportation safety.		x		Safety prioritization criteria is reflected in plans. Safety projects in the MTP and TIP are identified and called out which is distinct from being prioritized in those planning and programming documents. SANDAG is only able to control the extent to which safety is integrated in their own construction projects. SANDAG administered grants can prioritize local jurisdiction's projects that incorporate progressive safety designs.	TransNet and federal funds are passed through SANDAG to local governments. Local governments use these funding sources to implement their priority projects. SANDAG has limited authority to influence project scope.	
Capital Improvement Program (CIP) projects prioritize transportation safety.				Did not review individual agency CIPs	Did not review individual agency CIPs.	

[4] The FHWA refers to the SANDAG Regional Plan as a Metropolitan Transportation Plan/Regional Transportation Plan.

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Proven engineering countermeasures are being implemented.		x		Several plans identify and recommend roadway counter-measures from FHWA and CMF Clearinghouse. SANDAG monitors and evaluates projects using baseline data collection and 6-month observations. Local jurisdictions could replicate this process for their own projects. Traffic safety dashboards could be utilized for quicker and easier before and after review.	Difficult to tell what is being implemented, what is working, and potential roadblocks. Non-standard designs are difficult to implement, monitor, and evaluate. Local agencies are not sharing successes, unclear if they evaluate their safety projects.	x
Proven education countermeasures are being implemented.		x		Several plans identify and recommend education counter-measures (from NHTSA).	Difficult to tell what is being implemented, what is working, and potential roadblocks.	
Proven enforcement and emergency response countermeasures are being implemented.		x		Several plans identify and recommend enforcement counter-measures (from NHTSA).	Difficult to tell what is being implemented, what is working, and potential roadblocks.	

Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Appropriate and available funding is identified for each program and project.		x		Funding opportunities are identified in several plans. HSIP is an excellent resource that agencies are using for systemic improvements.	Difficult to tell if programmed projects are eventually being implemented.	
Safe System Framework						
Evidence of Safe System Approach.		x		Safe System elements and principles are evident in plans.	A limited number of plans acknowledge the Safe System Approach, but none use it to frame the planning process or results.	x
Safer Vehicles are being addressed in the region.	x			Strategies and solutions like enhanced pavement markings and lighting, which enhance vehicle safety features, are evident in plans.	Limited discussion in any documents about safe vehicles.	
Post-crash care is being addressed in the region.	x			Discussions are underway regarding the use of hospital and emergency medical system (EMS) data and involving emergency responders in stakeholder working groups.	Data is challenging to obtain. Limited discussion in plans about EMS data.	

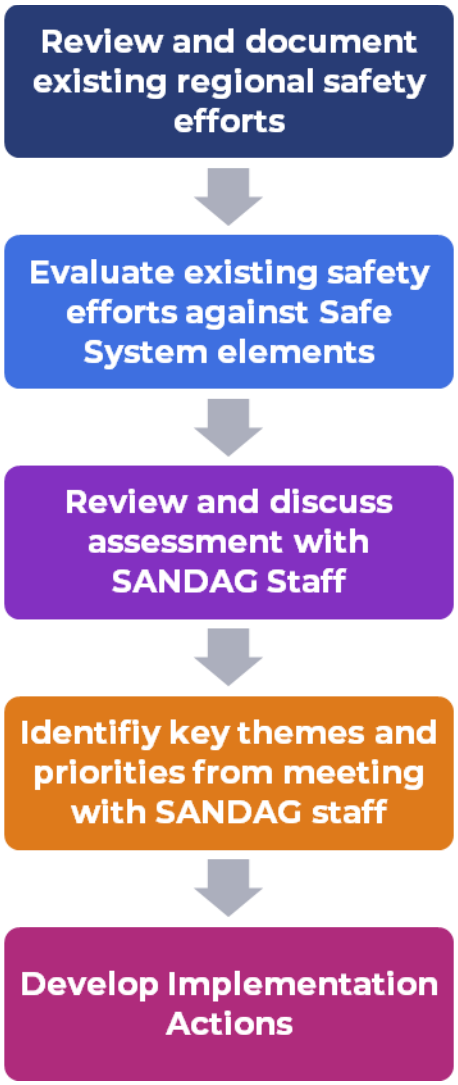
Benchmark	Not a Current Practice	Assessed Level of Commitment/ Implementation Occasional Practice	Institutional Practice	Opportunities	Challenges	Priority
Safe speeds are being addressed in the region.		x		Strategies and countermeasures in plans reflect speed-related priorities.	Evidence of some speed management programs, however, the extent to which solutions are being implemented is unclear.	x
Safe road users are being addressed in the region.			x	Strategies and countermeasures in plans reflect education and enforcement priorities.	Difficult to tell what is being implemented, what is working, and potential roadblocks.	
Safe roads are being addressed in the region.		x		Strategies and countermeasures in plans reflect infrastructure priorities.	Difficult to tell what is being implemented, what is working, and potential roadblocks. The institutional practice level could be achieved with effective implementation which is currently limited. Dated design manuals are still used as opposed to new proven/ experimental methods which could better address safety.	x

Implementation Actions

The following section provides an overview of the initiatives and strategies SANDAG will implement to help the region meet its goal of zero traffic fatalities and serious injuries by 2050. Included below are seven tables of SANDAG Implementation Actions with specific action items, supplemental objectives, responsible parties, and timelines. These tables serve as a roadmap for implementing Vision Zero goals, ensuring accountability, and tracking progress toward safer streets.

The graphic below illustrates the process used to develop the Implementation Actions.

Figure 1: Implementation Actions Development Process



The Implementation Actions are organized into seven categories:

1. **Coordinate:** SANDAG will bring together local governments, agency partners, federally recognized tribal governments, key stakeholders, and the public to align regional efforts and ensure a unified approach to advancing safety goals.
2. **Plan:** SANDAG will integrate Vision Zero principles into all aspects of regional planning by incorporating safety into its planning efforts including the Regional Transportation Plan's goals and project evaluation and development processes. Additionally, SANDAG will provide resources for local governments to implement safer speed limit setting practices, analyze slow streets, and prioritize safety in project planning and implementation.
3. **Fund:** SANDAG will prioritize funding projects that address critical safety needs and ensure resources are directed towards the most effective safety solutions and projects on the Safety Focus Network or Systemic Safety Network. This will be accomplished through updating regional funding scoring criteria, supporting local governments in securing state and federal funds, and preparing competitive grant applications for regionally significant projects.
4. **Educate:** SANDAG will raise safety awareness through targeted educational programs and resources for diverse regional stakeholders. Efforts will include education geared towards drivers and our most vulnerable roadway users, dedicated staff and training for stronger integration of safety principles in all SANDAG-led efforts, and community outreach to build momentum around Vision Zero implementation.
5. **Evaluate:** SANDAG will evaluate the effectiveness of safety strategies by tracking regional progress towards zero fatal and serious injury crashes. This will be provided through regular public updates, presentations to local jurisdictions, and a comprehensive update of the VZAP every 10 years.
6. **Implement:** SANDAG will enhance safety in our capital projects and support local jurisdictions in improving their facilities. This will be done by offering data and tools for prioritizing and implementing improvements, supporting Roadway Safety Audits, analyzing construction projects for safety upgrades, providing technical assistance, and integrating Vision Zero principles into decision-making and project development.
7. **Advocate:** SANDAG will advocate for policies, projects, funding, and legislative actions that prioritize and enhance safety across the region.

These seven categories capture the SANDAG role in advancing transportation safety in the region. Under each category are primary action items, along with supplemental objectives, responsible and supporting departments, and timelines to support implementation of each primary action.

Timelines are defined as near-term, mid-term, long-term, and ongoing. Near-term refers to actions or projects that will be implemented within one to three years, mid-term within three to seven years, and long-term beyond seven years. Ongoing actions refer to tasks, activities, or projects that are continuous and require continued attention over time.

Table 5: Implementation Actions – Coordinate

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
1.1	**Formalize Regional Safety Task Force** Establish a Safety Task Force with local governments, federally recognized tribal governments, and partners to prioritize funding and implementation for key regional safety challenges and locations.	Utilize the SANDAG Mobility Working Group as a platform for sharing successes, addressing challenges, and coordinating efforts on transportation safety.	Regional Planning	Engineering & Construction Public Affairs	Near-term/ Ongoing	Evaluate
		Establish a Regional Safety Task Force, including members from the SANDAG VZAP Technical Advisory Group and Local Agency Project Development Team, to meet quarterly and discussion project implementation, funding opportunities, and other safe system elements.	Regional Planning	Public Affairs Engineering & Construction	Near-term/ Ongoing	

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
1.2	**Engage Policy Leaders on Safety Implementation and Policies** Involve the SANDAG Board of Directors and Committees in discussions on safety.	Provide annual presentations to SANDAG committees on regional safety projects, programs, and policies (and local Regional Transportation Improvement Program (RTIP) projects). Coordinate presentations with the annual Federal Transportation Performance Management safety target setting presentation.	Regional Planning	Data Science Engineering & Construction Public Affairs	Ongoing	Evaluate
		Engage the Board and relevant committees in discussions on safety project implementation and supporting policies.	Regional Planning	Public Affairs	Ongoing	Advocate

Table 6: Implementation Actions - Plan

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
2.1	**Elevate Vision Zero Principles** Incorporate Vision Zero principles into all aspects of the Regional Plan's development and implementation.	Integrate safety into future Regional Plan evaluation process, including proximity to a regional safety priority location and following national best practices.	Regional Planning	Data Science Public Affairs	Mid-term	
2.2	**Prioritize Safe Vehicle Speeds** Support local governments in evaluating posted speed limits and addressing speeding through data-driven assessments, policy recommendations, and targeted interventions that improve roadway safety and crash severity.	Assist local governments in identifying "Safety Corridors," roadways eligible for reduced posted speed under new legislation (AB 1938 & AB43) and included in the California Manual on Uniform Traffic Control Devices (CA MUTCD).	Regional Planning	Engineering & construction	Near-term	
		Analyze and share outcomes of Slow Street programs and street calming measures with local jurisdictions for potential practice recommendations.	Regional Planning	Data Science Engineering & construction	Mid-term	Coordinate
		Provide Safety Corridor Updates to local governments every four to five years (as recommended in the CA MUTCD).	Regional Planning	Data Science	Ongoing	
2.3	**Integrate Vision Zero Principles into Plan Development Processes** Embed safety considerations into the development of all regional plans, ensuring recommendation to advance Vision Zero goals.	Develop standard operating procedures to help SANDAG staff prioritize Vision Zero principles in their daily job responsibilities.	Regional Planning	Engineering & Construction All other sections;	Mid-term	

Table 7: Implementation Actions – Fund

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
3.1	**Update Regional Fund Sources** Align regional funds managed by SANDAG to prioritize safety investments that advance safety goals.	Review reginal funding programs and identify opportunities for scoring criteria to provide additional priority for projects that enhance Safety Focus Network or at Systemic Safety Locations.	Regional Planning	Financial Planning, Budgets, & Grants	Near-term	
3.2	**Advance Coordinated Grant Applications** Develop competitive state and federal grant applications, prioritizing projects that address regional safety priority locations or safety challenges.	Coordinate with local governments to pursue state and federal funding for safety projects and programs addressing regional safety priority locations or challenges.	Financial Planning, Budgets, & Grants	Regional Planning	Near-term/ Ongoing	
		Maintain a tracking document for safety funding that identifies funding focus, agency eligibility, and additional key information for regional partners and local governments.	Regional Planning	Financial Planning, Budgets, & Grants	Near-term/ Ongoing	
		Track regional and local safety grant application status and project development.	Regional Planning	Financial Planning, Budgets, & Grants	Near-term/ Ongoing	
3.3	**Align Multiagency Agreements with Vision Zero** Explore prioritization processes for funding projects that addressed issues identified in the VZAP.	Research and draft an evaluation framework that prioritizes funding projects that address safety challenges raised in the Regional VZAP.	Regional Planning	Engineering & Construction	Mid-term	Plan
		Share and present proposed framework with Ordinance Framework Process for consideration,	Regional Planning	Engineering & Construction	Long-term	Plan

Table 8: Implementation Actions - Educate

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
4.1	**Dedicate Public Affairs Resources** Allocate staff to focus on safety initiatives, education, and partnerships, ensuring responsiveness to opportunities and safety needs across departments.	Provide semi-annual "State of Safety" training for Public Affairs staff to keep them informed about Vision Zero projects, trends, and progress, enhance their ability to develop meaningful and contemporary safety campaigns.	Public Affairs	Regional Planning	Ongoing	
		Allocate annual resources to support safety messaging and related initiatives	Public Affairs	Regional Planning	Ongoing	Coordinate
4.2	**Provide Regular Safety Training** Monitor safety legislation and trends, and share information with staff, partners, and the public.	Monitor legislation and provide regular updates to local governments and the public on relevant changes (e.g. revisions to CA MUTCD and other new CVC Road Rules), then incorporate information into public safety campaigns.	Regional Planning	Public Affairs	Ongoing	Advocate
		Regularly share information on regional safety efforts and progress toward zero fatal and serious injury crashes to Staff, Community-Based Organizations, news outlets, and the public.	Public Affairs	Regional Planning	Ongoing	Coordinate

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
4.3	**Engage in Continuous Community Outreach** Work with the Vision Zero Task Force to develop community-driven educational programs, campaigns, and resources targeting regional safety challenges identified through the Regional VZAP.	Partner with local governments and advocacy organizations to create targeted educational resources for groups disproportionately involved in high severity crashes. Including but not limited to: • Children: Bike Safety worksheets • Teenagers: Share success stories on youth transportation programs and track grant funding opportunities for programs. • Young Adults: Create safety-related resources to help universities and students implement safety policies and programs on campuses through partnerships with schools. • Older Adults: Create safety-related resources and administer to senior centers and partners.	Regional Planning	Public Affairs	Near-term	Coordinate
		Integrate safety messaging into existing and relevant future events, such as Bike Month and Sustainable Transportation Services.	Public Affairs	Regional Planning	Near-term/ Ongoing	

Table 9: Implementation Actions - Evaluate

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
5.1	**Track Regional Progress** Monitor the region's progress toward zero fatal and serious injury crashes by 2050.	Establish an internal Traffic Safety Data subcommittee to lead data evaluation and monitoring efforts, including annual Traffic Safety Dashboard updates.	Data Science	Regional Planning	Near-term	
		Public annual crash data to the Traffic Safety Dashboard.	Regional Planning	Data Science Engineering & Construction	Near-term/ Ongoing	
		Provide annual regional reporting, including publishing crash data and monitoring trends, as well as tracking progress on implementation.	Regional Planning	Data Science	Near-term/ Ongoing	
		Develop a transition plan for acquiring traffic safety data and addressing data gaps identified in the Regional VZAP.	Data Science	Regional Planning	Mid-term	
		Update Safety Focus Network analysis every four to five years.	Data Science	Regional Planning	Mid-term/ Ongoing	
		Provide a comprehensive update of VZAP analyses every eight to ten years.	Regional Planning	Data Science Engineering & Construction	Long-term/ Ongoing	

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
5.2	**Inform Regional Leaders** Provide regular traffic safety updates to SANDAG Board of Directors, Committees, and local governments on priority safety locations and crash trends (e.g. risk factors, crash profiles, vulnerable populations)	Monitor local government VZ commitments and adoption of local safety plans.	Regional Planning	Engineering & Construction	Ongoing	
		Share annual data updates to Transportation Committee.	Data Science	Regional Planning	Near-term/Ongoing	
5.3	**Evaluate Project Effectiveness** Collaborate with local governments and tribal partners to use crash data in evaluating the safety impact of projects at priority locations.	Integrate region-wide equity considerations including performance metrics related to traffic safety planning and implementation in disadvantaged communities, which cover only 19% of land in SANDAG region, but experience 40% of all fatal and serious injury crashes.	Regional Planning	Engineering & Construction All other sections;	Near-term	
		Work to reduce the delay between incident occurrence and data availability, enhancing regional response efforts.	Data Science	Regional Planning	Mid-term/Ongoing	Advocate
		Conduct before-and-after assessments of regionally relevant projects, sharing results with elected officials, local government, and the public annually.	Engineering & Construction	Regional Planning	Long-term	

Table 10: Implementation Actions - Implement

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
6.1	**Provide Technical Assistance for Member Agencies** Develop resources to facilitate informed decision-making and provide services to support regional safety needs.	Create an online platform to support implementation and prioritization of regional safety projects.	Regional Planning	Data Science	Near-term	
		Provide local governments with technical assistance in developing and implementing proven safety solutions to advance safety projects, especially along the Safety Focus Network and Systemic Safety Network.	Engineering & Construction	Regional Planning	Near-term/ Ongoing	
		Develop tools to streamline the integration of Vision Zero principles in traffic safety projects, including flow charts and checklists.	Data Science	Engineering & Construction Regional Planning	Mid-term/ Ongoing	

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
6.2	**Conduct Roadway Safety Audits** Establish an interdisciplinary team to evaluate safety opportunities as part of project scoping and development.	Establish an interdisciplinary team to perform regular Roadway Safety Audits (RSAs) on SANDAG-led projects, including project scoping and design reviews.	Engineering & Construction	Regional Planning	Mid-term/ Ongoing	Plan
		Establish metrics to assess effectiveness of implemented safety improvements and follow-up audits to measure progress and adjust strategies as needed.	Engineering & Construction	Regional Planning	Mid-term to Long-term	Evaluate
		Share findings and best practices from RSAs with local governments and stakeholders to foster a culture of safety and continuous improvement in roadway design.	Engineering & Construction	Regional Planning	Long-term	Convene

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
6.3	**Address Known Issues** Focus on addressing key issues and findings from the VZAP to ensure identified issues are integrated into new construction projects.	Promote quick-build and low-cost countermeasures before higher cost countermeasures to demonstrate safety project efficacy.	Engineering & Construction	Regional Planning	Near-term/ Ongoing	
		Prioritize funding for projects based on opportunities to reduce fatal and serious injury crashes, with additional points for projects on Safety Focus Network and Systemic Safety Network.	Regional Planning	Financial Planning, Budgets, & Grants	Near-term/Ongoing	Fund
		Coordinate with local jurisdictions to evaluate streetlighting effectiveness for all modes of transportation, addressing poor or insufficient lighting that contributes to high-severity crashes.	Engineering & Construction	Regional Planning	Mid-term/ Ongoing	Coordinate
		Document how projects address road safety needs (lighting, protected bike lanes, speed reduction)	Engineering & Construction	Regional Planning	Long-term	

Table 11: Implementation Actions - Advocate

No.	Implementation Actions	Supplemental Objectives	Responsible SANDAG Department	Supporting Departments	Timeline	Related Category
7.1	**Advance Policy Efforts** Advocate at the federal, state, and local levels for all elements of the Safe System Approach, with a focus on addressing speed as a critical safety challenge.	Provide regional perspective through comment processes for proposed rule makings. Focus policy efforts across each element in the Safe System Approach.	Regional Planning	Public Affairs	Near-term/ Ongoing	Coordinate
7.2	**Develop Guidance Materials** Develop resources to help local elected officials and local government staff prioritize safety through design, grant applications, policy changes, and enforcement.	Provide guidance on and encourage local governments to assess how their current policies align with the Safe System Approach and integrate safety into early phases of project development.	Regional Planning	Engineering & Construction	Mid-term	
		Develop best practice guidance to help local governments perform crash analyses and collaborate with local governments to prioritize safety project implementation.	Regional Planning	Data Science Engineering & Construction	Mid-term	
		Develop best practice design guidance specifically focused on addressing the critical crash profiles and risk factors in the region.	Regional Planning	Engineering & Construction	Long-term	
		Create and share research, project evaluations, and other resources to support safety equity and systemic safety in local planning processes.	Public Affairs	Data Science Regional Planning	Long-term	

Conclusion

The technical appendix detailed above was designed to help SANDAG satisfy two of the USDOT's CSAP requirements. The Benchmark Assessment is a comprehensive assessment of 38 current policies, plans, guidelines, and/or standards. As part of the assessment, SANDAG identified opportunities to improve on these processes and detailed new opportunities for policies, guidelines, and/or standards. The findings from the Benchmark Assessment process directly led to the development of the implementation actions. These implementation actions identify a comprehensive set of strategies to address documented safety challenges and opportunities, with information on the SANDAG department responsible for implementation and the proposed implementation timeline.

Appendix D: Evaluation and Monitoring

Introduction

This appendix outlines the SANDAG strategies for monitoring and reporting progress towards the regional goal of reducing fatalities and serious injuries to zero by 2050 and expands on the information outlined in the Regional Vision Zero Action Plan (VZAP) by detailing the data collection, performance measures, frequency of performance evaluation, methods for reporting progress to the public, and update cycles for key analysis and the VZAP itself.

The two primary functions of an evaluation and monitoring effort are to:

1. Track regional safety performance and actions completed by SANDAG and its partners.
2. Analyze outcome data to assess the effectiveness of implementation efforts.

The development of these performance measures was guided by a peer agency review, as well as federal guidance and other best practice documentation. Additionally, establishing a process for safety evaluation and monitoring is a Comprehensive Safety Action Plan requirement as specified by US Department of Transportation (USDOT).

Evaluation and Monitoring Methods

SANDAG has identified three methods for sharing performance measures collected as part of its evaluation and monitoring approach. These methods and associated performance measures were identified based on review of peer agencies, federal guidance, and best practice documentation.

These methods include:

1. Annual Regional Safety Reporting: Includes publishing crash data and statistics, and progress tracking on implementation.
2. Safety Analysis Update: Includes updates to the Safety Focus Network (SFN) and Safety Corridors Analysis every four to five years.
3. Comprehensive Safety Update: Includes a full update to the Regional VZAP every eight to ten years.

Annual Regional Safety Reporting

Each year SANDAG will publish crash data and key statistics, as well as progress tracking on implementation.

Traffic Safety Dashboard

In November 2023, SANDAG launched the Traffic Safety Dashboard with the intention of providing transportation safety data to help local and regional decision-makers improve road safety in their communities. The Traffic Safety Dashboard is a public interactive online tool that displays the locations and details of traffic crashes across the San Diego region.

The Traffic Safety Dashboard includes the most recent final data provided by the California Highway Patrol's (CHP) Statewide Integrated Traffic Records System (SWITRS). Data are considered final once CHP publishes their annual crash report. SANDAG then downloads, reviews, and geoprocesses (or "cleans") the data to enhance the data's spatial accuracy before uploading the data to the Traffic Safety Dashboard.

The Traffic Safety Dashboard displays spatial data and charts on traffic crashes by mode, crash locations, primary crash factors, and more. As part of the VZAP evaluation and monitoring efforts, SANDAG will provide annual updates to the Traffic Safety Dashboard to feature the most recent final data from SWITRS. An internal Traffic Safety Data subcommittee, comprised of data scientists, planners, and SANDAG leadership, will be tasked with developing and executing a process for ongoing Traffic Safety Dashboard updates.

The Traffic Safety Dashboard will be updated annually with the following performance measures outlined in Table 1.

Table 1: Traffic Safety Dashboard Annually Reported Performance Measures

Performance Measure	Data Source
• Number of serious injuries • Fatality rate by vehicle miles traveled (VMT) • Serious injury rate by VMT • Number of non-motorized fatalities and serious injuries	SWITRS, SANDAG VMT
• Transit safety events • Transit fatalities • Transit injuries	National Transit Database
• Number of fatal and serious injury crashes in VZAP Social Equity Priority Areas	US DOT Equitable Transportation Community and Census
• Amount of funding for projects on SFN • Number of SFN projects underway • Number of SFN projects completed	Regional Transportation Improvement Program Safety and Active Transportation project funds, ProjectTrak

Implementation Progress Reports

In addition to annual reporting on key safety performance measures to the Traffic Safety Dashboard, SANDAG will prepare an annual implementation progress report to share efforts made to advance Vision Zero goals. The Implementation Progress Report will include the data collected and shared on the Traffic Safety Dashboard and a status update on the Implementation Actions outlined in Table 5 of Technical Appendix C. Each Implementation Action will be marked as:

- Complete
- In Progress
- Not Initiated

Items marked not initiated will include a brief description of why progress is stalled and an indication of the next steps for action. SANDAG will share this report annually with the Transportation Committee and Board of Directors and provide links to the documents on the Vision Zero webpage.

Safety Analysis Update

Every four to five years, SANDAG will update the Safety Focus Network and Safety Corridors Analysis. This will allow SANDAG and its partners to understand the effectiveness of safety interventions and evolving crash trends. At minimum, SANDAG should wait four to five years to reanalyze the data to allow for shifts in traffic patterns, implementation of safety projects, population growth and development, and behavioral changes. The California Manual on Uniform Traffic Control Devices allows agencies to establish a frequency of review and re-evaluation, but recommends the frequency not exceed seven years.

Comprehensive Safety Update

A Comprehensive Safety Update will be produced every eight to ten years providing SANDAG and the region an opportunity to reflect on both the successes and challenges of the existing VZAP. Additionally, it provides an opportunity to identify new options for implementing the regional safety goals. SANDAG, to the extent possible, will align the Comprehensive Safety Update with scheduled notice of funding opportunities to support identification and implementation of safety improvements.

SANDAG aims to complete the first Comprehensive Safety update by 2034. An eight to ten year update schedule was determined based on national best practices, crash data availability, infrastructure project timelines, and alignment with SANDAG's four-year regional plan cycle. This report will help inform the safety component of future regional plans.

Table 2 includes the elements that will be featured in the Comprehensive Safety update, along with the intent, specific actions, and lead departments responsible for execution of each element.

Table 2: Comprehensive Safety Update Elements

Comprehensive Safety Update Element	Objective/ Goal	Proposed Action	Lead Department
Data	Provide a summary of the annual Traffic Safety Dashboard updates to track progress.	Summarize the key takeaways of the most recent five years of the Traffic Safety Dashboard. Create a standardized methodology or script to analyze and visualize the data.	Traffic Safety Data Subcommittee (likely to include Staff from Regional Planning and Data Science)
Safety Focus Network	Update the SFN to account for changes in the locations of crash concentrations.	Develop a process (e.g. analysis script) to streamline SFN updates. Create a central database to store all future updates in one location.	Regional Planning, Data Science
Systemic Safety Analysis	Update the regional Systemic Safety Analysis to account for roadway design, land use, and other changes that may affect where the highest concentration of crashes occur.	Develop a process (e.g. analysis script) to streamline Systemic Safety updates. Create central database to store all future updates in one location.	Regional Planning, Data Science
Benchmark Assessment	Reassess the progress of SANDAG, and its regional partners, in institutionalizing the safe system approach.	Create a standardized methodology to streamline VZAP benchmark assessment revisions and updates.	Regional Planning, Data Science, and Engineering & Construction
Implementation Maps	Provide maps illustrating where regional safety countermeasures are planned or completed.	Create a database that tracks the stages of implementation for TransNet, California Active Transportation Program, and Local Highway Safety Improvement Program funded projects proposed in the VZAP.	Regional Planning, Data Science
Community Outreach & Education	Track progress on regionwide engagement and engage partners and the public to inform safety plan update.	Create a database of ongoing SANDAG safety outreach. Develop engagement plan for safety plan update.	Regional Planning, Public Affairs

Comprehensive Safety Update Element	Objective/ Goal	Proposed Action	Lead Department
Community Outreach & Education	Track progress on regionwide engagement and engage partners and the public to inform safety plan update.	Create a database of ongoing SANDAG safety outreach. Develop engagement plan for safety plan update.	Regional Planning; Public Affairs
Social Equity Analysis	Analyze safety trends and funding investments in disadvantaged communities.	Track safety outcomes in disadvantaged communities and refresh analysis of crash data within these communities Track funding allocated and grant dollars awarded to disadvantaged communities.	Regional Planning, Data Science, Public Affairs, and Financial Planning, Budgets, & Grants
Comparison to Peer Regions	Compare safety data of peer regions to illustrate how San Diego trends compare to peers in terms of safety over time.	Follow the workflow developed by the VZAP Project Development Team to collect and organize peer region crash data (see Attachment 1). Assess applicability of peer region each comprehensive safety update.	Regional Planning, Data Science
Action Plan	Reassess progress made on existing Implementation Actions, as compared to the number of fatal and serious injury crashes and develop new implementation actions for next eight to ten years.	Provide status updates on all Action Plan initiatives. Develop new Action Plan outlining initiatives SANDAG Staff will take to help reach of the Vision Zero goal.	Regional Planning Public Affairs, and Engineering & Construction
Project Tracking	Track and provide summary of all regional safety projects seeking funding, funded, and completed.	Create a database to track regional safety projects funded.	Regional Planning and Engineering & Construction
Before and After Analyses	Collect and analyze roadway user volumes and crash data of select safety projects before and after safety countermeasure implementation.	Establish funding source to incorporate new projects into SANDAG's existing Data Collection and Monitoring Program.	Regional Planning and Engineering & Construction

Comprehensive Safety Update Element	Objective/ Goal	Proposed Action	Lead Department
Regional Partner Commitment to Vision Zero	Track commitments and plans developed by local governments, federally recognized tribal governments and partners.	Create a database to track the status of new and existing safety plans and resolutions in the region.	Regional Planning; Public Affairs
Integrate Safety into SANDAG Grant Programs	Integrate safety countermeasures with existing grant projects (e.g., Smart Growth Incentive Program, Active Transportation Grant Program).	Create a database that lists existing grant projects and opportunities to integrate safety countermeasures	SANDAG Traffic Safety Data subcommittee; SANDAG Regional Planning, Grants

Conclusion

This technical appendix details the evaluation and monitoring process SANDAG has established to track progress towards the regional goal of reducing fatalities and serious injuries to zero by 2050. The evaluation and monitoring approach was designed to satisfy progress and transparency requirements outlined by the USDOT for a Comprehensive Safety Action Plan. This requirement includes, "A description of how progress will be measured over time that includes, at a minimum, outcome data."[1] SANDAG has committed to three evaluation and monitoring methods:

- Annual Regional Safety Reporting
- Safety Analysis Update
- Comprehensive Safety Update

The appendix outlines the outcome data to be reported on, the party responsible for collecting, reporting, or updating it, and how the information will be shared with the public.

[1] USDOT Self-Certification Eligibility Worksheet, FY 2024
https://www.transportation.gov/grants/ss4a/self-certification-worksheet

Attachment 1

Peer Region Safety Comparison

To evaluate the San Diego region's safety progress, SANDAG selected seven regions (including the San Diego-Chula Vista-Carlsbad region) to compare fatalities over time. Regions were defined using metropolitan statistical areas, which consists of one or more counties or equivalent entities. By benchmarking safety outcomes against other regions, SANDAG can identify best practices, understand emerging trends, and recognize areas needing improvement. This comparative analysis helps set realistic and informed safety targets, drive policy development, and justify investments in infrastructure and safety programs. Additionally, understanding how safety outcomes in the San Diego region compare to other similarly sized regions can illuminate gaps, address disparities, and foster a culture of continuous improvement. SANDAG will publish the peer region comparison as part of the Comprehensive Safety Update every eight to ten years. This attachment details the process for completing the peer region comparison in 2023 and its results.

The data used for this analysis are sourced from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS). FARS is a nationwide census providing annual data regarding fatal injuries suffered in motor vehicle traffic crashes. The latest five years of crash data are used. Population data are sourced from the most recent year available of the US Census' Metropolitan and Micropolitan Statistical Area Tables.

SANDAG compared total annual fatalities and fatalities per 100,000 people for the seven selected regions. Evaluating fatalities per 100,000 people standardizes the regional comparison for differences in population sizes and develops a more meaningful and accurate picture of the safety challenges. Since the Comprehensive Safety Update will be published every eight to ten years, the Peer Region Comparison uses the latest five years of crash data to track progress over time.

Table 3 provides a comparison of the 2023 selected peer regions using data from 2018-2022.

The initial comparison shows most regions are seeing an increase in fatalities per 100,000 residents from 2018 to 2022, except San Jose-Sunnyvale-Santa Clara who saw a decrease by 2022, and Baltimore-Columbia-Towson's rate remained steady over the past two years analyzed. Future updates should expand on county-level data to understand if the county or its local jurisdictions have committed to Vision Zero. This will help inform best practices and understanding of emerging trends.

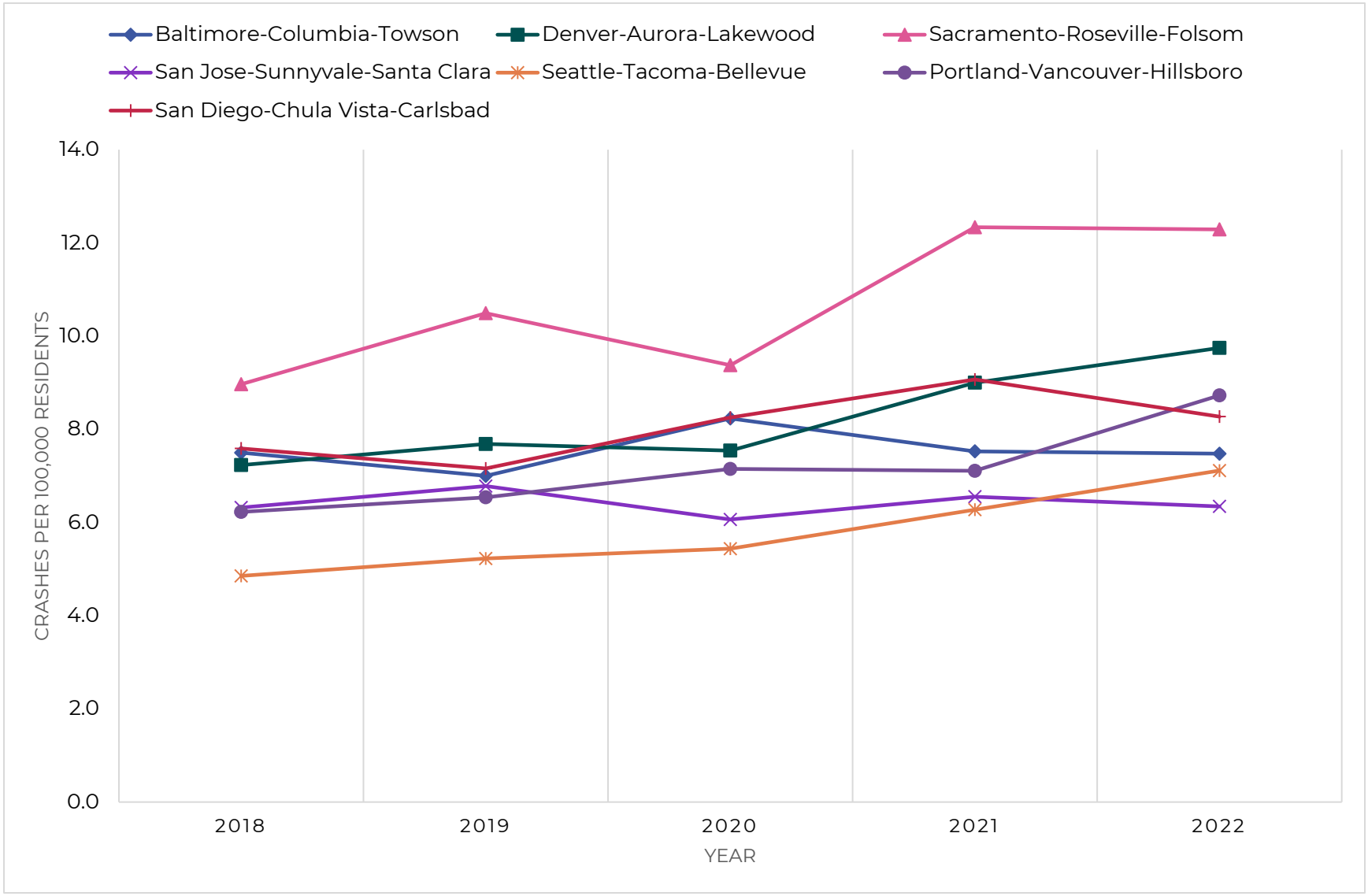
Table 3: 2023 Peer Region Safety Comparison (Fatal Crashes, 2018-2022)

Region	Data Source	County	2018	2019	2020	2021	2022
Baltimore-Colombia-Towson	Crashes and Fatalities by Jurisdiction https://zerodeathsmd.gov/resources/crashdata/						
		Baltimore (City)	33	45	63	47	45
		Baltimore (County)	78	57	60	75	63
		Anne Arundel	52	41	49	34	46
		Carroll	11	14	15	5	7
		Howard	19	21	26	31	29
		Harford	12	15	16	18	18
		Queen Anne's	5	3	5	4	4
		Total Fatalities	**210**	**196**	**234**	**214**	**212**
		Census Population Est.	2,800,743	2,800,053	2,842,463	2,843,354	2,853,672
		Per 100,000	**7.5**	**7.0**	**8.2**	**7.5**	**7.5**
Denver-Aurora-Lakewood	Fatal Crash Data Colorado Department of Transportation (codot.gov)						
		Denver	58	57	50	65	72
		Adams	49	64	48	59	75
		Arapahoe	45	31	49	47	57
		Broomfield	1	5	4	6	2
		Clear Creek	2	2	1	3	5
		Douglas	15	13	20	27	24
		Elbert	4	4	5	4	2
		Gilpin			1		1
		Jefferson	36	45	41	50	47
		Park	2	7	5	7	6
		Total Fatalities	**212**	**228**	**224**	**268**	**291**
		Census Population Est.	2,931,665	2,967,239	2,969,922	2,977,833	2,985,871
		Per 100,000	**7.2**	**7.7**	**7.5**	**9.0**	**9.7**

Region	Data Source	County	2018	2019	2020	2021	2022
Sacramento-Roseville-Folsom	TIMS - Transportation Injury Mapping System (berkeley.edu)						
		Sacramento	134	164	145	209	205
		El Dorado	29	27	18	24	27
		Placer	27	24	33	32	33
		Yolo	25	24	23	31	29
		Total Fatalities	**215**	**239**	**219**	**296**	**294**
		Census Population Est.	2,341,940	2,363,730	2,399,865	2,407,524.00	2,416,702.00
		Per 100,000	**9.2**	**10.1**	**9.1**	**12.3**	**12.2**
San Jose-Sunnyvale-Santa Clara	TIMS - Transportation Injury Mapping System (berkeley.edu)						
		Santa Clara	116	124	109	118	106
		San Benito	12	10	12	10	18
		Total Fatalities	**128**	**134**	**121**	**128**	**124**
		Census Population Est.	1,993,804	1,990,660	1,995,547	1,953,270	1,938,524
		Per 100,000	**6.4**	**6.7**	**6.1**	**6.6**	**6.4**
Seattle-Tacoma-Bellevue	Fatalities Dashboard - Washington Traffic Safety Commission https://zerodeathsmd.gov/resources/crashdata/						
		King	101	105	107	126	146
		Pierce	51	64	67	92	86
		Snohomish	39	39	45	34	57
		Total Fatalities	**191**	**208**	**219**	**252**	**289**
		Census Pop. Est.	3,935,179	3,979,845	4,027,487	4,016,274	4,034,248
		Per 100,000	**4.9**	**5.2**	**5.4**	**6.3**	**7.2**

Region	Data Source	County	2018	2019	2020	2021	2022
Portland-Vancouver-Hillsboro	TDS - Crash Reports (state.or.us)						
		Clackamas	34	29	34	33	43
		Columbia	6	8	3	5	3
		Multnomah	49	63	71	75	87
		Washington	25	30	23	21	26
		Yamhill	8	9	8	11	16
		Clark (WA)	28	23	35	31	38
		Skamania (WA)	4	1	6	3	6
		Total Fatalities	**154**	**163**	**180**	**179**	**219**
		Census Population Est.	2,473,350	2,492,412	2,518,007	2,518,310	2,509,489
		Per 100,000	**6.2**	**6.5**	**7.1**	**7.1**	**8.7**
San Diego-Chula Vista-Carlsbad	TIMS - Transportation Injury Mapping System (berkeley.edu)						
		San Diego	253	239	272	297	271
		Total Fatalities	**253**	**239**	**272**	**297**	**271**
		Census Population Est.	3,333,861	3,338,330	3,296,045	3,274,954	3,276,208
		Per 100,000	**7.6**	**7.2**	**8.3**	**9.1**	**8.3**

Figure 1: Comparison of Fatalities by MSA Population (Per 100,000 Residents)



Appendix E: Public Outreach

Introduction

Appendix E documents the community engagement conducted throughout the development of the Regional Vision Zero Action Plan (VZAP). The community engagement strategies used were informed by the VZAP's Public Engagement Plan (PEP) adopted by the SANDAG Board of Directors (Board) in fall 2023. The PEP reflects input from the Board, Policy Advisory Committees (PACs), working groups (WGs), tribal governments, a wide variety of communications experts, and regional stakeholders and partners, including a network of community-based organizations (CBOs). PEPs for individual projects draw upon the SANDAG Public Participation Plan (PPP), which serves as a guiding framework for all PEPs. The SANDAG PPP was adopted by the Board on December 21, 2012, and became SANDAG **Board Policy No. 025**, which was updated in February 2018.

The Public Engagement Plan

The VZAP's PEP detailed the responsibilities of SANDAG and consultant teams, identified critical community partners and their roles, and proposed activities to help facilitate engagement. Additionally, the PEP outlined a community outreach and public participation process aligned with the Safe Streets and Roads for All (SS4A) Comprehensive Safety Action Plan (CSAP) requirements set forth by the US Department of Transportation (USDOT),[1] the grant provider for this plan.

The requirements are as follows:

- Engage with the public and relevant stakeholders, including the private sector and community groups.
- Incorporate information received from the engagement and collaboration into the plan.
- Coordinate inter- and intra-governmental cooperation and collaboration.

Goals and Objectives

The PEP identifies various engagement options for SANDAG to involve the public and gather meaningful input on the various components of the VZAP. The primary goal of the PEP was to engage a broad and diverse cross-section of the San Diego region in the development of the plan. Community input is critical for creating a plan that represents the varied values, needs, and interests of the San Diego region's residents and businesses.

The objectives outlined in the PEP were to:

- **Create a comprehensive and transparent approach** to inform and engage community partners and the public in the plan development process.
- **Ensure engagement is equitable** and the perspectives of communities historically underserved by the current transportation system are included.
- **Garner visibility and access to information** to allow community partners the opportunity to understand the plan development approach, including its timing, benefits, and impacts.

[1] The SS4A CSAP Self-Certification Eligibility Public Engagement Requirements can be found at **https://www.transportation.gov/sites/dot.gov/files/2024-02/SS4A-FY24-Self-Certification-Worksheet.pdf**.

- **Interact with leadership groups, key stakeholders, community ambassadors, and the public** to understand transportation and safety needs from the community's perspective, capture impactful stories or testimonials, share concepts, and address challenges and expectations.
- **Assess the effectiveness of public engagement activities** by tracking each engagement activity and technique and documenting attendance and how the effort can be improved in the future.

Implementing the PEP

The PEP established a framework for a dynamic and interactive process to seek public input for the VZAP. Recognizing the importance of providing numerous opportunities for engagement through a variety of mediums, outreach for the VZAP was broken up into the following categories:

- Digital Outreach
- Governmental Stakeholder Coordination
- In-Person Engagement

Table 1 outlines the outreach strategies utilized and details the engagement category, technique or activity type, purpose, quantity, and the project phase engagement was completed.

Table 1: PEP Engagement Approaches

Engagement Category	Technique or Activity	Purpose	Project Phase/ Quantity
Digital Outreach	Interactive Online Feedback Map	Provide an interactive way for the public to share opinions and give SANDAG a "snapshot" of what participants are interested in.	First Mid-Plan Update
Digital Outreach	Project Webpage	Develop and maintain one project webpage for the VZAP on the SANDAG website throughout the life of the project. The webpage will host project information and updates, project documents, community surveys, and a sign up for email updates.	All Project Phases / One project webpage for the VZAP
Digital Outreach	Email Updates	Send regular email updates to community partners, who opt into the VZAP interest list, describing project updates and milestones, promoting opportunities for public involvement, providing a calendar of upcoming events, and featuring links to online surveys and social media.	All Project Phases
Digital Outreach	Social Media	Publish social media posts on all four SANDAG social media platforms (i.e., X, Instagram, Facebook, and LinkedIn) describing project milestones, community testimonials, share success stories from other cities, promoting opportunities for public involvement and upcoming events, and featuring links to the online interactive feedback map.	All Project Phases
Digital Outreach/In-person Engagement	SANDAG Language Assistance Program Support	Provide translation and interpretation services for outreach materials, meetings, workshops, and events.	All Project Phases
Governmental Stakeholder Coordination	SANDAG PAC Meetings	Provide updates on the development of the VZAP to these groups and the public and receive member and public feedback and direction. Respond to and document comments/ questions received.	Project Kick Off, Mid-Plan Update, Final Plan / Up to three PAC meetings
Governmental Stakeholder Coordination	SANDAG WG Meetings	Provide updates on the development of the VZAP to these groups and the public and receive member and public feedback and direction. Incorporate feedback received into plan development.	Project Kick Off, Mid-Plan Update, Final Plan / Up to three WG Meetings

Engagement Category	Technique or Activity	Purpose	Project Phase/ Quantity
Governmental Stakeholder Coordination	TAG Establishment and Workshops	Establish a TAG of multidisciplinary members and perspectives and have them participate in quarterly workshops that will support the development of the VZAP.	Project Kick Off, 1st Mid-Plan Update, 2nd Mid-Plan Update, Final Plan / Up to four 2-hour TAG workshops
Governmental Stakeholder Coordination	Community Ambassador Group	Identify a list of engaged community ambassadors with interests in VZAP to lead and support in outreach and engagement.	All Project Phases
In-person Engagement	Community Outreach and Engagement Events	Facilitate community outreach and engagement events (e.g., family friendly pop-up events and activities, traditional community meeting [in person or digital], other creative types of engagement) in various locations with diverse community partners to share project information and gather public input.	All Project Phases / Up to 20 in-person and digital events
In-person Engagement	CBO Coordination and Support	Coordinate with and support CBOs so people who are well connected in local communities can gather input, educate community members, and provide feedback about the desires of traditionally underserved and underrepresented communities. Document and incorporate feedback received from CBOs into plan development.	All Project Phases / Up to 22 CBO Public Events (up to 2 events facilitated by each of the 11 CBOs)

Digital Outreach Strategy

Given the growing role of the Internet in people's everyday lives, the PEP identified innovative opportunities for web-based communications to convey information and solicit public involvement in the plan development process. Digital outreach for the VZAP consisted of developing an interactive feedback map, an e-toolkit for CBOs and other partners, and a dedicated project webpage.

Interactive Feedback Map

To ensure that community members unable to attend in-person events could still share their input and experiences, SANDAG hosted an interactive feedback map on its engagement website - **https://engage.SANDAG.org/saferstreets**. The interactive feedback map allowed community members to provide location-specific feedback regarding safety concerns, potential safety improvements, bikeways, and walkways in the San Diego region. Community members could also leave general comments, upload supplementary pictures, and view other community members' comments. The interactive feedback map was open from November 15, 2023, to January 10, 2024, and received 2,970 contributions.

E-Toolkit

An important tactic for fostering region-wide collaboration is the creation and distribution of clear, concise, and engaging media content. Consistent with the PEP, SANDAG created an e-toolkit with sample e-blast and social media language, news articles regarding the SANDAG Vision Zero efforts, and Spanish translations for CBOs and other regional partners to share with their respective networks.

Social Media and Project Webpage

The PEP identified opportunities for SANDAG to use social media and a dedicated project webpage to communicate information to a broad audience and solicit public involvement. Over the course of plan development, SANDAG published social media posts on all four of its social media platforms (i.e., X, Instagram, Facebook, and LinkedIn) educating and soliciting feedback from the public on its Safer Streets efforts. SANDAG also created a dedicated VZAP webpage, **SANDAG.org/visionzero**, which included background information on Vision Zero efforts, resources and resolutions, and a dedicated email address for engaging with the public.

Governmental Stakeholder Coordination

In addition to the digital strategies outlined above, the PEP included specific actions to facilitate coordination among a variety of governmental stakeholders. The techniques and strategies used to engage these groups are described in this section.

Local Agency Project Development Team

The Local Agency Project Development Team (PDT) was comprised of representatives from all 18 local city governments, the County of San Diego, and partners-such as Caltrans District 11, and the Port of San Diego. The goal of the PDT was to provide a forum for information exchange, help inform data collection and analysis, and ensure regional alignment to support implementation.

The PDT was divided into four subregions – North, Central, East, and South – to foster more localized discussions. Each subregion held four meetings throughout the course of the plan's development, members and attendance are provided in Attachment 1. A summary of topics discussed at each of the four meetings and an overall summary of key input received is provided in this section.

PDT Meeting No. 1 – November 2023

SANDAG introduced the role of the PDT and provided project context surrounding the goals, timeline, and expected outcomes of the VZAP. PDT members were asked a series of questions regarding their respective safety programs, top safety priorities and challenges, best practices, and any opportunities for regional and local safety implementation and program expansion. Additionally, SANDAG highlighted some of the public engagement strategies that would be employed as part of the VZAP development process, and PDT members were asked to identify opportunities for public outreach to occur in their local communities.

PDT Meeting No. 2 – January/February 2024

SANDAG presented the process and criteria for developing the 2025 Regional Plan Regional Bikeway Network. An update on the Regional Safety Focus Network (SFN), including details on the analysis approach, process, and results, was presented. Draft systemic risk factors were also presented. SANDAG provided an overview of the prioritization process for both the Regional SFN and systemic risk factors. The Safety Solutions (Countermeasures) Toolbox was introduced and SANDAG presented an update on in-person engagement activities.

PDT Meeting No. 3 – March 2024

SANDAG presented an update on in-person engagement events, including preliminary results from the Safety Pillars pop-up activity. An update on the State of Safety in the region, which included regional crash statistics/trends, crash profiles, and a draft Systemic Safety Network, was also presented. This was followed by a recap of the prioritization process, a snapshot of draft prioritization scoring, and a group activity focused on soliciting feedback from PDT members on the priority locations identified in the prioritization process. PDT members provide insights on their internal safety solutions and countermeasure selection process. The goal of this exercise was to learn how agencies currently link safety data to project design and implementation, and identify opportunities for regional tools and solutions to support this decision-making.

PDT Meeting No. 4 – September 2024

SANDAG presented an update on development of final plan, near term implementation actions SANDAG has started progressing on, and discussed the future of local government staff involvement in regional safety planning. The meeting covered two key implementation actions: Assembly Bill 43 implementation support and an online data portal for sharing analysis results and other resources from the VZAP.

Technical Advisory Group

The Technical Advisory Group (TAG) functioned as a non-Brown Act task force consisting of multidisciplinary members and perspectives including representatives from local governments, federally recognized tribal governments, Caltrans, transit agencies, advocacy groups, first responders, health professionals, academic researchers, and others (TAG membership and meeting attendance is provided in Attachment 2). The role of the TAG was to provide expertise to inform the planning process, interdisciplinary collaboration, help inform data collection and analysis, provide evidence-based recommendations, introduce new ideas or technology, assist in identifying technical problems or challenges, and to help identify solutions. Each TAG member was expected to participate in four meetings, foster collaboration and knowledge sharing among members of the TAG, actively engage in discussions, contribute expertise, and provide input, feedback and suggestions on key project deliverables.

TAG Meeting No. 1 – September 2023

SANDAG introduced the roles and expectations of the TAG and introduced the VZAP. TAG members were asked a series of questions to help identify opportunities and challenges for traffic safety. Questions included: what their top traffic safety concerns were, what ideas they had for possible solutions or strategies to improve safety and who should be involved in implementing those solutions, and goals and desired outcomes that could be included in those plans. Additionally, SANDAG provided an overview of engagement opportunities and timelines, introduced the safety data dashboard, reviewed proposed data for analysis, and facilitated a discussion of potential interactive digital engagement opportunities.

TAG Meeting No. 2 – December 2023

SANDAG introduced the proposed methodology for the following data analyses: SFN, level of traffic stress, and health analysis. TAG members participated in a discussion on methods for in-person engagement and provided feedback on the pop-up engagement concept and key terminology. TAG members were updated on the launch of the online interactive feedback map and the Traffic Safety Dashboard.

TAG Meeting No. 3 – February 2024

SANDAG provided an overview on the State of Safety for the region, which included summary statistics and crash trends across the region. The team shared the draft SFN, and an early draft list of Systemic Risk Factors. Additionally, the TAG was introduced to the proposed prioritization approach and the Safety Solutions (Countermeasures) Toolbox.

TAG Meeting No. 4 – April 2024

SANDAG presented an update on outreach events completed to date. The State of Safety was revisited and included sharing draft Crash Profiles, draft Equity Analysis, draft Safety Focus Network, and draft Systemic Safety Network. A discussion on the results of the Prioritization process was held. SANDAG also introduced how the VZAP will be implemented through supporting safety solutions and the draft regional action plan. TAG members participated in a group discussion regarding managing expectations, opportunities for mutual support, and involving local governments and other agency partners.

TAG Meeting No. 5 – September 2024

SANDAG presented an update on development of the final plan, near term implementation actions it has started progressing on, and the group's interest in continuing to serve on a task force for regional safety planning.

SANDAG Board of Directors, Policy Advisory Committees, and Working Groups

Board of Directors

The Board serves as the governing body of SANDAG and is made up of elected mayors, councilmembers, and county supervisors that are appointed from each of the region's 19 local governments. The Board serves as the forum for bringing together local governments and public agencies to plan, program, and implement cooperative, comprehensive planning across the San Diego region. VZAP updates were presented to the Board in 2022 for the project kick-off, and 2024 for project completion and resource availability announcements.

SANDAG Policy Advisory Committees and TransNet Independent Taxpayers Oversight Committee

The PACs and TransNet Independent Taxpayers Oversight Committee (ITOC)[2] support SANDAG by addressing key public policy and funding responsibilities. The Board has delegated certain responsibilities to six PACs that are focused on distinct issue areas and the TransNet Ordinance established ITOC's oversight role. The PACs are made up of elected officials, residents, partner agencies, and representatives of civic and community groups. The ITOC is made up of community members with professional experience. Each committee has a focused responsibility and advises the Board on major policy-level matters related to regional programs.

The following PACs were updated on the development of the VZAP include:

- Public Safety Committee
- Regional Planning Committee
- TransNet ITOC
- Transportation Committee

SANDAG Working Groups

Working groups in SANDAG's public meeting structure are advisory bodies that report to a PAC on a specialized area of responsibility. The working groups provide opportunities for residents, elected officials, agency staff, and representatives of civic and community groups to come together to discuss or act on specific subject areas that support policies created by the Board. Based on input from the working groups, PACs make recommendations to the Board. Working group membership is determined by SANDAG needs and current projects. The following working groups were dated on the development of the VZAP:

- Mobility Working Group
- Regional Plan Social Equity Working Group
- Social Services Transportation Advisory Council
- San Diego Regional Military Working Group
- Sustainable Communities Working Group

SANDAG Task Forces

SANDAG task forces are non-Brown Act, topic specific bodies. The VZAP Technical Advisory Group is an example of a task force. The VZAP also provided updates and solicited feedback from the Tribal Technical Working Group which operates as a task force.

[2] ITOC is not formally a PAC due to its independent oversight mandate. ITOC's recommendations can go to the BOD or PACs as appropriate.

In-person Engagement

The PEP recognized the importance and value of face-to-face interactions and emphasized the need to provide interactive opportunities for community members to co-create solutions for building a safer transportation future. In-person outreach events for the VZAP were hosted by CBOs as well as SANDAG.

To help facilitate conversations with the public, SANDAG provided a custom-made pop-up kit that asked key questions about the goals of the VZAP. SANDAG and CBO staff were trained to facilitate conversations around road safety with participants, documentation steps, and pop-up kit set up and breakdown procedures.

The pop-up kit was interactive and human-sized, using colorful pillars to catch the eyes of those passing by. It also served as an educational tool that provided visual examples of effective safety countermeasures. Limiting the use of text and instead using color and images helped break down language barriers and communicate complicated topics to participants. The kit was made to be modular and easy to transport.

Pop-up Tool Kit

The pop-up kit posed a simple question to participants: “What would make you feel safer moving around the San Diego Region?” The kit included four colorful pillars that each represented different road safety categories. Atop each pillar were several stickers with icons showing specific road safety strategies (e.g. wider sidewalks, slower vehicle speeds, etc.). Participants were instructed to select stickers that represented the strategies that were most important to them, and to place them on the corresponding pillar. Participants were also invited to share an idea or experience related to road safety on the *Add Your Own* pillar.

Figure 1: Instruction and Information Boards

Note: The Instruction Board (left) showed passersby how to participate, and the Information Board (right) showed example photos of what each road safety strategy might look like.

Community Based Organization Pop-up Events

CBOs were directly hired by SANDAG to raise visibility and seek feedback regarding the VZAP. Partnering with local CBOs, who were already well-connected and trusted by residents, gave SANDAG a valuable opportunity to engage with underrepresented groups. The following CBOs participated with VZAP outreach:

- Bayside Community Center
- City Heights Community Development Corporation
- El Cajon Collaborative
- Olivewood Gardens and Learning Center
- South Bay Community Services (SBCS) Corporation
- Urban Collaborative Project
- Operation Samahan Inc.

CBOs were trained to use a Feedback Form (either using an online or printed version) to tally feedback received from each event. Each CBO team could host up to two pop-up events and documented their findings on the Feedback Form. Data collected from the pop-up events is summarized in the charts on the following pages.

SANDAG Pop-Up Demonstrations and Events

In addition to the pop-ups held by CBOs, SANDAG hosted a total of three pop-up demonstrations and events over the course of VZAP development. The events featured the same pop-up kit detailed above and included additional project-related materials, such as SFN maps.

Santee Discovery Day – January 27, 2024

SANDAG hosted its first pop-up demonstration at Santee Discovery Day in January 2024. This event was held from 10 a.m. to 1 p.m. at the Walker Preserve in the City of Santee. SANDAG engaged directly with community members, introduced the VZAP and allowed participants to identify their preferred safety strategies through the Safety Pillars activity. A total of 210 stickers were added to the pillars, with “More Pedestrian Lighting” and “Off-Street Bike Parking” being the most popular strategies selected.

Oceanside Sunset Market – February 22, 2024

In February, SANDAG hosted its second pop-up demonstration at the Oceanside Sunset Market. This event took place from 5 to 9 p.m. on Pier View Way in Downtown Oceanside. The Oceanside Sunset Market is a weekly food and music street fair that features up to 200 merchants and spans four city blocks. SANDAG engaged directly with community members, introduced the VZAP and allowed participants to identify their preferred safety strategies through the Safety Pillars activity. A total of 228 comments were received, with "More Pedestrian Lighting," "Wider Sidewalks," and "Protected Bike Lanes" emerging as the most frequently suggested strategies

UC San Diego Childhood Obesity Initiative – March 6, 2024

In March, SANDAG hosted an in-person outreach event in partnership with the UC San Diego Childhood Obesity Initiative (COI). This event took place from 1:30 to 4 p.m. at the Southeastern Live Well Center in the City of San Diego. The COI is a multi-sector coalition with the mission of reducing and preventing childhood obesity through policy, systems, and environmental change. The event began with a brief introduction from UC San Diego, followed by a presentation from SANDAG on its role in the region, Vision Zero, and the VZAP. Attendees had a chance to identify their preferred safety strategies through the Safety Pillars activity. A total of 45 stickers were added to the pillars in total, with “Shorter, More Visible Crossings” and “More Pedestrian Lighting” being the most popular strategies selected.

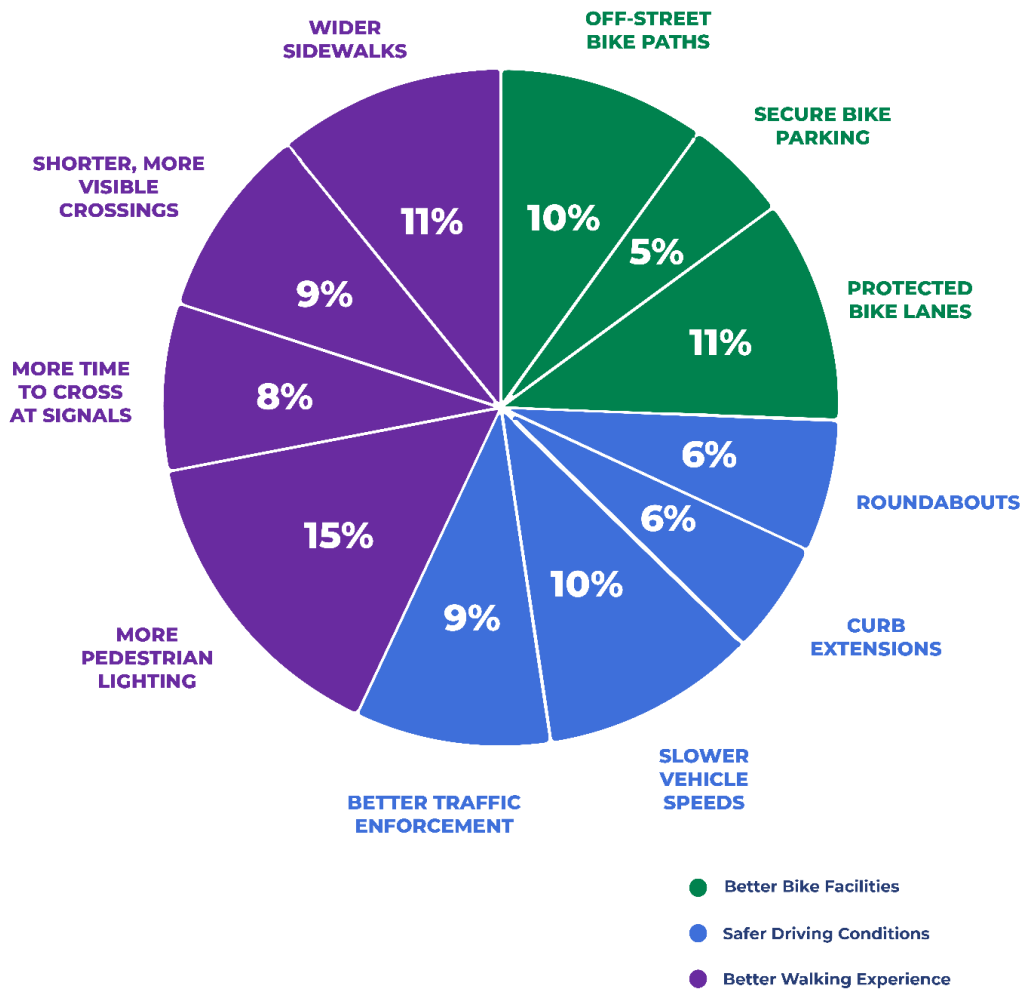
Pop-Up Events: Overall Results and Key Takeaways

Over the course of 15 events taking place in spring 2024 (12 CBO events and 3 SANDAG-led events), more than 2,792 stickers were added to the outreach feedback pillars. The main takeaways and overall feedback trends are summarized in Figure 2.

Table 2: Outreach Event Details

Subregion	Date	Event	Lead	CBO Name
East	1/27/2024	Santee Discovery Day	SANDAG	
Central	2/15/2024	Linda Vista Farmers Market	CBO	Bayside Community Center
North	2/22/2024	Oceanside Sunset Market	SANDAG	
South	2/23/2024	Olivewood Gardens Vision Zero Pop-up	CBO	Olivewood Gardens
Central	2/23/2024	Community Pop-Up	CBO	City Heights CDC
Central	2/28/2024	Copely YMCA Pop-up	CBO	OpSam Health
Central	3/6/2024	COI UCSD	SANDAG	
South	3/13/2024	SBCS Food Distribution	CBO	SBCS
Central	4/4/2024	Transit and Tacos	CBO	City Heights CDC
Central	4/6/2024	Transportation Expo	CBO	Urban Collaborative Project
Central	4/20/2024	Chula Vista Day of the Child	CBO	OpSam Health
East	4/21/2024	El Cajon Health Fair	CBO	El Cajon Collaborative
Central	4/27/2024	Linda Vista Multicultural Fair	CBO	Bayside Community Center
Central	5/4/2024	Resource Fair @ Jacobs Center	CBO	Urban Collaborative Project
East	5/7/2024	El Cajon Collaborative Meeting	CBO	El Cajon Collaborative

Figure 2: What would make you feel safer moving around the San Diego Region?[3]

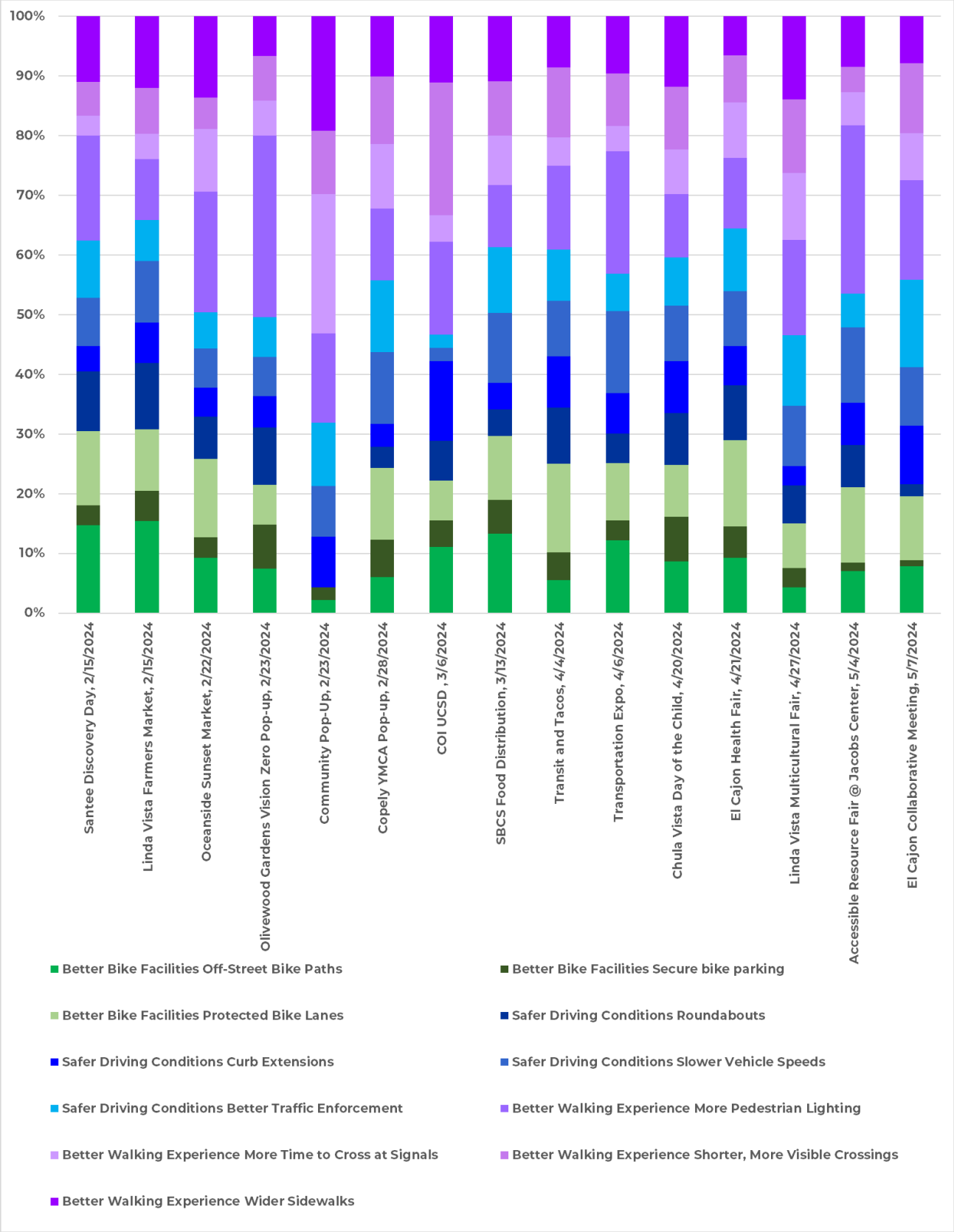


Overall, outreach participants generally selected strategies within *the Better Walking Experience* category as what would make them feel most safe moving around the San Diego region. Within the Better Walking Experience category, respondents showed a particular desire for "More Pedestrian Lighting" (419 responses, or 15% of all responses). The second-most popular category was Safer Driving Conditions, with "Slower Vehicle Speeds" (289 responses, or 10% of all responses) voted as the most important strategy. *Better Bike Facilities was the third most popular category*, in which people were most interested in adding "Protected Bike Lanes" (298 responses, or 11% of all responses) to local streets.

[3] Figure 1 excludes the Add Your Own open-ended category which is referenced below.

Trends varied from event to event, and while “More Pedestrian Lighting” was the most popular strategy selected at most of the events, some of the findings from each event differed. For example, the pop-up held on February 23, 2024, had a much lower proportion of bicycle-related responses, while other events had a more even split of responses between all categories. A breakdown of responses is visualized in Figure 3: Responses to the Pop-Up Engagement Activities .

Figure 3: Responses to the Pop-Up Engagement Activities across all events



In addition to the categories provided, there was also an *Add Your Own* pillar. From the eight events, there were a total of 224 comments placed on the *Add Your Own* pillar. The themes from the *Add Your Own* responses are summarized in Table 3: Summary of Feedback Received on the Add Your Own Pillar.

Table 3: Summary of Feedback Received on the Add Your Own Pillar

Theme	Key Takeaways
Maintenance and Repair	Roadway maintenance was a concern for many participants, as comments directly related to maintenance came up at six of the eight events. This included mentions about repairing potholes, repaving streets, and fixing sidewalk amenities, such as lighting, Americans with Disabilities Act curbs, etc.
Enhanced Pedestrian Amenities & Placemaking	Participants frequently expressed the need for enhanced pedestrian amenities. This included requests for additional streetscape amenities, public bathrooms, safe and comfortable bus stops, and improved first/last mile connectivity.
Driver Education	Driver education came up at many events as something people desired more of and targeted to specific countermeasures, such as roundabouts.
Traffic Congestion & Encouraging Public Transportation	While there was strong support for active transportation infrastructure overall, there was some concern about roadway congestion and requests for better, more connected public transit options.
Enforcement	Feedback on enforcement was mixed, with some community members calling for more security and enforcement against driving under the influence, which others expressed concerns for targeted enforcement.:

Event Photos

Figure 4: Pop-up kit photos captured by CBOs during the engagement events

Note: Selected photos are provided by Bayside Community Center, SBCS, and City Heights Community Development Corporation.

Figure 5: Pop-up kit engagement events at Oceanside Sunset Market

Note: Photos captured by SANDAG

Figure 6: Pop-up kit engagement events at Santee Discovery Day

Note: Photos captured by SANDAG.

Evaluating Public Outreach Activities

The outreach efforts mentioned above were designed to help SANDAG satisfy USDOT's CSAP requirements. Provided below is an assessment of each requirement outlined by USDOT and the metrics.

Table 4: Summary of Requirement No. 1 – Engage with the public and relevant stakeholders, including the private sector and community groups

Type of Engagement	Quantity	Stakeholder Type
Digital Engagement	Created dedicated project webpage Received 2,970 contributions online interactive feedback map Published 11 social media posts (X, Instagram, Facebook, and LinkedIn)	General Public
Local Agency PDT	16 total meetings (four meetings for each subregional PDT)	Public Sector
Technical Advisory Groups	Five meetings	Public Sector Relevant Stakeholder Community Groups
SANDAG Board	One meeting presentations	Public Sector
SANDAG PAC	Four meeting presentations	Public Sector Relevant Stakeholder
Working Group Meetings	14 meeting presentations	Relevant Stakeholder
In-person Engagement Activities	15 events	Public and Private Sector Community Groups General Public

Table 5: Summary of Requirement No. 2 - Incorporate information received from the engagement and collaboration into the plan

Type of Engagement	Integration of Engagement Effort into Final Plan
Digital Engagement	Data from the online interactive feedback map was reviewed and folded into the Action Plan and Implementation Steps included in the VZAP document. Additionally, SANDAG developed a data dashboard for local governments to have access and continue using this data to support local governments safety efforts.
Governmental Stakeholder Coordination	Feedback from all governmental stakeholder groups directly shaped the content and direction of the VZAP. Local government staff helped the project team identify events to participate in, provided insights on the prioritization methodology which shaped the approach and how variables were weighted, and shared how the Metropolitan Planning Organization can support their local safety programs. Feedback received on how SANDAG can support their local safety programs translated into deliverables prepared as part of the VZAP, as well as what was included in the Action Plan. Local government staff and partners provided input on verbiage used to describe the safety analysis, networks, and prioritization approaches, which directed naming conventions and how the results of the VZAP are communicated.
In-person Engagement	Data from the pop-up demonstration events played a crucial role in shaping the action plan. Key findings, including the need for improved lighting, protected bike lanes, and educational programs, were identified as top priorities. These insights were then translated into actionable items for the implementation of the VZAP.

Table 6: Summary of Requirement No. 3 - Coordinate inter- and intra-governmental cooperation and collaboration.

Type of Engagement	No. of Meetings	Evaluation of Success
Local Agency PDT	16	Participation from 18 local governments, the Port of San Diego, County of San Diego, and Caltrans District 11.
Technical Advisory Group	5	Participation from 24 organizations.
SANDAG Board of Directors	2	Feedback from Board
SANDAG PAC	4	Participation from five PACS.
SANDAG Working Group Meetings	14	Participation from five working groups

Attachment 1

Table 7: Local Agency PDT Members and Meeting Attendance

Sub-Region	Agency	Name	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4
Central	San Diego	Emanuel Alforja	20-Nov		27-Mar	26-Sep
Central	San Diego	Matthew Balan	20-Nov		27-Mar	
Central	San Diego	Marueen Gardiner	20-Nov	6-Feb	27-Mar	26-Sep
Central	San Diego	Everett Hauser	20-Nov	6-Feb	27-Mar	
Central	San Diego	Phil Rust				
Central	San Diego	Magdalena Taylor	20-Nov	6-Feb		26-Sep
Central	San Diego	Phil Trom	20-Nov		27-Mar	26-Sep
North	Carlsbad	Nathan Schmidt	15-Nov	7-Feb	20-Mar	
North	Del Mar	Joe Bride				
North	Del Mar	Karen Brindley				
North	Encinitas	Nick Buck		7-Feb	20-Mar	19-Sep
North	Encinitas	Evan Jedynak	15-Nov		20-Mar	19-Sep
North	Encinitas	Robin Luna	15-Nov		20-Mar	
North	Escondido	Julie Procopio	15-Nov	7-Feb		
North	Escondido	Craig Williams		7-Feb		
North	Oceanside	Teala Cotter	15-Nov	7-Feb	20-Mar	19-Sep
North	San Marcos	Kyrenne Chua			20-Mar	
North	San Marcos	Isaac Etchamendy	15-Nov			
North	San Marcos	Stephanie Kellar	15-Nov	7-Feb	20-Mar	19-Sep
North	San Marcos	Saima Qureshy				
North	Solana Beach	Katie Benson	15-Nov	7-Feb	20-Mar	
North	Solana Beach	Dan Goldberg	15-Nov	7-Feb	20-Mar	19-Sep
North	Solana Beach	Mo Sammak	15-Nov		20-Mar	19-Sep
North	Vista	Husam Hasenin			20-Mar	19-Sep
North	Vista	Darra Woods				19-Sep

Sub-Region	Agency	Name	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4
East	El Cajon	Olga Reyes		31-Jan		
East	El Cajon	Mario Sanchez		31-Jan	25-Mar	18-Sep
East	La Mesa	Hilary Ego			25-Mar	18-Sep
East	La Mesa	Lynette Santos				
East	La Mesa	Michael Thorne				
East	Lemon Grove	Michael Fellows		31-Jan		
East	Lemon Grove	Izzy Murguia				
East	Poway	Tracy Beach	17-Nov	31-Jan	25-Mar	
East	Poway	Andrea Thomas	17-Nov			
East	Santee	Minjie Mei	17-Nov	31-Jan	25-Mar	18-Sep
South	Chula Vista	Oscar Cortez				25-Sep
South	Chula Vista	Ramon Esquer				25-Sep
South	Chula Vista	Eddie Flores	16-Nov		21-Mar	
South	Coronado	Jasmine Bridges	16-Nov		21-Mar	25-Sep
South	Imperial Beach	Reyna Ayala				
South	Imperial Beach	Eric Minicilli				
South	Imperial Beach	Meagan Openshaw		1-Feb	21-Mar	
South	National City	Stephan Manganiello				
South	National City	Ricardo Rodriguez			21-Mar	
South	National City	Luca Zappiello	16-Nov			
South	San Diego	Matthew Balan	16-Nov	1-Feb	21-Mar	25-Sep
South	San Diego	Everett Hauser	16-Nov	1-Feb	21-Mar	25-Sep
South	San Diego	Phil Rust	16-Nov	1-Feb		
Multiple Sub-Regions	Port of San Diego	Liza Anderson	16-Nov			

Sub-Region	Agency	Name	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4
Multiple Sub-Regions	Port of San Diego	Dennis Campbell	20-Nov			
Multiple Sub-Regions	Port of San Diego	Lisa Madsen	16-Nov	6-Feb 1-Feb	21-Mar 27-Mar	25-Sep 26-Sep
Multiple Sub-Regions	County	Donald Chase		31-Jan	20-Mar	
Multiple Sub-Regions	County	Damon Davis		1-Feb		
Multiple Sub-Regions	County	Tanvir Hossein				18-Sep 25-Sep
Multiple Sub-Regions	County	Michael Kenney		7-Feb	27-Mar	19-Sep
Multiple Sub-Regions	County	Tara Lieberman		1-Feb	20-Mar	
Multiple Sub-Regions	County	Julie Marlett		31-Jan		
Multiple Sub-Regions	County	Nick Ortiz		31-Jan 1-Feb 6-Feb	20-Mar 25-Mar	26-Sep 18-Sep
Multiple Sub-Regions	County	Murali Pasumarthi		6-Feb		
Multiple Sub-Regions	County	Ashley Rivero		1-Feb 7-Feb	21-Mar	18-Sep
Multiple Sub-Regions	Caltrans	May Alsheikh	16-Nov 17-Nov	31-Jan 1-Feb 6-Feb 7-Feb	27-Mar	18-Sep
Multiple Sub-Regions	Caltrans	Alex Araize	15-Nov	31-Jan 7-Feb		18-Sep
Multiple Sub-Regions	Caltrans	Jacob Burkholder	15-Nov	7-Feb	25-Mar	19-Sep

Sub-Region	Agency	Name	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4
Multiple Sub-Regions	Caltrans	Seth Cutter		7-Feb	27-Mar	
Multiple Sub-Regions	Caltrans	Brandon Tobias	16-Nov 20-Nov	31-Jan 1-Feb 6-Feb	25-Mar	
Multiple Sub-Regions	Caltrans	Lazaro Vargas	17-Nov	31-Jan 1-Feb 6-Feb	21-Mar 27-Mar	18-Sep

Note: Caltrans and County of San Diego were invited to all subregional meetings. The Port of San Diego was invited to the Central and South subregional meetings.

Attachment 2

Table 8: TAG Members and Meeting Attendance

Organization	Attendee(s)	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4	Meeting No. 5
San Diego County Bicycle Coalition	Chloe Lauer	X	X	X	X	
Families for Safe Streets San Diego	Laura Keenan	X	X	X	X	
La Jolla Band of Luiseño Indians - SS4A Grant Partner	Carla Rodriguez Mark Webb			X	X	X
City of San Diego	Everett Hauser	X	X	X	X	X
City of Vista - SS4A Grant Partner	Husam Hasenin Dara Woods	X	X		X	X
City of Carlsbad	Tom Frank Nathan Schmidt	X	X	X	X	X
Rancho Santa Fe Fire Protection District	Chief Paul Roman Gregory O'Gordon					X
County Sheriff's Office	Lt. Nathan Rowley Lt. John Buckley Lt. Ashley Lewis Lt Michael Power Lt Eric Cottrell	X	X	X	X	X
Scripps Mercy Hospital - Trauma Service	Pualani Vazquez	X	X	X	X	X
UCSD – Public Health/AT Researcher	Dr. Katie Crist	X	X	X		X

Organization	Attendee(s)	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4	Meeting No. 5
UCSD Training Research and Education for Driving Safety (TREDS)	Renee Dell'Acqua	X	X	X	X	
City of Carlsbad Attorney's Office	Gina Herrera	X	X			
La Mesa - Spring Valley Schools	Jennifer Coronel					
Department of Geography, Metabolism of Cities Living Lab SDSU	Dr. Gabriela Fernandez	X	X	X		X
San Diego Quality of Life Coalition	Nicole Burgess	X	X	X	X	X
San Diego Metropolitan Transit System (MTS)	Jared Garcia	X	X	X	X	X
North County Transit District (NCTD)	Karen Harris Mary Dover Karen Tucholski	X	X	X		X
San Diego Regional Center	Todd Lordson	X			X	X
Caltrans D11 - Safety	May Alsheikh Tonya Carter	X	X	X	X	X
Caltrans D11 – Active Transportation	Seth Cutter Brandon Tobias Lazaro Vargas	X	X	X		X
Health & Human Services Agency HHSA	Hugo Salgado	X	X	X	X	
South Bay Community Services	Rachel Morineau	X	X	X		X

Organization	Attendee(s)	Meeting No. 1	Meeting No. 2	Meeting No. 3	Meeting No. 4	Meeting No. 5
	Barbara Lugo Jose Mireles					
AARP	Kathy Frederick Ted Kagan	X	X	X	X	X
Bike SD	Anar Salayev	X	X	X		X

SANDAG

Regional Vision Zero Action Plan Technical Appendix

Appendix F: Walk Audits Initiative

Introduction

The Regional Vision Zero Action Plan (VZAP) development process introducted the Safety Focus Network (SFN) in spring 2024. Using concentrations of high-severity crashes this network identified that 54% of high-severity crashes crashes ocurred on only 6% of the regional transportation network.[1] These findings were shared with regional partners including the San Diego County Childhood Obesity Initiative (COI) implemented by UC San Diego Center for Community Health in support of the Live Well San Diego vision for healthy, safe, and thriving communities.

COI highlights the link between transportation facility safety, impediments to use, and the use of active transportation. The more challenges an individual encounters when walking or biking the less likely they are to use those modes on a routine basis. These impediments greatly reduce purpose-based active transportation. Those trips are often replaced by vehicle trips and the average time residents are active diminishes.

To identify barriers to active transportation and safety concerns, COI organized **safety walk audits** through its partners' network. SANDAG and COI coordinated on the use of the regional SFN to help prioritize walk audit locations. The prioritization looked at schools on or near the SFN. This is the first demonstration of leveraging VZAP technical analysis into partner agency's processes to further promote safety.

The on-the-ground feedback from COI partners will play a significant role in informing agencies that own or have maintenance responsibility for these facilities. Ultimately, this collaboration holds great potential for addressing safety concerns as documented by the community and improving opportunities for active transportation to and around schools enabling more active lifestyles.

[1] Based on 2018-2022 data from the Statewide Integrated Transportation Records System with location enhancements by SANDAG available on the **Traffic Safety Dashboard**. See Appendix A for more details about the SFN.

This partnership between SANDAG and COI represents a crucial step in aligning safety-focused infrastructure planning with efforts to promote active living and healthier lifestyles in the San Diego region. The next section will delve deeper into how COI's mission ties into this partnership, particularly its focus on addressing key public health challenges through improved transportation safety. By connecting Vision Zero with COI's longstanding goals around active living, this partnership has the potential to create safer, more accessible environments that encourage physical activity and reduce chronic disease risks. The collaboration is also a unique example of input (SFN informing walk audits) becoming an output (walk audits included in Vision Zero Action Plan). More than 50% of deaths in San Diego County are caused by just four diseases: cancer, heart disease and stroke, type 2 diabetes, and lung disease. Behaviors that contribute to these diseases include unhealthy eating and a sedentary lifestyle.[2] To prevent and mitigate against these diseases, the San Diego COI engages healthy eating and active living policy, systems, and environmental change work. When the COI learned about the SANDAG Vision Zero and Active Transportation Plan updates they actively engaged in the process by providing input into the plans.

Active living has been a long-standing COI priority area and recently amplified as a community-centered policy priority by the COI Community Council. The COI has previously done extensive work around Vision Zero and Safe Routes to School efforts by partnering with Alta Planning + Design, Circulate San Diego, and County Health and Human Services Agency to draft Intersection Analysis Resource Sheets that identify intersections with the most bicyclist/pedestrian-involved collisions within 0.5 miles of a public school.[3]

From January to May 2024, COI partners have been actively engaged in providing feedback in the most recent plan updates by working with SANDAG to identify schools, parks, and healthcare facilities on the SFN and provide opportunities for people and organizations in the network to provide feedback.

The 2024 Community Walk Audit Report below includes a brief background on the COI, description of data collection methods, 13 walk audits, and summary of key findings.

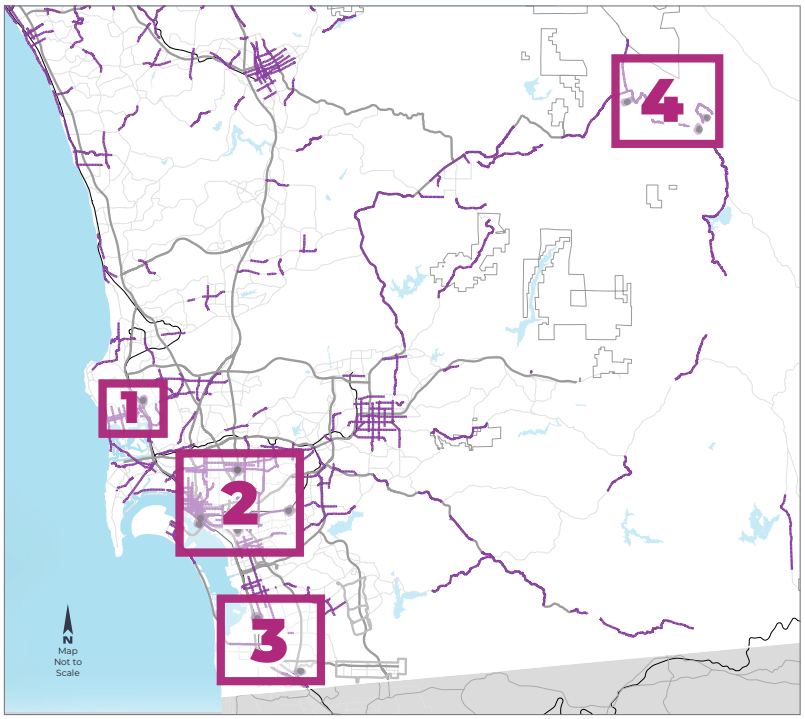
[2] County of San Diego Health and Human Services. (n.d). 3-4-50: Chronic Disease Deaths in San Diego County –Central Region 2000-2018. **https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/CHS/3-4-50/3-4-50_Central_Detailed_Brief_2020%20FINAL.pdf** (Accessed May 3, 2024)

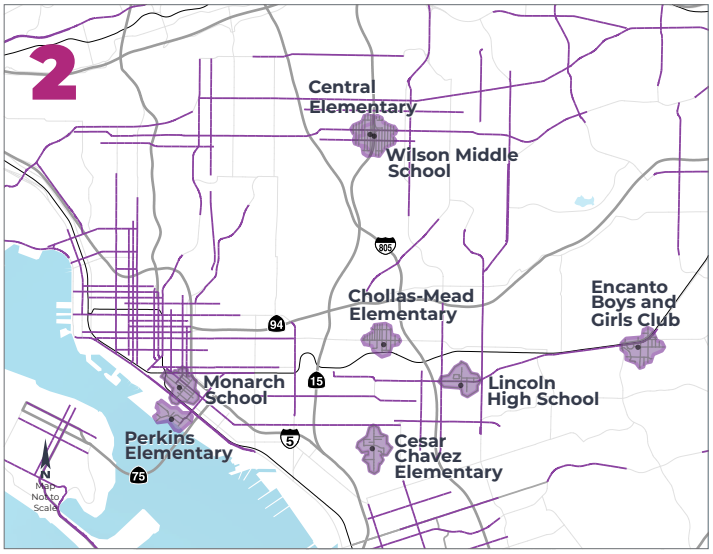
[3] San Diego COI (2024). Vision Zero + Safe Routes to Schools **https://sdcoi.org/vision-zero-safe-routes-to-school-resource-sheets/**

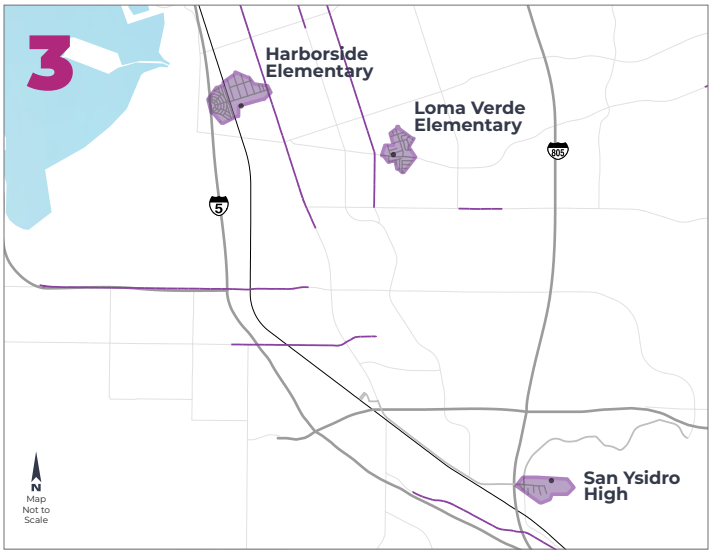
Figure 1: Walk Audits Conducted by UC San Diego COI

1/4 mile walk distance

Safety Focus Network

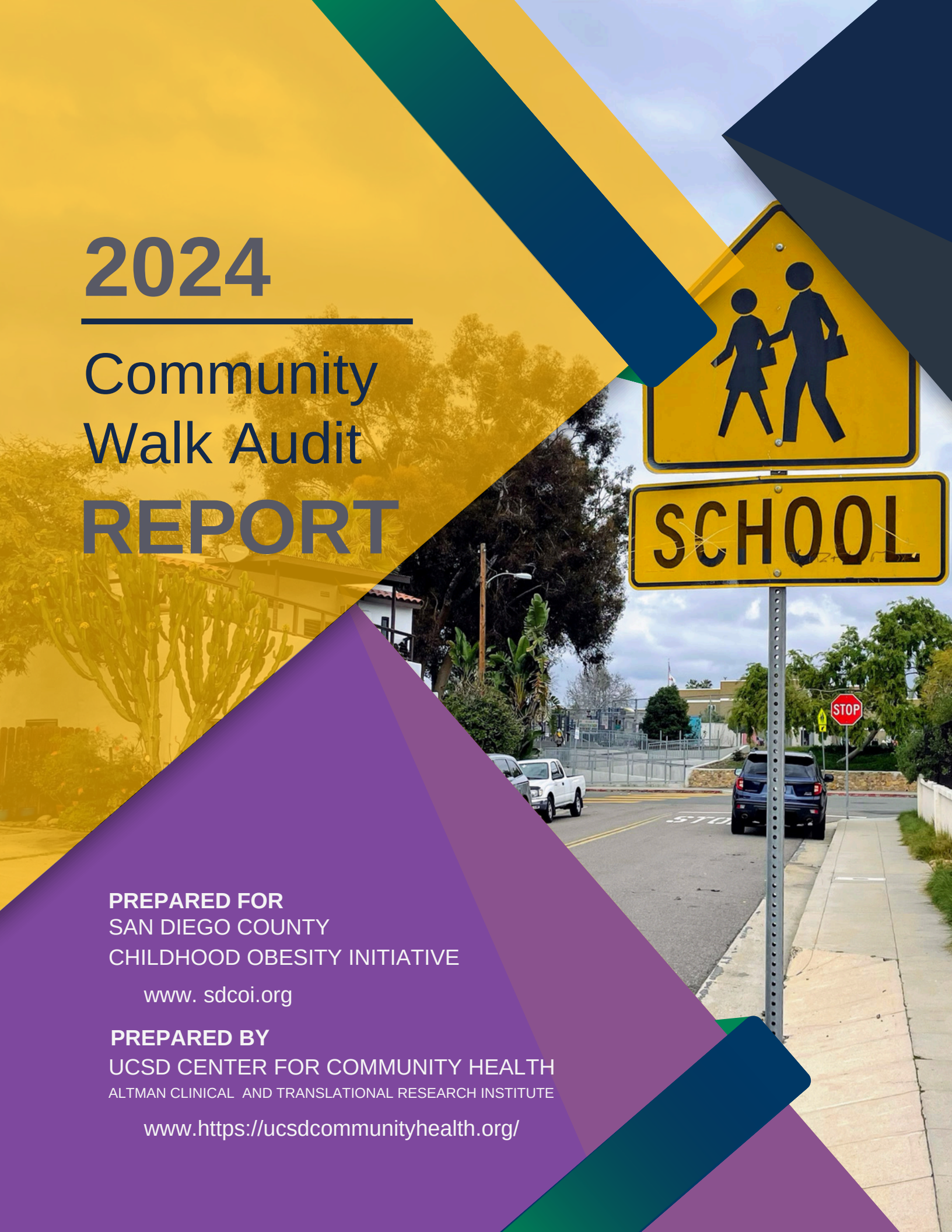






2024

Community Walk Audit REPORT



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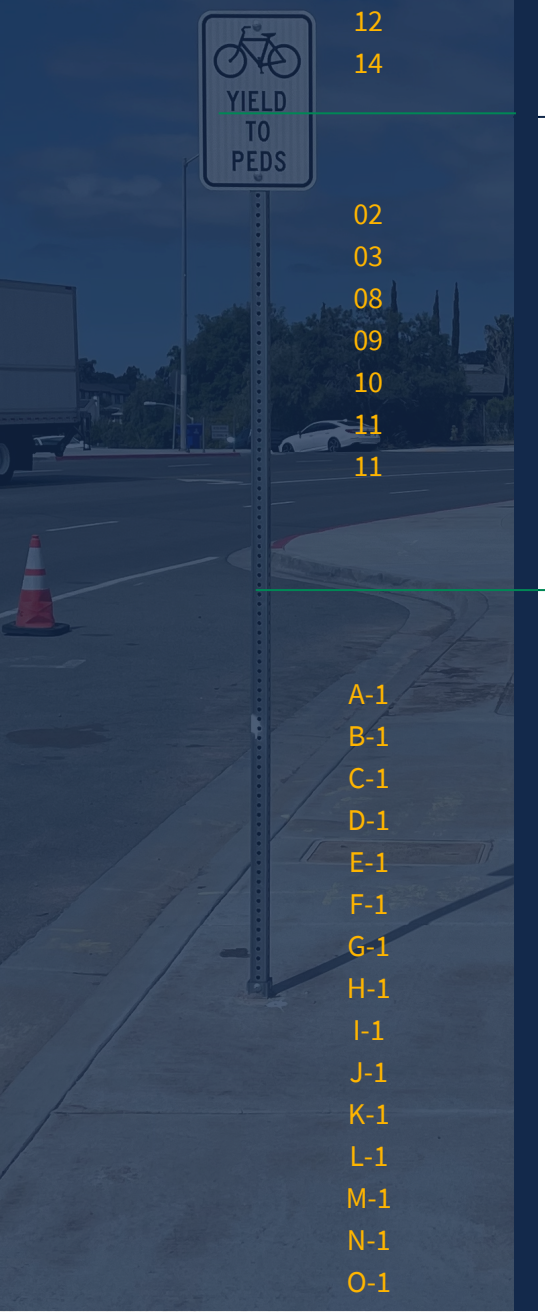

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ACKNOWLEDGEMENTS

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The San Diego County Childhood Obesity Initiative is implemented by UC San Diego Center for Community Health in support of the Live Well San Diego vision for healthy, safe, and thriving communities. For more information, visit LiveWellSD.org.

ACRONYMS

Abbreviations	Definitions
ACTRI	Altman Clinical and Translational Research Institute
CC	Community Council
CCH	Center for Community Health
COI	Childhood Obesity Initiative
HHS	Health and Human Services
HHSA	Health and Human Services Agency
OMH	Office of Minority Health
RLA	Resident Leadership Academy
SANDAG	San Diego Association of Governments
SAY	Social Advocates for Youth
SBCS	South Bay Community Services
SFN	Safety Focus Network
UCSD	University of California, San Diego

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2024 Community Walk Audit Report

1. INTRODUCTION

Nearly 14% of children in San Diego County are overweight and over 28% of teens in the county are overweight or obese.[1] The environments in which children live, learn, and play contribute to their health behaviors and likelihood to experience obesity or other chronic diseases. To prevent and mitigate diet and sedentary-related chronic diseases like obesity, diabetes, heart disease and stroke, the San Diego County Childhood Obesity Initiative (COI) supports policy, systems, and environmental change work to promote healthy eating and active living throughout San Diego County, prioritizing low-income communities and communities of color.

Active living has been a long-standing COI priority area. In 2018 COI partners, Alta Planning + Design, Circulate San Diego, and San Diego County Health and Human Services Agency (HHSA) conducted analysis of intersections with the most bicyclist/pedestrian-involved collisions within 0.5 miles of a public school in 17 cities.[2] The goal was to inform Vision Zero, a strategy to eliminate all traffic fatalities and severe injuries and promote Safe Routes to Schools, a movement to increase the number of children walking and biking safely to school.

The COI Community Council (CC), a diverse group of residents from areas most impacted by persisting health disparities, recently developed a community-centered policy agenda which includes safe streets for all, particularly around schools, parks, and health care facilities so that children and families can get to critical facilities safely while walking, biking, or taking other modes of transportation.

When the San Diego Association of Government's (SANDAG) began inviting communities to provide suggestions for road safety improvements, better biking and walking connections, and more throughout the region, the COI was ready to participate. Community input will be used to inform SANDAG's Active Transportation Plan and Regional Vision Zero Action Plan.

1 County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit, 08/2022.
2 San Diego Childhood Obesity Initiative (n.d.). Vision Zero + Safe Routes to Schools https://sdcoi.org/vision-zero- safe-routes-to-school-resource-sheets/

From January to May of 2024, COI partners worked with SANDAG to create awareness about the plan updates; identify schools, parks, and healthcare facilities in the Safety Focus Network (SFN), areas that currently experience high rates of transportation-related deaths and severe injuries; engaged the COI network in walk audits in the SFN; and provide community feedback on street safety. The following sections include a brief background of the San Diego County Childhood Obesity Initiative, description of data collection methods, as well as walk audit findings and recommendations.

1.1 San DiegoCounty Childhood Obesity Initiative

The San Diego County Childhood Obesity Initiative (COI) was formed in 2006 as a multi-sector coalition with a mission of reducing and preventing childhood obesity by advancing policy, systems, and environmental change through a collective impact model. Its vision is for healthy eating and active living to result in optimal health and wellness for all children and families in the San Diego region. The COI takes a comprehensive, community-based approach to combat childhood obesity by addressing social determinants of health associated with healthy eating and active living.

The COI structurally incorporates community partnership in all aspects of the initiative. In 2022, the Community Council (CC) was formed to center community voice in every aspect of our collective work (Figure 1). To-date there are 16 active members from diverse demographic backgrounds and live in different county regions where health disparities persist. The CC has three Tri-Chairs guiding the development of the CC and providing strategic vision by serving in leadership roles at several levels in the COI including the Domain, Leadership, and Executive Leadership Council.

Figure 1. San Diego County Childhood Obesity Organizational Chart

Domain workgroups include Government, Healthcare, Schools and After- School, Early Childhood, Community, Media, and Business. The San Diego County Board of Supervisors provides core funding for the COI andthe University of California, San Diego (UCSD) Center for Community Health (CCH) at the Altman Clinical and Translational Research Institute (ACTRI) serves as the backbone facilitating organization.

The COI utilizes the collective impact model to coordinate countywide programs, sustain cross- sector public-private partnerships, and create an environment that encourages children and families to develop lifelong healthy habits. The COI has over 400 collaborative partners.

2. HOW WE DID IT

Led by the COI Government Domain, the COI developed a three-pronged (2.1-2.3) approach to create awareness of the SANDAG's transportation plan updates and collect community input to collectively contribute to the development of safer streets.

2.1 Plan

2.1.1 SANDAG Data

SANDAG has identified schools, parks, and healthcare facilities located within its designated Safety Focus Network (SFN) - areas that currently experience high rates of transportation- related deaths and severe injuries. These SFN locations are prioritized by transportation agencies to receive funding for safety improvements. A list of schools, parks, and healthcare facilities within the SFN was provided to COI partners to highlight priority areas. Partners were encouraged to conduct walk audits anywhere they had concerns, especially in the SFN.

2.2 Engage

2.2.1 Training

A walk audit training was developed and conducted by the COI Government Domain Co-Chair, Kristen Haukom, Senior Planning Associate at Alta Planning and Design. She is a national subject matter expert on Safe Routes to Schools and active transportation. An online training was

delivered five separate times during January and February of 2024 to five groups including the Government, Schools and After School, Healthcare, and Early Childhood Domain workgroups plus the Community Council. The training was recorded in English and translated into Spanish. A two page walk audit guide was also developed in English (Appendix A) and Spanish (Appendix B) to accompany the training. The guide included links to the training videos and instructions on how to plan, conduct, and share their findings with the COI team.

2.2.2 Outreach

The Vision Zero Action Plan update was promoted on COI social media accounts and shared with over 400 partners via the weekly COI partner newsletter. Outreach materials included SANDAG's social media materials (Figure 2) along with the COI walk audit guides.

Figure 2: Social media posts in English and Spanish

2.3 Act

2.3.1 Resident Activation and Data Collection

From January to March 2024, COI partners activated their social networks which included residents and organizations to conduct walk audits in their neighborhoods and areas of concern. They mapped out the walk route, wore safety vests, documented their observations and feelings of safety on paper and took photos to provide more evidence of walkability issues they encountered. The COI backbone team provided walk audit materials including walk audit maps, safety vests, clipboards, and pens, as needed. Participants shared their data with the COI team after the walk audit to later create individual walk audit reports.

2.3.2 Walk Audit Reports

The COI backbone team developed a walk audit template to create uniform reports. Staff conducted basic research on neighborhood characteristics and input walk audit data gathered by auditors into each report.

3. WHAT WE FOUND

On March 6, 2024, SANDAG staff attended the COI All-Partner Convening to conduct theirPillars of Street Safety activity and present the purpose and goals of the Vision Zero Action Plan update. Over 40 COI partners attended the meeting. Community walk auditors shared their initial findings from eight walk audits. These walk audits were sent on April 1, 2024, to SANDAG for evaluation and incorporation into the Vision Zero Action Plan update.

This convening generated excitement among partners, and five more walk audits were conducted in April-May 2024. Four of these audits were organized by the Business and Community Domains to engage business and community leaders. All audits are included in the analysis and appendices of this report. This section provides information about the participants (community walk auditors), locations of walk audits, identified themes of concern, and regional recommendations.

COI partners completed 13 walk audits around the county. Table 1 lists the walk audit sites by location, city or county, HHSA Region, and community walk auditor names and their affiliations.

Table 1. Walk Audit Sites

Site #	Location	City/County	HHSA Region	Community Walk Auditor Names and Affiliations
01	Harborside	Chula Vista	South	Regina Moreno, COI Community Council Miriam Couret, SBCS Promotoras Parents & Caregivers, Harborside Elementary
02	Loma Verde	Chula Vista	South	Jazmin Cardona, COI Community Council
03	Barrio Logan	San Diego	Central	David Barber-Dunham, COI Community Council Jose “Pepe“ Luis, Barrio Logan resident Kristin Haukom, Alta Planning + Design Deirdra Kleske, SD County HHSA Lan Nguyen, Jackie Resnick, and Luis Galvan, COI
04	Chollas View	San Diego	Central	David Barber-Dunham, COI Community Council Donna DeBerry, President of SD Black Chamber of Commerce Lan Nguyen and Liliana Osorio, COI
05	City Heights	San Diego	Central	Guillermina Rice, COI Community Council Marlin Rice, City Heights Resident
06	Encanto	San Diego	Central	Luis Galvan, COI Andrea Rodriquez, Office of Chairwoman Vargas
07	Lincoln Park	San Diego	Central	Tana Lepule, COI Community Council Amelia Barile-Simon, and Ramona Prado, SD County HHSA Shana Wright, COI
08	Lincoln Park	San Diego	Central	Bonnie Beckman Spear, COI Community Council Anniza Gallegos, Shannon Stracener, and Maddie Heeren, SAY SD Deirdre Kleske, SD County HHSA Jackie Resnick, COI
09	Southcrest	San Diego	Central	Judit Garcia, COI Community Council Deirdre Kleske, Alondra Estrada, and Lourdes Dovalina, SD County HHSA
10	Balboa AveTransit Center	San Diego	North Central	Carlos Rojas, Pacific Beach resident
11	Otay Mesa	San Diego	South	Maritza Chavarin, Blanca Rodriquez, and Becky Lowe, Resident Leadership Academy Otay Mesa
12	Julian	Unincorporated, San Diego County	North Inland	Bonnie Beckman Spear, COI Community Council Group of Julian mothers
13	Wynola	Unincorporated, San Diego County	North Inland	Bonnie Beckman Spear, COI Community Council Kelly Baas, Kathleen McKenzie, Thomas, Spencer Valley School District

3.1 Who participated

Seven CC members organized neighborhood residents and organizations from several regions within the County of San Diego to serve as community walk auditors. Participants included representatives from the San Diego Black Chamber of Commerce, San Diego County HHSA, SAY SanDiego, Alta Planning+ Design, South Bay Community Services (SBCS), Resident Leadership Academy (RLA) – Otay Mesa, policy advisors from elected offices including the Office of Chairwoman Vargas and the Office of Assembly member Akilah Weber, and community residents.

3.2 Walk Audit Locations

Most walk audits (69%) were conducted in the City of San Diego spanning three county regions (Central, North Central, and South). Two walk audits were conducted in the City of Chula Vista (South)and two in unincorporated San Diego County (North Inland).

Figure 3: Photo of Hartley & 47th St in Lincoln Park. Well-maintained sidewalk with pedestrian signal and painted crosswalk.

Figure 4: Photo of Imperial & 63rd in Encanto. Well-maintained sidewalk and landscaping.

3.3 Helpful Walking Assets

A walk audit is an activity designed to encourage community members to evaluate the walking environment and identify issues that affect their comfort and safety. COI's community walk auditors completed this task and they were also encouraged to identify and document existing walking assets that are helpful to a particular location. Eight of 13 audits included a few details noting walking assets. Identification of these walking assets is critical because they can help inform future infrastructure developments and further study to determine when public education campaigns and healthy behavior messages are needed to support the proper usage of existing infrastructure such as pedestrian-activated traffic signals. Additionally, identified assets can serve as tangible examples for future design improvements and serve as a point of pride for community residents to reclaim usage of public right-of-way spaces as shown in Figure 3 and 4.

3.4 Themes of Concern & Regional Recommendations

3.4.1 City of Chula Vista: South Region

Teams of community walk auditors conducted two walk audits, primarily around school and public park locations, in South San Diego County in the City of Chula Vista (Sites 01-02). Auditors identified significant barriers to safe sidewalk passage and other public right-of-way spaces were also noted due to unregulated vendors, unhoused individuals and encampments (Figure5).

Auditors at these sites had several specific recommendations for improvements. Overall, recommendations included adding or improving sidewalks (paving, trash and graffiti removal, tree and brush maintenance, and addressing public right-of-way encroachment from unhoused people and vendors), improved crosswalks (repainting, pedestrian crossing signs), and installing new traffic calming measures. See Table 2 for recommendations and Appendix C and Appendix D for more details on Sites 01-02.

3.4.2 City of San Diego: Central, North Central, and South Regions

Teams of community walk auditors conducted seven walk audits in Central San Diego around schools, libraries, health clinics, and other critical community resource locations in the City of San Diego (Sites 03-11). One major area of concern identified includes a lack of or poor maintenance of pedestrian infrastructure such as cracked, narrowed, unshaded, and trash-strewn sidewalks and limited or unmarked/unpainted crosswalks on busy streets. A lack of curb cut outs for wheel chair and stroller accessibility was also observed. Poor biking infrastructure was noted on most Central audits, indicating a need for more designated bike lanes painted green for high visibility. Lastly, evidence of the city's ongoing homelessness crisis was noted in two audits (Site 03 in Barrio Logan and Site 05 in City Heights), as unhoused individuals, encampments, dangerous trash items (hypodermic needles, glass), and human waste created physical barriers for pedestrian travel on sidewalks.

Overall, auditors recommend investment in improved crosswalk infrastructure (marked, painted, flashing lights, timed), install more curb cut outs for increased sidewalk accessibility, plant trees and other vegetation for shade and neighborhood beautification, improve biking infrastructure, and install shade structures and trash cans at identified transit stops (Figure 6).

Figure 5. Photo of encampment encroaching on sidewalk. Impending pedestrian travel near Harborside Elementary School and Harborside Park in Chula Vista.

Table 2. Recommendations for Sites 01-02.

Site #	Location	Recommendations
01	Harborside	• Limit the size of the set-up of sidewalk vendors located on Oxford St across from Harborside Park leading to Harborside Elementary to provide a fair and safe pathway for parents and students. • Reduce the speed limit of Industrial Blvd from 40 mph to 25 mph to reflect the speed limit in front of Harborside Elementary or incorporate another traffic safety measure to create a safer environment for students crossing the corner of Naples St and Industrial Blvd. • Graffiti & trash clean-up, add public trash bins. • Installing more streetlights & speed limit signs. • Add new crosswalks. • Maintain trees along the perimeter of Oxford St, Industrial Blvd, and Naples St.
02	Loma Verde	• School parking improvement and maintenance, including installing new traffic signs and pedestrian crossing road signs on crosswalks leading into the school parking lot.

Figure 6: Photo of 47th St in Lincoln Park. No shelter, shade, or trashcan at bus stop.

Figure 7: Photo of poorly lit and narrow sidewalk I-5 underpass on Garnet Ave.

One community walk auditor conducted one walk audit around the Balboa Avenue Transit Center (Site 10), which includes the Balboa Ave Trolley Stop, a popular stop for commuters that sits on the east side of the I-5. Identified areas of concern include speed of car travel, lack of sidewalk buffer and narrow sidewalks, drivers disobeying “no turn on right” sign, poor overhead lighting under the overpass (Figure 7). The auditor recommends improving the road layout, and shoulders, widening sidewalks, and installing sidewalk buffers to encourage biking and safer pedestrian travel along Garnet Avenue.

Walk auditors in Otay Mesa (Site 11) identified major concerns associated with lack of sidewalk infrastructure and poor maintenance around pedestrian pathways. Students are forced to walk along high speed roadways to get to and from school. There is a need for sidewalks, street calming measures, and signage to enhance pedestrian safety.

See Table 3 for recommendations and Appendices E-M for more details on Sites 03-11.

Table 3. Recommendations for Sites 03-11.

Site #	Location	Recommendations
03	Barrio Logan	• Label crosswalks at 4-way stop intersections on Newton Ave & Beardsley St and Newton Ave & Sigsbee St with car stop lines. • Implement 15-minute parking in front of Perkins Elementary on Newton Ave or designate drop-off and pick-up zones to minimize congestion and improve traffic flow. • More street lighting along Newton Ave, especially in front of Perkins Elementary. • Improve and maintain sidewalk leading to Monarch School and Perkins Elementary on S 16th St between Newton Ave & National Ave.
04	Chollas View	• Plant trees and tall vegetation in the Market St. median to slow down traffic, reduce urban heat, and beautify the community. • Mark pedestrian and bike pathways clearly on the road and sidewalks. • Add a shelter and trashcan at the bus stop on the northeast corner of Market St. and 47th.
05	City Heights	• Include more crosswalk infrastructure support/signals on Orange Ave between 37th and 38th St. • The flashing pedestrian warning sign is helpful, but this is not enough for a busy street, especially when students are arriving at and leaving school each day.
06	Encanto	• Install bike lane along Imperial Ave (beyond 63rd St). • Maintain multiple crosswalks along Imperial Ave, especially between 61st St & 68th St, needs to be repainted. • Paint new crosswalks between the main sidewalk on Imperial Ave and the train tracks so pedestrians can cross safely. • Sidewalk needs maintenance along Imperial Ave especially between Woodman St and 63rd • St. • Install bus stop shade coverings, speed limit signs, and trees along Imperial Ave.
07	Lincoln Park	• Add one or more stop signs and/or stop lights at the intersections along 47th street to slow traffic. Include crosswalk paint on the road where new stops are added. • We spoke with a resident, and they recommended putting a walkway bridge over the road to ensure people can safely cross without relying on cars to slow down. • Add a shade structure, bench, and trashcan to bus stop. • Repave the section of sidewalk that leads to the trolley station, so it is easily accessible to pedestrian and wheelchair traffic. • Add shade trees along the sidewalk.
08	Lincoln Park	• Install curb cuts at the SW and SE corners of Market and Euclid intersection. • Install bike lane along Euclid Ave.

Site #	Location	Recommendations
09	Southcrest	• Add at least one crosswalk with pedestrian crossing road signs along S 40th St between Alpha St and Gamma St to prevent children and families from crossing the street mid-block, especially since S 40th St is on a hill. • Add a speedometer on S 40th St. • Install pedestrian crossing road signs at the main school intersection of S 40th St & Alpha St. • Label crosswalks at the intersections 1-2 blocks away from the entrance/exit of the school, including the intersection between S 40th St and Gamma St. • Fix and maintain sidewalks leading to Cesar Chavez Elementary.
10	Balboa Ave. Transit Center	• Pedestrians need a convenient, safe, and attractive route to reach Mission Bay Park and Pacific Beach. • Bikes should be encouraged with major modifications to the road layout and shoulders. • Sidewalk buffers can provide a sense of relief to pedestrians walking along a high-speed road like Garnet Ave.
11	Otay Mesa	• Install proper sidewalk that connects the rest of Otay Mesa Rd to Caliente Ave. • Add traffic-calming measures as vehicles on Otay Mesa Rd approach Caliente Ave. • Repaint crosswalks on the intersection of Otay Mesa Rd & Caliente Ave.

3.4.3 Unincorporated San Diego County; North Inland Region

Teams of community walk auditors conducted two walk audits around school locations in Julian and Santa Ysabel in unincorporated San Diego County (Sites 12-13). The lack of sidewalks, crosswalks, and 4-way stop signs at intersections were identified as challenges to safe walking in both locations (Figure 8). Additionally, a normative high speed of car travel and poor visibility of speed limit enforcement signs were reported as contributing factors to safety concerns and poor overall walkability.

Figure 8: Photo of CA-78 and C St. in Julian without 4-way stop or crosswalk near school.

Auditors recommend installing radar speed signs, flashing lights ahead of blind curves, paved sidewalks, widening the finished road shoulder, and adding 4-way stop intersections. See Table 4 for recommendations and Appendices N and O for more details on Sites 12-13.

Table 4. Recommendations for Sites 12-13.

Site #	Location	Recommendations
12	Julian	• Install radar speed signs on CA-78 at the school zone near the intersection of CA-78 & 2nd St. • Install sidewalk on CA-78 leading into town starting at the corner of CA-78 & 2nd St. • Insert pavement on the dirt path from C St to 2nd St along Cape Horn Ave. • Add more 4-way stop intersections with labeled crosswalks within the town of Julian, especially at the intersections with CA-78 (including B St and C St).
13	Wynola	• Further reduce the speed limit around Spencer Valley School, including installing flashing lights to draw drivers' attention to the need to slow down. • Widen the finished shoulder.

4. CONCLUSION

The COI is committed to improve active living by design. COI Community Council members and partners continue to remain steadfast in their commitment to advocate for the (re)design and (re)development of safe streets for all, especially around schools, parks, and healthcare facilities.

Community walk auditors assessed a diversity of geographic locations and found interconnected community needs and interests. They observed walkability assets, challenges, and documentedbarriers and recommendations along 13 unique walking routes throughout the County of San Diego. Auditors and the COI partner network aim to inform transportation plans including SANDAG'S Active Transportation Plan Update and Regional Vision Zero Action Plan to improve walking, biking, and all forms of active transit in priority neighborhoods in San Diego County. Children, families, and the community deserve safer streets for healthy and active living.

APPENDIX A

Walk Audit Guide in English

When in doubt, go for a walk!

Got a traffic safety concern? Want to improve walking and biking to improve children's health? Here's how you can help!

The San Diego Childhood Obesity Initiative (COI) is partnering with the San Diego Association of Governments (SANDAG) to collect feedback on the Vision Zero Action Plan to make our streets safer.

We invite community members and partners to **plan, conduct, and share a walk audit** - a traffic safety assessment of an area. The purpose of a walk audit is to identify barriers to walking or bicycling along the route between home (or other starting point) and school, work, grocery stores, healthcare facilities, or other critical community spaces.

How to Conduct a Walk Audit

Watch a quick walk audit training video: English and Spanish

Plan

Step 1: Identify a specific location (school, park, health clinic, library, intersection, etc.). Print out an aerial map of the location with ¼ mile radius (google maps). Plan your route.

Step 2: Identify participants. You can do this by yourself or involve staff at your organizations or other partners.

Step 3: Select day and time, preferably choose a time when there is a lot of traffic to better capture challenges.

Step 4: Gather your materials. Bring the printed aerial map, clipboard, pen, camera, checklist, and reflective vest (recommended).

Conduct

Step 5: The goal of the walk audit is to share your knowledge, attitudes, and beliefs about traffic safety about a specific area. You can handwrite or type up your observations on the printed map using highlighters and pens (see example). Here are some things you can ask yourself when conducing the walk audit:

- What do I notice on my walk about people walking, biking, or driving?
- What did I notice about the built environment (sidewalks, crosswalks, lighting, roads, etc.)?
- What did I notice about the natural environment (trees, bushes, sun, heat, cold, etc.)?
- What "feels" unsafe? What "feels" safe?
- Do I/Would I feel comfortable walking, biking, or driving around here?

Share

Step 6: Share your findings with COI and SANDAG by bringing them to the March 6th in-person all-partner event or email them to sd-coi@ucsd.edu by March 25th.

Thank you, Kristen Haukom for sharing your expertise on how to do conduct a walk audit. She is the Government Domain Co-Chair and Senior Planning Associate at Alta Planning + Design Inc. I

If you have any questions, contact Luis Galvan at lgalvan@health.ucsd.edu

EXAMPLE WALK AUDIT

Note: Nobody walked these streets. This is an example of how to take walk audit notes on a map.

APPENDIX B

Walk Audit Guide in Spanish

¡Cuando tengas dudas, sal a caminar!

¿Tienes preocupaciones sobre la seguridad del tráfico? ¿Quieres mejorar las oportunidades de caminar y montar en bicicleta para mejorar la salud de los niños? ¡Aquí te explicamos cómo puedes ayudar!

La Iniciativa de Obesidad Infantil de San Diego (COI) está colaborando con la Asociación de Gobiernos de San Diego (SANDAG) para recopilar comentarios sobre el Plan de Acción Visión Cero para hacer que nuestras calles sean más seguras.

Invitamos a los miembros de la comunidad y a nuestros socios a realizar una caminata de auditoría, es decir, una evaluación de seguridad vial de un área, y compartirla con nosotros.

Cómo realizar una caminata de auditoría

Mira este corto video de capacitación sobre la caminata de auditoría en español

Planea

Paso 1: Identifica una ubicación específica (escuela, parque, clínica de salud, biblioteca, intersección, etc.). Imprime un mapa aéreo de la ubicación con un radio de ¼ de milla (Google Maps). Planea tu ruta.

Paso 2: Identifica a los participantes. Puedes hacerlo solo o involucrar al personal de tu organización u otros colaboradores.

Paso 3: Selecciona día y hora, preferible elegir un momento en el que haya mucho tráfico para capturar mejor los problemas.

Paso 4: Reúne tus materiales. Lleva el mapa aéreo impreso, un portapapeles, bolígrafo, cámara, lista de verificación y chaleco reflector (recomendado).

Realiza

Paso 5: El objetivo de la caminata de auditoría es compartir tus conocimientos, actitudes y creencias sobre la seguridad vial en un área específica. Puedes escribir tus observaciones en el mapa impreso utilizando rotuladores y plumas (ver ejemplo). Aquí hay algunas cosas que te puedes preguntar al realizar la caminata de auditoría:

- ¿Qué noté en mi caminata sobre las personas que caminan, andan en bicicleta o conducen?
- ¿Qué noté sobre el entorno construido (banquetas, cruces peatonales, iluminación, calles, etc.)?
- ¿Qué noté sobre el entorno natural (árboles, arbustos, sol, calor, frío, etc.)?
- ¿Qué "se siente" inseguro? ¿Qué "se siente" seguro?
- ¿Me siento cómodo/a caminando, andando en bicicleta o conduciendo por aquí?

Comparte

Paso 6: Comparte tus hallazgos con COI y SANDAG llevándolos al evento en persona de todos los socios de COI el 6 de marzo o envíalos por correo electrónico a sd-coi@ucsd.edu antes del 25 de marzo.

Gracias a Kristen Haukom por compartir tu experiencia sobre cómo realizar una caminata de auditoría. Ella es copresidenta del Comité de Gobierno de COI y Asociada Principal de Planificación en Alta Planning + Design Inc.

Si tienes alguna pregunta, ponte en contacto con Luis Galván en lgalvan@health.ucsd.edu

EJEMPLO DE CAMINATA DE AUDITORÍA

Nota: Nadie caminó por estas calles. Este es un ejemplo de cómo tomar notas de auditoría de recorrido en un mapa.

APPENDIX C

Site 01. Haborside, Chula Vista

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #01

AUDITOR NAME & ORGANIZATION

Regina Moreno, COI Community Council
Miriam Couret, SBCS Promotoras
Parents & Caregivers of Harborside Elem

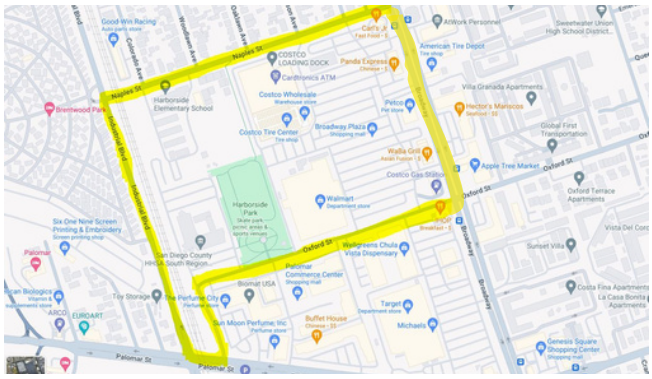
AUDIT LOCATION

Harborside, Chula Vista

AUDIT DATE

03/04/2024

MAP OF AREA AUDITED



Within the boundaries of Naples St. & Oxford St. and Industrial Blvd. & Broadway, Chula Vista, CA 91911

Primary focus on Industrial Blvd. & Oxford St. near Harborside Elementary and Harborside Park. Harborside is a metropolitan community on the west side of Chula Vista known for its Palomar Street Transit Center, San Diego County Health and Human Services Agency (HHSA) South Region facility, and shopping plazas along Palomar St. & Broadway.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- A large displacement of unhoused population especially concentrated along the perimeter of main streets: Palomar St., Naples St., Industrial Blvd., Oxford St., and Broadway (Figure 1).
- Overgrown trees blocked parking regulation signs on Industrial Blvd. between Naples St. & Palomar St. and exposed electric boxes on Oxford St. between Industrial Blvd. & Broadway (Figure 2).
- The set-up of sidewalk vendors on Oxford St. between Industrial Blvd. & Broadway limits fair and safe passage to parents and students on the way to and from school. Families at times have to cross into the street to avoid vendors (Figure 3).
- Significantly unkept and lifted streets, including difficult-to-walk sidewalks, pose a safety concern for the disabled community on the routes leading to Harborside Elementary along Industrial Blvd. & Naples St. (Figure 4).
- The 40 mph speed limit on Industrial Blvd. is a safety hazard for students and other pedestrians since it is the cross street to Harborside Elementary (Figure 5).
- Minimal streetlighting on Industrial Blvd. between Naples St. & Oxford Ave.
- Faded crosswalks on the corner of Naples St. & Industrial Blvd. next to Harborside Elementary (Figure 6).

Figure 1. Numerous homeless encampments along Industrial Blvd. between Naples St. & Palomar St.

Figure 2. Exposed electric boxes on Oxford St. between Broadway & Industrial Blvd.

Figure 3. Vendors blocking sidewalk on Oxford St. between Broadway & Industrial Blvd.

SAN DIEGO COUNTY WALK AUDIT

Figure 4. Lifted sidewalks along Naples St. between Broadway & Industrial Blvd.

Figure 5. Speed limit of 40 mph on Industrial Blvd. next to Harborside Elementary

Figure 6. Faded crosswalks on the corner of Industrial Blvd. & Naples St.

NOTES AND PHOTOS

- On the corner of Industrial Blvd. & Naples St. sits Harborside Elementary, a K-6 school that enrolls about 600 students.
- Behind Harborside Elementary sits the County HHSA South Region facility and Harborside Park, a sprawling green park with benches, basketball courts, and a skate park.
- Across Harborside Elementary along Industrial Blvd. sits the Brentwood mobile home community that borders the Interstate-5 and home to several enrolled students.
- Industrial Blvd. between Naples St. & Palomar St. and Oxford St. between Broadway & Industrial Blvd. has had a chronic issue with homeless encampments that have risen exponentially since the COVID-19 pandemic.
- Students are seen walking past homeless encampments to and from school and sometimes having to avoid encampments by walking on the curb or on the side of Industrial Blvd. which has a 40 mph speed limit.
- In August 2022, the Chula Vista City Council was forced to fence Harborside Park to evict dozens of unhoused residents. Though the City Council since the closure has allocated $1.25 million toward reopening and improving the park, the park's temporary closure has resulted in community residents including Brentwood resident kids to play on the roads.
- Historically, Chula Vista's west side has less than a third of the parks that its east side contains.

RECOMMENDATIONS

- Limit the size of the set-up of sidewalk vendors located on Oxford St. across from Harborside Park leading to Harborside Elementary to provide a fair and safe pathway for parents and students
- Reduce the speed limit of Industrial Blvd. from 40 mph to 25 mph to reflect the speed limit in front of Harborside Elementary or incorporate another traffic safety measure to create a safer environment for students crossing the corner of Naples St. and Industrial Blvd.
- Need for various safety features to create a healthier community and safer passage for Harborside students including graffiti & trash clean-up, installing more streetlights & speed limit signs, adding crosswalks and public trash bins, and upkeeping trees along the perimeter of Oxford St., Industrial Blvd., and Naples St.

For more information or questions about this walk audit, please reach out to the San Diego County Childhood Obesity Initiative via email at sd-coi@ucsd.edu

APPENDIX D

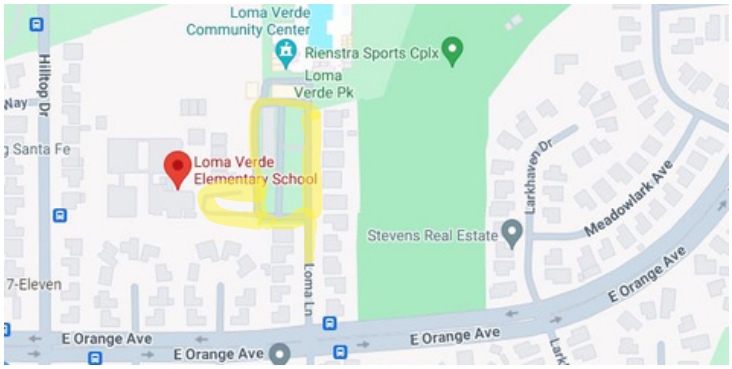
Site 02. Loma Verde, Chula Vista

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #02

AUDITOR NAME & ORGANIZATION	AUDIT LOCATION	AUDIT DATE
Jazmin Cardona, COI Community Council	Loma Verde, Chula Vista	02/29/2024

MAP OF AREA AUDITED & BACKGROUND



Loma Ln. including the school parking lot area Loma Verde, Chula Vista, CA 91911

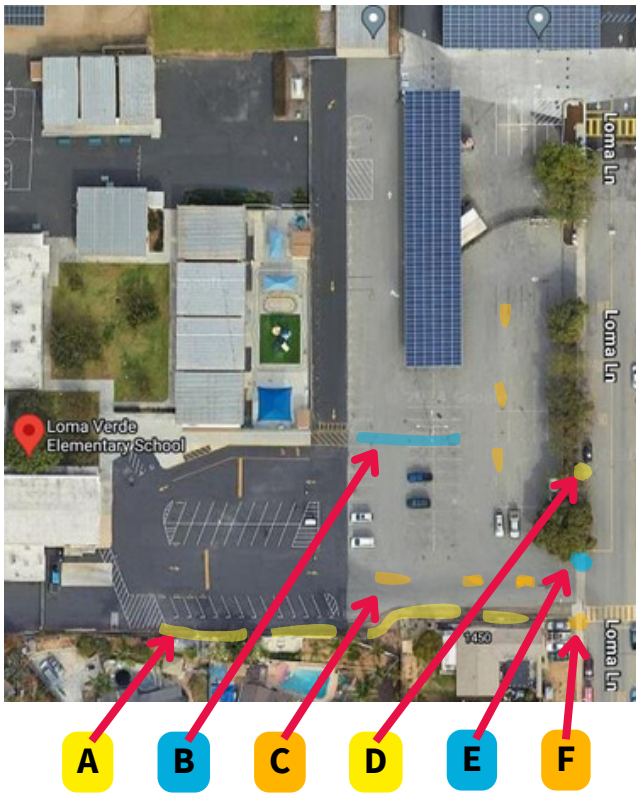
Primary focus within Loma Verde Elementary shared parking lot.

Loma Verde is a neighborhood in Chula Vista with access to several parks, recreational facilities, and green spaces.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- **A**- This sidewalk needs improvement: it is partially dirt and contains cracks that pose a safety concern to pedestrians (Figure 1).
  - Families take this path that starts on Loma Ln. to Loma Verde Elementary.
- **B**- Painted walkway is needed (Figure 2).
  - Pedestrians/families have to walk into traffic areas to get in/out of their cars and a painted walkway would help families cross the traffic area.
- **C**- Paint traffic direction arrows on asphalt between lanes in the parking lot (Figure 3).
  - The right side of the parking lot is missing traffic direction arrows on the asphalt.
- **D**- This sidewalk needs improvement: - There is a crack higher than 2 inches, which can endanger pedestrians and disabled people.
- **E**- "Do Not Enter" traffic sign needed and/or permanent traffic cones to stop cars from entering this prohibited way (Figure 4).
- **F**- This crosswalk on Loma Ln. needs a new "School Zone" sign and a pedestrian crossing road sign with blinking lights (Figure 4).

<u>Map of Parking Lot for Loma Verde Elementary and Community Center</u>



SAN DIEGO COUNTY WALK AUDIT

Figure 1. Dirt path that leads to Loma Verda Elementary from Loma Ln. needs pavement and maintenance.

Figure 2. The walkway that leads into the school parking lot needs to be extended for familes to safely cross traffic.

Figure 3. Traffic direction arrows are missing on one half of the school parking lot.

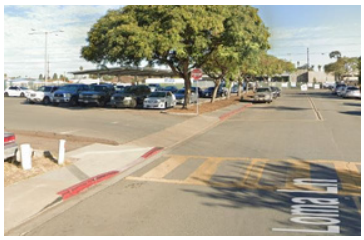


Figure 4. The exit of school parking lot needs a clear “Do Not Enter” sign and the crosswalk on Loma Ln. needs a pedestrian crossing road sign.

NOTES AND PHOTOS

- Loma Verde Elementary sits in the City of Chula Vista, 5 miles from the US-Mexico international border.
- The student population of Loma Verde Elementary (K-5) is 542 and about 90% of students identify as Hispanic/Latino.
- Loma Verde Elementary sits next to Loma Verde Park, a 6.28-acre neighborhood park, that includes South Bay Little League and the Loma Verde Community Center.
- The Loma Verde Community Center includes the Loma Verde Aquatic Center and Fair Winds Family Resource Center.
- Loma Verde Elementary and Loma Verde Community Center share a parking lot that becomes congested with traffic at drop off/pick up times.

RECOMMENDATIONS

- The school parking lot needs improvement and maintenance (see map above) since many students and families pass through the parking lot to reach/leave from Loma Verde Elementary.
- This includes installing new traffic signs and pedestrian crossing road signs on crosswalks leading into the school parking lot.

APPENDIX E

Site 03. Barrio Logan, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #03

AUDITOR NAME & ORGANIZATION

David Barber-Dunham, COI Community Council; Jose "Pepe" Luis, Barrio Logan resident; Kristin Haukom, Alta Planning + Design; Deirdra Kleske, County SD HHSA; Lan Nguyen, COI; Jackie Resnick, COI; Luis Galvan, COI

AUDIT LOCATION

Barrio Logan, San Diego

AUDIT DATE

03/04/2024

MAP OF AREA AUDITED

Within the boundaries of National Ave. & Main St. and S 16th St. & Beardsley St. in Barrio Logan, San Diego, CA 92113

Primary focus on Newton Ave. in front of Perkins Elementary and Monarch School.

Perkins Elementary and Monarch School sit in Barrio Logan near the San Diego downtown area and the Port of San Diego.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- In front of Monarch School on Newton Ave. between S. 16th St. & Sigsbee St., there are wide sidewalks, adequate street lighting, 15-minute parking, and trimmed trees.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- About 40% of Perkins Elementary students pass the corner of Newton Ave. and Beardsley St. to get to school. At this intersection, there is a lack of school zone (yellow) high visibility crosswalks, with only 1 out of the 4 crosswalks painted on the street without clear stop lines for cars (Figure 1).
- The sidewalk in front of Perkins Elementary also lacks pedestrian-scale lighting and, in general, has inadequate street lighting. According to Barrio Logan residents, this section of Newton Ave. becomes very dark after 6pm and creates a high level of concern, especially for students (Figure 2).
- Between Newton Ave. and Sigsbee St., there is another 4-stop intersection that lacks labeled crosswalks (1 out of 4) and a bus stop without a bench or shade cover. About 15% of students walking to Perkins Elementary pass this intersection, and this corner is a hotspot for families dropping off their children at Monarch School (Figure 3 & 4).

Figure 1. The intersection between Newton Ave. & Beardsley St. lacks labeled crosswalks

Figure 2. Only one streetlight in front of Perkins Elementary on Newton Ave. for the entire block

SAN DIEGO COUNTY WALK AUDIT #5

- Students and families walking down S. 16th St. between National Ave. and Newton Ave., on route to Monarch School or Perkins Elementary, are met with a narrow, underdeveloped sidewalk adjacent to the Alpha Project Temporary Bridge Shelter and an empty lot. Pedestrians walk on the side of the street to avoid the sidewalk (Figure 5 and 6).
- In front of Perkins Elementary's main entrance on Newton Ave., there is congested traffic and minimal space for cars, let alone enough space for students who are dropped off to safely walk onto the school sidewalk. This portion of the street contains slanted rows of parked cars that leave a small corridor for cars to pass in both directions (Figure 7).
- Though not a structural issue, there are usually a high number of unhoused individuals blocking sidewalks, parking, and engaging in illegal activities. All these factors create major safety concerns and barriers to active travel to and from school.

Figure 3. Intersection between Newton Ave. and Sigsbee St. lacks labeled crosswalks

Figure 4. The corner of Newton Ave. and Sigsbee St. with congested traffic & unlabeled crosswalks

Figure 5. Underdeveloped sidewalk causes pedestrians to walk onto the street to get to school

Figure 6. Alpha Project Temporary Bridge Shelter at the corner of Newton Ave. & S. 16th St.

Figure 7. Small corridor for cars to pass on Newton Ave. between Sigsbee St. & Beardsley St.

SAN DIEGO COUNTY WALK AUDIT

NOTES AND PHOTOS

- Perkins Elementary and Monarch School are both located in the Barrio Logan neighborhood, known for its rich history deeply rooted in Chicano culture and activism.
- Barrio Logan is situated between major transportation corridors including the I-5, the Coronado Bridge, and the Port of San Diego including the Navy shipyards and manufacturing plants that has brought substantial pollution and other environmental concerns to the community.
- Perkins Elementary (K-8) has a student population of about 400 students, with 1 out 3 students experiencing homelessness and 2 out of 3 students chronically absent.
- More than 90% of the school's families are Latino or Black.
- For some students, getting to school is the hardest part of the day. Some of them wake up at 3 a.m. to cross the border because their families had moved to Tijuana to find somewhere affordable to live. Some walk from a shelter past homeless encampments without an adult to accompany them. Others take the trolley or bus to school.
- Monarch School is a K-12 transitional school run by a public-private partnership between the San Diego County Office of Education and the nonprofit Monarch School Project.
- Students at Monarch School are met with a trauma-informed and strength-based community as they persevere through the trauma of homelessness.
- Monarch School neighbors the Alpha Project homeless shelter that sits at the corner of Newton Ave. and S. 16th St. This corner is also known for having a significant amount of trash including used needles, condoms and wrappers, alcohol bottles and cans, human waste, and bloody clothes.

RECOMMENDATIONS

- Label crosswalks at 4-way stop intersections on Newton Ave. & Beardsley St. and Newton Ave. & Sigsbee St. with car stop lines.
- Implement 15-minute parking in front of Perkins Elementary on Newton Ave or designate drop-off and pick-up zones to minimize congestion and improve traffic flow.
- More street lighting along Newton Ave., especially in front of Perkins Elementary.
- Improve and maintain sidewalk leading to Monarch School and Perkins Elementary on S. 16th St. between Newton Ave. & National Ave.

APPENDIX F

Site 04. Chollas View, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #04

AUDITOR NAME & ORGANIZATION

David Barber-Dunham, COI Community Council; Donna Deberry, SD Black Chamber of Commerce; Lan Nyugen, COI, Liliana Osorio, COI

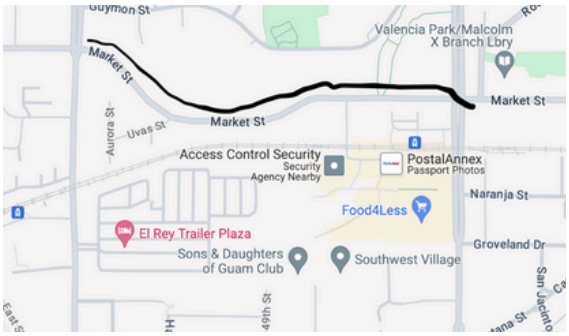
AUDIT LOCATION

Chollas View, San Diego

AUDIT DATE

04/24/2024

MAP OF AREA AUDITED



Walked on the northside of Market St. from 47th St. to Euclid Ave, San Diego, CA, 92114. Observed activity west of 47th and east of Euclid during our walk down Market St.

Southeastern San Diego is one of the most ethnically diverse neighborhoods in San Diego. The neighborhood is home to a thriving small business community and a vibrant arts and culture scene. Despite facing socioeconomic challenges, residents demonstrate resilience and perseverance in striving for positive change.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- The sidewalks are big and easy to walk down.
- There is room for biking and other wheeled recreational devices.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- Cars are driving fast on Market St. (Figure 1).
- Food trucks were backing out onto Market St. near 47th St. on the southwest corner. One truck was honking the entire time it was backing up onto the street creating an alarming and dangerous environment in front of the elementary school and a busy intersection.
- There are mothers and children crossing at Market St. and 47th St. They had a difficult time on the northwest corner of the intersection because there needs to be an additional curb cut out to transition from the street to the sidewalk more safely (Figure 2).
- The bus stop on the northeast corner of Market St. and 47th St. has not shade or trash can (Figure 3).
- No crossing on Market St. at Uvas St. There is a “No pedestrian crossing” sign missing on the north side of Market St. (Figure 4). There should be a crossing available to pedestrians because there is housing on Uvas St.

Figure 1. St.oned median on Market St.

Figure 2. Curb not cut on Market St. and 47th St.

SAN DIEGO COUNTY WALK AUDIT

WALK CHALLENGES CONTINUED

- Need a curb cut out on Market St. and Euclid St. as well. This intersection is busy as it is a major transportation corridor.
- The bike lanes need to be painted green like in other parts of the city (Figure 5).
- The bike path and pedestrian walkway need to be clearly marked on the sidewalk (Figure 6).

Figure 3. Bus stop with no shelter and trashcan.

Figure 4. Missing "no pedestrian crossing" sign.

Figure 5. Bike lane is not painted.

Figure 6. Bike path and walkway are not clearly marked.

NOTES AND PHOTOS

- Chollas-Mead Elementary is located two blocks east of Interstate 805, in the Chollas View neighborhood of the Diamond District, which includes Emerald Hills, Lincoln Park, Mountain View, Mount Hope, Encanto, Oak Park, Valencia Park and Webster.
- The school has two campuses with one central office. Mead houses Pre K, 1, and 2. Chollas contains grades 3 through 5. Together, they form a student population of 500. The child-care center and preschool classes are located in between both campuses.
- Nearby community resources include the Malcolm X Library, Jacobs Foundation, and Jackie Robinson YMCA.
- Family Health Centers of San Diego (FHCSD) operates multiple locations throughout the city, including the Diamond Neighborhoods Family Health Center on 47th St. and Market St. Many community members come to this clinic to seek acute, chronic, and preventative care.

RECOMMENDATIONS

- Plant trees and tall vegetation in the Market St. median to slow down traffic, reduce urban heat, and beautify the community.
- Mark pedestrian and bike pathways clearly on the road and sidewalks.
- Add a shelter and trashcan at the bus stop on the northeast corner of Market St. and 47th.

APPENDIX G

Site 05. City Heights, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #05

AUDITOR NAME & ORGANIZATION

Guillermina Rice, COI Community Council
Marlin Rice, City Heights Resident

AUDIT LOCATION

City Heights, San Diego

AUDIT DATE

02/15/2024

MAP OF AREA AUDITED

Orange Ave. between 37th and Central Ave. in City Heights, San Diego, CA 92105

Primary area in front of Wilson Middle School and Central Elementary School.

Central Elementary and Wilson Middle are located at the heart of City Heights, a culturally diverse and densely populated neighborhood in San Diego.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- There is a flashing pedestrian crosswalk warning sign close to the exit of an alley on Orange Ave., between 37th St. and 38th St. (Figure 1).

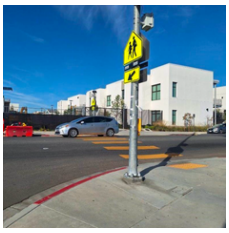


Figure 1. Flashing pedestrian crosswalk on Orange Ave.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- Orange Ave. is a busy street. When a dedicated bus lane was created on El Cajon Blvd., it seems that more drivers chose to use Orange Ave. as an alternative route to El Cajon Blvd.
- Cars seem to be going faster than the posted speed limit of 25 MPH.
- There is no crossing sign in front of Central Elementary School.
- One end of the handicap ramp on Orange Ave. in front of the schools needs maintenance and repair (Figure 2).
- On the sidewalk on the I-15 overpass, pedestrians must go out into the street as tents are taking up the sidewalk space. Electrical outlets built into the overpass are used by unsheltered people (Figure 3).

Figure 2. Handicap ramp needs repair in front of Central Elementary on Orange Ave. between 37th St. & 39th St.

Figure 3. Sidewalk closed and tents on bridge overpass at the corner of Orange Ave. & 40th St.

SAN DIEGO COUNTY WALK AUDIT

NOTES AND PHOTOS

- A new dual campus for Wilson Middle School and Central Elementary School opened August 2023. Nearly 1,300 students in grades TK-8 go to school here and most live in the surrounding neighborhoods.
- About 85% of Central Elementary students are English learners with non-English speakers at home. The community surrounding the school is densely populated with older, single-family houses, apartments, and small businesses.
- The schools are also located a block away from the Teralta Neighborhood Park that sits on top of the Interstate-15 freeway and serves as an important green and multicultural space for the residents of City Heights. Due to its proximity to the Interstate-15 freeway, Central Elementary and Wilson Middle School sit between two very busy and traffic-prone streets, Orange Ave. and El Cajon Blvd.
- The observation time was the time students are typically released but on this date school closed early so it was not as busy as usual.
- During two one-minute timed periods, 20 cars and 16 cars were observed passing the schools on Orange Ave.
- There are barriers in front of the schools for some repair work, and some of the barriers have fallen over. Some sidewalk repair work requires pedestrians to go out into the street (Figures 4 and 5).

Figure 4. Construction barriers knocked down at the corner of Orange Ave. & 39th St.

Figure 5. Construction blocking sidewalk at the corner of Orange Ave. & Central Ave.

RECOMMENDATIONS

- Include more crosswalk infrastructure support and signals on Orange Ave. between 37th St. and 38th St.
- The flashing pedestrian warning sign is helpful, but this is not enough for a busy street, especially when students are arriving to and leaving school each day.

For more information or questions about this walk audit, please contact Luis Galvan at the San Diego County Childhood Obesity Initiative via email at l2galvan@ucsd.edu

APPENDIX H

Site 06. Encanto, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

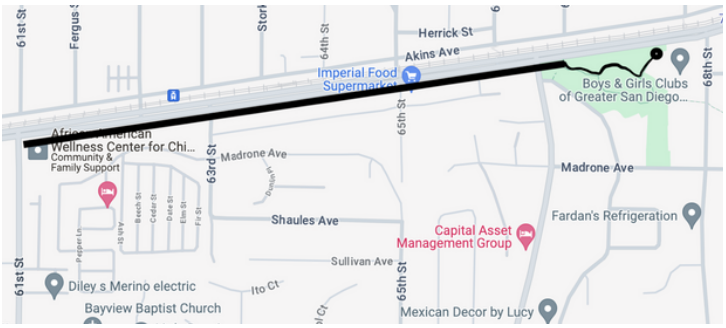
SAN DIEGO COUNTY WALK AUDIT #06

AUDITOR NAME & ORGANIZATION
Luis Galvan, COI
Andrea Rodriguez, Office of Sup. Vargas

AUDIT LOCATION
Encanto, San Diego
Imperial Ave. (61st St. to 68th St.)

AUDIT DATE
04/24/2024

MAP OF AREA AUDITED



Imperial Ave. between 61st St. and 68th St., San Diego, CA 92114

Southeastern San Diego is one of the most ethnically diverse neighborhoods in San Diego. The neighborhood is home to a thriving small business community and a vibrant arts and culture scene. Despite facing socioeconomic challenges, residents demonstrate resilience and perseverance in striving for positive change.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- The sidewalk in front of Marie Widman Memorial Park, between Woodman St. and 68th St., is spacious with good amount of streetlighting
- In front of the affordable housing complex, between 63rd St. and 64th St. along Imperial Ave., there is a well-kept and spacious portion of sidewalk with plants and minimal trash (Figure 1).

Figure 1. Upkept sidewalk in front of afforable housing complex along Imperial Ave. between 63rd St. and 64th St.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- Bike lane abruptly ends after 63rd St. heading toward 68th St.
- The intersection of Imperial Ave. and 63rd St. needs a painted crosswalk.
- The crosswalks on the intersection between Woodman St. and Imperial Ave. don't make sound and need to be repainted, not ADA-friendly (Figure 2).
- On the median of Imperial Ave. near 65th St., there is construction material that looks like it can roll onto the street (Figure 3).
- Between Woodman St. and 65th St., there is a very noticeable unkept sidewalk (Figure 4).
- Unkept sidewalk between 63rd St. & 65th St. along Imperial Ave. (Figure 5 and Figure 6).
- No crosswalk leads to the bus stop on the median of Imperial Ave., near its intersection with Woodman St.
- One of the entrances to Marie Widman Memorial Park was blocked.
- Bus stop on Imperial Ave. near the corner of 68th St. has a bench but no shade cover.
- Labeled crosswalks are needed along Imperial Ave. that connect the trolley stops to the main sidewalk (Figure 7).
- There are very few speed limit signs and minimal tree coverage along Imperial Ave.

SAN DIEGO COUNTY WALK AUDIT

Figure 2. Crosswalks at the intersection of Imperial Ave. & Woodman St. needs repainting

Figure 3. Safety hazard from construction material on the median at the intersection of 65th St. & Imperial Ave.

Figure 4. Unkept sidwalk between Woodman St. and 65th St.

Figure 6. Unkept sidewalk near the intersection of 65th St. & Imperial Ave.

Figure 5. Unkept sidewalk between 63rd St. & 65th St. along Imperial Ave.

Figure 7. Labeled crosswalks are needed along Imperial Ave. that connects the trolley stop to the main sidewalk

NOTES AND PHOTOS

- Imperial Ave. is a major thoroughfare in Southeastern San Diego, with various businesses, schools, and community centers lining the street.
- This portion of Imperial Ave. (between 61st St. and 68th St.) has a couple of community hotspots including the Boys & Girls Clubs of Greater San Diego, Marie Midman Memorial Park, and the African American Wellness Center.
- Along Imperial Ave., there were traces of closed small businesses that had become vacant with unkept sidewalks in front of these vacant properties.

RECOMMENDATIONS

- Install bike lane along Imperial Ave. (beyond 63rd St.).
- Maintain multiple crosswalks along Imperial Ave., especially between 61st St. & 68th St., needs to be repainted.
- Paint new crosswalks between the main sidewalk on Imperial Ave. and the train tracks so pedestrians can cross safely.
- Sidewalk needs maintenance along Imperial Ave. especially between Woodman St. and 63rd St. Install bus stop shade coverings, speed limit signs, and trees along Imperial Ave.

For more information or questions about this walk audit, please reach out to the San Diego County Childhood Obesity Initiative via email at sd-coi@ucsd.edu

APPENDIX I

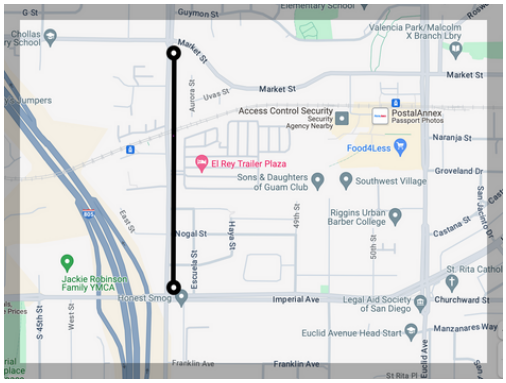
Site 07. Lincoln Park, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #07

AUDITOR NAME & ORGANIZATION	AUDIT LOCATION	AUDIT DATE
Tana Lepule, Amelia Barile-Simon, Ramona Prado-Lyon, Shana Wright, COI	Lincoln Park, San Diego	04/24/2024

MAP OF AREA AUDITED



47th St. between Imperial Ave. and Market St. in Southeast, San Diego, CA 92102

Southeastern San Diego is one of the most ethnically diverse neighborhoods in San Diego that lies south of the SR-94, east of I-5, and split by the SR-15 and I-805 freeways. The neighborhood is home to a thriving small business community and a vibrant arts and culture scene. Despite facing socioeconomic challenges, residents demonstrate resilience and perseverance in striving for positive change. Community organizations, activists, and local leaders work tirelessly to address issues such as education, economic opportunity, and social justice.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- Flashing light crosswalk on Hartley St. & 47th St. (Figure 1 and 2).
- Sidewalks present on both sides of the street that were mostly consistent (Figure 3).
- Trolley station, with dedicated parking lot.
- Previous graffiti that had been cleaned up.

Figure 1. Well maintained sidewalk with flashing light crosswalk on Hartley St. & 47th St.

Figure 2. Hartley St. & 47th St. Crosswalk

Figure 3. Sidewalks on both sides of the street

SAN DIEGO COUNTY WALK AUDIT

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- 47th St. between Market St. and Imperial is a .5 mile stretch of road with no stop signs in between to slow traffic.
- Cars seem to be driving faster than the posted 30 MPH speed limit.
- The 805 off and on ramps are both on Imperial Ave and Market St. right around the corner from 47th St. so cars are going very fast.
- Right where you walk up to the trolley station from the road, the sidewalk is very cracked, and it is no longer easy to walk on, and would be inaccessible for someone with mobility issues, in a wheelchair, or pushing a stroller.
- There was trash and overgrown weeds along the route, except for in front of the CalTrans building which was nicely manicured and clean.

NOTES AND PHOTOS

- Muang Lao Market is located on 47th St. and Imperial Ave. in a small strip mall with limited parking.
- The 47th St. Trolley station is located on this route, with a parking lot for commuters (Figure 4).
- On the corner of Market and 47th St. is the Diamond Neighborhoods Family Health Centers (FHC), one of the largest clinics in the FHC system with 47 physicians and 21 specialty areas of medicine.
- Near the corner of Market St. & 47th St. sits Chollas-Mead Elementary with a population of about 500 students.
- There is a bus stop on 47th and Hartley St. with no shade or place to sit while waiting for the bus. There was an electrical box in the area where a bench would go (Figure 5).
- There are new apartments being built on 47th St. between Hartley St. and Market St. In this area, there is a crosswalk, with flashing lights for pedestrians to cross. However, we spoke to a resident and the builders and they both agreed that cars do not slow for pedestrians at the crosswalk, even with the flashing lights.
- There was a pipe coming from the fire hydrant that had been paved over disrupting the sidewalk and curb cuts on the entrance to the Creekside Villas on Castana St. & 47th St. (Figure 6).

Figure 4. Sidewalk ends at entrance to 47th St. Trolley Station

Figure 5. Bus stop with no shade or place to sit. Littered with trash

Figure 6. Pipe coming from the fire hydrant that has been paved over disrupting the sidewalk and curb

SAN DIEGO COUNTY WALK AUDIT

RECOMMENDATIONS

- Add one or more stop signs and/or stop lights at the intersections along 47th St. to slow traffic. Include cross-walk paint on the road where new stops are added.
- We spoke with a resident, and they recommended putting a walkway bridge over the road to ensure people can safely cross without relying on cars to slow down.
- Add a shade structure, bench, and trashcan to bus stop.
- Repave the section of sidewalk that leads to the trolley station so it is easily accessible to pedestrian and wheelchair traffic.
- Add shade trees along the sidewalk.

APPENDIX J

Site 08. Lincoln Park, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #08

AUDITOR NAME & ORGANIZATION

Bonnie Beckman, COI Community Council; Anniza Gallegos, SAY SD; Deirdre Kleske, County SD HHSA; Maddie Heeren, SAY San Diego; Shannon Stracener, SAY SD; Deirdre Kleske, County SD HHSA; Jackie Resnik, COI

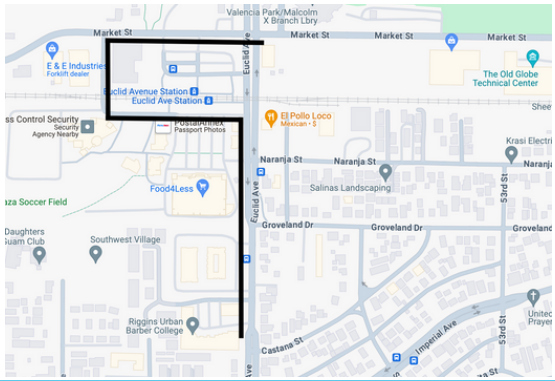
AUDIT LOCATION

Lincoln Park, San Diego

AUDIT DATE

04/24/2024

MAP OF AREA AUDITED



Euclid Ave between Market St. and Castana St., San Diego, CA 92114, and around Euclid Ave. Station

Southeastern San Diego is one of the most ethnically diverse neighborhoods in San Diego that lies south of the SR-94, east of I-5, and split by the SR-15 and I-805 freeways. The neighborhood is home to a thriving small business community and a vibrant arts and culture scene. Despite facing socioeconomic challenges, residents demonstrate resilience and perseverance in striving for positive change. Community organizations, activists, and local leaders work tirelessly to address issues such as education, economic opportunity, and social justice.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- There was a wobbly fence (between Naranja St. and Groveland Dr.) that was designed with gaps that people used to create walking paths from the sidewalk down into the shopping center (Figure 1).
- There was a lot of trash all along Euclid Ave. (Figure 2).
- There are many shopping/business centers along the west side of Euclid Ave. (from the trolley tracks to Castana St.) with multiple driveways, so cars are slowing down the traffic on Euclid Ave. to pull into centers. This means pedestrians walking on the sidewalk have to be very careful of cars pulling in and out of centers.
- At the SW and SE corners of Market St. and Euclid Ave. intersection, there needs to be two curb cuts, so wheelchairs don't have to pull into the middle of the intersection and then choose which way to cross (Figure 3).
- There is no bike lane along Euclid Ave., so we did see one bicyclist on the sidewalk.
- The sidewalk is also under construction on Euclid Ave. near the trolley tracks. Pedestrians have to step into the street (Figure 4).

Figure 1. Wobbly Fence (between Naranja St. and Groveland Dr.)

Figure 2. Trash all along Euclid Ave.

SAN DIEGO COUNTY WALK AUDIT

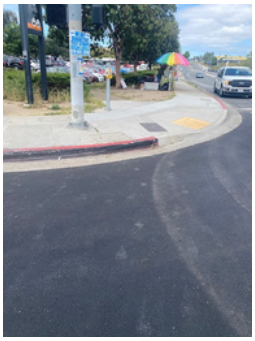


Figure 3. Needs additional curb cut (SW and SE corners of Euclid Ave./Market St.)

Figure 4. Sidewalk construction on Euclid Ave. near the trolley tracks

NOTES AND PHOTOS

- Lincoln Park serves as a major transportation hub (Euclid Avenue Station) next to several schools, health clinics, and other social services critical to the Southeastern San Diego region.
- The Malcolm X Library and Performing Arts Center is a significant community hub offering a variety of resources including books and computer access, and hosts cultural events, performances, and educational workshops.
- Lincoln Park also contains the Market Creek Plaza, a commercial and cultural center with retail stores, restaurants, and community spaces.
- Schools in the area include Lincoln High School (student population of 1,400), KIPP Adelante Preparatory Academy (student population of 321), and Chollas-Mead Elementary School (student population of 500) which serve a predominantly Hispanic and African American student population, with a significant number of students coming from low-income households.
- There is also access to healthcare services such as San Ysidro Health Euclid and Planned Parenthood, primarily serving low-income and uninsured individuals and families in the Southeastern San Diego region.

RECOMMENDATIONS

- Install curb cuts at the SW and SE corners of Market St. and Euclid Ave. intersection.
- Install a bike lane along Euclid Ave.

APPENDIX K

Site 09. Southcrest, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #9

AUDITOR NAME & ORGANIZATION

Judith Garcia, COI Community Council;
Deirdre Kleske, SD County HHSA;
Alondra Estrada, SD County HHSA;
Lourdes Dovalina, SD County HHSA

AUDIT LOCATION

Southcrest, San Diego

AUDIT DATE

03/01/2024

MAP OF AREA AUDITED

S. 40th St. between Gamma St. and Alpha St., San Diego, CA 92113
Time of day 1:45 - 2:30 pm

Cesar Chavez Elementary School sits in the community of Southcrest in the southeastern section of the City of San Diego. Notable for its Southcrest Trails Park and major thoroughfares include National Ave. and S. 40th St.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- There is a 4-way stop with painted crosswalks at the intersection of S. 40th St. and Alpha near the entrance of Cesar Chavez Elementary School
- Heading westbound on Alpha St., from the corner of Alpha St. & S. 40th St., there is a crosswalk mid-block with a radar speed sign placed ahead to alert cars to slow down

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- School crosswalks are very sparse on S. 40th St. If students don't use the crosswalk directly in front of the school at S. 40th St. & Alpha St., they must walk two blocks (about 0.2 miles) up a hill to get to the next crosswalk at the intersection of S. 40th St. & Gamma St. As a result, students are seen crossing S. 40th St. mid-block on their way to and from school (Figure 1).
- North of S. 40th St. is a hill, increasing the speed of cars traveling from Gamma St. to Alpha St. without any signs announcing a school zone. The hill also hides the visibility of the school and pedestrians. The 25mph speed limit signs are not very close to the school on S. 40th St. (Figure 1).
- At the intersection of S. 40th St. & Gamma St., there are unlabeled crosswalks (Figure 2).

Figure 1. No mid-block crosswalks on S. 40th St. between Alpha St. & Gamma St.

Figure 2. Unlabeled crosswalks at the intersection of S. 40th St. & Gamma St.

SAN DIEGO COUNTY WALK AUDIT

- The crosswalks on S. 40th St. & Alpha St. in front of the school do not have pedestrian crossing road signs (Figure 3).
- School signs are present only on Alpha St. along with a speedometer in an area that is far from the school's one entrance/exit.
- At the corner of S. 40th St. and Z St., the curb ramp needs maintenance and the gutter area has an exposed pipe (Figure 4).
- Multiple cars were seen parked illegally obstructing traffic, in handicapped parking with no placard, or in the 15-minute green zones for more than the allotted time, making illegal U-turns in the middle of the street (Figure 5).
- A tree shades one of the crosswalks at the intersection of S. 40th St. & Alpha St. in the afternoon. Cars turning into this intersection don't easily see pedestrians on the shaded crosswalk and sometimes come very close to pedestrians (Figure 6).
- Some vehicles park in the red zone, obstructing the sight of drivers coming from up the hill on S. 40th St. (Figure 7).

Figure 3. Crosswalk in front of Cesar Chavez Elementary without pedestrian crossing road sign

Figure 4. Curb ramp at the corner of S. 40th St. & Z St. needs maintenance

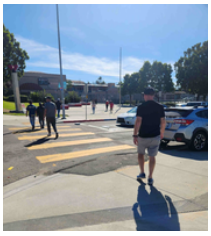


Figure 5. Car on the right parked partially on the sidewalk

Figure 6. Shaded crosswalk on S. 40th St. & Alpha St. makes it difficult for cars to see crossing pedestrians

Figure 7. Vehicle parked in the red zone and obstructing the sight of drivers in observing crossing pedestrians

NOTES AND PHOTOS

- Cesar Chavez Elementary serves 355 students ranging from PreK-5 and is across from Southcrest Park, which holds the Southcrest Recreation Center and Southeastern Little League.
- A parent mentioned that she now leaves her baby at home when she walks her 3 year old child to school because she is scared to take the baby in the stroller as they have almost been hit. multiple times by cars. She also stated that the cars will honk at pedestrians and go, even when it is the pedestrian's right of way. The parent also mentioned that San Diego Police Dept. used to patrol the area of Alpha St. but has not been around for months.
- Another parent mentioned unsafe crossing for children and families and mentioned a pothole close to a crosswalk.
- Coming down the hill from Gamma St. to Alpha St. on S. 40th St., two dogs bark at pedestrians – one on either side of the street. One is a large German Shepherd behind a wood fence. The other is a smaller dog but since the page-fenced yard is elevated and directly adjacent to the sidewalk, the dog barks at about head level for an adult.

SAN DIEGO COUNTY WALK AUDIT

RECOMMENDATIONS

- Add at least one crosswalk with pedestrian crossing road signs along S. 40th St. between Alpha St. and Gamma St. to prevent children and families from crossing the street mid-block, especially since S. 40th St. is on a hill.
- Add a speedometer on S. 40th St.
- Install pedestrian crossing road signs at the main school intersection of S. 40th St. & Alpha St.
- Label crosswalks at the intersections 1-2 blocks away from the entrance/exit of the school, including the intersection between S. 40th St. and Gamma St.
- Fix and maintain sidewalks leading to Cesar Chavez.

APPENDIX L

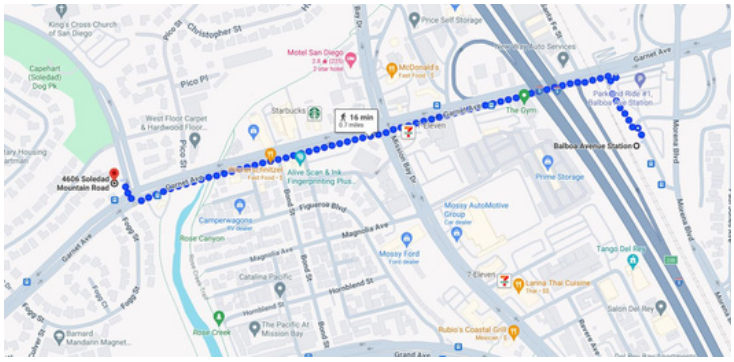
Site 10. Balboa Ave., Transit Center, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #10

AUDITOR NAME & ORGANIZATION	AUDIT LOCATION	AUDIT DATE
Carlos Rojas, Community Resident	Balboa Ave. Transit Center, San Diego	02/22/2024

MAP OF AREA AUDITED



Garnet Ave. between Soledad Mountain Rd. and Balboa Ave. (Balboa Ave. Transit Center), Pacific Beach, San Diego, CA 92109

Garnet Ave. serves as a vital route to multiple neighborhoods in San Diego including Pacific Beach, La Jolla, and Clairemont. It is also a popular route to and from school, including Mission Bay High School, La Jolla High School, and Toler Elementary School.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- Walking westbound along Balboa Ave. from the Balboa Ave. Transit Center, cars are seen driving about 50 MPH past pedestrians without a sidewalk-street buffer (Figure 1).
- At the pedestrian crossing for the I-5 eastbound Balboa Ave. exit, cars do not always respect the “No Right on Red” sign (Figure 2).
- The I-5 underpass sidewalk that connects Balboa Ave. to Garnet Ave. is filled with debris and very narrow sidewalks, especially for pedestrians walking in opposite directions. There is also poor overhead lighting, and the underpass gets very dark at night (Figure 3).
- Entrances and exits to businesses including “The Gym” along Garnet Ave. become a safety hazard for pedestrians as cars attempt to quickly merge onto Garnet Ave. without looking out for pedestrians (Figure 4).
- Crossing the busy intersection of Garnet Ave. and Mission Bay Dr. is dangerous for pedestrians who have to watch out for incoming traffic encroaching the sidewalk turning right from Mission Bay Dr. toward Balboa Ave. and those turning right from Garnet Ave. onto Mission Bay Dr. (Figure 5).
- The bridge over Rosa Creek contains a narrow sidewalk that poses another safety hazard (Figure 6).

Figure 1. Balboa Ave. Transit Center splits the busy streets of Balboa Ave. & Garnet Ave.

Figure 2. Cars exiting I-5 E Balboa Ave. exit do not respect crosswalks

Figure 3. 1-5 underpass on Garnet Ave. contains narrow sidewalks, debis, and poor lighting

SAN DIEGO COUNTY WALK AUDIT

Figure 4. Cars merging onto Garnet Ave. heading eastbound sometimes disregard pedestrians

Figure 5. Intersection between Garnet Ave. & Mission Bay Dr. experiences heavy congestion

Figure 6. Narrow sidewalk on Rose Creek bridge

NOTES AND PHOTOS

- The segment of Garnet Ave. that intersects with Interstate-5 and Mission Bay Dr. serves as a crucial link in San Diego's transit network, connecting Pacific Beach with adjacent neighborhoods, schools, and parks.
- The Balboa Ave. Transit Center, which includes the Balboa Ave. trolley stop, is a popular stop for commuters and sits on the east side of the I-5.
- Garnet Ave. experiences significant vehicular traffic, especially during peak hours and tourist seasons, with heavy congestion at its intersection with Mission Bay Dr.
- Pedestrians fear for their safety walking along Garnet Ave. toward Mission Bay Dr. from the Balboa Ave. Transit Center as cars reach high speeds around 50 mph without a sidewalk buffer
- This segment of Garnet Ave. does not contain bike lanes.
- Sidewalks along this route are described as narrow, dirty, without vegetation, and uninviting to pedestrians.
- Though the Balboa Ave. Transit Center is a very popular trolley stop, very few pedestrians walk down Garnet Ave. to reach destinations within Pacific Beach.
- Commuter recounts having to walk on grass and cut through business driveways to avoid fast traffic going eastbound on Garnet Ave.
- This is a popular route to several schools in the area including Mission Bay High School (student population of 1,190), La Jolla High School (student population of 1,350), and Toler Elementary School (student population of 250).

RECOMMENDATIONS

- Pedestrians need a convenient, safe, and attractive route to reach Mission Bay Park and Pacific Beach.
- Bikes should be encouraged with major modifications to road layout and shoulders.
- Sidewalk buffers can provide a sense of relief to pedestrians walking along a high-speed road like Garnet Ave.

For more information or questions about this walk audit, please reach out to the San Diego County Childhood Obesity Initiative via email at sd-coi@ucsd.edu

APPENDIX M

Site 11. Otay Mesa, San Diego

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #11

AUDITOR NAME & ORGANIZATION

Maritza Chavarin, RLA Otay Mesa
Blanca Rodriquez, RLA Otay Mesa
Becky Lowe, RLA Otay Mesa

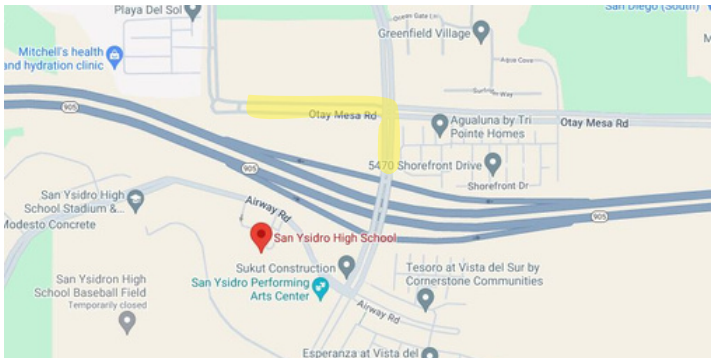
AUDIT LOCATION

Otay Mesa, San Diego

AUDIT DATE

02/29/2024

MAP OF AREA AUDITED



Otay Mesa Rd. between Caliente Ave. & Sea Fire Point, San Diego, CA 92154

Primary focus on a small segment on Otay Mesa Rd.

Otay Mesa is situated east of San Ysidro in the southeastern part of San Diego near the US-Mexico border.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- Otay Mesa Rd. is a concern for the community because students from San Ysidro High School walk to and from school through Otay Mesa Rd.
- Starting at the corner of Otay Mesa Rd. & Caliente Ave. and heading toward Sea Fire Point, there are no sidewalks and students are forced to walk on the street (Figure 1 and 2).

Figure 1. Students walking home from school in the street on Otay Mesa Rd. between Caliente Ave. & Sea Fire Point.

Figure 2. No accessible sidewalk for pedestrians walking on Otay Mesa Rd. from Caliente Ave.

- At the intersection of Otay Mesa Rd. & Caliente Ave., the crosswalks are faded and not properly labeled, which does not help to control the speed of traffic (Figure 3).

Figure 3. Crosswalks on intersection between Caliente Ave. & Otay Mesa Rd. need to be repainted.

SAN DIEGO COUNTY WALK AUDIT

NOTES AND PHOTOS

- Otay Mesa is split from San Ysidro by the I-805 and is home to the Otay Mesa Port of Entry.
- The community of Otay Mesa is characterized by its industrial and commercial development, with extensive warehouse and distribution facilities, manufacturing plants, and business parks.
- While Otay Mesa is well-connected to major highways such as the I-805, SR 905, and SR 125, it's residential development is generally less dense with more open space and undeveloped land.
- San Ysidro High School has a population of about 2,400 students and is located off the SR 905 on a spacious piece of land with several trails.
- Due to a majority of residential neighborhoods being on the other side of the SR 905, some San Ysidro High School students walk long distances to and from school.
- Otay Mesa Rd. is a popular route that many San Ysidro High School students take to and from school, however, a segment of Otay Mesa Rd. does not contain a proper sidewalk.
- This segment on Otay Mesa Rd. heading towards Sea Fire Point is just an extension of the road and what would be the sidewalk is covered by dense shrubs.
- Rather than taking a longer alternative route, students are subject to walking on the road alongside cars heading toward them without a buffer.
- By having well-designed streets and fixing existing active transportation infrastructure, the Otay Mesa community would be safer when driving or walking in this area.

RECOMMENDATIONS

- Install a proper sidewalk that connects the rest of Otay Mesa Rd. to Caliente Ave.
- Adding traffic-calming measures as vehicles on Otay Mesa Rd. approach Caliente Ave.
- Repaint crosswalks on the intersection of Otay Mesa Rd. & Caliente Ave.

APPENDIX N

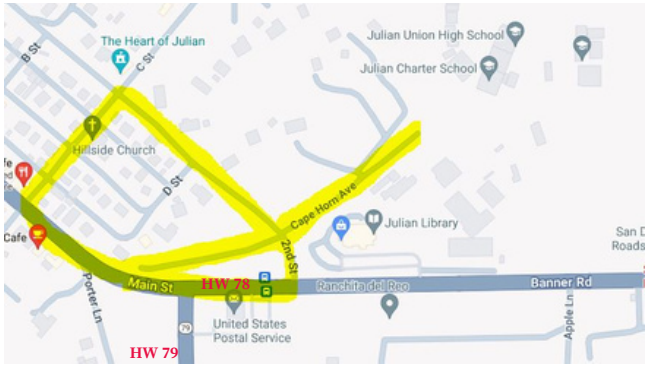
Site 12. Julian, Unincorporated County

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #12

AUDITOR NAME & ORGANIZATION	AUDIT LOCATION	AUDIT DATE
Bonnie Beckman Spear, COI Community Council; Group of Julian moms	Julian, Unincorporated	03/06/2024

MAP OF AREA AUDITED



Within the boundaries of C St. & Cape Horn Ave. and 2nd St. & CA-78 in Julian, CA 92036

Primary focus on routes to Julian Elementary, Julian Charter School, and Julian Union High School, which together sit on the edge of town on a hill.

Julian is a town located in the Cuyamaca Mountains of San Diego County known for its apple farming and historic Gold Rush era past.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- There are 25 mph speed signs in both directions on CA-78 leading up to the intersection of CA-78 & 2nd St. indicating a school zone, however not every car respects this speed limit.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- There are three main routes from Julian Elementary School into town. The first route is heading up 2nd St. toward C St. from the corner of 2nd St. & Cape Horn Ave., this is the least popular route since it involves going up a hill (Figure 1).
- The second route is heading down 2nd St. toward CA-78. At this intersection, students can use only one labeled crosswalk to head into town. There are no labeled crosswalks to cross the busy road of CA-78, the main road leading into town.
- Heading into town from the corner of 2nd St. & CA-78, there are no sidewalks and cars do not respect the speed limit of 25 mph. Because the high school is adjacent to CA-78, Julian Union High School students are seen walking on the road along the CA-78 (Figure 2).
- The safest route to take into town is heading down Cape Horn Ave. toward C St. from the intersection of 2nd St. & Cape Horn Ave., however, this route becomes a dirt path that is sometimes covered in mud or snow depending on the weather (Figure 3 and 4).
- Once in town, there is a lack of crosswalks and 4-way stop intersections, such as at the intersection of Main St. & C St. and Main St. & B St. (Figure 5).

Figure 1. Three routes to take into town from school that branch out from Cape Horn Ave. (going up or down 2nd St. or going straight through a dirt path)

Figure 2. Some students walk along the narrow edge of CA-78 to get to and from school

SAN DIEGO COUNTY WALK AUDIT

Figure 3. Mud and puddles on the dirt path on the way to school on Cape Horn Ave.

Figure 4. Another view of the dirt path that leads into town toward C St.

Figure 5. The intersection of Main St. & C St. does not contain a 4-way stop or labeled crosswalks.

BACKGROUND NOTES AND PHOTOS

- Julian is a rural unincorporated town in eastern San Diego County that is surrounded by mountains, forests, and meadows with a population of over 1,700 according to the 2020 Census.
- Located at the edge of town, the schools of Julian together serve about 580 students and include Julian Elem., Julian Union High School, Julian Charter School, and Julian Junior High School.
- Some high school students who take the route along the CA-78 to school are seen “playing” by pushing one another into the traffic lane.
- The only 4-way stop intersection that exists in the town of Julian is at the intersection of Main St. & CA-79.
- The poor walkability in the town of Julian discourages locals from conducting walk audits because it feels unsafe walking with children, particularly on busy days.

RECOMMENDATIONS

- Install radar speed signs on CA-78 at the school zone near the intersection of CA-78 & 2nd St.
- Install sidewalk on CA-78 leading into town starting at the corner of CA-78 & 2nd St.
- Insert pavement on the dirt path from C St. to 2nd St. along Cape Horn Ave.
- Add more 4-way stop intersections with labeled crosswalks within the town of Julian, especially at the intersections with Main St. (including B St. and C St.).

APPENDIX O

Site 13. Wynola, Unincorporated County

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future
Facilitated by the UC San Diego Center for Community Health

SAN DIEGO COUNTY WALK AUDIT #13

AUDITOR NAME & ORGANIZATION

Bonnie Beckman, COI Community Council; Kelly Baas, Superintendent; Thomas, Staff; Kathleen, Staff

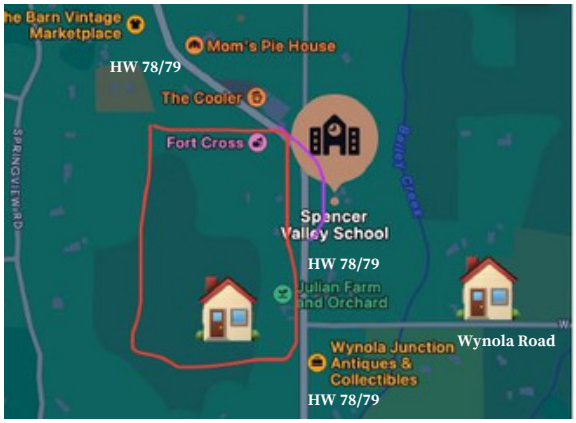
AUDIT LOCATION

Wynola, Unincorporated

AUDIT DATE

05/06/2024

MAP OF AREA AUDITED



Along CA Highway 78/79 between Orchard Lane and Wynola Road, Santa Ysabel, CA 92070

Primary focus on routes to Spencer Valley School from students' homes and frequent field trip locations.

WALKING ASSETS: WHAT IS HELPFUL TO PEDESTRIANS?

- There are school zone speed limit signs approaching Spencer Valley School from either direction on Hwy 78/79.

WALKING CHALLENGES: WHAT MAKES IT DIFFICULT OR UNSAFE TO WALK?

- The school is located at a blind curve (indicated in purple on the map above) and cars frequently pass at a high rate of speed despite posted signs (Figure 1 and 2).
- The map additionally shows approximate locations of homes students would want to walk to/from if conditions felt safe to do so.
- Speed limit sign traveling west is difficult to see behind a power pole and a sign for a local business (Figure 3).
- Speed limit is 45 mph within a two block area around the school, otherwise it is 55 mph.
- There are no stop signs, crosswalks, or sidewalks anywhere around the school, with the exception of a stop sign for vehicles exiting the school's driveway (Figure 4).

SAN DIEGO COUNTY WALK AUDIT

Figures 1 and 2. show views from the driveway where vehicles exit Spencer Valley School, particularly the blind curve toward the right.

Figure 3. shows the school zone sign traveling west.

Figure 4. shows the shoulder of the road where pedestrians can walk while cars travel past with a posted speed limit of 45 mph.

NOTES AND PHOTOS

- Santa Ysabel is an unincorporated community in the eastern part of San Diego County near the community of Julian, characterized by its agricultural activities, including cattle ranching and farming.
- Santa Ysabel serves as a gateway to various natural attractions, including the Santa Ysabel Open Space Preserve and the Cleveland National Forest.
- Spencer Valley School is a small, rural elementary school located within the Santa Ysabel area. The school provides education for grades K-8 to about 35 students and emphasizes a close-knit, community-oriented approach to education, with a focus on personalized learning and student engagement.

RECOMMENDATIONS

- Further reducing the speed limit around Spencer Valley School, including installing flashing lights to draw drivers' attention to the need to slow down.
- Widening the finished shoulder.

For more information or questions about this walk audit, please reach out to the San Diego County Childhood Obesity Initiative via email at sd-coi@ucsd.edu

SAN DIEGO COUNTY
CHILDHOOD
OBESITY
INITIATIVE

Working Together to Shape a Healthy Future

COUNTY OF SAN DIEGO
Health and Human Services Agency

LIVE WELL
SAN DIEGO

UC San Diego
ALTMAN CLINICAL & TRANSLATIONAL RESEARCH INSTITUTE

Center for
Community Health

SANDAG

Regional Vision Zero Action Plan Technical Appendix

Appendix G: At Grade Rail Crossing

Introduction

As San Diego County continues to grow, the need for efficient, safe, and sustainable transportation systems becomes increasingly important. Rail grade separations play a crucial role in enhancing safety, improving traffic flow, and supporting broader transportation goals highlighted in the 2021 Regional Plan and 2025 Regional Plan Initial Concepts.

The purpose of developing rail grade separation criteria is to prioritize development of separated crossings that most urgently require improvements, focusing on key areas such as safety, equity, traffic congestion, and overall transportation efficiency. Rail crossings can create significant bottlenecks, delaying road traffic, and increasing the potential for collisions. By implementing grade separations at critical locations, the region can reduce these delays and improve public safety for people walking, rolling, and driving.

The overall goal of this effort is to facilitate the construction of grade separation projects that offer the greatest benefits to the region. Funding considerations will be critical, and allocations will need to balance grade separations with other transportation priorities. Through this prioritization, SANDAG aims to create a more efficient transportation network for San Diego County that supports the movement of people and goods while reducing traffic congestion, improving safety, and addressing broader community needs.

Goals

In 2006, the SANDAG Cities/County Transportation Advisory Committee[1] developed regional rail grade separation prioritization criteria that's focused on congestion relief, safety and funding. The updated rail grade separation prioritization criteria adopt a more comprehensive approach. By considering safety, equity, traffic impacts, and broader community goals, the updated framework ensures that the most critical projects that reflect the community needs are prioritized. This methodology incorporates both quantitative and qualitative measures, with six overarching goals which are listed below.

Figure 1: Rail Grade Separation Goals

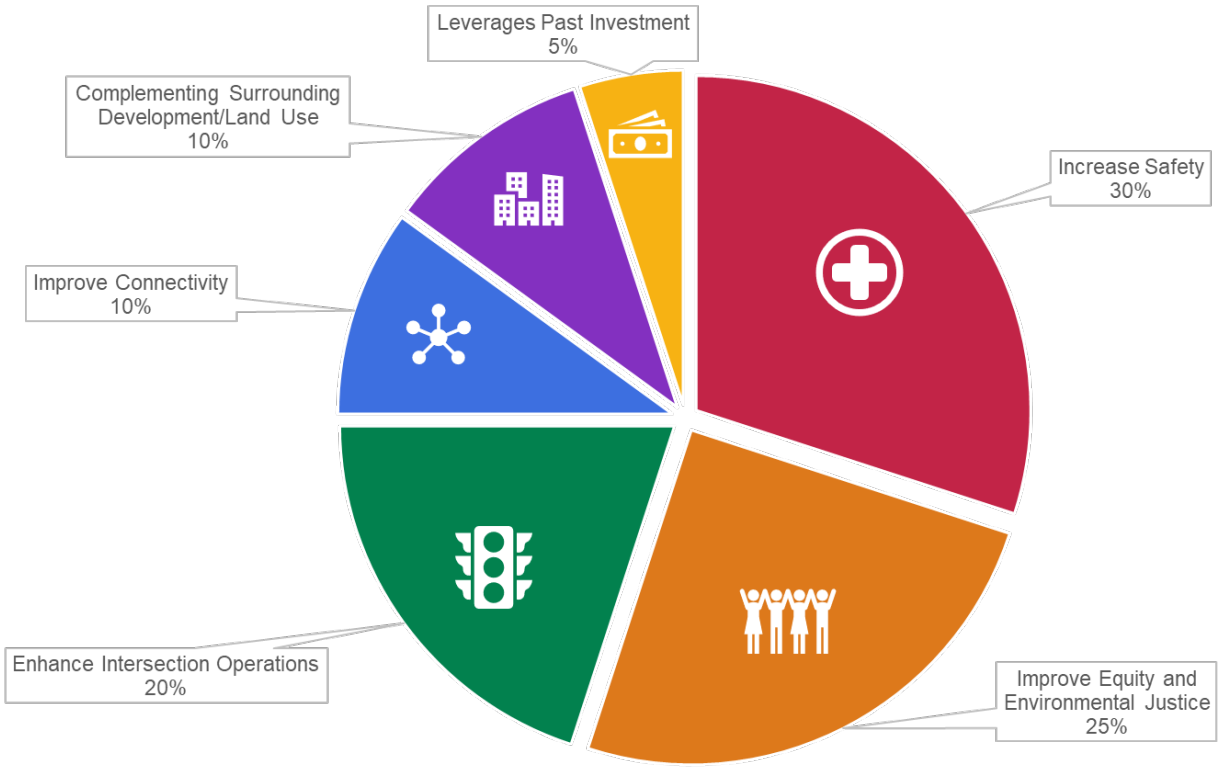
Source: SANDAG

[1] This advisory committee has since been merged with similar groups to form the Mobility Working Group.

The framework also assigns weights to each goal, ensuring an evaluation that reflects regional priorities:

- **Safety (30%)** – Reducing collisions and enhancing the safety of all users—vehicles, pedestrians, and bicyclists—remains the highest priority. Crossings with a history of accidents or high-risk factors are given special attention.
- **Equity & Environmental Justice (25%)** – Ensuring that underserved communities are prioritized among others. Vulnerable populations benefit from improved safety, connectivity, and reduced environmental impacts.
- **Traffic Flow Enhancement (20%)** – Enhancing the efficient movement of people and goods across the region. This would reduce congestion, vehicle delays, and idling times at rail crossings.
- **Improve Connectivity (10%)** – Strengthening connections between communities, transportation modes (rail, road, pedestrian, and transit), and key destinations. This goal promotes a more integrated, accessible transportation network.
- **Complement Surrounding Development (10%)** – Ensuring rail grade separation projects complement surrounding land use and development plans, promoting growth without compromising the quality of life for surrounding residents.
- **Leverage Past Investment (5%)** – Building on previous infrastructure improvements to maximize the impact of new projects, ensuring the most efficient use of resources and extending the benefits of prior investments.

Figure 2: Weights of Rail Grade Separation Goals



Source: SANDAG

Criteria

The prioritization of rail grade separation projects relies on a structured scoring system of 23 metrics designed to assess each crossing based on a variety of factors. This approach ensures that all six goals, including safety, equity, traffic flow, connectivity, surrounding development, and past investment, are considered.

Each metric is scored according to defined ranges, with quantitative and qualitative measures contributing to the overall assessment. In total, there are 17 quantitative metrics and 6 qualitative metrics, providing both numerical data and contextual insights. The scores for all metrics collectively sum to 55 points, with each project being evaluated against these benchmarks to determine its overall priority. With a blend of quantitative and qualitative metrics, each project can be evaluated holistically, with higher-priority metrics and goals receiving greater weight.

Table 1: Rail Grade Separation Scoring Metrics

ID	Goals	Metric	Description	Type
1.	Increase Safety	Fatalities and injuries	Fatalities and injuries at rail crossings (2013-2024)	Quantitative
		Incidents	Incidents at rail crossings over time	Quantitative
2.	Improve Equity and Environmental Justice	Proximity to Underserved Communities	Reduction in air and noise pollution in neighborhoods surrounding grade crossings, particularly in low-income and minority communities	Quantitative
		Proximity to Social Institutions	Includes schools, senior communities, places of worship, courthouses, libraries, parks, government facilities, shopping centers, healthcare facilities, HHSA mental health service providers, affordable housing/shelters, and food bank distribution sites (within 0.5 mi)	Quantitative
		Community Support	Elected officials or community members support for elimination or improvements	Qualitative
3.	Intersection Operation	Passenger Rail Traffic	Passenger trains per day through rail crossing	Quantitative
		Benefit to Emergency Services	Rail crossings are located near emergency services with no grade separated alternative nearby	Quantitative
		Bus Operations Impacts	Weekday MTS and NCTD bus crossings	Quantitative
		Traffic Volumes	Total 24 hrs traffic volumes of all motorized vehicles - closest road with 80 feet gets joined to the crossing, and that roadway speed limit gets assigned to the crossing.	Quantitative
		Interaction with Freight Trucks	Rail crossing located between freeway and major truck freight transfer point	Quantitative
		Pedestrian Traffic	Weekday pedestrian volumes through rail crossings - closest road with 80 feet gets joined to the crossing, and the ped counts associated with that road gets assigned to the crossing.	Quantitative
		Bike Traffic	Weekday bike volumes through rail crossings - closest road with 80 feet gets joined to the crossing, and the bike counts associated with that road gets assigned to the crossing.	Quantitative
		Crossing User Experience	Level of Traffic Stress on roads crossing through rail crossings	Quantitative

ID	Goals	Metric	Description	Type
4.	Improve Connectivity	Access to public transit	Combined ridership stops next to rail crossing (within 0.125 mi)	Quantitative
		Presence of active transportation elements	Rail crossing equipped with features like bike lanes and/or ADA-compliant facilities (within 105 ft)	Quantitative
		Access to a AAA network	Proximity to a AAA (All Ages and Abilities) network (within 0.25 mi)	Quantitative
5.	Complement Surrounding Development/Land Use	Land use suitability for rail crossing	Adjacent land use develops high activity	Quantitative
		Employment Density	Concentration of jobs within 0.25 mi of rail crossings	Quantitative
		Population Density	Concentration of people living within 0.25 mi of rail crossings	Quantitative
		Integration of grade separation with plans	Transit-Oriented development plans, General Plans, and other City adopted plans call for grade separation of rail crossings. Also includes planned bikeway, active transportation facilities, and next gen transit plans.	Qualitative
6.	Leverages Past Investment	Engineering greater than or equal to 10% design	Engineering greater than or equal to 10% design	Qualitative
		Local Funding dedicated	Local jurisdictions have set us aside funds for grade separation	Qualitative

Each metric within these categories contributes a specific point value. For example, metrics like fatalities and injuries, traffic volumes, and pedestrian and bike traffic are scored quantitatively, with detailed scoring ranges (e.g., based on counts). Qualitative metrics, such as community support, integration with local plans, and engineering progress, provide additional context to ensure that important non-quantifiable but tangential factors are also considered.

The final scores help guide the selection of the most impactful projects for grade separation, making sure that resources are directed toward initiatives that deliver the most significant benefits across multiple criteria. The updated criteria will guide the implementation of projects that deliver lasting improvements across the transportation system.

Increase Safety

Table 2 provides a summary of the data inputs for the safety criteria and lists the at grade rail crossings with the highest number of traffic safety incidents in the San Diego Region. Information on the remaining prioritization criteria can be found in the 2025 Regional Plan.

Table 2: Number of Incidents by Crossing

Street Name	Total Incidents	Fatalities	Injuries	Non-Injuries
Washington Street	7	4	2	5
Hawthorn Street	5	2	2	5
Surfrider Way	4	4	0	0
Coast Boulevard	4	3	1	2
Grand Avenue	4	3	1	2
Mission Avenue	4	2	2	4
Cassidy Street	4	2	2	4
Palm Street	4	0	1	5
Commercial Street	3	1	1	3
Sorrento Valley Boulevard	3	0	2	5
University Avenue	3	0	1	4
Commercial Street	3	0	0	3
28th Street	3	0	0	3
19th Street	3	0	0	3
Leucadia Boulevard	2	2	1	1
66th Street Ped.	2	2	0	0
Sampson Street	2	2	0	0
Naples Street	2	1	1	2
Taylor Street	2	1	1	2
Smythe Street	2	1	0	1
Grape Street	2	1	0	1
Enterprise Street	2	1	0	1
L Street	2	1	0	1
21st Street	2	0	2	4
Central Avenue	1	1	0	0
60th Street	1	1	0	0
Schley Street	1	1	0	0
West Park Avenue	1	1	0	0
Francis Street	1	1	0	0
India/Market Street	1	1	0	0
Noell Street	1	1	0	0
Carlsbad Village Station Ped.	1	1	0	0
Andreasen Drive	1	1	0	0
Civic Center Drive	1	1	0	0
Wisconsin Avenue	1	1	0	0
Oceanside Boulevard	1	1	0	0