City of Indio
Local Roadway Safety Plan (LRSP)

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Acknowledgements

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Executive Summary

The Local Roadway Safety Plan (LRSP) is the result of a Citywide Traffic Safety Analysis identifying emphasis areas. The Plan is to be used by City staff and safety stakeholders as a guide for further safety evaluation, planning for the City's transportation network, and future CIP projects. The analysis includes types of collisions, certain locations, and notable relationships between current efforts and collision history. The LRSP also analyzes collision data on an aggregate basis as well as at specific locations to identify high-collision locations, high-risk locations, and city-wide trends and patters. The analysis of collision history on the City's transportation network allows for opportunities to: 1) identify factors in the transportation network that inhibit safety for all roadway users, 2) improve safety at specific high-collision locations, and 3) develop safety measures using the 5E's of transportation safety: Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies, to encourage safer driver behavior and better severity outcomes.

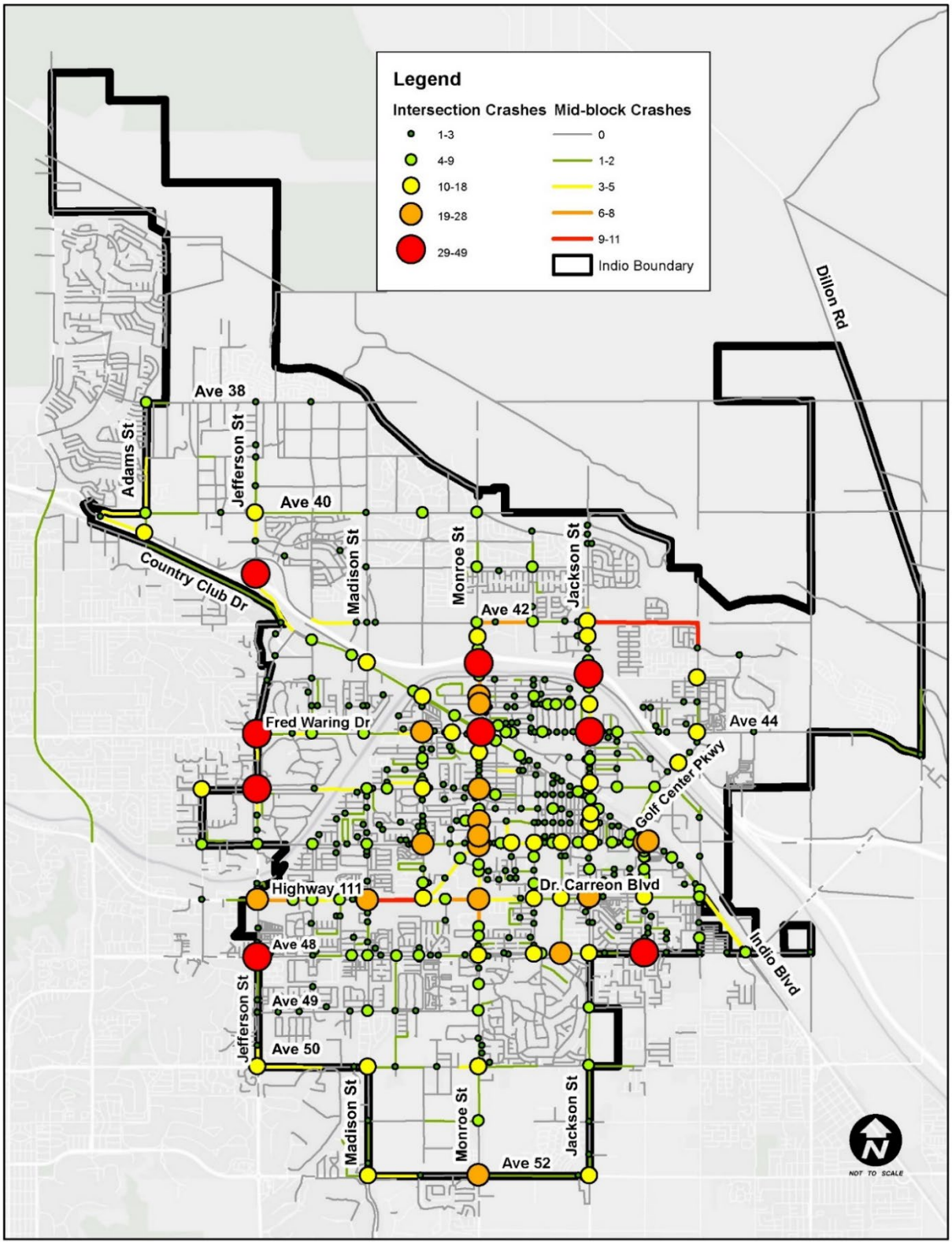
Indio has been successful at taking steps to enhance traffic safety throughout the City. This is demonstrated in its California Office of Traffic Safety (OTS) rankings which identifies the City as belonging to the top 50% tier for safety compared to peer cities in most categories. The City is continuing these safety efforts through this plan by identifying areas of emphasis and opportunities for systemic improvement that can be implemented to enhance safety. This LRSP analyzes the most recent range of collision data (January 1, 2015 to December 31, 2020) and recent roadway improvements to assess historic trends, patterns, and areas of concern.

During the LRSP development process, the City has drafted a vision for traffic safety and outlined the goals that will help mark plan success. The vision is to enhance the transportation network to achieve zero traffic fatalities and serious injury related collisions. The goals were identified as:

- Identify areas with a high risk for collisions.
- Illustrate the value of a comprehensive safety program and the systemic process.
- Plan future safety improvements for near-, mid- and long-term implementation.
- Define safety projects for HSIP and other program funding consideration.

Indio's collision history was analyzed to identify locations with elevated risk of collisions either through their collision histories or their similarities to other locations that have more active collision patterns. Using a network screening process, locations within the City that will most likely benefit from safety enhancements were identified. Using historic collision data, collision risk factors for the entire network were derived. The outcomes informed the identification and prioritization of engineering and non-infrastructure safety measures that address certain roadway characteristics and related behaviors that contribute to motor vehicle collisions with active transportation users. The map on the following page shows the results of collision analysis, including the number of collisions that occurred at each intersection and along each roadway segment in the City.

Number of Collisions at Intersections and Segments (2015-2020)



Emphasis areas were developed by revisiting the vision and goals developed at the onset of the planning process and comparing them with the trends and patterns identified in the collision analysis. Where these areas aligned, or major challenges were observed, the following emphasis areas were developed:

1. Pedestrians & Bicyclists (Vulnerable Road Users)
2. Speeding
3. Driver Safety/Education
4. Impaired Driving
5. Nighttime Collisions

The LRSP identified countermeasures for both infrastructure and non- infrastructure improvements. The report then applies Collision Modification Factor's (CMFs), which are used to estimate the safety effects of safety improvements to compare and prioritize the improvements. This provides a planning level cost/benefit estimate that the City can use to prioritize improvements.

Site-specific opportunities for improvement were identified for the following 10 case study locations. The case study locations were chosen to be representative of the corridor and intersection designs throughout the City.

1. Segment: Highway 111 (Clinton St to Monroe St)
2. Segment: Monroe St (Fred Waring Dr to Highway 111)
3. Segment: Monroe St (Doctor Carreon Bl to Ave 48)
4. Segment: Fred Waring Dr (Madison St to Clinton St)
5. Segment: Jefferson St (Ave 39 to Varner Rd)
6. Segment: Valencia Ave (Monroe St to Arabia St)
7. Signalized Intersection: Ave 44 & Jackson St
8. Signalized Intersection: Monroe St & Doctor Carreon Bl
9. Unsignalized Intersection: Highway 111 & Calhoun St
10. Unsignalized Intersection: Indio Bl & Sun Gold St

The report also identifies opportunities that can be implemented systemically throughout the City. These opportunities were assembled into the "countermeasure toolbox" shown in the tables on the following pages and include both engineering-based and non-engineering countermeasures. Additionally, this information can be used to help the City to apply for future grants and other funding opportunities to implement these safety improvements.

City-wide Countermeasure Toolbox (Engineering Opportunities)

COUNTERMEASURE	LRSM/CMF ID	CRF	20-YEAR COST ESTIMATE	PER UNIT
Install signal; includes signal warrants	NS03	30%	$ 270,000	per intersection
Convert intersection to roundabout (from 2-way stop or yield control)	NS05	35%	$ 1,100,000	per intersection
Install/upgrade larger or additional stop signs/other intersections warning/regulatory signs (stop signs with LED borders)	NS06	15%	$ 1,500	per sign
Install flashing beacons at Stop-Controlled intersections	NS08	15%	$ 3,000	per beacon
Install splitter-islands on the minor road approaches	NS13	40%	$ 20,000	per intersection
Create direction median openings to allow/restrict left-turns and U-turns (right-in/right-out)	NS15	50%	$ 15,000	per structure
Install raised medians (refuge islands)	NS19PB	45%	$ 25,000	per intersection
Install/upgrade pedestrian crossing at uncontrolled locations	NS20PB	25%	$ 22,000	per intersection
Install/upgrade pedestrian crossing at uncontrolled locations	NS21PB	35%	$ 10,000	per intersection
Add segment lighting	R01	35%	$ 50,000	per mile
Install dynamic/variable speed warning systems	R26	30%	$ 16,000	per sign
Install edge-lines and centerlines	R28	25%	$ 8,000	per mile
Install green paint in bicycle lanes	R32PB	35%	$ 15,000	per intersection
Install Rectangular Rapid Flashing Beacon (RRFB)	R37PB	35%	$ 50,000	per intersection
Install retroreflective backplates	S02	15%	$ 12,000	per intersection
Update signal heads to meet current standards	S02	15%	$ 12,000	per intersection
Improve signal timing (coordination, phasing, red, yellow, operation)	S03	15%	$ 8,000	per intersection
Install advanced dilemma zone detection	S04	40%	$ 34,000	per intersection
Provide protected left-turn phase	S07	30%	$ 40,000	per intersection
Install raised pavement markers and striping (Through Intersection)	S09	10%	$ 22,000	per intersection
Install flashing beacons as advanced warning	S10	30%	$ 3,000	per beacon

COUNTERMEASURE	LRSM/CMF ID	CRF	20-YEAR COST ESTIMATE	PER UNIT
Create directional median openings to allow (and restrict) left-turns and U-turns (S.I.)	S14	50%	$ 15,000	per structure
Install improved pedestrian crossing	S18PB	25%	$ 50,000	per intersection
Install striping to address parked car collisions	-	5%	$ 12,000	per location
Change intersection geometry to reduce intersection skew	-	5%	$ 70,000	per intersection
Set up speed enforcement zone	-	5%	$ 5,000	per location
Update striping to ensure parked cars have sufficient clearance from driveways	-	5%	$ 1,500	per mile
Implement school zone enforcement	-	5%	$ 3,000	per intersection
Convert 12-ft lanes to 11-ft lanes	7825	24%	$ 12,000	per mile

City-wide Countermeasure Toolbox (Non-Engineering Opportunities)

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
ENFORCEMENT		
Establish enforcement and visibility program for aggressive driving	Local law enforcement; CHP	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Continued enforcement in school zones	Local law enforcement; CHP; school districts; CVAG; SCAG	Obtain grant funding for additional personnel in school zones
Increased enforcement of safe driving & active transportation behaviors near busy crosswalk locations	Local law enforcement; CHP	Obtain grant funding for additional enforcement near high pedestrian activity locations
EDUCATION		
Campaign to target aggressive driving and DUIs	Local law enforcement; CHP; California Office of Traffic Safety (OTS)	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Bicycle and pedestrian safety campaign	Local law enforcement; CVAG; SCAG	SCAG's 'Go Human' Campaign; ' OTS' 'Ride with Traffic' campaign Planned educational events at high activity locations such as future CV Link locations
Explore safe routes to school education grants to expand program	Local school districts; local law enforcement; CVAG; SCAG	Safe Routes to School Program, funded by Caltrans
Coordinate safety education campaigns with CVAG	CVAG; SCAG; local law enforcement	Coordination of new safety education with new CVAG projects such as CV Link or CV Sync Roadway safety fairs at schools

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
		Education campaign for aging drivers
EMERGENCY SERVICES		
Continue to work on interdepartmental communication between City staff and City police department and fire department	Local law enforcement & fire department	Incorporate law enforcement/fire department as stakeholders on transportation improvement projects
Incorporate public health agencies and fire departments as stakeholders in safety projects	Local public health agencies and fire departments	Adjust safety project development processes to include public health and fire department feedback
EMERGING TECHNOLOGY		
Continue to use best practices for pedestrian crossings at high pedestrian traffic areas	City Public Works; CVAG; Caltrans	Continuously update pedestrian crossing design standards in accordance with latest best practices
Utilize new data sources to monitor traffic conditions and inform County safety plans	City Public Works; CVAG; Caltrans	Utilization of data from forthcoming CVAG Regional Traffic Management Center (RTMC)

An evaluation and implementation plan was created that identifies actionable items that will help the City achieve the goals and vision set out in this report. This section laid out next steps for the City to continue to capitalize on the analysis and information provided in this report.

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1 Introduction

Indio is a key economic engine of the Coachella Valley due to its abundance of retail and hospitality attractions, as well as several world-famous events such as the Coachella and Stagecoach music festivals. The City has a growing population of around 89,100 residents with nearly 1.4 million yearly visitors. The population pressures, along with general tourists and festival attendees creates layers of tension and complexity for the transportation network.

This Local Roadway Safety Plan (LRSP) identifies emphasis areas to focus and guide further safety enhancements to the City's transportation network. The LRSP analyzes collision data on an aggregate basis as well as at specific locations to identify high-collision locations, high-risk locations, and city-wide trends and patterns. The analysis of collisions throughout the City's transportation network provided the opportunity to: 1) identify factors in the transportation network that inhibit safety for all roadway users, 2) improve safety at specific high-collision locations, and 3) develop safety measures using the five E's of safety: Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies to encourage safer driver behavior and reduced collision severities.

The process and analysis performed for the City's LRSP is described in this document. The plan includes a vision and associated goals for safety, collision history analysis, and specific emphasis areas that represent the most challenge for safety in the City. The plan provides a foundation for decision making and prioritization for safety countermeasures and projects that enhance safety for all modes.

Indio has been successful at taking steps to enhance safety for all modes throughout the City. This is supported by their California Office of Traffic Safety rankings identifying it amongst the top 50% tier for safety as compared to peer cities in most categories. The City is continuing these systemic safety efforts through this plan by identifying areas of emphasis and opportunities for systemic improvement that can be implemented to enhance safety. This LRSP analyzes the most recent 6-year period of available collision data (January 1, 2015 – December 31, 2020) and roadway improvements to assess historic trends, patterns, and areas of elevated collision activity.

The intent of the LRSP is to:

- Create a greater awareness of road safety and risks
- Reduce the number of fatal and severe-injury collisions
- Develop lasting partnerships
- Support for grant/funding applications, and
- Help prioritize investments in traffic safety.

2 Vision and Goals

The Indio LRSP evaluates the transportation network as well as non-infrastructure programs and policies within the City. Mitigation measures are evaluated using criteria to analyze the safety of road users (drivers, bicyclists, and pedestrians), the interaction of modes, influences on the roadway network from adjacent municipalities, and the potential benefits of safety countermeasures. This effort is intended to use historical data to identify trends and develop a toolbox of countermeasures applicable to conditions in the City that can be used for proactive identification and implementation of opportunities, without relying solely on a reaction and response to collisions as they occur.

LRSPs have been effective across the country as part of the effort to reduce fatal and severe-injury collisions because they provide a locally developed and customized roadmap to directly address the most common safety challenges in the given jurisdiction. Consistent with these findings, the following Vision, Goals, and Objectives have been established for this project.

VISION:	To enhance the transportation network to achieve zero traffic fatalities and serious injury related collisions.

Goal #1: Identify areas with a high risk for collision.

Objectives:

- Identify intersections and segments that would most benefit from mitigation.
- Identify areas of interest with respect to safety concerns for vulnerable users (pedestrians and bicyclists).

Goal #2: Illustrate the value of a comprehensive safety program and the systemic process.

Objectives:

- Demonstrate the systemic process' ability to identify locations with higher risk for collisions based on present characteristics closely associated with severe collisions.
- Demonstrate, through the systemic process, the gaps and data collection activities that can be improved upon.

Goal #3: Plan future safety improvements for near-, mid- and long-term.

Objectives:

- Identify safety countermeasures for specific locations (case studies).
- Identify safety countermeasures that can be applied city-wide.

Goal #4: Define safety projects for future HSIP and other program funding consideration.

Objectives:

- Create the outline for a prioritization process that can be used in this and forth-coming cycles to apply for funding.
- Use the systemic process to create Project Case Studies.
- Use Case Studies to apply for HSIP funding consideration.

3 Process

Providing safe, sustainable, and efficient mobility choices for their residents and visitors is a primary goal for the City and its safety partners. The City will continue its collaboration with safety partners to identify and discuss safety issues within the community through the development of the LRSP and its implementation.

Guidance on the LRSP process is provided at both the national (Federal Highway Administration, *FHWA*) and state (California Department of Transportation, *Caltrans*) level.

FHWA encourages:

- The establishment of a working group (Stakeholders) to participate in developing an LRSP.
- Review collision, traffic, and roadway data to identify areas of concern.
- Establish goals, priorities, and countermeasures to identify possible improvements at spot locations, systemically, and comprehensively.

Caltrans guidance includes:

- Establish leadership
- Analyze the safety data
- Determine emphasis areas
- Identify strategies
- Prioritize and incorporate strategies
- Evaluate and update the LRSP

This LRSP documents the results of data and information obtained, including the preliminary vision and goals for the LRSP, existing safety efforts, initial collision analysis, and resulting emphasis areas. The identification of opportunities to enhance safety presented in this LRSP are connected to the five E's of traffic safety defined by the California Strategic Highway Safety Plan (SHSP): Engineering, Enforcement, Education, Emergency Response, and Emerging Technologies throughout its process.

3.1 Guiding Manuals

The following section describes the analysis process undertaken to evaluate safety within Indio at a systemic level. Using a network screening process, locations within the City that will most likely benefit from safety enhancements will be identified. Using historic collision data, collision risk factors for the entire network were documented. The outcomes will inform the identification and prioritization of engineering and non-infrastructure safety measures that address certain roadway characteristics and related behaviors that contribute to motor vehicle collisions with active transportation users.

This process uses the latest National and State best practices for statistical roadway analysis described as follows.

3.1.1 Local Roadway Safety Manual (LRSM)

The *Local Roadway Safety Manual: A Manual for California's Local Road Owners* (Version 1.5, April 2020) purpose is to encourage local agencies to pursue a proactive approach to identifying

and analyzing safety issues, while preparing to compete for project funding opportunities. A proactive approach is defined as analyzing the safety of the entire roadway network through either a one-time, network wide analysis, or by routine analyses of the roadway network.[1]

According to the *Local Roadway Safety Manual* (LRSM), "The California Department of Transportation (Caltrans) – Division of Local Assistance is responsible for administering California's federal safety funding intended for local safety improvements."

To provide the most benefit and to be competitive for funding, the analysis leading to countermeasure selection should focus on both intersections and roadway segments and be considerate of roadway characteristics and traffic volumes. The result should be a list of locations that are most likely to benefit from cost-effective countermeasures, preferably prioritized by benefit/cost ratio. The manual suggests using a mixture of quantitative and qualitative measures to identify and rank locations that considers both collision frequency and collision rates. These findings should then be screened for patterns such as collision types and severity to aid in the determination of issues causing higher numbers of collisions and the potential countermeasures that could be most effective. Qualitative analysis should include field visits and a review of existing roadway characteristics and devices. The specific roadway context can then be used to assess what conditions may increase safety risk at the site and systematic level.

Countermeasure selection should be supported using Collision Modification Factors (CMFs). These factors are the peer reviewed product of before and after research that quantifies the expected rate of collision reduction that can be expected from a given countermeasure. If more than one countermeasure is under consideration, the LRSM provides guidance on how to apply CMFs appropriately.

3.1.2 Highway Safety Manual

"The AASHTO *Highway Safety Manual* (HSM), published in 2010, presents a variety of methods for quantitatively estimating collision frequency or severity at a variety of locations."[2] This four-part manual is divided into Parts: A) Introduction, Human Factors, and Fundamentals, B) Roadway Safety Management Process, C) Predictive Method, D) Collision Modification Factors.

Chapter 4 of Part B of the HSM discusses the Network Screening process. The Network Screening Process is a tool for an agency to analyze their entire network and identify/rank locations that (based on the implementation of a countermeasure) are most likely to least likely to realize a reduction in the frequency of collisions.

The HSM identifies five steps in this process:[3]

1. **Establish Focus:** Identify the purpose or intended outcome of the network screening analysis. This decision will influence data needs, the selection of performance measures and the screening method that can be applied.

[1] Local Roadway Safety Manual (Version 1.5) 2020. Page 5.
[2] AASHTO, Highway Safety Manual, 2010, Washington D.C., http://www.highwaysafetymanual.org/Pages/About.aspx
[3] AASHTO. *Highway Safety Manual.* 2010. Washington, DC. Page 4-2.

2. **Identify Network and Establish Reference Populations:** Specify the types of sites or facilities being screened (i.e., segments, intersections, geometrics) and identify groupings of similar sites or facilities.
3. **Select Performance Measures:** There are a variety of performance measures available to evaluate the potential to reduce collision frequency at a site. In this step, the performance measure is selected as a function of the screening focus and the data and analytical tools available.
4. **Select Screening Method:** There are three principle screening methods described in this chapter (i.e., ranking, sliding window, peak searching). Each method has advantages and disadvantages; the most appropriate method for a given situation should be selected.
5. **Screen and Evaluate Results:** The final step in the process is to conduct the screening and analysis and evaluate the results.

The HSM provides several statistical methods for screening roadway networks to identify high risk locations based on overall collision histories. In addition to identifying the total number of collisions, this study uses a method referred to as Critical Collision Rate to analyze the data.

3.2 Analysis Techniques

3.2.1 Collision and Network Screening Analysis

Intersections and roadways were analyzed using four collision metrics:

- Number of Collisions
- Critical Crash Rate (HSM Ch. 4)
- Probability of Specific Collision Types Exceeding Threshold Proportion (HSM Ch. 4)
- Equivalent Property Damage Only (HSM Ch. 4)

The initial steps of the collision analysis established sub-populations of roadway segments and intersections that have similar characteristics. For this study, intersections were grouped by their control type (Signalized, Unsignalized, Roundabout) and segments by their roadway category (Arterial, Collector, Minor Collector, Local). Individual collision rates were calculated for each sub-population. The population level collision rates were then used to assess whether a specific location has more or fewer collisions than expected. These sub-populations were also used to determine typical collision patterns to help identify locations where unusual numbers of specific collision types are seen.

The network screening process ranks intersections and roadway segments by the number of collisions that occurred at each one over the analysis period, and then identifies areas that had more of a given type of collision than would be expected for that type of location. These collision type factors were 1) collision injury (fatal, serious injury, other visible injury, complaint of pain, property damage only), 2) collision type (broadside, rear-end, sideswipe, head-on, hit object, overturned, bicycle, pedestrian, other), 3) environmental factors (lighting, wet roads), and 4) driver behavior (impaired, aggressive, and distracted driving). With these additional factors, the locations were further analyzed.

From the results of the network screening analyses, a short-list of locations was chosen based on collision activity, collision severity, collision patterns, location type, and area of the City of Indio to provide the greatest variety of locations covering the widest range of safety opportunities for

toolbox development. The intent is to populate the safety toolbox with mitigation measures that will be applicable to most of the collision activity in the City. Ten locations were ultimately selected for mitigation analysis.

3.2.2 Critical Crash Rate (CCR) Analysis

Reviewing the number of collisions at a location is a good way to understand the impact to society incurred at the local level but does not give a complete indication of the level of risk for those who use that intersection or roadway segment on a daily basis. The Highway Safety Manual describes the Critical Crash Rate method which provides a statistical review of locations to determine where risk is higher than that experienced by other similar locations. It is also the first step in analyzing for patterns that may suggest systemic issues that can be addressed at that location, and proactively at others to prevent new safety challenges from emerging.

The Critical Crash Rate compares the observed collision rate to the expected collision rate at a particular location based on facility type and volume using a locally calculated average collision rate for the specific type of intersection or roadway segment being analyzed. Based on traffic volumes and a weighted citywide collision rate for each facility type, a critical collision rate threshold is established at the 95% confidence level to determine locations with higher collision rates that are unlikely to be random. The threshold is calculated for each location individually based on its traffic volume and the collision profile of similar facilities.

Figure 1 – Critical Crash Rate Formula

$$R_{c,i} = R_a + \left[P \times \sqrt{\frac{R_a}{MEV_i}} \right] + \left[\frac{1}{(2 \times (MEV_i))} \right]$$

Where,

$R_{c,i}$ = Critical crash rate for intersection i

R_a = Weighted average crash rate for reference population

P = P-value for corresponding confidence level

MEV_i = Million entering vehicles for intersection i

Source: Highway Safety Manual

Data Needs

CCR can be calculated using:

- Daily entering volume for intersections, or vehicle miles traveled (VMT) for roadway segments,
- Intersection control types to separate them into like populations,
- Roadway functional classification to separate them into like populations,
- Collision records in GIS or tabular form including coordinates or linear measures.

Strengths

- Reduces low volume exaggeration
- Considers variance
- Establishes comparison threshold

3.2.3 CCR Methodology

The Process of analyzing the CCR and comparing locations (separately by intersections and segments) is a multi-step process. The following is a high-level description of the process undertaken to develop the initial ranking of locations.

The first step in the process was to establish a city-wide collision rate for each facility population. These populations are broken into two categories with sub-categories:

- Intersection:
  - Signalized
  - Unsignalized
- Roadway Classification:
  - Major Arterial
  - Primary Arterial
  - Secondary Arterial
  - Collector Arterial
  - Local

The individual collision rate for each location was then calculated based on the associated traffic volume. This volume was either collected through data count resources or calculated based on the roadway classification. The next step was to establish a Significance Threshold. This Threshold was used to determine what level of exceedance (how much the collision rate exceeded the critical collision rate) a location must have based on traffic volume to provide a high level of confidence that the collision occurring at the location is not random. For this study, a confidence level of 95% was used. The local collision rates were then compared to Significance Threshold to see if each location exceeded the expected CCR and if so, by how much. After this analysis was completed, the locations were ranked by their categories according to that level of exceedance.

3.2.4 Probability of Specific Collision Types Exceeding Threshold Proportion

The Highway Safety Manual describes the methodology for determining the probability that collision type is greater than an identified threshold proportion. This helps to identify locations where a collision type is more likely to occur.

Data Needs

The probability of a specific collision type can be determined using collisions records with location data, and classifications of the locations (intersections or segments) studied.

Strengths

- Can be used as a diagnostic tool
- Considers variance in data
- Not affected by selection bias

The HSM methodology first determines the frequency of a specific collision type at an individual location, then determines the observed proportion of that collision type relative to all collision types at that location. A threshold proportion is then determined for the specific collision type; HSM suggests utilizing the proportion of the collision type observed in the entire reference population (e.g. throughout the entire City of Indio).

These proportions are then utilized to determine the probability that the proportion of a specific collision type is greater than the long-term expected proportion of that collision type.

Figure 2 – Probability of Specific Collision Types Exceeding Threshold Proportion

$$P\left(p_i > \overline{p^*_i} \,/\, N_{observedj}, N_{observedj(TOTAL)}\right) = 1 - betadist\left(\overline{p^*_i}, a + N_{observedj}, \beta + N_{observedj(TOTAL)} - N_{observedj}\right)$$

Where:

$\overline{p^*_i}$ = Threshold proportion

p_i = Observed proportion

$N_{observed,i}$ = Observed target crashes for a site i

$N_{observed,i(TOTAL)}$ = Total number of crashes for a site i

Source: Highway Safety Manual

3.2.5 Equivalent Property Damage Only (EPDO)

The equivalent property damage only (EPDO) method is described in the Highway Safety Manual. This method assigns weighting factors to collisions based on injury level (severe, injury, property damage only) to develop a property damage only score. In this analysis, the injury collision costs were calculated for each location (based on the latest Caltrans injury costs). This figure is then divided by the injury cost for a property damage only collision. The resulting number is the equivalent number of property damage only collisions at each site. This figure allows all locations to be compared based on injury collision costs. (Highway Safety Manual, Chapter 4).

4 Safety Partners

As part of the LRSP, local stakeholders were included in the process to ensure that a diverse set of local perspectives were consistently involved in this planning effort. In addition to the Project Team which included City Staff from the Public Works Department, a stakeholder group was organized. This group consisted of members from other City Departments (Community Development, Finance, Police Department, Fire Department, Communication, and Marketing), Sunline Transit Agency, ED Desert Medical Transport, Desert Sands Unified School District, Desert Ridge Academy, Coachella Valley Unified School District, and local advocates from the Friends of CV Link and Desert Bicycle Club.

These leaders in the City and community were called together to offer insight on the safety issues present in the city's transportation network. After the initial network screening and safety analysis, the stakeholder group met to discuss potential countermeasures and challenge areas. The summary of the stakeholder meetings is outlined below.

4.1 Stakeholder Meeting #1

The first stakeholder meeting was conducted virtually on July 29, 2021. At the meeting, safety partners were introduced to the project and provided an overview of the data used, the required outputs, and the potential outcomes of the study.

In addition to the overview, Stakeholders were asked to provide local insight and knowledge at 10 case study locations that were identified after the initial network screening and collision analysis process. Potential countermeasures were identified and discussed. Additionally, potential emphasis/challenge areas were proposed during the meeting to include vulnerable users (pedestrians and bicyclists), speeders, driver safety/education, impaired drivers, and nighttime collisions.

Stakeholder feedback regarding the plan and identified safety opportunities were reviewed and incorporated into the study process for the development of the LRSP. Most of the feedback received expressed a strong desire to prioritize bicycle safety throughout the City.

4.2 Stakeholder Meeting #2

The Second Stakeholder meeting was conducted on September 29, 2021, virtually as well. During the meeting, the safety partners plus additional stakeholders and interest groups were provided with a recap of the project and the previous meeting. A presentation of the draft identified opportunities and case study sheets from the LRSP was discussed and additional feedback regarding countermeasures, funding, and general opportunities took place. This information was processed and incorporated into the LRSP.

4.3 City of Indio/SCAG 'Streets are Treats' Event

On October 30, 2021, the City of Indio held a pop-up safety demonstration in partnership with 'Southern California Association of Governments' (SCAG) 'Go Human' campaign. The event demonstrated SCAG's 'Go Human Kit of Parts' and how it can be used to build infrastructure enhancements such as crosswalks, curb extension, bicycle lanes, and parklets.

At the event, City staff distributed information about the Local Roadway Safety Plan and invited members of the public to provide input and observations about roadway safety in the City. **Appendix A** contains the feedback received at this event.

5 Existing Efforts

Existing plans, policies, and projects that were recently completed, planned, or are on-going within the City of Indio were compiled at the start of the LRSP process to gain perspective on the existing efforts for transportation-related improvements within the City. High-level key points regarding transportation improvements and safety-related topics were identified to inform decision making in this LRSP. Information reviewed included the following:

PLANS

- **Indio General Plan (2019 – Indio/SCAG)**: A long-range plan that incorporates elements such as a mobility element, future circulation plan, active transportation, and discussion of complete streets.
- **Complete Streets & Drainage Master Plan (2020 – Indio):** A strategic plan that discusses sustainable roadway priorities for bikeways, sidewalk areas, roadways, intersections, and crossings.
- **Highway 111 Corridor Specific Plan (ongoing – Indio):** A proposed strategic plan for 3.9 miles of future Highway 111 revitalization between Indio Boulevard and Jefferson Street.
- **Safe Routes to Schools (2019 – Indio/Caltrans):** A masterplan that structures the importance of safety and improvements around school within the City of Indio.
- **Better Connected Indio (2020 – Indio/KOA/Stantec):** An evaluation of possible locations to implement a Multi-Modal Hub.

PROJECTS

- **TS1301 CMAQ – Jackson Street Signal Upgrades & Synchronization (Completed April 2020):** The project scope included new traffic signal at Jackson St. & Kenner Ave., minor improvements/restriping, traffic signal synchronization and video detection.
- **ST1305 CVAG – Highway 111 From Madison to Rubidoux (Completed September 2018):** Widening and repaving of the roadway and replacing sidewalks to current ADA standards, traffic signal synchronization and video detection.
- **ST1701/1702 HSIP 7 – Signal Modifications Dr Carreon Blvd. & Oasis St., and Monroe St. from Oleander Ave. to Comet Ln. (Completed April 2021):** Replace permissive left-turns with protected left turn phases with new signal heads and mast arms, and traffic signal synchronization and video detection along Monroe Street.
- **TS1703 HSIP 8 – Pedestrian Countdown Head Timers at 21 Signalized Intersections (Completed April 2021):** A project replacing pedestrian heads with countdown timer heads at 21 intersections.

- **ST1708 HSIP 9 - Avenue 44 Road Diet (Completed February 2021 – Indio):** A project which reduced the corridor from a four-lane roadway to a two-lane facility with two-way left turn lanes, bike lanes, and space for street parking.

- **SW1801 Active Transportation Program (ATP) – Herbert Hoover Elementary School Pedestrian improvements (Planned 2022):** Sidewalk gap closure. The proposed project includes installation of new sidewalk, pedestrian access ramps, and driveway approaches along 14 streets in the community surrounding the Herbert Hoover Elementary School east of Monroe Street and north of Miles Avenue. The project also includes educational outreach to students and their families.

- **SW1802 SB821 – Avenue 42 Sidewalk Gap Closure (Completed July 2020):** Sidewalk gap closure on north side of Avenue 42.

- **ST1804 CVAG – Calhoun Street Improvements (Completed March 2019):** The project consisted of widening Calhoun Street between Capricorn Ave and Dr. Carreon Blvd. Curb, gutter, and sidewalk were added to the east side of Calhoun Street. Including restriping for two lanes each direction and center median/left turn lane and adding bicycle facilities and streetlights.

- **ST1805 CVAG – Avenue 48 Restriping (Completed April 2018):** Pavement rehabilitation and re-striping, adding buffered or class II bike lanes (depending on space availability) each side in the corridor from Jefferson Street to Jackson Street.

- **TS901 CVAG – Avenue 50 and Jackson Intersection Improvements (Planned 2022):** Project will widen Jackson north to Avenue 49 and south approximately 1000 ft, and widening Avenue 50 west approximately 1000 ft, and east to the city boundaries of Coachella. Both Streets will be widened to two lanes each direction.

- **TS2003 HSIP9 – Traffic Signal Modifications (Planned 2022):** The Project will upgrade the video and radar detection at 15 intersections to enable advance dilemma zone detection. Including the installation of new signal equipment and signal timing.

6 Data Summary

6.1 Roadway Network

The collision analysis is built upon the existing roadway network. This project uses the Caltrans California Road System (CRS) nomenclature in order to focus on the number of lanes with each designation. A comparison of the corridors was used to identify the reasonable counterpart. **Figure 3** illustrates Indio's roadway network categorized using Caltrans' Classification System. The classification assigned to each corridor roadway segment (Arterial, Collector, Minor Collector, or Local road) is used in the analysis process. Ultimately, corridors will be compared to roadway segments with similar designations.

6.2 Intersections

The collision analysis requires each intersection be classified by type: Signalized or Unsignalized. The safety analysis compares intersection safety performance to locations with similar control types. This information is also displayed in **Figure 3.**

6.3 Count Data

Vehicular count data is used as part of the analysis process to evaluate the impact of traffic and understand the natural hierarchy of the roadway network. Count data utilized for this project will be pulled from the CVAG model. For locations without volume or count data, other resources were utilized to identify a reasonable assumption for individual corridors and classification types.

6.4 Collision Data

Collision data was collected from Crossroads Software for the period from January 1, 2015 through December 31, 2020 in order to have a complete set of collision data for analysis. We utilize six-years of data instead of the minimum three to provide more history to evaluate trends or patterns. In response to the COVID-19 pandemic it was decided to include 2020 collision data in the analysis to identify any trends associated with changing roadway user behavior during the pandemic. Analysis of the collision data is the first step in understanding the specific and systemic challenges faced throughout the City. Analyzing the six years of data provided insight on the following collision trends and patterns. The locations of fatal and severe injury collisions are displayed in **Figure 4**. The density of collisions at intersections and along roadway segments is shown in **Figure 5.**

Figure 3 – Functional Classification (CRS) and Traffic Signal Locations as of May 2021

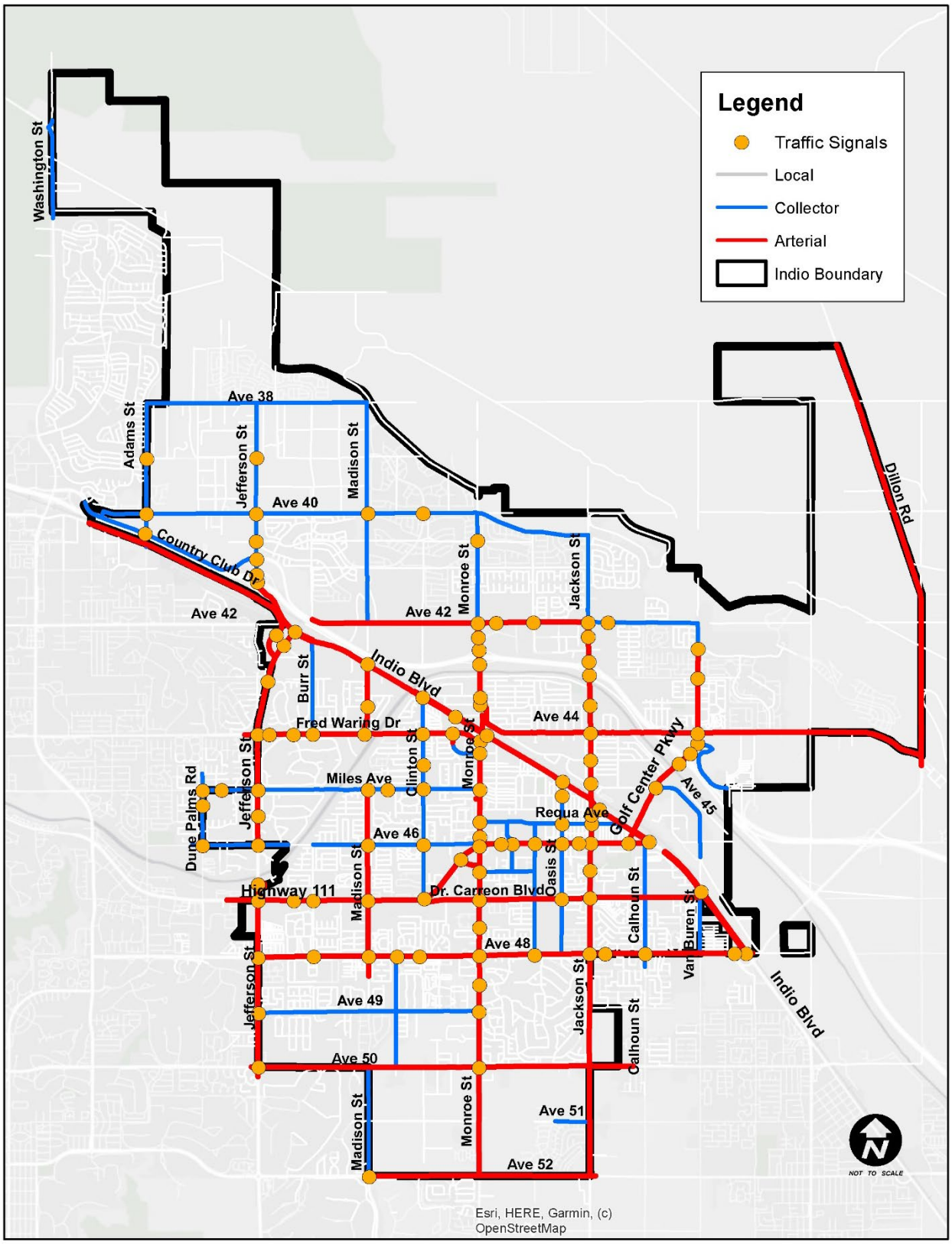


Figure 4 – Fatal and Severe Injury Collision Locations (2015-2020)

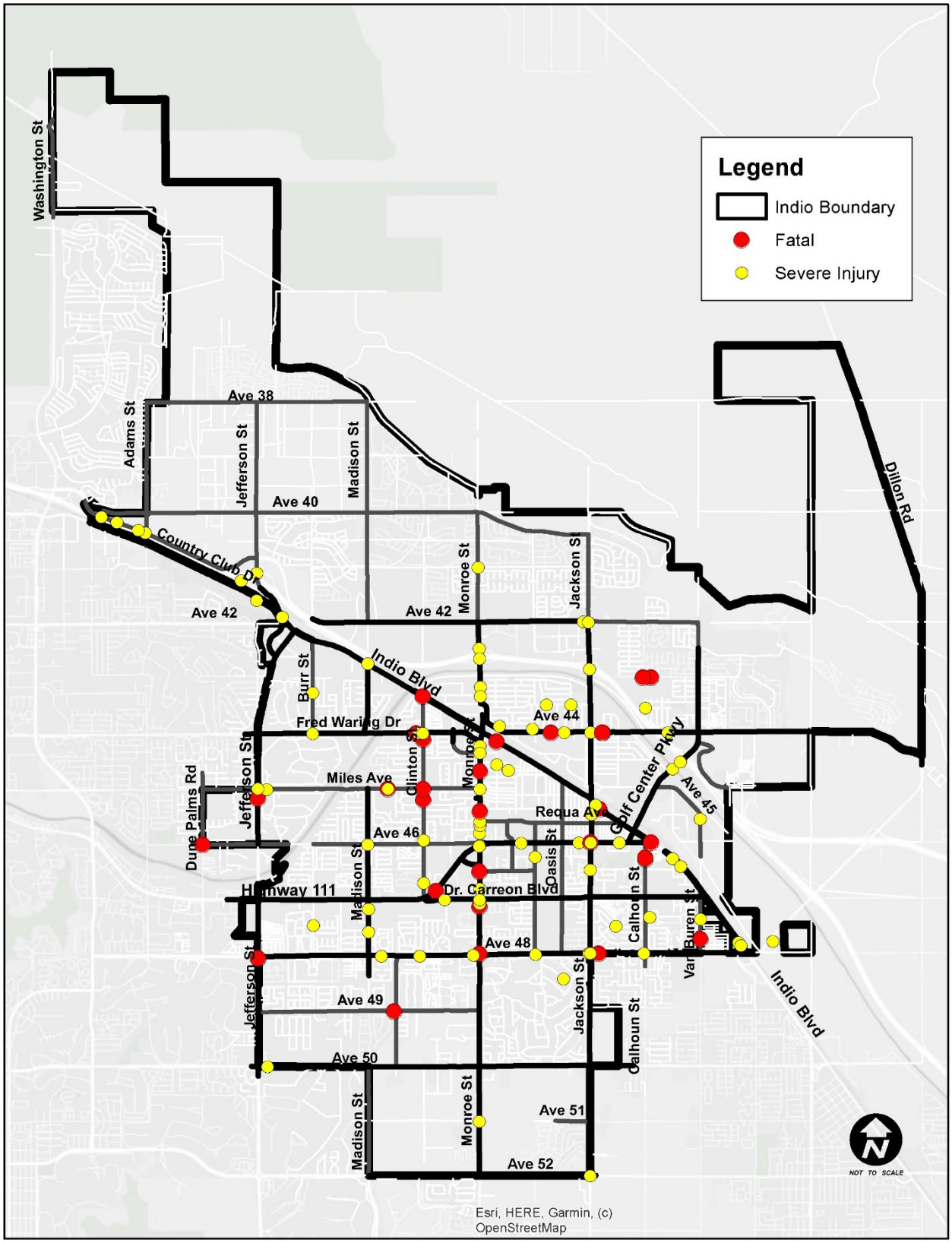
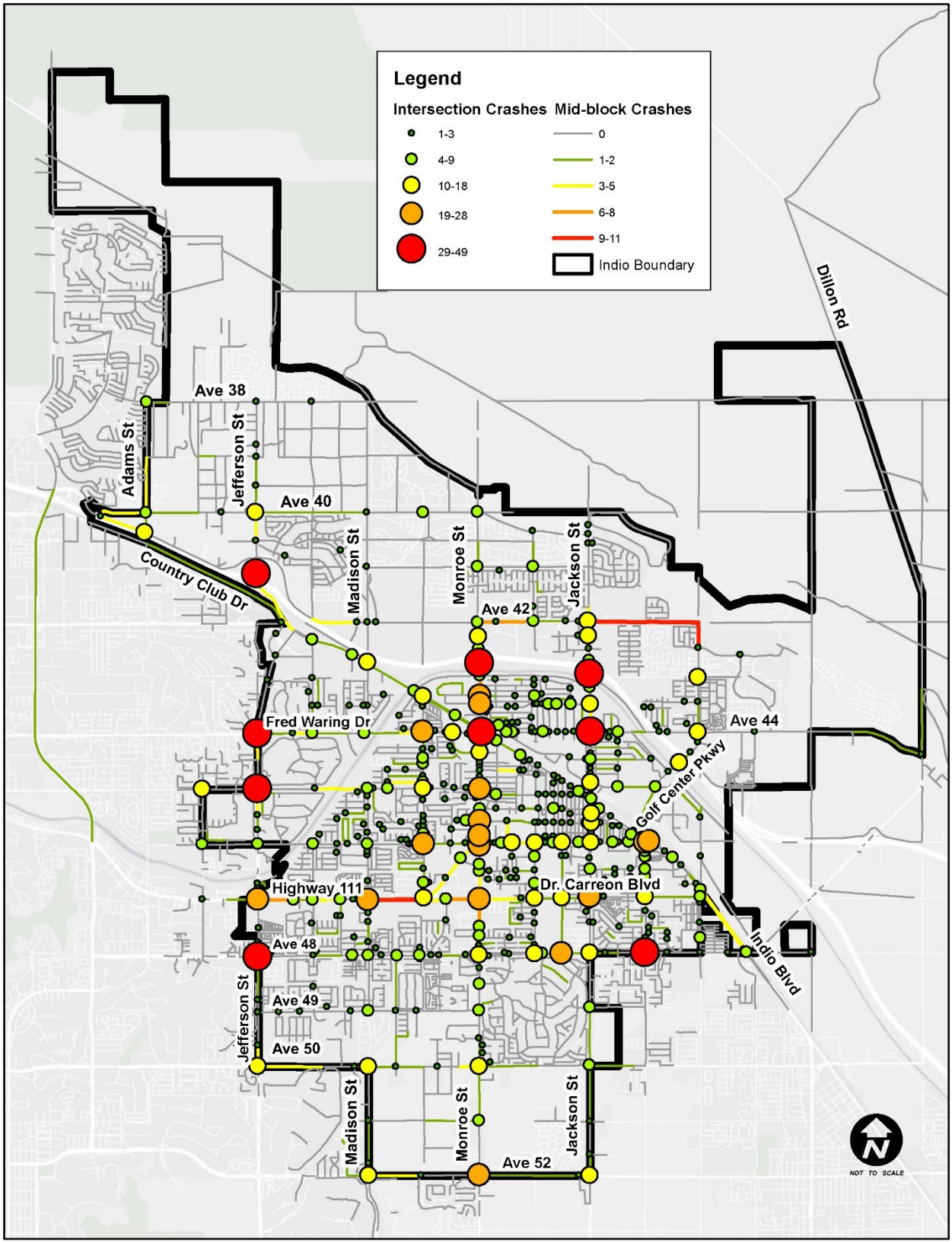


Figure 5 – Density of all Collisions at Intersections and Segments (2015-2020)



7 Collision Safety Trend

The following section breaks down the collision data by a variety of factors and user types. This information will be used to highlight areas of concern for the City.

7.1 All Collisions

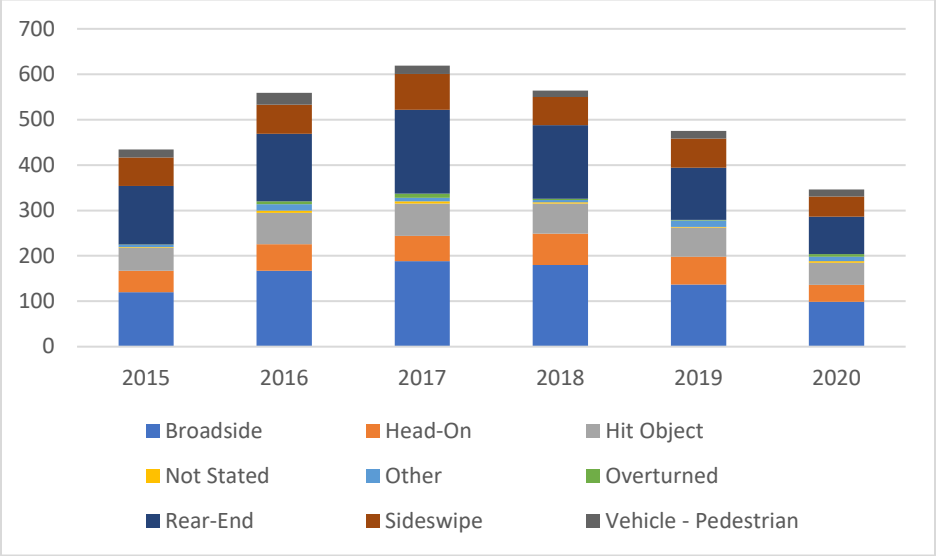
This report utilized collision data for a six-year period to provide a better understanding of trends and to reflect the patterns in collisions that have occurred on City streets. New data is added to the system in an ongoing basis which means that each time the City updates the analysis, a full 5-year draw from the database, rather than just adding records from the last query should be standard practice. Data used for this report were extracted from Crossroads Software analytics on May 18, 2021 and was current as of that date. Collision data from January 1, 2015 through December 31, 2020 as reported to Crossroads from the local enforcement indicated that during this time there were 2,997 collisions recorded within Indio and at intersections of shared jurisdiction. LRSP requirements include the most recent three years of finalized collision data which would include 2018-2020.

Table 1 – Total Collisions January 1, 2015 through December 31, 2020

Year	Count of Collisions
2015	434
2016	559
2017	619
2018	564
2019	475
2020	346
TOTAL	**2997**

During this time, the most common occurring collision types were broadside (30%) and rear-ends (27%). The next common collision type was sideswipe with 13% of collisions. The total number of collisions have been trending downward since 2017. A 4% drop is shown from 2019-2020, however, this may be impacted by changes in driving habits/behaviors during the pandemic. **Figure 6** shows the distribution of collision types during the study period.

Figure 6 – Collision Type by Year (2015-2020)



7.2 Fatalities

During the study period, 30 fatal collisions occurred, as seen in **Figure 4.** This number represents total collisions, which is different from the number of fatalities (i.e. two fatalities could occur in one collision).

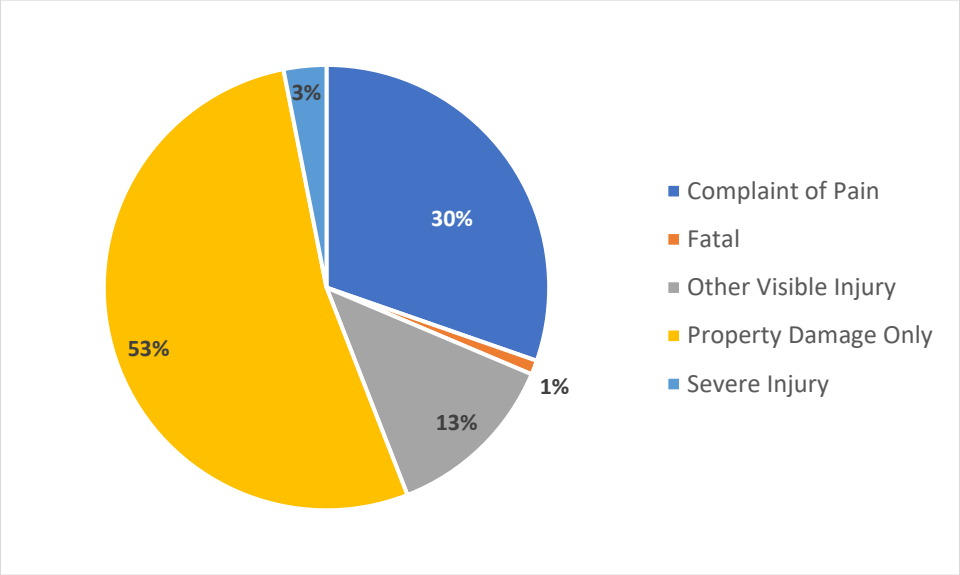
Table 2 – Fatal Collisions Categorized by modes Involved (2015-2020)

Collision Involved With	Count of Fatal Collisions
Fixed Object	3
Motor Vehicle on Other Roadway	1
Other Motor Vehicle	9
Pedestrian	17

7.3 Injury Levels

More than half of the collisions reported during the study-period resulted in property damage only (53%). Fatal and severe injury collisions accounted for 4% percent of all collisions.

Figure 7 – Collisions by Injury Levels (2015-2020)



7.4 Cause of Collision

The highest cause of collisions in Indio is unsafe speed at 22% of collisions, followed by auto right-of-way violation (19%), and improper turning (18%). Issues with traffic signals and signs also had a substantial impact on the City, comprising 13% of the collisions. This means that the officer reporting the collision indicated that due to some failure (e.g. signal outages, visibility of signage, poor maintenance, etc.) led to the collision.

Table 3 – Cause of Collisions (2015-2020)

Cause Type	Count of Collisions	% of Total
Unsafe Speed	645	22%
Auto R/W Violation	556	19%
Improper Turning	554	18%
Traffic Signals and Signs	386	13%
Driving Under Influence	263	9%
Unsafe Lane Change	127	4%
Unsafe Starting or Backing	97	3%
Following Too Closely	73	2%
Pedestrian Violation/ ROW Violation	101	3%

Cause Type	Count of Collisions	% of Total
Wrong Side of Road	39	1%
Other Hazardous Movement	29	1%
Improper Passing	16	1%
Other Than Driver or Ped	15	1%
Other Improper Driving	14	0%
Impeding Traffic	4	0%
Other Equipment	4	0%
Hazardous Parking	1	0%
Other/Unknown/Not Stated	73	2%
Total	**2997**	**100%**

7.5 Vulnerable Users

Pedestrians and bicyclists have been identified by Caltrans as Vulnerable Users, indicating that they are the most likely to suffer a severe injury or fatality in a collision. As such, they should be prioritized in the transportation system. The majority of the collisions for pedestrians and bicyclists were reported as a violation of right-of-way by either the vehicle or pedestrian/bicyclists. **Figure 8** shows the location of bicycle and pedestrian collisions during the study period.

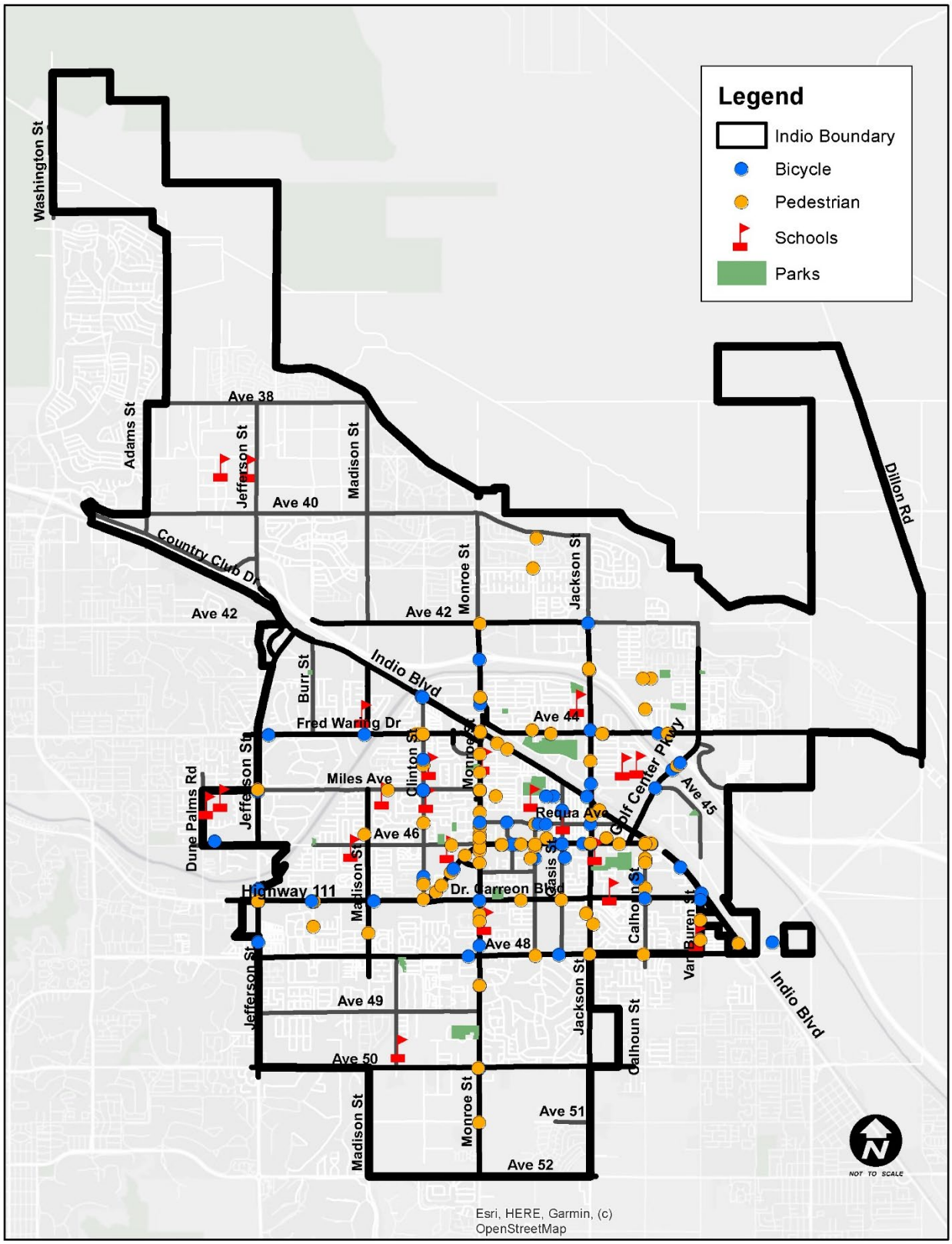
7.5.1 Pedestrians

There were 107 collisions involving pedestrians during the study period. The injury level reported for the collision (not the number of victims) was 17 fatal, 23 serious injury, 63 with either complaint of pain or other visible injury, and four (4) with property damage only. Of these collisions, two occurred when raining. 57 occurred at night; 10 of these collisions were in locations without streetlights or where they were not functioning.

7.5.2 Bicycle

There were 66 collisions involving bicyclists during the study period. The injury level reported for the collision (not the number of victims) was 6 severe injuries, 48 with either complaint of pain or other visible injury, and 12 with property damage only. 22 occurred at night; 5 of which were where in locations where there were no streetlights, or they were not functioning.

Figure 8 – Bicycle and Pedestrian Collisions and Proximity to Schools and Parks



7.6 Behavioral

7.6.1 Driving Under the Influence

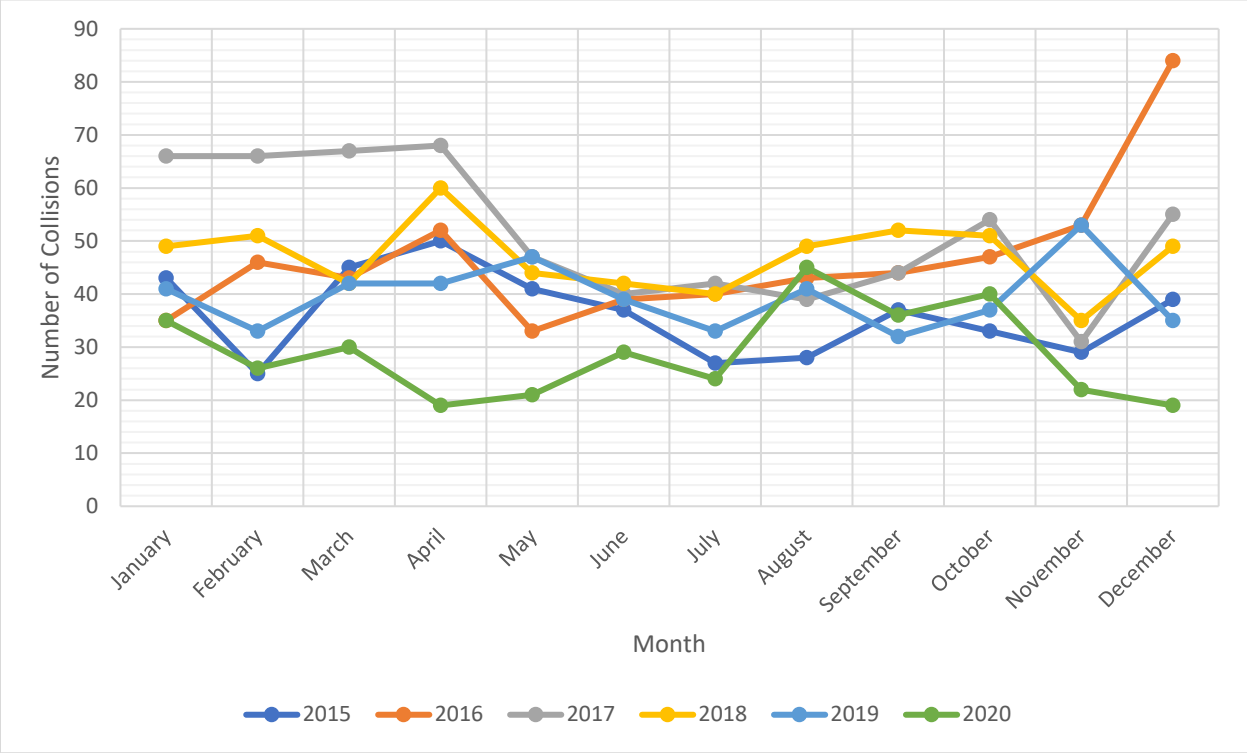
When evaluating the influence of alcohol or drugs on a collision, the sobriety of the first party is reviewed first as they are indicated as being the party at fault, followed by the remaining parties in the collision. During the study period, approximately nine percent, or 263 collisions indicated that one of the parties were under the influence of either alcohol or drugs.

7.6.2 Seasonal Drivers

Due to the seasonal change in residents of Indio, an evaluation of the total collisions that occur in Indio by month was conducted. Seasonal drivers include 'snowbird' retirees that transition to living in the desert during winter months, as well as the concert/festival seasons that are known in the valley during the spring/summer. As shown in **Figure 9** below, collision levels are fairly consistent across the years with similar trends. April and December are typically the highest months in respect to total number of collisions.

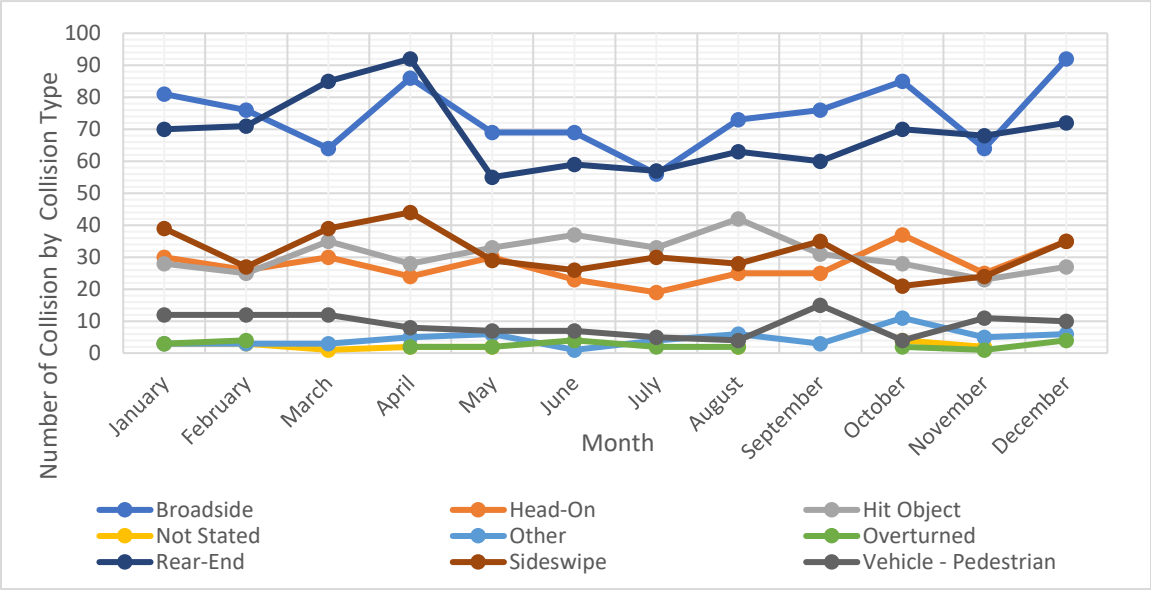
The uptick in collisions during April/May are likely due to the local festivals, Coachella and Stagecoach. These months also observe a slightly higher count of collisions with young drivers involved. There is also a peak during December, which is another high count of collisions involving young drivers.

Figure 9 – All Collisions by Month and Year (2015-2020)



As shown in **Figure 10** below, the highest reoccurring collision types by month consistently alternate between the top four collision types within the City (Broadside, Rear-End, Sideswipe, Hit Object).

Figure 10 – Collision Type by Month



7.6.3 Collision Lighting

Collisions are reported by whether they occurred during daylight, dusk/dawn or at night. During the study period, 1,055 collisions occurred at night. Collisions occurring at night are shown in **Figure 11**. This is further categorized by the functioning of streetlights in the area where the collisions took place:

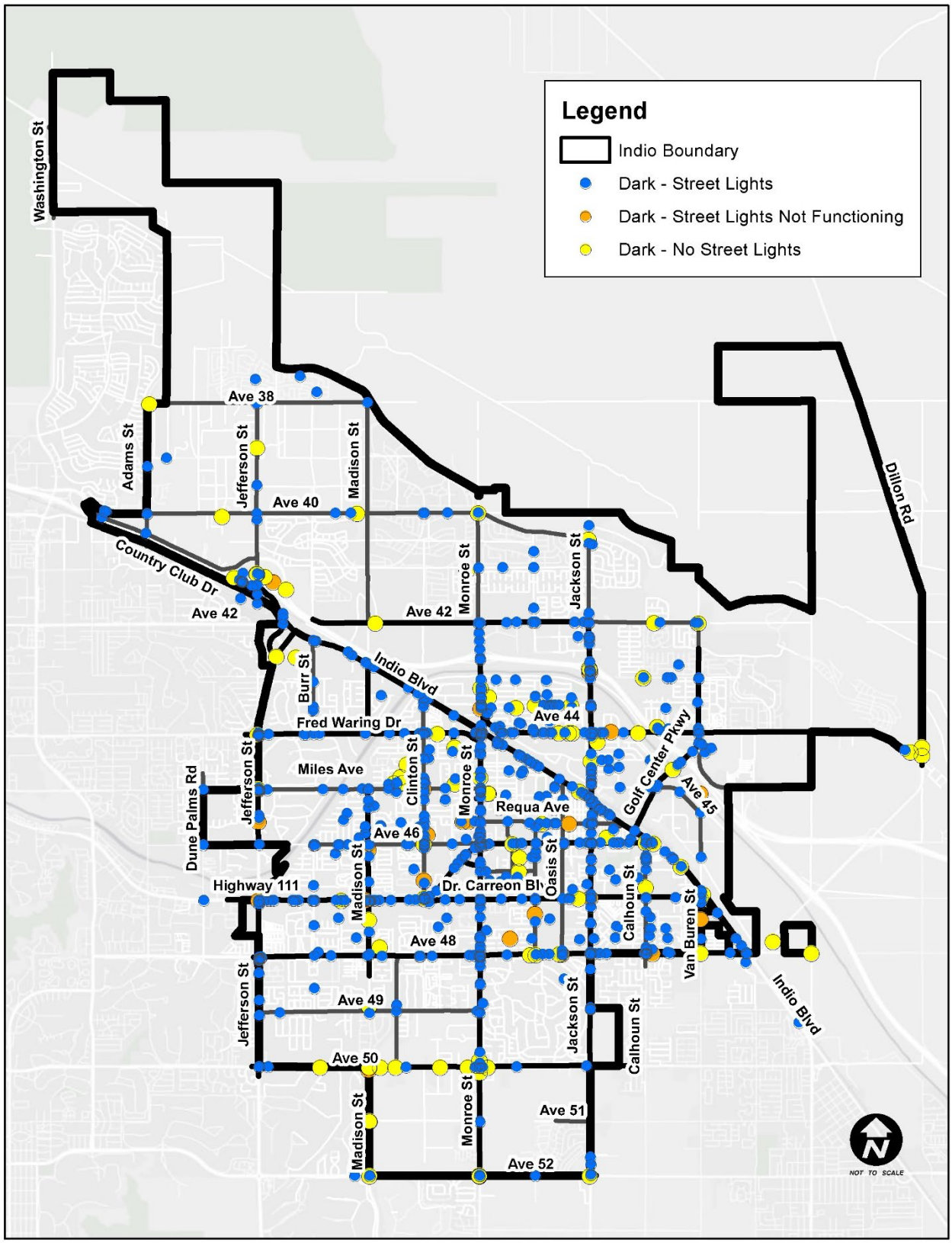
- Streetlights Functioning: 937
- Streetlights Not Functioning: 22
- No Streetlights: 96

The most commonly occurring collision type at night was rear-end (23%), followed by broadside (20%), and hit object (18%). The collision type breakdown of the collisions occurring at night are shown in **Table 4.**

Table 4 – Collisions Occurring at Night by Collision Type

Collision Type	Number of Collisions
Rear-End	241
Broadside	214
Hit Object	192
Head-On	178
Sideswipe	132
Vehicle - Pedestrian	54
Overturned	14
Not Stated/Other	30

Figure 11 – Collisions Occurring at Night (2015-2020)



7.6.4 Young/Aging Drivers

An evaluation of the age of drivers is completed by using the Party 1 age, as this is typically referenced as the person at fault in a collision. Young drivers are identified as those ages 24 and under. Aging drivers are identified as person 65 years and older. During the study period (2015-2020), 22.8% of collisions (685) involved young drivers, and 8.5% of collisions (254) involved aging drivers.

7.7 Initial Findings

7.7.1 Top Collision Locations

Through the initial collision and network screening analysis, an initial ranking of locations of interest was developed. The intersections and roadway segments by sub-population are identified in **Table 6**. Locations were only considered if they had three or more collisions to be statistically relevant.

A complete table of collision analysis for intersections and segments can be found in **Appendix C.**

Table 5 – Top Collision Locations – Intersections

Intersection	Collisions	TEV	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*
Signalized Intersections									
Ave 48 - Jefferson St	**49**	19,318	1.0	522	2	0	4	21	22
Jefferson St - Miles Ave	**48**	14,600	1.4	492	0	2	1	21	24
Ave 48 - Calhoun St	**44**	12,731	1.4	343	0	1	5	17	21
Jefferson St - Fred Waring Dr	**36**	56,248	0.0	116	0	0	3	10	23
Ave 44 - Jackson St	**34**	15,254	0.8	279	0	1	1	14	18
Monroe St - I-10 EB	**32**	35,092	0.1	489	0	2	5	16	9
Monroe St - Doctor Carreon Bl	**28**	22,334	0.3	589	0	3	3	8	14
Jefferson St - Old Hwy 111	**26**	65,852	-0.1	120	0	0	6	7	13
Highway 111 - Monroe St	**26**	12,938	0.66	434	0	2	1	14	9
Jackson St - Doctor Carreon Bl	**25**	15,344	0.47	109	0	0	6	5	14
Unsignalized Intersections									
Indio Bl & Ave 44	**33**	39,320	0.4	33	0	0	3	17	13
Highway 111 & Calhoun St	**24**	14,218	0.8	24	0	0	3	8	13
Calhoun St & Taurus Ave	**9**	15,576	0.2	9	2	0	0	3	4
Ave 48 & Heifitz Dr	**8**	14,512	0.2	8	0	0	2	5	1
Highway 111 & Shopping Center w of Madison St	**8**	27,950	0.1	8	0	0	1	2	5
Indio Bl & Maple St	**8**	29,672	0.1	8	0	0	1	1	6
Monroe St & Alley n/o Avenida del Mar	**8**	21,459	0.1	8	0	1	3	3	1
Indio Bl & Sun Gold St	**8**	22,048	0.1	8	1	1	1	2	3
Fargo St & Requa Ave	**7**	18,807	0.1	7	0	0	2	1	4
Indio Blvd & Palm St	**7**	22,048	0.1	7	0	0	1	1	5

1. Local Critical Collision Rate Differential
2. Equivalent Property Damage Only Collisions

Table 6 – Top Collision Locations – Segments

Facility	Limits	Collisions	ADT	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*
Other Principal Arterial										
Highway 111	Madison St - Clinton St	**11**	27,950	0.2	36	0	0	1	3	7
Highway 111	Jefferson St - Jackalope Trail	**6**	32,926	0.0	16	0	0	0	2	4
Jefferson St	Fred Waring Dr - Independence Way	**5**	28,124	0.1	25	0	0	0	4	1
Highway 111	Las Palmas Dr - Granada Dr	**5**	8,529	0.8	20	0	0	1	1	3
Highway 111	Granada Dr - Clinton St	**5**	18,491	0.2	194	1	0	1	3	0
Jefferson St	Miles Ave - Pebble Beach Dr	**3**	7,300	0.3	181	1	0	1	1	0
Highway 111	Rubidoux St - Arabia St	**3**	6,469	0.5	167	0	1	0	0	2
Highway 111	Monroe St - Las Palmas Rd	**3**	6,469	0.5	13	0	0	0	2	1
Indio Blvd	Van Buren St - Ave 48	**3**	24,388	-0.17	167	0	1	0	0	2
Highway 111	Shields Rd - Younge Ln	**3**	27,950	-0.10	8	0	0	0	1	2
Minor Arterial										
Monroe St	43rd Ave - Oleander Ave	**8**	17,900	0.9	187	0	1	0	3	4
Dr. Carreon Blvd	Monroe St - Cheyenne Rd	**8**	11,167	0.9	38	0	0	0	6	2
Ave 42	Monroe St - Spectrum St	**6**	5,748	0.7	36	0	0	2	2	2
Monroe St	Doctor Carreon Bl- Bella Gate	**6**	11,167	0.5	195	1	0	1	3	1
Monroe St	Date Ave - Doctor Carreon Bl	**5**	11,167	0.5	179	0	1	0	2	2
Ave 42	Burr St - Madison St	**4**	10,608	0.2	19	0	0	0	3	1
Jackson St	Ave 44 - Kenner Ave	**4**	7,627	0.6	9	0	0	0	1	3
Ave 48	Monroe St - Desert Grove Dr	**4**	9,197	1.3	168	0	1	0	0	3
Jefferson St	Derek Alan Dr - Ave 50	**4**	41,124	0.0	23	0	0	2	0	2
Jackson St	Ave 42 - Atlantic Ave	**3**	7,363	0.4	13	0	0	0	2	1
Major Collector										
Ave 42	Jackson St - Collection Dr	**10**	7,363	0.3	10	0	0	1	0	9
Varner Rd	Adams St - Fifties Way	**5**	35,539	0.0	5	0	1	2	1	1
Adams St	39th Ave - Ave 40	**4**	6,812	0.3	4	0	0	2	0	2
Ave 40	Varner Rd - Adams St	**4**	6,812	0.3	4	0	0	1	0	3
Miles Ave	Heritage Palms Dr S - Madison St	**4**	7,300	0.3	4	0	0	0	1	3
Jefferson St	40th Ave - Sun City Blvd	**3**	2,384	1.0	3	0	0	1	0	2

Jackson St	Generations Dr - Ave 42	3	7,363	0.9	3	0	0	0	1	2
Rubidoux St	Requa Ave - Highway 111	3	6,469	0.5	3	0	0	1	0	2
Jefferson St	39th Ave - Shadow Hills HS	2	4,100	0.3	2	0	0	1	1	0
Jefferson St	Shadow Hills HS - Ave 40	2	2,384	0.8	2	0	0	0	1	1
Local										
Francis Ave	Swingle Ave - Clinton St	4	6,761	0.78	4	0	0	0	0	4
Valencia Ave	Sun Gold St - Palm St	3	3,821	-0.45	176	0	1	1	0	1
44th Ave	Fred Waring Dr - Indio Blvd	2	19,660	0.22	2	0	0	0	0	2
Dillon Ave	Serrano Ln - Palo Verde St	2	5,997	0.53	2	0	0	0	0	2
Helen Ave	Swingle Ave - Clinton St	2	6,761	0.28	2	0	0	0	0	2
Ave 45	Palo Verde St - Highway 111	2	12,068	0.12	7	0	0	0	1	1
Shadow Palm Ave	Aladdin St - Monroe St	2	14,306	0.36	2	0	0	0	0	2

1. Local Critical Collision Rate Differential
2. Equivalent Property Damage Only Collisions

7.8 Statewide Comparison

Due to the availability of data, a comparison of collision data to the State averages could only be conducted for data from 2015-2018. These numbers may vary slightly from those mentioned previously, due to the differences in the years of the study period. The following are areas where Indio's collision rates are higher or lower than those of the State. These numbers specifically compare the proportion of fatal and serious injury collisions that have the characteristics listed in **Table 7**.

Table 7 – Comparison of Statewide and Indio Collisions (2015-2018)

Challenge Area	Statewide %	Indio %	Percentage Difference
Indio has a Higher Percentage of Collisions			
Young Drivers	13.6%	15%	1.4%
Intersections	23.6%	24.8%	1.2%
Distracted Driving	5.2%	6.4%	1.2%
Commercial Vehicles	6.4%	6.8%	0.4%
Indio has a Lower Percentage of Collisions			
Work Zones	1.5%	1.3%	-0.2%
Aging Drivers	11.9%	10.70%	-1.2%
Occupant Protection	14.8%	12.80%	-2.0%
Bicyclists	8.4%	6.40%	-2.0%
Impaired Driving	25.8%	23.50%	-2.3%
Lane Departure	43.7%	36.80%	-6.9%
Motorcyclists	20.8%	13.20%	-7.6%
Aggressive Driving	33.2%	21.40%	-11.8%

8 Emphasis Areas

Emphasis Areas are behavioral, road user, or road condition characteristics that the City of Indio can strategically focus efforts on to have a large impact on transportation safety. Emphasis areas were developed by revisiting the Vision and Goals developed at the onset of this planning process and comparing them with the trends and patterns identified in the collision analysis. Where these areas aligned, or major challenges were observed, Emphasis Areas and strategies were developed.

Emphasis Area #1: Pedestrians & Bicyclists (Vulnerable Road Users)

Description: Pedestrians and bicyclists are classified by Caltrans as a vulnerable user, meaning they have the highest potential for severe harm during a collision. Pedestrian and bicycle activity is high in Indio, with active transportation amenities such as CV Link nearby. According to the collision analysis, 6 percent of collisions involving pedestrians and bicycles within the City resulted in some form of injury or pain. 16% of pedestrian collisions resulted in fatalities, and 9% of bicycle collisions resulted in severe injuries.

Goals for Emphasis Area #1:

- Reduce the number of collisions involving vulnerable road users
- Identify hot spots and priority corridors for addressing vulnerable road user collisions
- Apply for funding and implement countermeasures to address pedestrian & bicyclist collisions

Strategies for Emphasis Area #1:

- Implement pedestrian and bicycle countermeasures at key locations
- Install active transportation counters to identify high volume locations and implement infrastructure improvements at these locations
- Establish education and training programs to improve vulnerable road user safety citywide

These strategies can be implemented by the City, while partnering with Caltrans, CVAG, California Highway Patrol (CHP) and other community partners. Funding sources for these strategies may include HSIP, ATP, STIP, and SB1 grand funding programs.

Emphasis Area #2: Speeding

Description: Speeding is a form of aggressive driving that accounts for 22% (645 out of 2997) of the causes of collisions from 2015-2020 in Indio. Behaviors considered within the category includes tailgating, and other reckless driving maneuvers. Two collisions caused by speeding resulted in fatalities and five resulted in severe injuries.

Goal for Emphasis Area #2:

- Reduce the instances of speeding and speeding related collisions
- Identify hot spots and priority corridors for addressing speeding & speed-related collisions
- Apply for and increase funding for countermeasures and implementations that address speeding

Strategies for Emphasis Area #2:

- Increase enforcement of speed limits and vehicle code infractions at hot spots and along key corridors
- Implement education campaign to target speeding and other reckless driving behaviors
- Increased coordination with law enforcement and other community organizations to address speeding

These strategies can be implemented by the City, while partnering with Caltrans, CVAG, CHP and other community partners. Funding sources for these strategies may include HSIP, ATP, STIP, and SB1 grand funding programs.

Emphasis Area #3: Driving Safety/Education

Description: Young drivers are identified as those under the age of 25. A substantial number of collisions in Indio involved young drivers. This may be impacted by seasonal events, such as Coachella and Stagecoach which occurs in April/May. Identifying countermeasures for year-round and seasonal implementation is important.

Goal for Emphasis Area #3:

- Reduce the number and severity of collisions that involve younger drivers
- Identify hot spots/key corridors and time periods for young driver incidents
- Apply for funding and implement countermeasures to address young driver collisions

Strategies for Emphasis Area #3:

Strategies to address young driver behaviors will mainly focus on education, encouragement, and enforcement. Strategies that have had success nationally include driver's education courses, implementing technology in young drivers' vehicles, and education campaigns to target aging drivers with messages regarding road safety, common mistakes, and challenges that young drivers face. Strategies may also include increased enforcement near hotspots of young driver collisions and increased coordination with community organizations.

These strategies will be implemented by the City, law enforcement, and local community organizations. Funding sources for these strategies may include HSIP, STIP, and SB1 grant programs.

Emphasis Area #4: Impaired Driving

Description: Impaired driving, as defined by the Caltrans SHSP, includes proof of drug or alcohol use by the driver, even if the driver is not over the legal limit. Whether under the influence of alcohol or drugs, approximately 9% of collisions are caused by impaired driving for within the City of Indio.

Goal for Emphasis Area #4:

- Reduce the incidence and severity of collisions attributed to impaired driving
- Identify hot spots and key corridors for impaired driving
- Apply for funding to implement countermeasures to reduce impaired driving collisions

Strategies for Emphasis Area #4:

- Authorize, publicize, and conduct sobriety checkpoints programs
- Implement an impaired driving education campaign
- Develop educational programs targeting specific audiences based on age group
- Additional enforcement presence
- Create effective media campaigns in both visual and print media

These strategies will be implemented by the City, law enforcement, and community organizations. Funding sources for these strategies may include HSIP, OTS, and SB1 grant programs.

Emphasis Area #5: Nighttime Collisions

Description: Collisions occurring at night, accounted for about 33% of all collisions withing Indio. The main type of collisions occurring at night were rear-end (24%), followed by broadside (21%), and hit-object (19%).

Goal for Emphasis Area #5:

- Reduce the incidence and severity of nighttime collisions
- Identify hot spots and key corridors that have concentrations of nighttime collisions, including collisions that occurred in locations where there were no streetlights
- Apply for funding to implement countermeasures to reduce nighttime collisions

Strategies for Emphasis Area #5:

- Implement countermeasures to address nighttime and lighting issues throughout the City
- Increased enforcement of nighttime driving infractions
- Develop educational programs to increase safe nighttime driving behaviors

These strategies will be implemented by the City, law enforcement, and community organizations. Funding sources for these strategies may include HSIP, OTS, and SB1 grant programs.

9 Opportunities

The following provides more information on general identified issues, collision modification factors, improvements, and countermeasures identified for the City of Indio, as well as for specific project locations identified as part of this analysis.

9.1 Infrastructure Improvements

9.1.1 Countermeasure Selection Process

Part D of the HSM provides information on Collision Modification Factors (CMF) for roadway segments, intersections, interchanges, special facilities, and road networks. CMFs are used to estimate the safety effects of highway improvements and apply CMFs to compare and select highway safety improvements. A CMF less than 1.0 indicates that a treatment has the potential to reduce collisions. A CMF greater than 1.0 indicates that a treatment has the potential to increase collisions. The application of an appropriate CMF can influence the decision to implement a particular project, and the misapplication of CMFs can lead to misinformed decisions. Key factors to consider when applying CMFs include:

1. Selection of an appropriate CMF,
2. Estimation of collisions without treatment,
3. Application of CMFs by type and severity, and
4. Estimation of the combined effect for multiple treatments

Examples of Safety Countermeasures can be found through several sources. This Report utilizes the countermeasures found in the California LRSM (https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf) and the CMF Clearinghouse (CMF CH) website (http://www.cmfclearinghouse.org/).

Countermeasures for each of the Safety Project Case Studies are based on the data analysis and site visits. Additional countermeasures were identified for the high-level issues on a city-wide level and are discussed in **Section 9.3** (General City-Wide Safety Project Opportunities*)* of this Report.

9.1.2 Safety Project Case Studies

From the city-wide analysis, ten project case study locations were selected for further analysis and identification of possible projects. For each of these locations, Safety Project Case Studies were developed to provide a case study to organize projects when applying for funding. These locations were identified through the analysis process based on their collision histories, the observed collision patterns, and their differing characteristics to provide the most insight into potential systemic safety countermeasures that the City can employ to achieve the most cost-effective safety benefits.

A Safety Project Case Study was developed for these locations:

1. Segment: Highway 111 (Clinton St to Monroe St)
2. Segment: Monroe St (Fred Waring Dr: Highway 111)
3. Segment: Monroe St (Doctor Carreon Bl to Ave 48)
4. Segment: Fred Waring Dr (Madison St to Clinton St)
5. Segment: Jefferson St (Ave 39 to Varner Rd)
6. Segment: Valencia Ave (Monroe St to Arabia St)

7. Signalized Intersection: Ave 44 & Jackson St
8. Signalized Intersection: Monroe St & Doctor Carreon Bl
9. Unsignalized Intersection: Highway 111 & Calhoun St
10. Unsignalized Intersection: Indio Bl & Sun Gold St

Appendix B contains the Case Study pages which summarize conditions at each location, and potentially beneficial countermeasures. Countermeasures were subjected to a benefit/cost assessment and scored according to their potential return on investment. These case studies can be used to select the most appropriate countermeasure, and to potentially phase improvements over the longer-term. The potential benefit of these countermeasures at locations with similar design characteristics can then be extrapolated regardless of collision history. These case study sheets can also be used to position the City for future grant funding opportunities.

9.2 Non-Infrastructure Improvements

Non-Infrastructure opportunities have also been proven to impact safety conditions of the transportation network. These education and enforcement measure opportunities are developed to target specific behavior types and populations. Based on a review of the existing plans, policies, and programs within the City, the following topics have been reviewed to identify areas where the City can implement or enhance safety efforts.

Table 8 – Summary of Programs, Policies, and Practices for the City of Indio

Summary of Programs, Policies, and Practices for City of Indio		
Topic	Initiatives/Current Status	Implement or Enhance
COMMITTEES / ROLES		
Active Transportation Coordinator	No	Designate member of City staff to serve in this role
Safety or Active Advisory Committee	No	Create safety or active advisory committee/subcommittee in existing structures
Active Transportation Safety Education Program	No	Create active transportation safety education program in partnership with local schools and law enforcement
POLICY / PLANS		
Complete Streets	A complete streets plan was developed by the City of Indio from April 2018 until the development of the final plan in December 2019. Finalized 4/20/2020.	Identify roadways that are good candidates for complete street implementation consistent with guidance provided in these plans

Summary of Programs, Policies, and Practices for City of Indio		
Topic	**Initiatives/Current Status**	**Implement or Enhance**
Traffic Impact Fees	Yes, as part of the Municipal Code	Continue to assess traffic impact fees and review the potential for safety impacts to be included as fundable mitigations
Safe Routes to School	The City of Indio had a Safe Routes to School Plan developed. Finalized 4/5/2019.	Identify potential grant projects and apply for grant funding
Traffic Calming Policies	Yes	Continue to enact traffic calming implementations throughout the City
Speed Surveys	Yes; speed limits are current	Continue to update as required by law; review new guidance from Assembly Bill 43
Warrants for Stop Signs and Signals	Yes (California Vehicle Code and MUTCD)	Continue to use CVC and CA MUTCD warrants; identify areas where additional locally developed warrants may be appropriate
Planning for Density and Walkable Areas	Yes	Continue to plan for density & identify areas where additional active transportation infrastructure is needed
Transportation Demand Management (TDM)/Vehicle Miles Travelled (VMT) Reduction	Yes	Continue to implement TDM programs and monitor opportunities to VMT reductions
Traffic Collision Monitoring	City Engineer has a program for reviewing collision activity	Continue to formalize a program for reviewing collision activity
POLICY / PLANS		
Active Transportation Master Plan	Bike Share Plan Project headed by Community Development Department	Formalize an Active Transportation Master Plan that outlines proposed actions on active transportation
Pedestrian Signal Timing	No	Update pedestrian signal timing to be consistent with latest CA MUTCD guidelines
Crosswalks	Yes	Continue to identify locations for improved crosswalks

Summary of Programs, Policies, and Practices for City of Indio		
Topic	**Initiatives/Current Status**	**Implement or Enhance**
Enforcement	Law enforcement coordinates with local jurisdictions; does conduct sobriety/seatbelt checks	Continue to coordinate with law enforcement; use collision analysis to identify areas for increased enforcement
Bicycle Policy	City has ordinances on bicycle helmet use / riding on sidewalks / jay-walking	Implement policies that promote safe bicycling throughout the City
Transit	SunLine transit vehicles accommodate bicycles	Continue to coordinate with local transit agencies (SunLine) on actions to increase safety of transit users
Wayfinding	Yes, program is led by the Community Services Department	Formalize wayfinding program in areas with high active transportation use
DATA COLLECTION / INVENTORY		
Inventory of Pedestrian Signs and Signals	Yes	Continue to collect inventory; digitize and assemble GIS database of signs & signals
Inventory/Mapping of Active Transportation Routes	No, but could potentially include on the GIS map on City website	Include active transportation routes on GIS maps
Crossroad Database	Annually updated	Continue to update on a regular basis and monitor input for data integrity
Active Transportation Volume Counting	No	Perform active transportation volume counts at key locations to determine trends in active transportation use
COORDINATION / FEEDBACK		
Citizen Feedback	Via online portal	Continue to engage with citizens and implement feedback into project planning
Institutional Coordination	Yes	Continue to coordinate with community organizations and other institutions
School Engagement	City engages with Desert Sands Unified School Districts and Indio Police Department	Continue to engage with schools regarding roadway safety and potential projects nearby

Summary of Programs, Policies, and Practices for City of Indio		
Topic	Initiatives/Current Status	Implement or Enhance
Law Enforcement/Emergency Service Engagement	Yes	Continue to engage with law enforcement; use collision analysis to identify areas for increased enforcement

9.3 General City-wide Countermeasure Toolbox

This evaluation considered city-wide trends to identify countermeasures that would likely provide the most benefit with widespread implementation. Countermeasures for each of the 5E Safety Strategies (Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies) were identified. These include both infrastructure opportunities, non-infrastructure opportunities. **Table 9** outlines the city-wide safety project opportunities, which is also referred to as the "Countermeasure Toolbox". Within the toolbox, the description of the countermeasure along with its LRSM ID number is listed. The next column, Collision Reduction Factor (CRF) also known as Collision Modification Factor (CMF), are "multiplicative factors used to estimate the expected number of collisions after implementing a given countermeasure at a specific site (the lower the CMF, the greater the expected reduction in collisions)[4]."

For each of these countermeasures, a planning level benefit/cost analysis was completed. Applying the benefit/cost at the city-wide level was estimated assuming some randomness in collision distribution. The location characteristics, such as whether there is a traffic signal, and the type of collisions, were used at the city-wide level to calculate an average cost of collisions that the countermeasure might reduce. The benefit per location was then factored out to a 20-year life-cycle savings, with an Opinion of Project Probable Cost (OPCC) for the initial installation costs and a per-year maintenance cost estimate. The cost shown in **Table 9** should be considered initial planning costs using 2020 dollars and not assumed final.

Table 10 describes additional, non-engineering opportunities for the remaining categories of traffic safety which includes Enforcement, Education, Emergency Services, and Emerging Technology.

[4] LRSM Version 1.5 (2020), Page 27

Table 9 – City-wide Safety Projects Opportunities (Countermeasure Toolbox)

COUNTERMEASURE	LRSM/CMF ID	CRF	20-YEAR COST ESTIMATE	PER UNIT
Install signal; includes signal warrants	NS03	30%	$ 270,000	per intersection
Convert intersection to roundabout (from 2-way stop or yield control)	NS05	35%	$ 1,100,000	per intersection
Install/upgrade larger or additional stop signs/other intersections warning/regulatory signs (stop signs with LED borders)	NS06	15%	$ 1,500	per sign
Install flashing beacons at Stop-Controlled intersections	NS08	15%	$ 3,000	per beacon
Install splitter-islands on the minor road approaches	NS13	40%	$ 20,000	per intersection
Create direction median openings to allow/restrict left-turns and U-turns (right-in/right-out)	NS15	50%	$ 15,000	per structure
Install raised medians (refuge islands)	NS19PB	45%	$ 25,000	per intersection
Install/upgrade pedestrian crossing at uncontrolled locations	NS20PB	25%	$ 22,000	per intersection
Install/upgrade pedestrian crossing at uncontrolled locations	NS21PB	35%	$ 10,000	per intersection
Add segment lighting	R01	35%	$ 50,000	per mile
Install dynamic/variable speed warning systems	R26	30%	$ 16,000	per sign
Install edge-lines and centerlines	R28	25%	$ 8,000	per mile
Install green paint in bicycle lanes	R32PB	35%	$ 15,000	per intersection
Install Rectangular Rapid Flashing Beacon (RRFB)	R37PB	35%	$ 50,000	per intersection
Install retroreflective backplates	S02	15%	$ 12,000	per intersection
Update signal heads to meet current standards	S02	15%	$ 12,000	per intersection
Improve signal timing (coordination, phasing, red, yellow, operation)	S03	15%	$ 8,000	per intersection

Install advanced dilemma zone detection	S04	40%	$	34,000	per intersection
Provide protected left-turn phase	S07	30%	$	40,000	per intersection
Install raised pavement markers and striping (Through Intersection)	S09	10%	$	22,000	per intersection
Install flashing beacons as advanced warning	S10	30%	$	3,000	per beacon
Create directional median openings to allow (and restrict) left-turns and U-turns (S.I.)	S14	50%	$	15,000	per structure
Install improved pedestrian crossing	S18PB	25%	$	50,000	per intersection
Install striping to address parked car collisions	-	5%	$	12,000	per location
Change intersection geometry to reduce intersection skew	-	5%	$	70,000	per intersection
Set up speed enforcement zone	-	5%	$	5,000	per location
Update striping to ensure parked cars have sufficient clearance from driveways	-	5%	$	1,500	per mile
Implement school zone enforcement	-	5%	$	3,000	per intersection
Convert 12-ft lanes to 11-ft lanes	7825	24%	$	12,000	per mile

Non-Engineering Safety Strategy Countermeasures:

These identified countermeasures were derived from the collision analysis and build on the actions identified in Section 9.2. These relate to the additional Es of Traffic Safety outside of engineering, which include Enforcement, Education, Emergency Services and Emerging Technologies.

Table 10 – Non-Engineering Safety Strategy Countermeasures

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
ENFORCEMENT		
Establish enforcement and visibility program for aggressive driving	Local law enforcement; CHP	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Continued enforcement in school zones	Local law enforcement; CHP; school districts; CVAG; SCAG	Obtain grant funding for additional personnel in school zones
Increased enforcement of safe driving & active transportation behaviors near busy crosswalk locations	Local law enforcement; CHP	Obtain grant funding for additional enforcement near high pedestrian activity locations
EDUCATION		
Campaign to target aggressive driving and DUIs	Local law enforcement; CHP; California Office of Traffic Safety (OTS)	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Bicycle and pedestrian safety campaign	Local law enforcement; CVAG; SCAG	SCAG's 'Go Human' Campaign; ' OTS' 'Ride With Traffic' campaign Planned educational events at high activity locations such as future CV Link locations
Explore safe routes to school education grants to expand program	Local school districts; local law enforcement; CVAG; SCAG	Safe Routes to School Program, funded by Caltrans
Coordinate safety education campaigns with CVAG	CVAG; SCAG; local law enforcement	Coordination of new safety education with new CVAG projects such as CV Link or CV Sync Roadway safety fairs at schools Education campaign for aging drivers
EMERGENCY SERVICES		
Continue to work on interdepartmental communication between City staff and City police department and fire department	Local law enforcement & fire department	Incorporate law enforcement/fire department as stakeholders on transportation improvement projects
Incorporate public health agencies and fire departments as stakeholders in safety projects	Local public health agencies and fire departments	Adjust safety project development processes to include public health and fire department feedback
EMERGING TECHNOLOGY		
Continue to use best practices for pedestrian crossings at high pedestrian traffic areas	City Public Works; CVAG; Caltrans	Continuously update pedestrian crossing design standards in accordance with latest best practices
Utilize new data sources to monitor traffic conditions and inform County safety plans	City Public Works; CVAG; Caltrans	Utilization of data from forthcoming CVAG Regional Traffic Management Center (RTMC)

10 Evaluation & Implementation Plan

10.1 Evaluation

The success of the LRSP will be evaluated using the preliminary process outlined below. This process will be useful to ensure proper implementation of goals and to determine when updates are needed.

- Progress meetings will be conducted to track the implementation of the plan. In addition, the success of the plan will be evaluated on a recurring basis.
- An update to the plan should be considered after no more than five years.
- Continued monitoring and recording of traffic incidents on local roadways by law enforcement.
- Maintain a list of focus areas where there are transportation safety concerns.

10.2 Implementation

Implementation of the LRSP can be accomplished through several avenues including development of projects, the establishment of new policies and programs, and development/strengthening of relationships with stakeholders.

With regard to projects, the following identifies potential focus areas for the City in the near-to-mid-term.

Near- & Mid-Term Focus Areas

The opportunities identified in this report provide more of the systemic countermeasures that can be applied within the City. Over the next three to five years, there is an opportunity for the City to concentrate its efforts on the emphasis areas:

1. Vulnerable Users
2. Speeding
3. Driving Safety/Education
3. Impaired Driving
4. Nighttime Collisions

Analysis conducted at the citywide level indicated that these factors were some of the most frequent influences contributing to collisions within the City. The countermeasure opportunities previously discussed in this report for both systemic and project-specific improvements can be used as a basis for developing projects at locations where addressing these focus areas would be of the most benefit. Projects that address these focused areas can be developed with a high benefit-to-cost ratio (by applying City-wide collision rates), allowing projects to be developed even at sites with little to no direct collision history, but with conditions that might contribute to future collisions.

10.3 Funding

Competitive funding resources are available to assist in the development and implementation of safety projects in Indio. The City should continue to seek available funding and grant opportunities from local, state, and federal resources to accelerate their ability to implement safety improvements throughout Indio. The following is a high-level introduction into some of the main funding programs and grants for which the City can apply. In addition to the funding sources mentioned below, the City should consider examining and allocating a portion of its Measure A and other local funding sources to help fund safety improvements. The City should also work with regional agencies such as CVAG, RCTC, and SCAG to identify and apply for safety improvement funding.

10.3.1 Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP) is a Federal program housed under Fixing America's Surface Transportation (FAST) Act. This program apportions funding as a lump sum for each state, which is then divided among apportioned programs. These flexible funds can be used for projects to preserve or improve safety conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for non-motorized transportation, and other project types. Example safety improvement projects eligible for this funding include:

- New or upgraded traffic signals
- Upgraded guard rails
- Pedestrian warning flashing beacons
- Marked crosswalks

California's local HSIP focuses on infrastructure projects with national recognized collision reduction factors. Normally HSIP call-for-projects is made at an interval of one to two years. The applicant must be a city, a county, or a tribal government federally recognized within the State of California.

Additional information regarding this program at the Federal level can be found online at: https://safety.fhwa.dot.gov/hsip/. California specific HSIP information – including dates for upcoming call for projects - can be found at: http://www.dot.ca.gov/hq/LocalPrograms/hsip.html.

10.3.2 Caltrans Active Transportation Program

Caltrans Active Transportation Program (ATP) is a statewide funding program, created in 2013, consolidating several federal and state programs. The ATP funds projects that encourage increased mode share for walking and bicycling, improve mobility and safety for non-motorized users, enhance public health, and decrease greenhouse gas emissions. Projects eligible for this funding include:

- Bicycle and pedestrian infrastructure projects
- Bicycle and pedestrian planning projects (e.g. safe routes to school)
- Non-infrastructure programs (education and enforcement)

This program funding is provided annually. The ATP call for projects typically comes out in the spring. Information on this program and cycles can be found online at: http://www.dot.ca.gov/hq/LocalPrograms/atp/

10.3.3 State Transportation Improvement Program

The State Transportation Improvement Program (STIP) provides state and federal gas tax money for improvements both on and off the state highway system. STIP programming occurs every two years. The programming cycle begins with the release of a proposed fund estimate, followed by California Transportation Commission (CTC) adoption of the fund estimate. The fund estimate serves to identify the amount of new funds available for the programming of transportation projects. Once the fund estimate is adopted, Caltrans and the regional planning agencies prepare transportation improvement plans for submittal. Caltrans prepares the Interregional Transportation Improvement Program (ITIP) using Interregional Improvement Program (IIP) funds, and regional agencies prepare Regional Transportation Improvement Programs (RTIPs) using Regional Improvement Program (RIP) funds. The STIP is then adopted by the CTC.

10.3.4 California Senate Bill 1 (SB 1)

SB 1 is a landmark transportation investment to rebuild California by fixing neighborhood streets, freeways and bridges in communities across California and targeting funds toward transit and congested trade and commute corridor improvements.

California's state-maintained transportation infrastructure will receive roughly half of SB 1 revenue: $26 billion. The other half will go to local roads, transit agencies and an expansion of the state's growing network of pedestrian and cycle routes. Each year, this new funding will be used to tackle deferred maintenance needs both on the state highway system and the local road system, including:

- Bike and Pedestrian Projects: $100 million
    - This will go to cities, counties and regional transportation agencies to build or convert more bike paths, crosswalks and sidewalks. It is a significant increase in funding for these projects through the Active Transportation Program (ATP).
- Local Planning Grants: $25 million

10.3.5 California Office of Traffic Safety (OTS) Grants

This program has funding for projects related to traffic safety, including transportation safety education and encouragement activities. Grants applications must be supported by local collision data (such as the data analyzed in this report) and must relate to the following priority program areas:

- Alcohol Impaired Driving
- Distracted Driving
- Drug-Impaired Emergency Medical Services
- Motorcycle Safety
- Occupant Protection
- Pedestrian and Bicycle Safety
- Police Traffic Services
- Public Relations, Advertising, and Marketing Program
- Roadway Safety and Traffic Records

10.3.6 SCAG Sustainable Communities Program (SCP)

This program is an innovative vehicle for promoting local jurisdictional efforts to test local planning tools. The SCP provides direct technical assistance to SCAG member jurisdictions to complete

planning and policy efforts to implement the regional Sustainable Communities Strategies (SCS). Grants are available in the following three categories:

- Integrated Land Use
  - Sustainable Land Use Planning
  - Transit Oriented Development (TOD)
  - Land Use & Transportation Integration
- Active Transportation
  - Bicycle Planning
  - Pedestrian Planning
  - Safe Routes to School Plans
- Green Region
  - Natural Resource Plans
  - Climate Action Plans (CAPs)
  - Green House Gas (GHG) Reduction programs

10.3.7 SB 821 (Bicycle and Pedestrian Facilities Program)

The Bicycle and Pedestrian Facilities Program is funded through a ¼ cent statewide sales tax and provides funding for bicycle and pedestrian facility projects. The program is administered by the Riverside County Transportation Commission (RCTC). The Call for Projects occurs on a biennial basis. The following types of projects are eligible for funding:

- Construction, including related engineering expenses, of bicycle and pedestrian facilities, or for bicycle safety education programs.
- Maintenance of bicycling trails, which are closed to motorized traffic.
- Maintenance and repairs of Class I off-street bicycle facilities only.
- Restriping Class II bicycle lanes.
- Facilities provided for the use of bicycles that serve the needs of commuting bicyclists, including, but not limited to, new trails serving major transportation corridors, secure bicycle parking at employment centers, park and ride lots, and transit terminals where other funds are available.
- Development of comprehensive bicycle and pedestrian plans (limitations apply). Plans must emphasize bike/pedestrian facilities that support utilitarian bike/pedestrian travel rather than solely recreational activities.

10.4 Next Steps

The City of Indio has completed this LRSP to guide the process of future transportation safety improvements for years to come. The data-driven analysis process identified collision types, related primary collision factors, and locations of many collisions. Based on this process, Emphasis Areas were developed. These Emphasis Areas will guide corridor improvements, education programs, and capital improvements for the City.

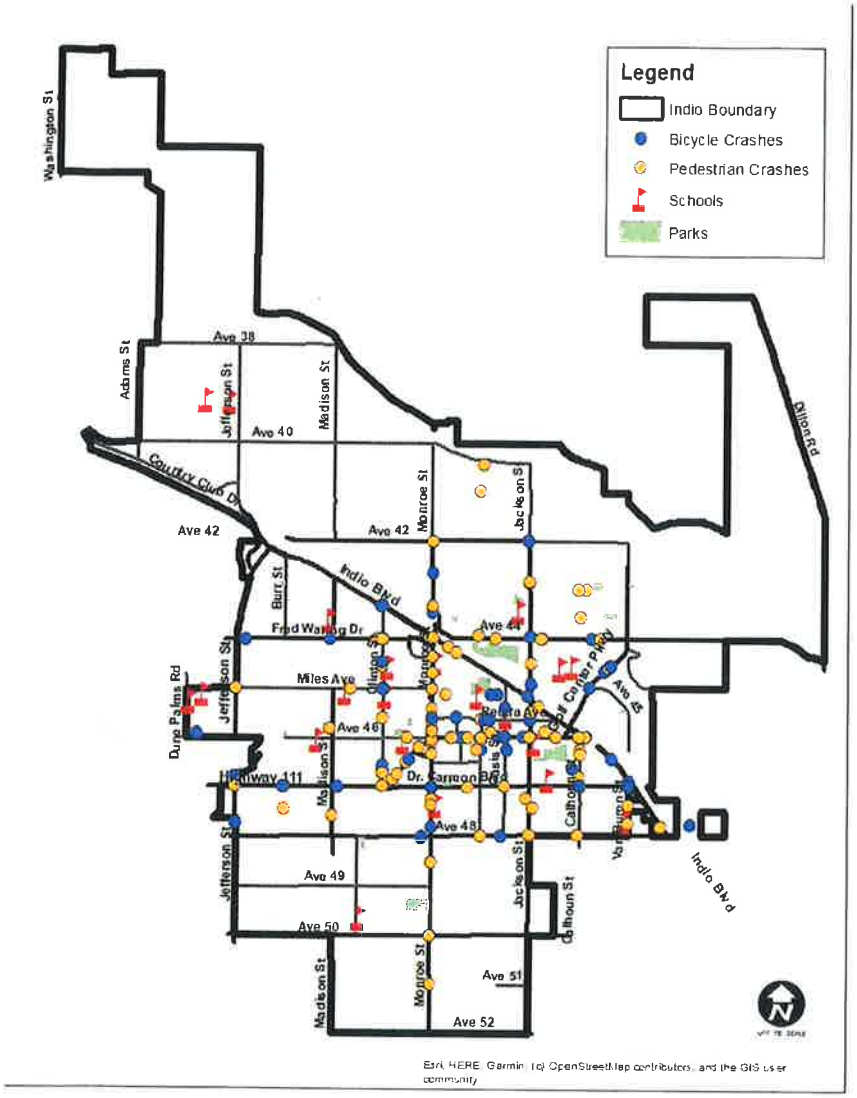
Using the analyzed data and outputs from this LRSP, the City has the opportunity to complete the following tasks:

- Actively seek other funding opportunities to improve safety for all modal users
- Collaborate with established safety partners & neighboring municipalities as improvements are made to create a cohesive transportation network
- Iteratively evaluate existing and proposed transportation safety programs and capital improvements to design a safer transportation network in Indio
- Continually review collision data and update the analysis performed in this report
- Monitor collision activity at locations where improvements were made to determine their impacts

The City also plans to have the City Council formally approve and adopt the Local Road Safety Plan (LRSP) in 2022. Based on current Caltrans guidelines, the City can plan to update the LRSP in five years in 2027.

Appendix A: Feedback from SCAG Event

CITY OF INDIO



18 PEOPLE HAD NO CONCERNS.

Instructions/Instrucciones:

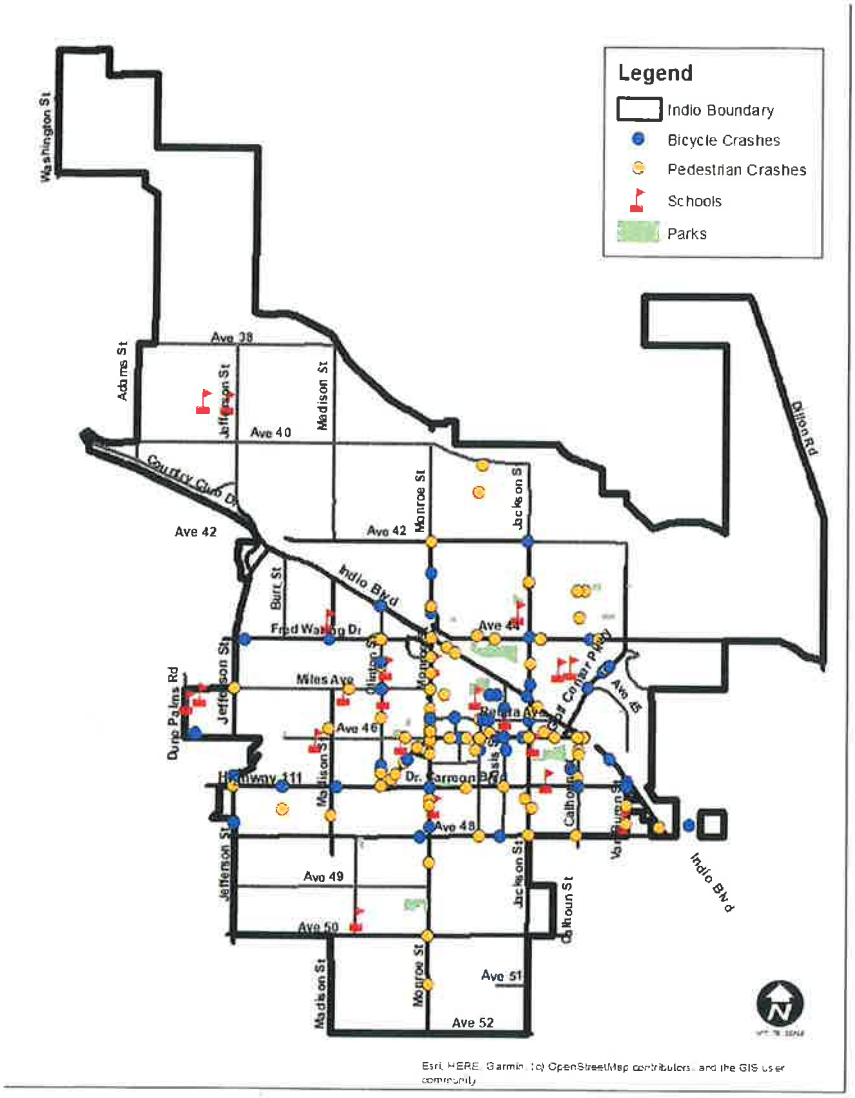
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

CHEYENNE RD AND DR. CARREON BLVD.

CITY OF INDIO



Instructions/Instrucciones:

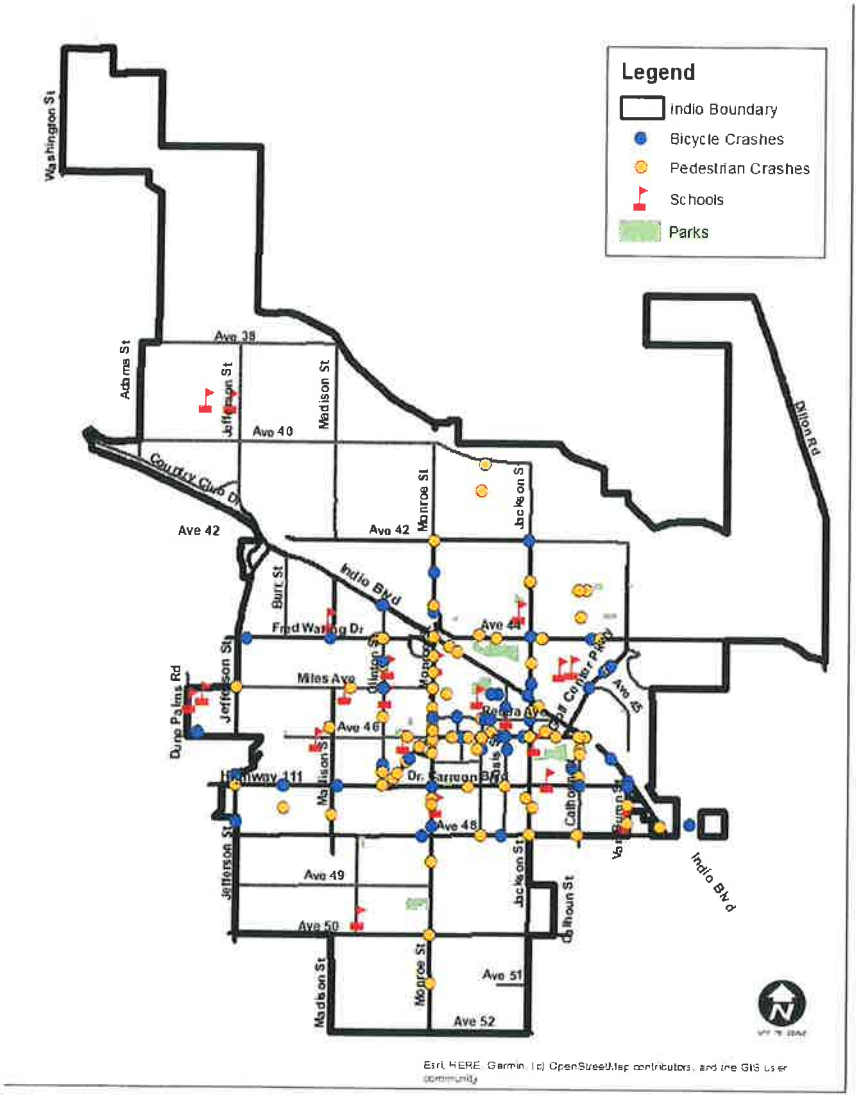
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

- Resurface parts of Deglet Noor.
- GREAT CITY EFFORT AT THIS EVENT
- Many RVs 45740 Rio St.

CITY OF INDIO



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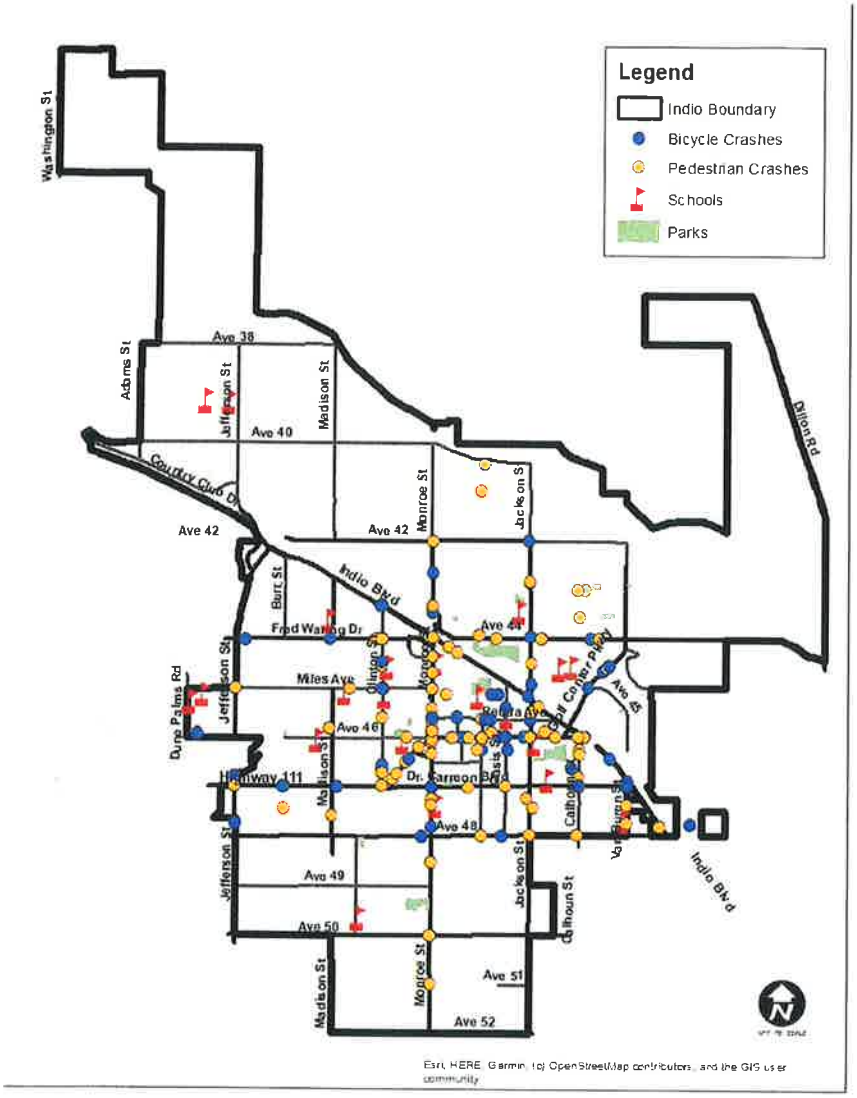
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

Monroe St. in front of Waterecrest Apt. Big Dip.

CITY OF INDIO



Instructions/Instrucciones:

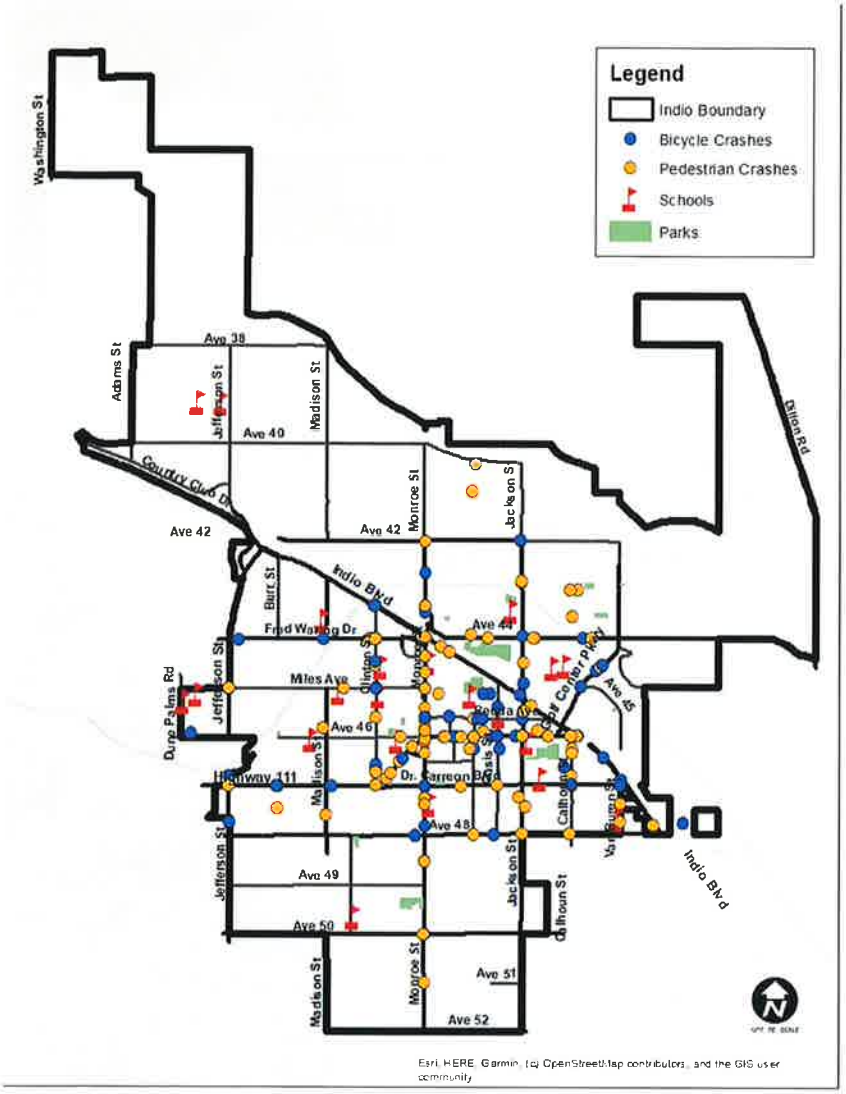
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

HIGHWAY 111 AND CALHOUN STREET

CITY OF INDIO



Instructions/Instrucciones:

Please provide safety concern locations on the lines provided below or by drawing on the map.

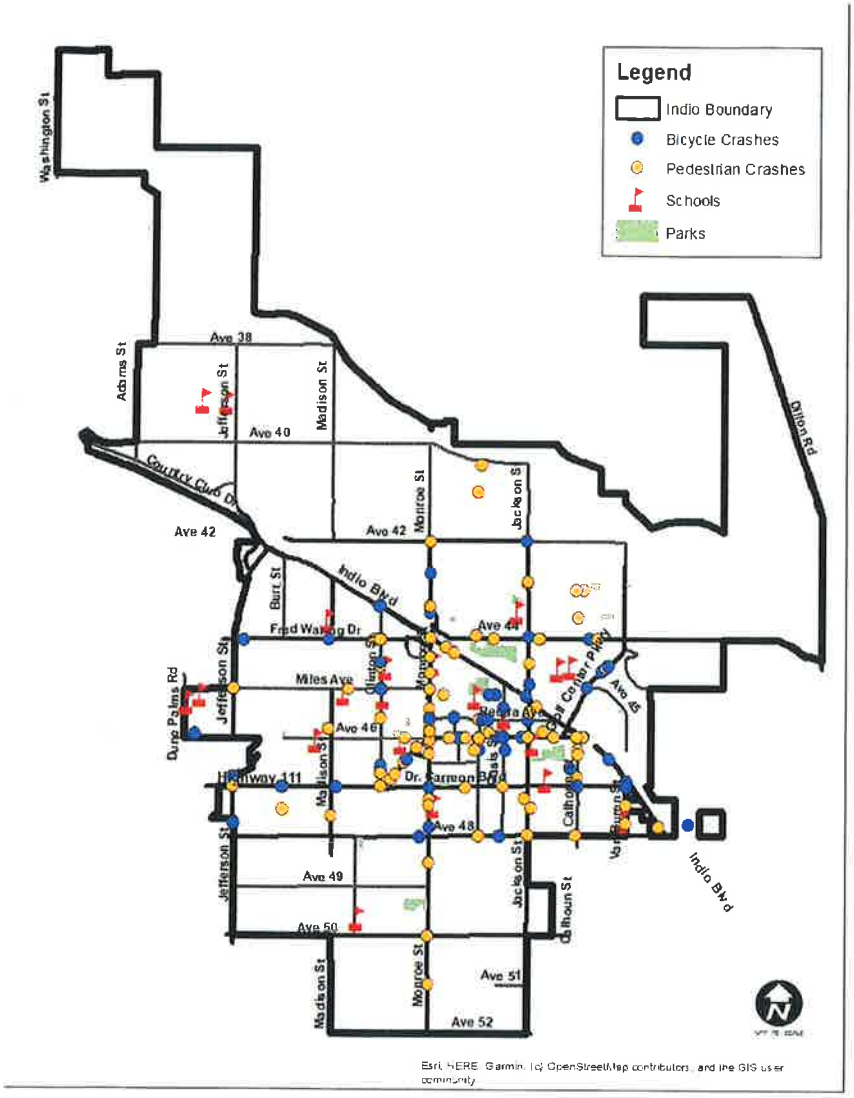
Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

Fred Waring and Monroe.

Avenue 44 and Monroe

CITY OF INDIO



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Please provide safety concern locations on the lines provided below or by drawing on the map.

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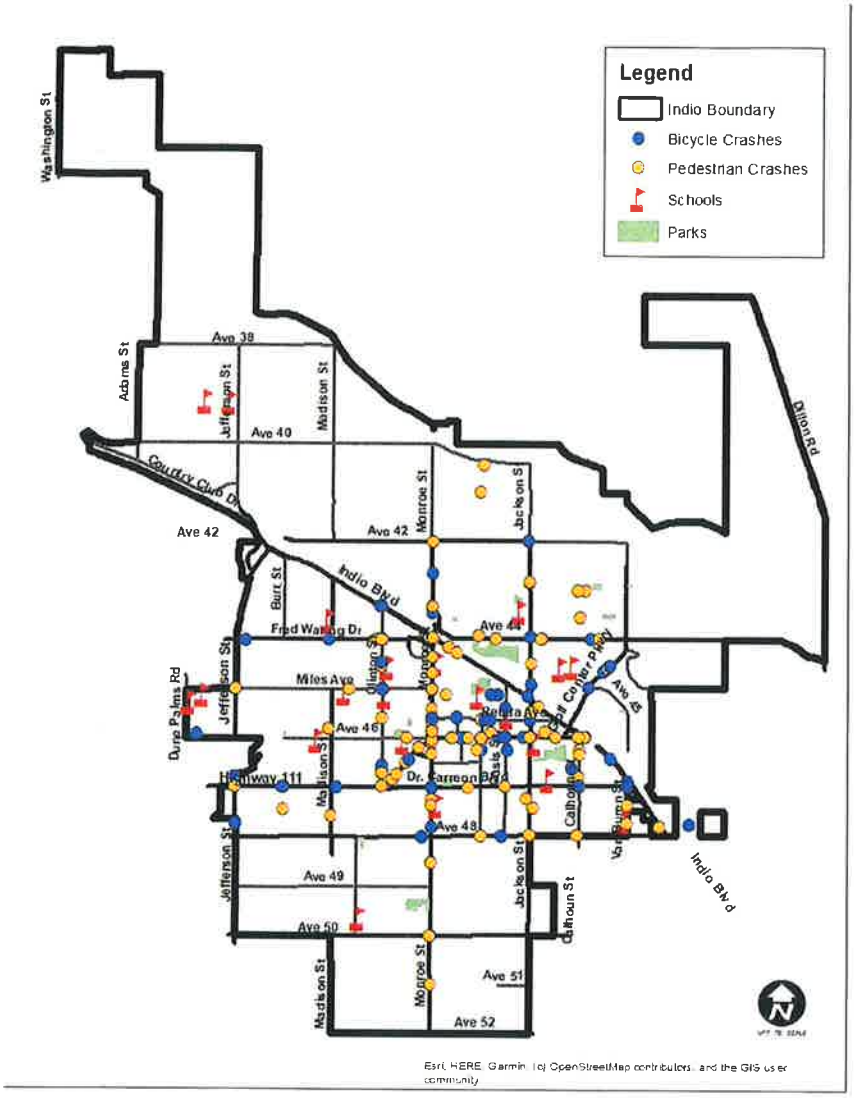
COMMENTS/COMENTARIOS

MONROE ST. AND I-10 FREEWAY

CITY OF INDIO



Instructions/Instrucciones:

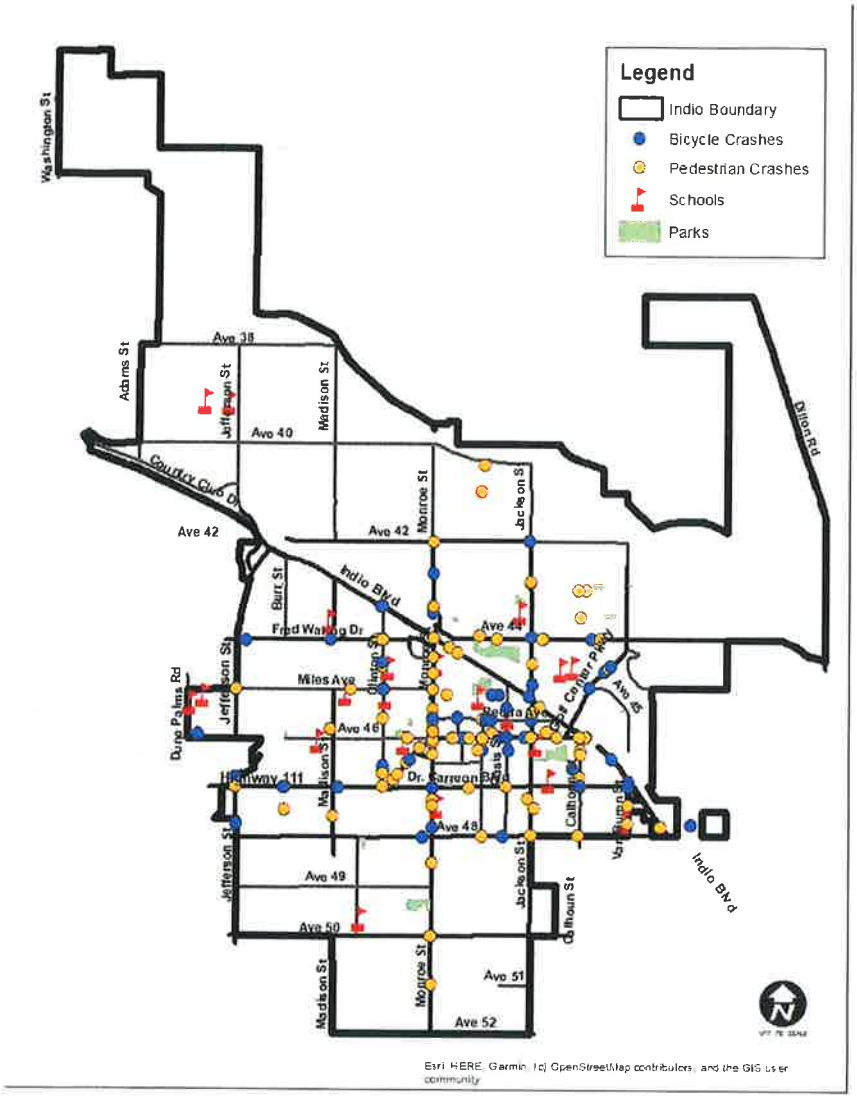
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

JACKSON ST. AND AVENUE 44

CITY OF INDIO



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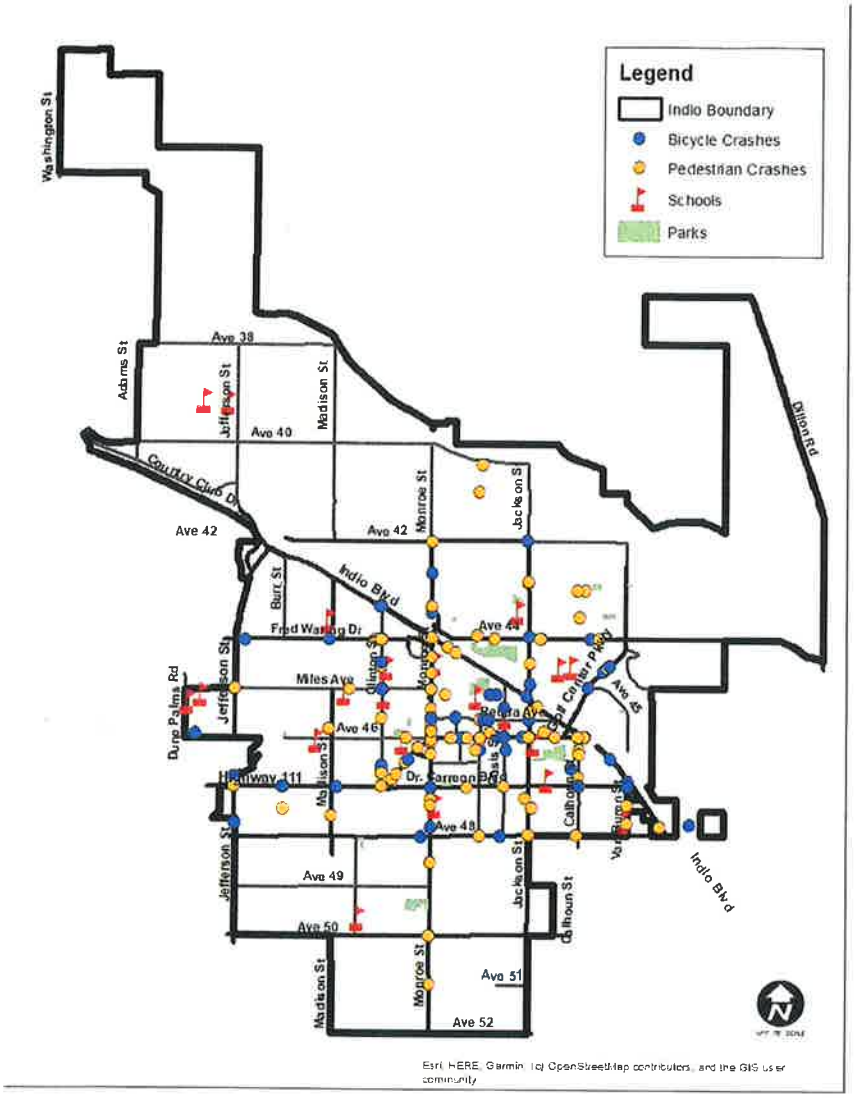
Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

JACKSON STREET AND DR. CARREON BOULEVARD

CITY OF INDIO



Instructions/Instrucciones:

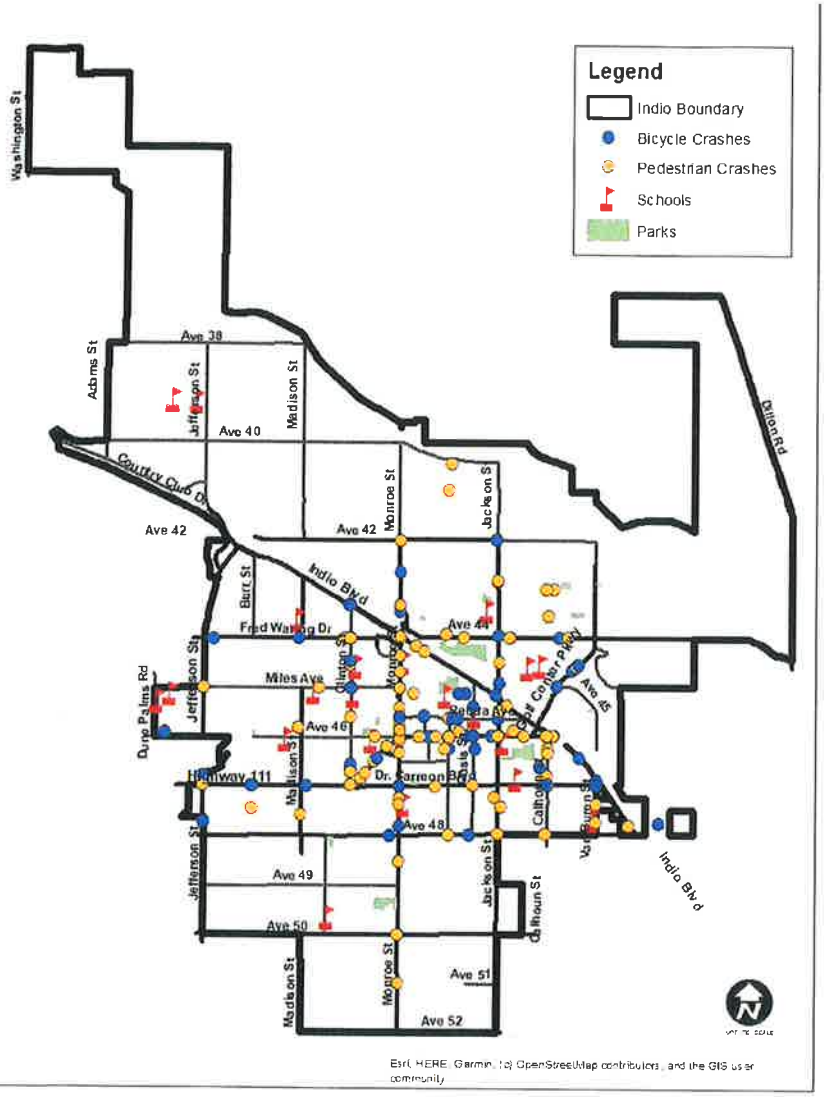
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

AVENUE 48 AND CALHOUN STREET LEFT TURN ARROW NORTH BOUND CALHOUN STREET TO WEST BOUND AVENUE 48.

CITY OF INDIO



Instructions/Instrucciones:

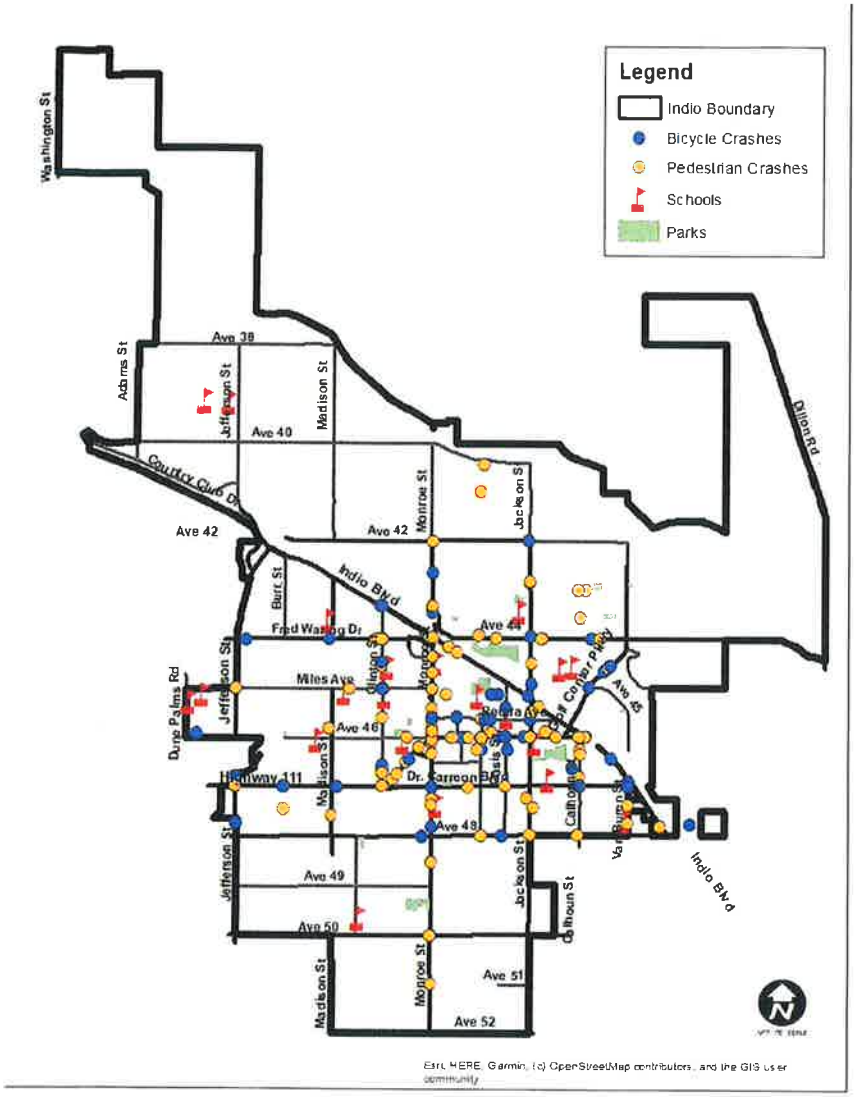
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

Help the homeless people more out. You see a whole lot of them.

CITY OF INDIO



Instructions/Instrucciones:

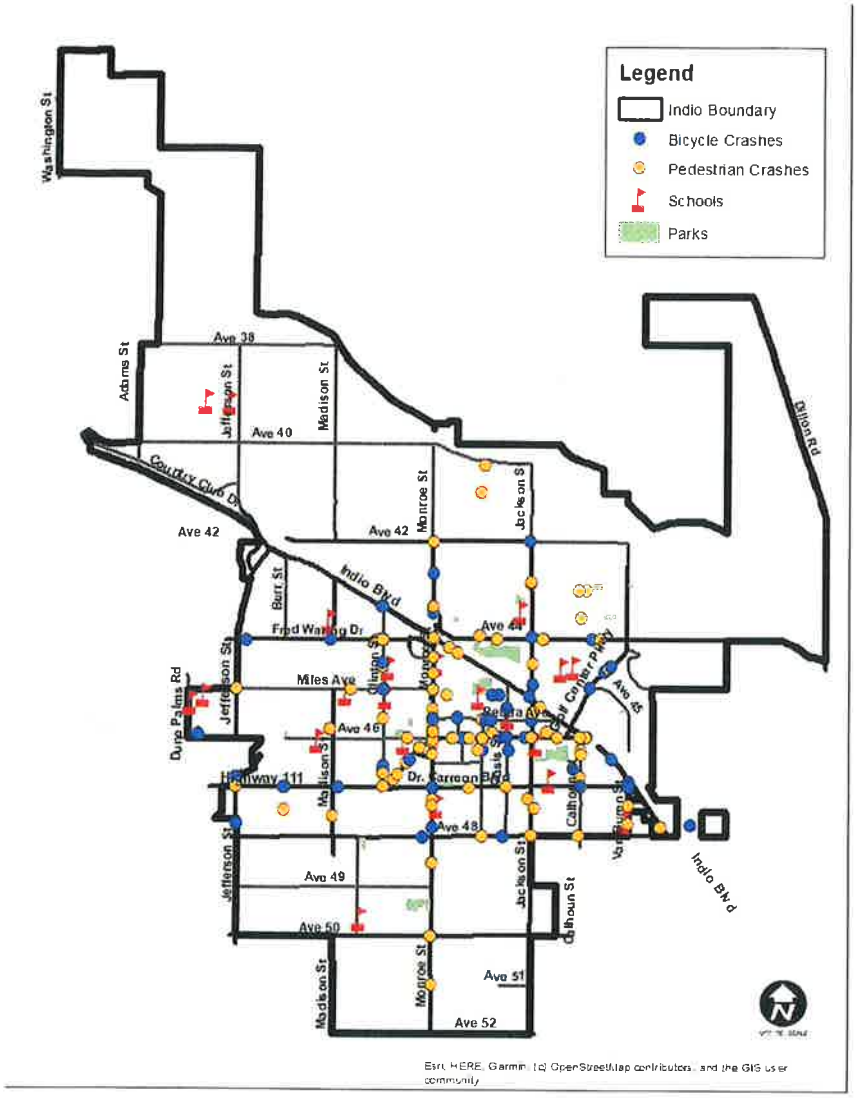
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

JACKSON STREET AND AVENUE 50

CITY OF INDIO



Instructions/Instrucciones:

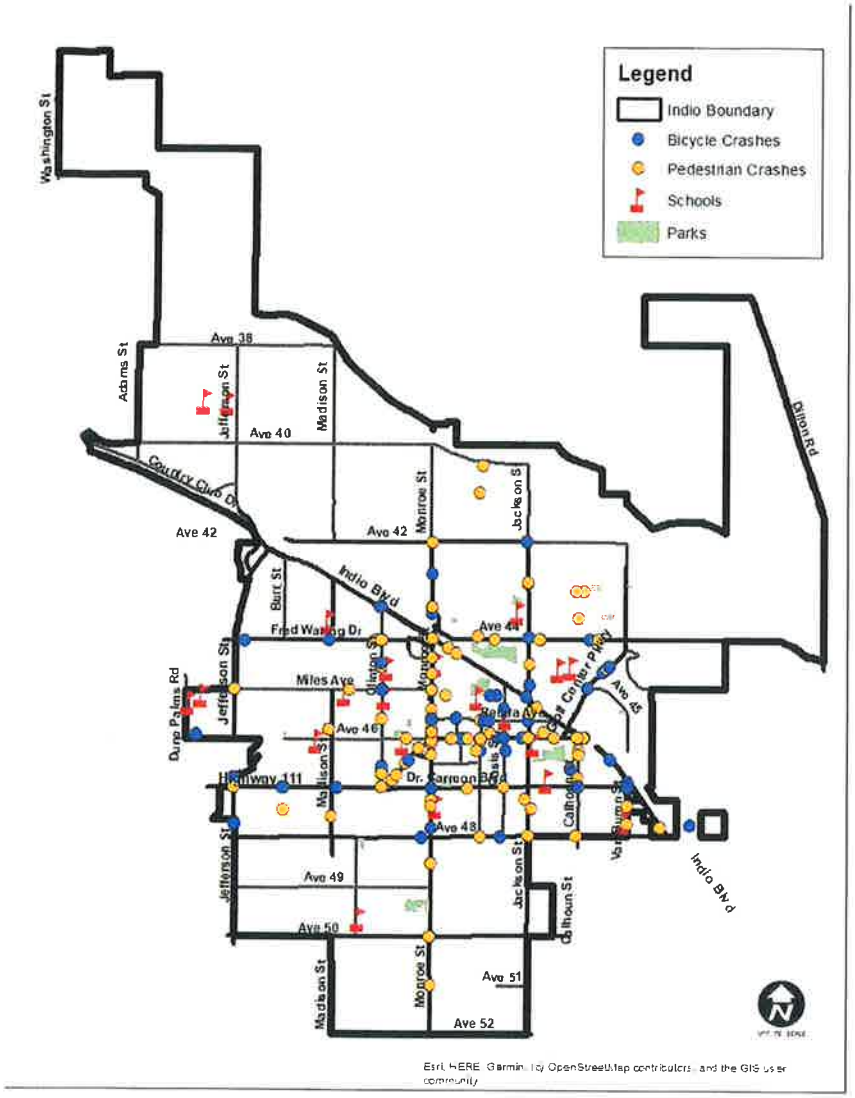
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

AVENUE 48 AND OASIS STREET

CITY OF INDIO



Instructions/Instrucciones:

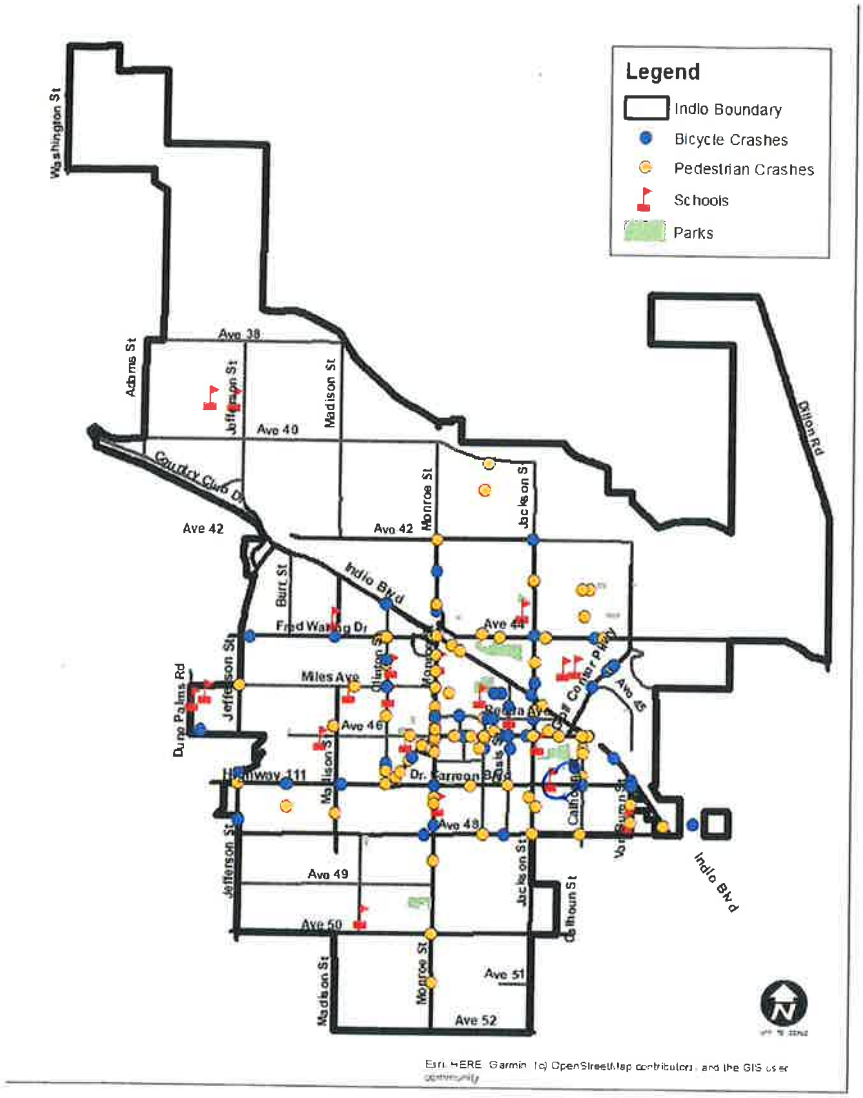
Please provide safety concern locations on the lines provided below or by drawing on the map.

Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

Please fix Van Buren pot holes

CITY OF INDIO



Instructions/Instrucciones:

Please provide safety concern locations on the lines provided below or by drawing on the map.

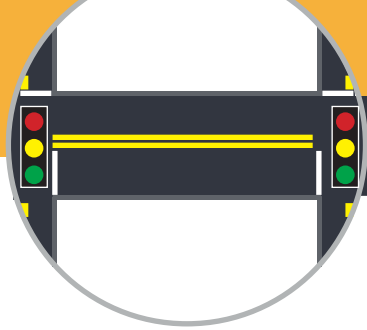
Por favor de escribir las locaciones de preocupación de seguridad en las líneas abajo o dibuje en el mapa.

COMMENTS/COMENTARIOS

The south jackson park area unsafe for kids homeless are near when kids walk home and they approach kids. There needs to be a staff member from school patroling the two crosswalks on jackson street near Jefferson Middle school so that kids can be safer.

Appendix B: Case Study Sheets

Segment #1: Highway 111 - Clinton St to Monroe St



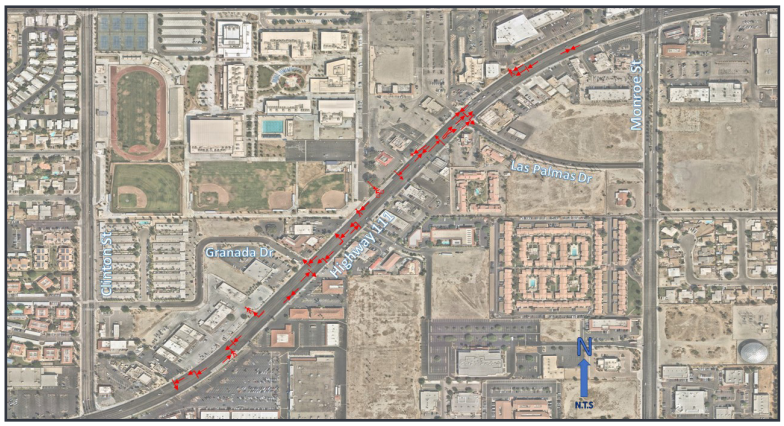
SEGMENT

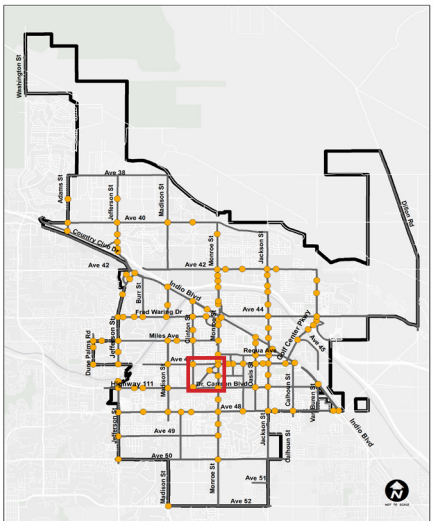
Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Highway 111 from Clinton St to Monroe St
Examples of Similar Segments: Indio Bl - Highway 111 to Van Buren St; Indio Bl - Jefferson St to Madison St





Traffic and Geometric Data:

Collision Data	
Total Collisions	23
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 0 Visible Injury - 2
Top 3 Collision Types (percentage)	Broadside (43.5%) Head-On (17.4%) Vehicle-Pedestrian (17.4%)
Total Nighttime Collisions	7
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	1

Traffic Data	
Average Daily Traffic (ADT)	48,500
Lighting	Yes
Highest Posted Speed Limit	50 MPH

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
18	4	1

Additional Notes:

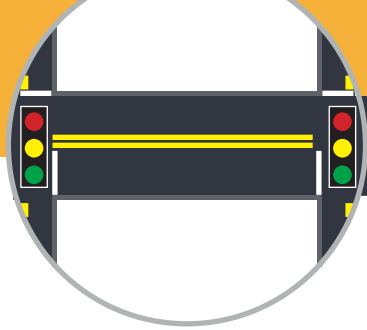
- Distance between pedestrian crossings is long (~1/2 mi)
- Several bus stops along the segment
- Crosswalk at Highway 111 & Las Palmas has only 3 legs
- 45 mph speed limit but many drivers driving above the speed limit
- Indio High School Safe Routes to School are nearby

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Improve signal hardware: lenses, mounting, size, and number	0.85 (S02)	$2,009,400	$12,000	167.45
Ped & Bike	Install crosswalks on sidestreets/ driveways	0.65 (NS21PB)	$3,690,960	$10,000	369.10
All	Install advanced dilemma zone detection	0.60 (S04)	$5,358,400	$34,000	157.60
All	Install medians to restrict conflicting turning movements	0.50 (NS15)	$6,698,000	$15,000	446.53
Ped & Bike	Install high-visibility crosswalk at Las Palmas Dr	0.75 (S18PB)	$2,636,400	$50,000	52.73
Ped & Bike	Install pedestrian refuge islands in median	0.55 (NS19PB)	$4,745,520	$50,000	94.91

Segment #2: Monroe St - Fred Waring Dr to Highway 111



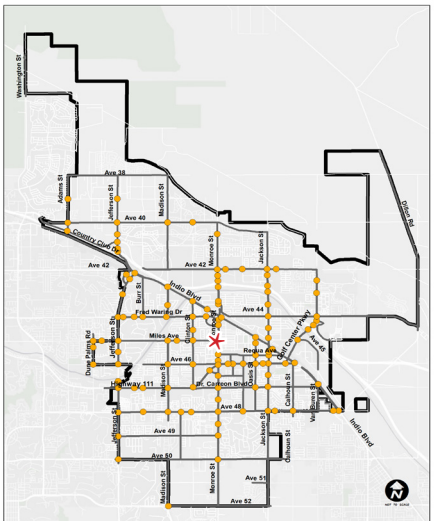
SEGMENT

Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Monroe St from Fred Waring Dr to Highway 111
Examples of Similar Intersections: Clinton St - Highway 111 to Fred Waring Dr; Jefferson St - Fred Waring St to Highway 111



Traffic and Geometric Data:

Collision Data	
Total Collisions	18
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 1 Visible Injury - 2
Top 3 Collision Types (percentage)	Rear-End (38.9%) Broadside (16.7%) Head-On/ Hit Object (11.1%)
Total Nighttime Collisions	6
Wet Surface Collisions	2
Drug and Alcohol Related Collisions	3

Traffic Data	
Average Daily Traffic (ADT)	39,320
Lighting	Yes
Highest Posted Speed Limit	40 MPH

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
11	1	0

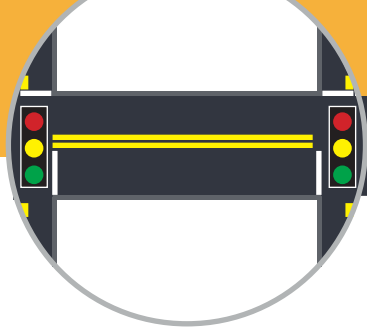
Additional Notes:

- 12 ft lanes could be shortened to give space to bicycle lanes
- 40 mph speed limit but many drivers were speeding
- Herbert Hoover Elementary School Safe Routes to School is along Monroe St (similar issues identified)

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install crosswalks at side streets/ driveways	0.65 (NS21PB)	$7,453,600	$60,000	124.23
All	Install dynamic/variable speed signage	0.70 (R26)	$6,388,800	$32,000	199.65
All	Install medians to restrict conflicting movements	0.50 (NS15)	$10,648,000	$15,000	709.87
All	Install advanced dilemma zone detection along corridor	0.60 (S04)	$8,518,400	$34,000	250.54
All	Reduce size of lanes from 12 ft to 11 ft	0.76 (7825)	$5,111,040	$12,000	425.92
All	Set up speed enforcement zone	0.95	$1,064,800	$5,000	212.96

Segment #3: Monroe St - Dr Carreon Bl to Ave 48

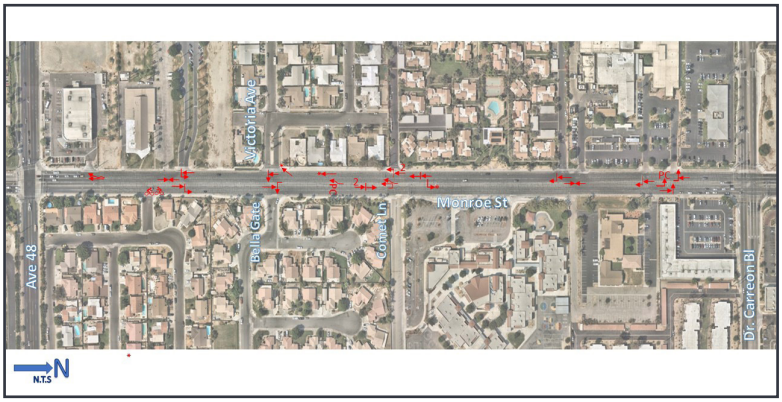


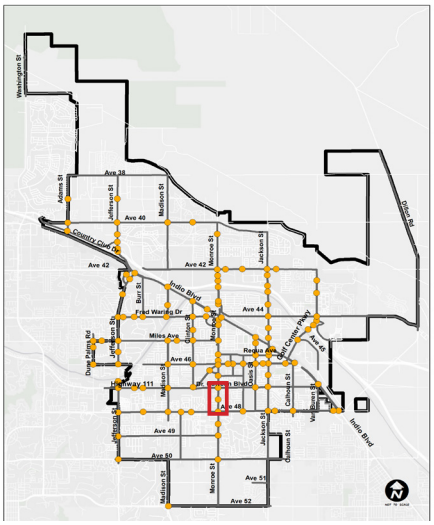
Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Monroe St from Dr Carreon Bl to Ave 48
Examples of Similar Segments: Monroe St - Ave 48 to Ave 50; Jackson St - Ave 48 to Ave 50





Traffic and Geometric Data:

Collision Data	
Total Collisions	23
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 0 Visible Injury - 3
Top 3 Collision Types (percentage)	Broadside (39.1%) Hit Object (17.4%) Rear-End/ Sideswipe (13.0%)
Total Nighttime Collisions	9
Wet Surface Collisions	1
Drug and Alcohol Related Collisions	4

Traffic Data	
Average Daily Traffic (ADT)	11,167
Lighting	Yes
Highest Posted Speed Limit	40 MPH

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
16	1	1

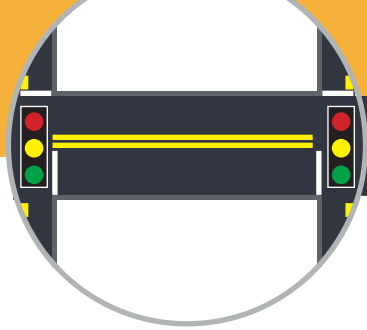
Additional Notes:

- Many cars observed cutting across traffic from hospital entrance
- 45 mph speed limit but many drivers were speeding
- Bike lanes were added after 2017, there were several bicyclists during field observations
- Monroe St identified in Safe Routes to School Plan (similar issues identifieds

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
Bike & Ped	Install green paint in bicycle lanes	0.65 (R32PB)	$131,880	$15,000	8.79
Bike & Ped	Install enhanced crosswalk at Comet Ln intersection	0.75 (S18PB)	$94,200	$50,000	1.88
All	Install advance dilemma zone detection along corridor	0.60 (S04)	$5,348,480	$34,000	157.31
All	Install improved signal hardware	0.85 (S02)	$2,005,680	$12,000	167.14
All	Advanced intersection signage at Comet Ln	0.85 (NS06)	$2,005,680	$3,000	668.56
All	Install protected left-turn operations on Comet Ln	0.70 (S07)	$4,011,360	$40,000	100.28
All	Install emergency signal at ER entrance of hospital	0.70 (NS03)	$4,011,360	$270,000	14.86

Segment #4: Fred Waring Dr - Madison St to Clinton St

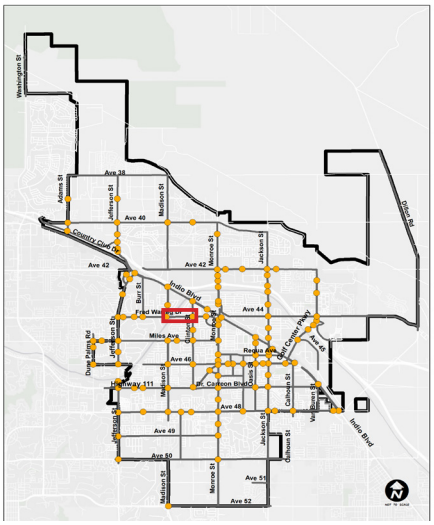


Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Fred Waring Dr from Madison St to Clinton St
Examples of Similar Locations: Fred Waring Dr - Clinton St to Hoover Ave; Indio Bl - Madison St to Clinton St; Fred Waring Dr & Heritage Palms Dr



Traffic and Geometric Data:

Collision Data	
Total Collisions	5
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 0 Visible Injury - 0
Top 3 Collision Types (percentage)	Hit Object (40%) Rear-End (40%) Vehicle-Pedestrian (20%)
Total Nighttime Collisions	2
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	1

Traffic Data	
Average Daily Traffic (ADT)	21,361
Lighting	Yes
Highest Posted Speed Limit	50 MPH

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
4	1	0

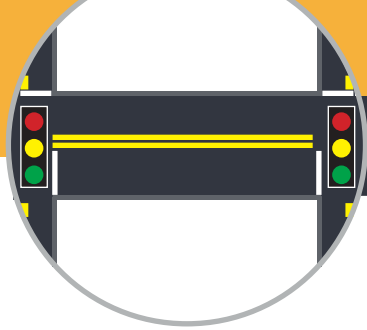
Additional Notes:

- 50 mph speed limit here, many drivers were speeding
- Lack of street lights on north side of Fred Waring Dr east of the bridge
- Similar collisions at Fred Waring Dr & Heritage Palms Dr (hit object & head-on)
- Madison St/Fred Waring Dr are identified as a Safe Routes to School Corridors

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install speed warning signage	0.70 (R26)	$2,691,840	$16,000	168.24
Dark	Install segment lighting	0.65 (R01)	$37,240	$50,000	0.74
Ped & Bike	Install green paint in bicycle lanes	0.65 (R32PB)	$3,066,000	$15,000	204.40
All	Install advanced dilemma zone detection	0.60 (S04)	$3,589,120	$34,000	105.56

Segment #5: Jefferson St - Varner Rd to Ave 39

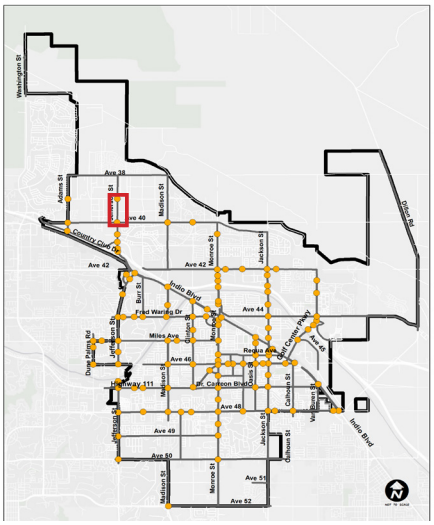


Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Jefferson St from Varner Rd to Ave 39
Examples of Similar Segments: Ave 42 - Monroe St to Jackson St; Ave 40 - Jefferson St to Madison St



Traffic and Geometric Data:

Collision Data	
Total Collisions	22
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 6
Top 3 Collision Types (percentage)	Broadside (36.4%) Rear-End (27.3%) Head-On/ Hit Object (13.6%)
Total Nighttime Collisions	6
Wet Surface Collisions	1
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	18,954
Lighting	Yes
Highest Posted Speed Limit	45 MPH

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
18	0	0

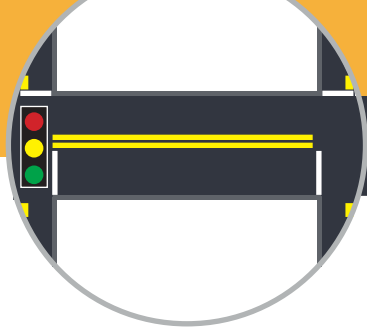
Additional Notes:

- 45 mph speed limit, but many drivers were speeding
- Observed U-turns to the south of the high school
- Lack of lighting to the south of the high school
- Jefferson St is identified as a Safe Routes to School corridor (similar issues identified in SRTS plan)

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install median south of school to limit conflicting movements	0.50 (S14)	$999,200	$15,000	66.61
Dark	Add more segment lighting	0.65 (R01)	$386,960	$50,000	7.74
All	Install enhanced pedestrian crossing	0.75 (S18PB)	$1,087,200	$50,000	21.74
All	Install advanced dilemma zone detection	0.60 (S04)	$1,739,520	$34,000	51.16
All	Improve signal hardware	0.85 (S02)	$652,320	$12,000	54.36
All	Improve signal timing	0.85 (S03)	$652,320	$8,000	81.54
All	Install flashing beacons as advanced warning	0.70 (S10)	$1,304,640	$12,000	108.72
All	Install RRFB at school with drop-off lane on east side of Jefferson St	0.65 (R37PB)	$699,440	$50,000	13.99

Segment #6: Valencia Bl - Monroe St to Arabia St

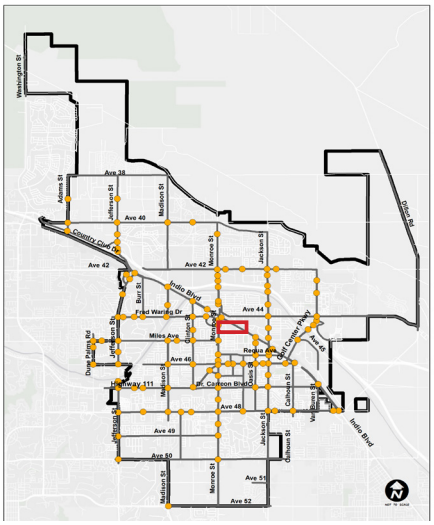


Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Segment: Valencia Bl from Monroe St to Arabia St
Examples of Similar Segments: Miles Ave - Monroe St to Rubidoux St; Sierra Ave - Monroe St to Rubidoux St



Traffic and Geometric Data:

Collision Data	
Total Collisions	5
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 1 Visible Injury - 1
Top 3 Collision Types (percentage)	Head-On (40.0%) Broadside (20.0%) Rear-End (20.0%)
Total Nighttime Collisions	2
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	2

Traffic Data	
Average Daily Traffic (ADT)	27,612
Lighting	No
Highest Posted Speed Limit	No Posted SL

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
5	0	0

Additional Notes:

- There is slight curve between Sun Gold St & Palm St
- Several cars speeding along segment
- EB leg crosswalk is missing at Sun Gold St intersection
- Valencia Bl is within the walkshed of Herbert Hoover Elementary School (similar issues identified in Safe Routes to School plan)

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install speed warning signage	0.70 (R26)	$2,846,640	$16,000	177.92
Ped & Bike	Upgrade pedestrian crossing at uncontrolled locations	0.75 (NS20PB)	-	$22,000	-
Parked Car Collisions	Install striping to address parked car collisions	0.95	$456,840	$12,000	38.07
All	Install centerline striping along segment	0.75 (R28)	$2,310,800	$4,000	577.70
Parked Car Collisions	Update striping to ensure parked cars have sufficient clearance from driveways	0.95	$456,840	$750	609.12

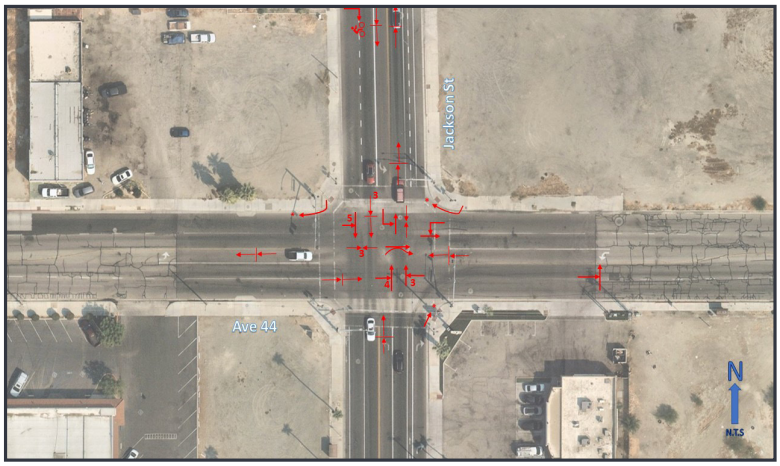
Location #7 - Ave 44 & Jackson St

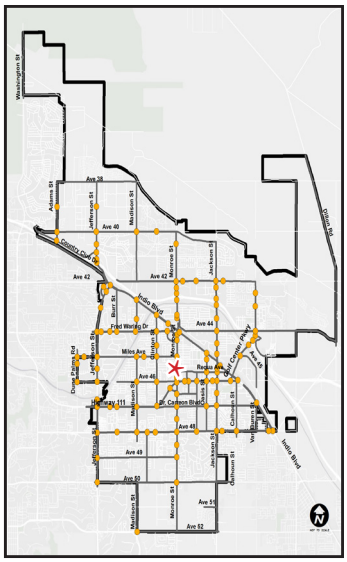
Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Intersection: #7 - Ave 44 & Jackson St
Examples of Similar Intersections: Jackson St & Dillon Ave; Ave 44 & Gold Center Pkwy





Traffic and Geometric Data:

Collision Data	
Total Collisions	34
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 1 Visible Injury - 1
Top 3 Collision Types	Broadside (47.1%) Rear-End (26.5%) Head-On (11.8%)
Total Nighttime Collisions	12
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Number of Approaches	4
Total Entering Vehicles	15,254
Crosswalk Condition	Good
Control Type	Signalized
Lighting	Yes
Highest Posted Speed Limit	45 MPH
Median	No

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
30	0	1

Additional Notes:

- Truck traffic was heavy in this area
- Speed limit was 40 mph, however many drivers were speeding
- Ave 44 & Jackson St are identified as SRTS Corridors in the Safe Routes to School Plan

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Reduction Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Improve signal hardware	15% (S02)	$2,222,580	$12,000	185.22
Bike & Ped	Install green paint on Jackson St bicycle lanes	35% (R32PB)	$113,260	$15,000	7.55
All	Install advanced dilemma zone detection	40% (S04)	$5,926,880	$34,000	174.32
All	Install pavement markers through intersection	10% (S09)	$1,481,720	$22,000	67.35
All	Install speed feedback signage	30% (R26)	$4,445,160	$64,000	69.46
All	Install signal warning beacons to alert when signal will change	30% (S10)	$4,445,160	$12,000	370.43

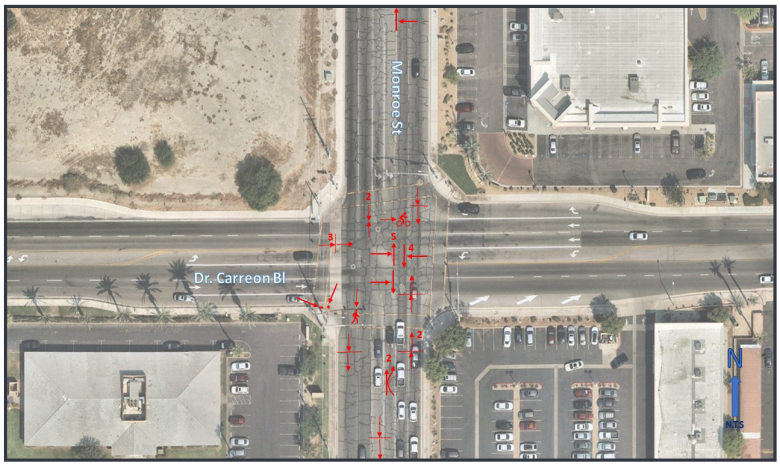
Case Study Sheet: Location #8 - Monroe St & Dr. Carreon Bl

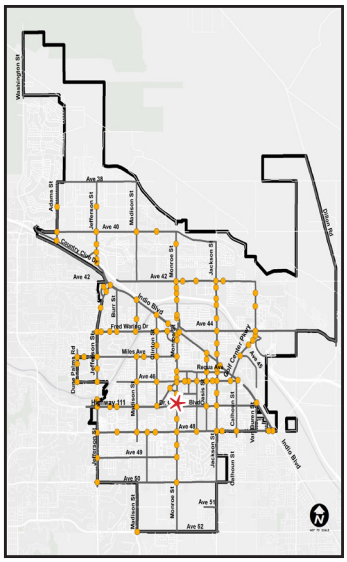
Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Intersection: Monroe St & Dr. Carreon Bl
Examples of Similar Intersections: Monroe St & Ave 48; Jackson St & Dr. Carreon Bl





Traffic and Geometric Data:

Collision Data	
Total Collisions	28
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 3 Visible Injury - 3
Top 3 Collision Types	Broadside (42.9%) Rear-End (32.1%) Sideswipe (7.1%)
Total Nighttime Collisions	8
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	2

Traffic Data	
Number of Approaches	4
Total Entering Vehicles	22,334
Crosswalk Condition	Good
Control Type	Signalized
Lighting	Yes
Highest Posted Speed Limit	40 MPH
Median	No

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
24	1	1

Additional Notes:

- Significant vehicle traffic from JFK Hospital on SW corner
- Observed high amount of pedestrian traffic
- Several vehicles observed speeding
- Monroe St and Dr. Carreon Bl are both identified as Safe Routes to School Corridors (Carreon Academy and Roosevelt HS are nearby)

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Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Reduction Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
Bike & Ped	Install enhanced pedestrian crossing	25% (S18PB)	$50,000	$50,000	1.88
All	Install advanced dilemma zone detection	40% (S04)	$12,528,480	$34,000	368.48
All	Improve signal hardware	15% (S02)	$4,698,180	$12,000	391.52
All	Install speed feedback signage	30% (R26)	$9,396,360	$16,000	587.27
All	Implement school zone enforcement	5%	$1,566,060	$3,000	522.02

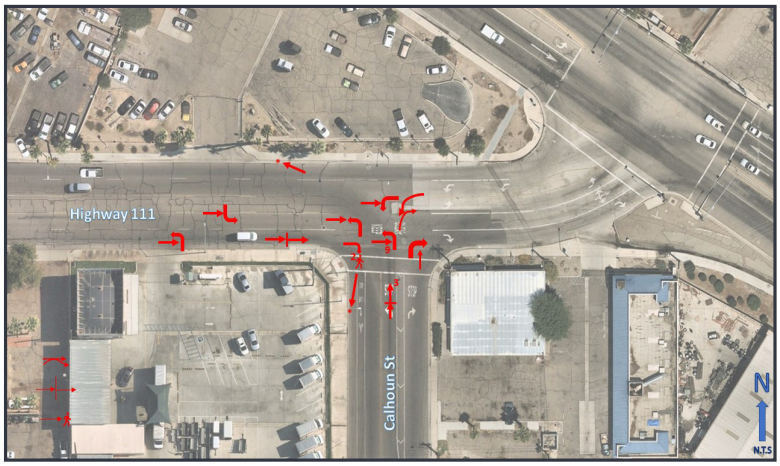
Case Study Sheet: Location #9 - Highway 111 & Calhoun St

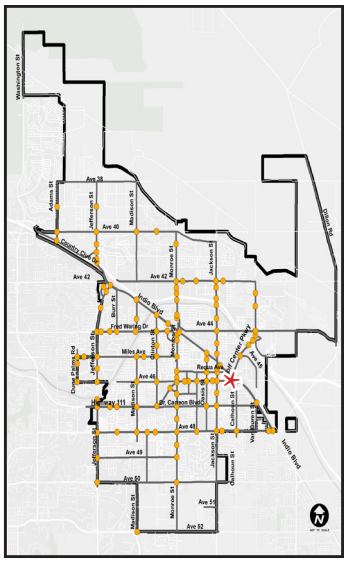
Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Intersection: Highway 111 & Calhoun St
Examples of Similar Intersections: Monroe St & Ave 48; Jackson St & Dr. Carreon Bl





Traffic and Geometric Data:

Collision Data	
Total Collisions	23
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 2
Top 3 Collision Types	Broadside (56.5%) Rear-End (17.4%) Ped/Hit Object (8.7%)
Total Nighttime Collisions	5
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	1

Traffic Data	
Number of Approaches	3
Total Entering Vehicles	14,218
Crosswalk Condition	Good
Control Type	Unsignalized
Lighting	Yes
Highest Posted Speed Limit	40 MPH
Median	No

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
18	0	2

Additional Notes:

- Observed a significant amount of truck traffic
- Observed significant queueing on WBL and NBL turn movements
- Many vehicles on NBL turn movement had to wait awhile for gap to appear
- There was also queueing on EB movement from Highway 111 & Indio Bl intersection

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Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Reduction Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
Bike & Ped	Install pedestrian crossing at uncontrolled locations	35% (NS21PB)	$312,480	$10,000	31.25
All	Intersection control evaluation (potentially install signals, combine this with Highway 111/Indio Bl collision with split phasing)	30% (NS03)	$1,325,640	$270,000	4.91
All	Install flashing warning beacons on approaches	15% (NS08)	$662,820	$6,000	110.47
All	Install median to restrict conflicting turning movements	15% (NS15)	$2,209,400	$15,000	147.29

Case Study Sheet: #10 - Indio Bl & Sun Gold St

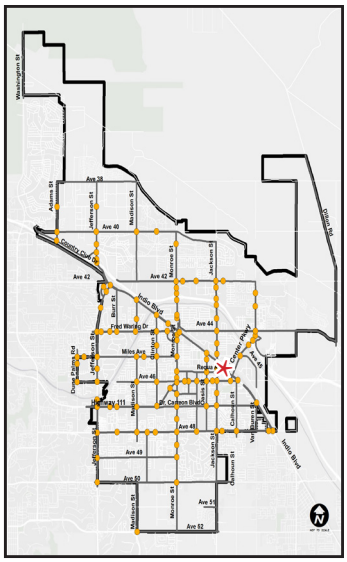
INTERSECTION

Project Name: Indio LRSP
Agency Name: Indio
Contact Name: Juan Raya
Email: jraya@indio.org

Prepared by: Kimley-Horn
Checked by: Jean Fares
Date: November 2021

Project Location Description & Maps:

Intersection: Indio Bl & Sun Gold St
Examples of Similar Intersections: Indio Bl & Palm St; Indio Bl & King St



Traffic and Geometric Data:

Collision Data	
Total Collisions	6
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 1 Visible Injury - 1
Top 3 Collision Types	Rear-End (66.7%) Broadside (33.3%) Sideswipe (16.7%)
Total Nighttime Collisions	3
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Number of Approaches	3
Total Entering Vehicles	22,048
Crosswalk Condition	No crosswalks
Control Type	Unsignalized
Lighting	Yes
Highest Posted Speed Limit	45 MPH
Median	On EB/WB approaches

Collision Breakdown		
Veh vs. Veh	Veh vs. Ped	Veh vs. Bike
5	1	0

Additional Notes:

- Many vehicles on Indio Bl were speeding
- Intersection has significant skew

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Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Reduction Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
Broadsides	Install median to prohibit left-turns from Sun Gold St	50% (NS15)	$8,948,400	$15,000	596.56
All	Install traffic signal	30% (NS03)	$5,668,800	$270,000	21.00
Pedestrian	Upgrade pedestrian crossing	35% (NS21PB)	$199,220	$70,000	13.50
All	Install raised median & centerline to reduce intersection skew on Sun Gold St approach	40% (NS13)	$7,558,400	$20,000	377.92

Appendix C: Analysis Rankings Table – Segments and Intersections

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	Fatal	Serious Injury	Other Visible Injury	Complaint of Pain	PDO	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Other Principal Arterial																							
Highway 111	Madison St - Clinton St	**11**	0.2	36	0	0	1	3	7	3	0	3	1	2	0	0	0	1	3	0	1	0	0
Highway 111	Jefferson St - Jackalope Trail	**6**	0.0	16	0	0	0	2	4	1	0	2	1	1	0	0	0	0	2	0	0	0	1
Jefferson St	Fred Waring Dr - Independence Way	**5**	0.1	25	0	0	0	4	1	1	0	2	0	0	0	0	0	0	2	0	0	0	1
Highway 111	Las Palmas Dr - Granada Dr	**5**	0.8	20	0	0	1	1	3	3	0	0	0	1	0	0	1	1	0	0	0	0	0
Highway 111	Granada Dr - Clinton St	**5**	0.2	194	1	0	1	3	0	2	0	1	0	0	0	0	2	0	1	0	1	0	0
Indio Blvd	I-10 EB Ramps - Jefferson St	**4**	0.0	178	0	1	0	2	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0
Jefferson St	Miles Ave - Pebble Beach Dr	**3**	0.3	181	1	0	1	1	0	0	0	2	1	0	0	0	0	0	2	0	0	0	0
Highway 111	Rubidoux St - Arabia St	**3**	0.5	167	0	1	0	0	2	0	0	0	0	2	0	0	1	0	0	0	1	0	0
Highway 111	Monroe St - Las Palmas Rd	**3**	0.5	13	0	0	0	2	1	0	0	1	0	1	0	0	1	0	1	0	1	0	1
Indio Blvd	Van Buren St - Ave 48	**3**	-0.17	167	0	1	0	0	2	0	0	0	1	1	0	0	1	0	0	0	1	0	0
Highway 111	Shields Rd - Younge Ln	**3**	-0.10	8	0	0	0	1	2	0	0	1	0	0	0	0	0	0	2	0	1	0	0
Minor Arterial																							
Monroe St	43rd Ave - Oleander Ave	**8**	0.9	187	0	1	0	3	4	2	0	2	2	0	0	0	0	0	2	0	0	1	0
47th Ave	Monroe St - Cheyenne Rd	**8**	0.9	38	0	0	0	6	2	4	0	3	1	0	0	0	0	0	3	0	0	0	1
Ave 42	Monroe St - Ave 42	**6**	0.7	36	0	0	2	2	2	1	0	2	0	2	0	0	0	0	1	0	0	0	0
Monroe St	Doctor Carreon Bl - Bella Gate	**6**	0.5	195	1	0	1	3	1	3	0	0	1	1	0	0	1	0	0	0	0	0	0
Monroe St	Date Ave - Doctor Carreon Bl	**5**	0.5	179	0	1	0	2	2	3	0	2	0	0	0	0	0	0	2	0	0	0	0
Ave 42	Burr St - Madison St	**4**	0.2	19	0	0	0	3	1	1	0	0	0	0	2	0	0	0	2	0	0	0	1
Jackson St	Ave 44 - Kenner Ave	**4**	0.6	9	0	0	0	1	3	0	0	4	0	0	0	0	0	0	4	1	0	0	1
Ave 48	Monroe St - Desert Grove Dr	**4**	1.3	168	0	1	0	0	3	3	0	0	0	0	0	0	0	0	0	0	1	0	0
Jefferson St	Derek Alan Dr - Ave 50	**4**	0.0	23	0	0	2	0	2	1	0	2	0	0	0	0	0	0	1	0	0	0	0
Jackson St	Ave 42 - Atlantic Ave	**3**	0.4	13	0	0	0	2	1	0	0	2	0	0	0	0	0	0	2	0	0	0	1
Ave 44	Saguaro Gate - Market St	**3**	0.48	22	0	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Fred Waring Dr	Forest Dr - Clinton St	**3**	0.00	167	1	0	0	0	2	0	0	2	0	0	0	0	1	0	1	0	0	0	0
Fred Waring Dr	Heritage Palms Dr N - Burr St	**3**	0.00	8	0	0	0	1	2	0	0	0	1	2	0	0	0	0	1	0	1	0	1
Major Collector																							
Ave 42	Jackson St - Collection Dr	**10**	0.3	10	0	0	1	0	9	0	0	2	2	5	0	0	0	0	3	0	3	2	0
Varner Rd	Adams St - Fifties Way	**5**	0.0	5	0	1	2	1	1	3	0	0	1	0	0	0	0	0	1	0	0	0	0
Adams St	39th Ave - Ave 40	**4**	0.3	4	0	0	2	0	2	0	0	2	0	1	0	1	0	0	3	0	1	0	0
Ave 40	Varner Rd - Adams St	**4**	0.3	4	0	0	1	0	3	1	0	1	1	1	0	0	0	0	1	0	2	0	0
Miles Ave	Heritage Palms Dr S - Madison St	**4**	0.3	4	0	0	0	1	3	1	0	1	0	1	1	0	0	0	1	0	0	0	0
Jefferson St	40th Ave - Sun City Blvd	**3**	1.0	3	0	0	1	0	2	0	0	2	0	1	0	0	0	0	2	0	0	0	0
Jackson St	Generations Dr - Ave 42	**3**	0.9	3	0	0	0	1	2	0	0	0	2	0	0	0	0	0	0	0	0	0	1
Rubidoux St	Requa Ave - Highway 111	**3**	0.5	3	0	0	1	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0
Jefferson St	39th Ave - Shadow Hills High School	**2**	0.3	2	0	0	1	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1
Jefferson St	Shadow Hills High School - Ave 40	**2**	0.8	2	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Ave 40	Kevin Rd - Madison St	**2**	1.27	2	0	0	0	0	2	0	0	1	0	1	0	0	0	0	1	0	0	1	0
Clinton St	Fred Waring Dr - Laurel Gate	**2**	-0.06	2	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Hoover Ave	Monroe St - Armata Ave	**2**	-0.10	2	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Requa Ave	Rubidoux St - Arabia St	**2**	0.13	2	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Local																							
Francis Ave	Swingle Ave - Clinton St	**4**	0.8	4	0	0	0	0	4	0	0	2	1	0	0	0	0	0	0	0	0	2	0
Valencia Ave	Sun Gold St - Palm St	**3**	-0.5	176	0	1	1	0	1	1	0	0	2	0	0	0	0	0	0	0	2	0	0
44th Ave	Fred Waring Dr - Indio Blvd	**2**	0.2	2	0	0	0	0	2	0	0	0	2	0	0	0	0	0	1	0	1	0	0
Dillon Ave	Serrano Ln - Palo Verde St	**2**	0.5	2	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	1	0	0
Helen Ave	Swingle Ave - Clinton St	**2**	0.3	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Ave 45	Palo Verde St - Highway 111	**2**	0.1	7	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Shadow Palm Ave	Aladdin St - Monroe St	**2**	0.4	2	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0

1. Local Critical Crash Rate Differential

2. Equivalent Property Damage Only Crashes

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Intersection	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Signalized Intersections																						
Ave 48 - Jefferson St	**49**	1.0	522	2	0	4	21	22	10	3	33	0	2	0	1	0	0	25	1	6	0	1
Jefferson St - Miles Ave	**48**	1.4	492	0	2	1	21	24	16	2	14	2	9	0	1	2	1	28	2	6	2	1
Ave 48 - Calhoun St	**44**	1.4	343	0	1	5	17	21	19	8	9	5	2	0	0	1	0	25	1	8	0	2
Jefferson St - Fred Waring Dr	**36**	0.0	116	0	0	3	10	23	11	8	15	0	1	1	0	0	0	13	2	3	1	1
Jackson St - I-10 EB Ramps	**35**	0.7	318	0	1	5	14	15	8	3	17	3	3	0	0	1	0	14	0	3	0	1
Ave 44 - Jefferson St	**34**	0.8	279	0	1	1	14	18	16	3	10	4	1	0	0	0	1	16	0	1	0	0
Jefferson St - I-10 WB Ramps	**33**	0.6	276	0	1	4	8	20	11	10	7	3	1	0	1	0	0	17	1	1	2	3
Monroe St - I-10 EB	**32**	0.1	489	0	2	5	16	9	10	3	7	12	0	0	0	0	1	9	0	1	0	2
Monroe St - Doctor Carreon Bl	**28**	0.3	589	0	3	3	8	14	12	2	9	2	2	0	0	1	1	17	0	2	0	0
Jefferson St - Old Hwy 111	**26**	-0.1	120	0	0	6	7	13	9	1	9	3	2	0	0	2	0	12	1	4	0	1
Highway 111 - Monroe St	**26**	0.66	434	0	2	1	14	9	10	1	7	2	2	1	0	3	1	8	0	1	0	1
Ave 46 - Jackson St	**18**	0.20	242	0	1	2	8	7	7	1	5	2	1	0	2	0	3	11	0	2	0	1
Dune Palms Rd - Miles Ave	**18**	0.01	82	0	0	4	5	9	12	0	4	2	0	0	0	0	0	10	2	2	0	0
Ave 48 - Monroe St	**17**	0.10	230	1	0	3	4	9	3	1	12	1	0	0	0	0	0	10	0	3	0	0
Miles Ave - Clinton St	**17**	0.25	394	1	1	2	6	7	7	2	4	0	0	0	0	1	3	9	0	1	0	0
Golf Center Pkwy - Ave 44	**17**	-0.06	67	0	0	1	8	8	8	1	5	1	2	0	0	0	0	6	0	0	0	1
Old Hwy 111 - Clinton St	**16**	-0.14	51	0	0	1	5	10	5	4	6	0	1	0	0	0	0	5	0	3	0	1
Oasis St - 47th Ave	**16**	0.08	76	0	0	2	8	6	10	0	1	4	0	0	0	1	0	5	0	0	0	0
Jackson St - Requa Ave	**16**	0.03	65	0	0	3	4	9	6	1	4	1	1	1	2	0	1	9	0	3	0	0
Fred Waring Dr - 44th Ave	**15**	4.25	94	0	0	5	6	4	12	2	0	1	0	0	0	0	0	9	1	0	0	0
Ave 48 - Jackson St	**14**	0.04	203	0	1	0	5	8	3	2	8	0	0	0	0	1	0	8	0	1	0	1
Calhoun St - 47th Ave	**14**	0.21	74	0	0	3	6	5	7	1	2	3	0	0	0	1	1	7	0	2	0	0
Rubidoux St - Old Hwy 111	**14**	0.15	82	0	0	6	2	6	6	4	1	2	1	0	0	0	2	7	0	1	1	1
Monroe St - Hoover Ave	**14**	-0.13	60	0	0	0	9	5	5	1	8	0	0	0	0	0	0	13	0	0	0	0
Jackson St - Kenner Ave	**14**	0.11	54	0	0	2	4	8	4	2	5	2	1	0	0	0	0	6	0	2	0	0
Golf Center Pkwy - Ave 43	**14**	0.54	59	0	0	1	7	6	10	1	0	2	0	0	1	0	0	2	0	1	0	0
Jefferson St - Ave 40	**14**	1.02	68	0	0	4	3	7	6	2	2	3	1	0	0	0	0	8	0	0	0	0
Arabia St - Old Hwy 111	**13**	0.11	33	0	0	0	4	9	0	2	6	2	1	0	0	3	0	4	0	3	0	0
Indio Bl - Clinton St	**13**	-0.01	216	1	0	2	4	6	4	2	4	1	1	0	0	1	2	7	0	1	0	0
Jackson St - Ave 42	**13**	-0.11	207	0	1	1	4	7	4	2	1	4	1	0	0	0	1	2	0	3	0	0
Adams St - Varner Rd	**13**	-0.17	231	0	1	3	5	4	8	0	1	3	0	0	1	0	0	2	0	0	0	0
Monroe St - Ave 50	**12**	-0.15	61	0	0	4	2	6	3	1	3	0	3	1	0	1	1	6	0	2	0	0
Ave 48 - Arabia St	**12**	0.01	32	0	0	0	4	8	2	1	7	0	2	0	0	0	0	7	0	2	1	1
Oasis St - Old Hwy 111	**12**	0.54	37	0	0	1	3	8	5	2	3	0	1	0	0	2	1	6	0	2	0	0
Jackson St - 52nd Ave	**11**	-0.12	364	0	2	0	5	4	7	0	4	0	0	0	0	0	0	6	1	3	1	2
Ave 50 - Madison St	**11**	-0.06	61	0	0	2	6	3	7	0	2	1	0	0	1	0	0	6	1	2	2	0
Blass Ave - Jackson St	**11**	-0.17	200	0	1	0	5	5	3	0	3	2	1	1	0	1	0	4	0	1	0	0
Jackson St - Ave 45	**11**	-0.18	46	0	0	2	3	6	1	0	7	0	2	0	0	0	1	6	0	1	0	0
Monroe St - Buena Vista Ave	**11**	-0.13	26	0	0	1	1	9	5	1	5	0	0	0	0	0	0	8	0	1	0	0
Arabia St - 47th Ave	**10**	-0.09	45	0	0	2	3	5	7	0	0	3	0	0	0	0	0	4	0	2	0	0
Dewitt St - Madison St	**10**	-0.15	228	0	1	4	3	2	3	1	4	0	2	0	0	0	0	6	0	2	0	1
Golf Center Pkwy - I-10 EB Ramps	**10**	-0.17	50	0	0	1	6	3	6	2	2	0	0	0	0	1	0	8	0	2	0	0
Jackson St - Showcase Pkwy	**10**	0.84	54	0	0	3	3	4	3	1	4	0	1	0	0	0	0	5	0	1	0	0
Madison St - Ave 48	**9**	-0.22	39	0	0	1	4	4	1	1	3	1	2	0	1	0	0	6	0	1	0	0
Highway 111 - Jackalope Trail	**9**	-0.12	39	0	0	1	4	4	1	1	4	0	3	0	0	0	0	3	0	3	0	0
Van Buren St - Indio Blvd	**9**	-0.24	34	0	0	1	3	5	4	0	3	1	0	0	1	0	1	4	0	0	0	0
Highway 111 - Las Palmas Rd	**9**	-0.08	24	0	0	0	3	6	4	1	1	3	0	0	0	0	0	3	0	0	0	0
Madison St - Ave 46	**9**	-0.20	198	0	1	1	3	4	3	0	1	2	3	0	0	0	0	3	0	3	0	1
Monroe St - Bliss Ave	**9**	-0.17	198	1	0	1	3	4	3	1	3	1	0	0	0	1	0	2	0	0	0	0
Monroe St - Ave 42	**9**	-0.03	28	0	0	2	0	7	5	0	2	0	1	0	0	1	0	5	0	1	0	1
Spectrum St - Ave 42	**9**	-0.16	44	0	0	2	3	4	3	2	1	1	2	0	0	0	0	4	0	1	0	2
Shields Rd - Hwy 111	**8**	-0.26	33	0	0	0	5	3	3	0	3	0	1	0	0	1	1	5	0	1	0	0
Clinton St - Palmyra Ave	**8**	-0.04	38	0	0	1	4	3	2	0	5	0	0	0	0	1	0	5	0	0	0	0
Madison St - Fred Waring Dr	**8**	-0.23	33	0	0	1	3	4	3	2	1	0	2	0	0	0	1	2	1	1	0	0
Monroe St - I-10 WB Ramps	**8**	-0.24	207	0	1	1	5	1	4	1	1	2	0	0	0	0	0	2	0	0	0	0
Golf Center Pkwy - Ave 46	**8**	-0.23	23	0	0	0	3	5	2	0	3	0	3	0	0	0	0	5	1	1	0	0
Jackson St - Ave 50	**7**	-0.24	17	0	0	0	2	5	4	2	1	0	0	0	0	0	0	2	0	0	0	1
Madison St - Ave 49	**7**	-0.13	22	0	0	1	1	5	5	1	1	0	0	0	0	0	0	7	1	0	1	0
Ave 48 - Calle Diamante	**7**	-0.25	180	0	1	1	0	5	3	1	1	1	1	0	0	0	0	2	1	1	0	0
Indio Blvd - Ave 48	**7**	-0.27	22	0	0	0	3	4	2	0	3	1	0	0	1	0	0	6	0	0	0	1

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Intersection	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Dune Palm Rd - Blackhawk Wy	**7**	-0.19	186	1	0	0	3	3	4	1	2	0	0	0	0	0	0	4	0	0	0	0
Jefferson St - Westward Ho Dr	**7**	-0.26	42	0	0	2	3	2	2	0	3	1	0	0	0	0	0	4	0	0	0	0
Golf Center Pkwy - Ave 45	**7**	-0.23	42	0	0	2	3	2	2	2	1	2	0	0	0	0	1	3	0	1	0	1
Indio Blvd - 44th Ave	**7**	-0.21	17	0	0	1	0	6	1	2	1	1	2	0	0	0	0	4	0	2	0	0
Indio Blvd - Burr St	**7**	-0.23	27	0	0	1	2	4	4	1	0	1	1	0	0	0	0	0	0	0	0	0
Monroe St - Reynaldo Carreon School	**7**	0.13	27	0	0	1	2	4	2	1	3	0	1	0	0	0	0	3	0	0	0	1
Jefferson St - I-10 Ramps	**7**	-0.05	41	0	0	3	1	3	4	2	0	0	0	0	1	0	0	0	0	0	0	0
47th Ave - Cheyenne Rd	**6**	-0.23	21	0	0	1	1	4	3	0	1	0	2	0	0	0	0	2	0	0	0	0
Indio Bl - Civic Center Dr	**6**	-0.25	175	1	0	0	1	4	1	2	0	0	2	0	0	1	0	1	0	2	0	0
Miles Ave - Swingle Ave	**6**	-0.21	353	1	1	1	2	1	3	0	1	1	0	0	0	1	0	1	0	0	0	1
Burr St - Fred Waring Dr	**6**	-0.27	184	0	1	1	1	3	1	0	2	1	0	0	1	0	0	3	0	0	0	0
Monroe St - Ave 41	**6**	-0.12	190	0	1	1	2	2	4	0	1	0	1	0	0	0	0	1	0	0	0	0
Monroe St - 40th Ave	**6**	0.72	41	0	0	2	3	1	2	0	0	0	3	0	1	0	0	2	0	0	1	1
Jackson St - I-10 WB Ramps	**6**	0.16	21	0	0	0	3	3	4	1	1	0	0	0	0	0	0	1	0	1	0	0
Highway 111 - Indio Fashion Mall	**6**	0.34	26	0	0	1	2	3	0	0	4	0	0	0	0	1	0	2	0	0	0	0
40th Ave - Sun City Bl	**6**	2.48	26	0	0	1	2	3	3	1	1	1	0	0	0	0	0	4	0	0	0	0
Monroe St - Date Ave	**5**	-0.24	183	1	0	1	1	2	3	0	2	0	0	0	0	0	0	3	0	0	0	0
Jackson St - Date Ave	**5**	-0.25	183	0	1	1	1	2	2	2	0	0	1	0	0	0	0	1	0	1	0	0
Adams St - Ave 40	**5**	-0.24	35	0	0	2	2	1	4	0	0	0	1	0	0	0	0	3	0	0	0	0
Monroe St - Ave 49	**4**	-0.30	19	0	0	1	1	2	0	2	1	0	1	0	0	0	0	1	0	0	0	0
Jackson St - Ave 49	**4**	-0.30	19	0	0	1	1	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0
Monroe St - Country Club Dr	**4**	-0.30	19	0	0	1	1	2	2	0	1	0	0	0	0	1	1	1	0	0	0	0
Ave 48 - Hjorth St	**4**	-0.30	14	0	0	0	2	2	0	1	2	0	1	0	0	0	0	2	0	1	0	0
Smurr St - Hwy 111	**4**	-0.26	168	0	1	0	0	3	1	2	0	0	0	0	0	0	0	3	0	1	0	0
Miles Ave - Madison St	**4**	-0.28	9	0	0	0	1	3	0	0	2	0	2	0	0	0	0	2	0	2	0	0
Jackson St - Dillon Ave	**4**	-0.30	14	0	0	0	2	2	1	0	1	0	0	0	1	1	0	0	0	1	1	0
Gore St - Ave 41	**4**	-0.26	9	0	0	0	1	3	3	0	1	0	0	0	0	0	0	3	1	1	0	0
Ave 38 - Adams St	**4**	-0.28	14	0	0	1	0	3	0	1	1	2	0	0	0	0	0	0	0	0	1	0
Hjorth St - Ave 50	**3**	-0.32	3	0	0	0	0	3	2	1	0	0	0	0	0	0	0	1	0	0	1	0
Shields Rd - Ave 48	**3**	-0.32	13	0	0	0	2	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0
Van Buren St - Ave 48	**3**	-0.32	18	0	0	1	1	1	1	0	2	0	0	0	0	0	0	2	0	0	1	0
Jefferson St - Pebble Beach Dr	**3**	-0.32	8	0	0	0	1	2	0	0	3	0	0	0	0	0	0	3	0	0	0	1
Oasis St - Requa Ave	**3**	-0.27	8	0	0	0	1	2	3	0	0	0	0	0	0	0	0	1	0	0	0	0
Indio Blvd - Oasis St	**3**	-0.32	18	0	0	1	1	1	1	0	2	0	0	0	0	0	0	3	0	0	0	0
Dillon Rd - Ave 44	**3**	-0.25	13	0	0	1	0	2	1	2	0	0	0	0	0	0	0	0	0	1	1	0
Golf Center Pkwy - Indio Springs Dr	**3**	-0.32	3	0	0	0	0	3	0	1	0	1	0	0	1	0	0	0	0	2	0	0
Fred Waring Dr & Shopping Ctr e/o Jefferson St	**3**	-0.32	3	0	0	0	0	3	0	2	1	0	0	0	0	0	1	1	0	0	0	0
&			0																			
Arabia St & Garden Ave	**6**	0.18	6	0	0	0	2	4	2	0	0	1	3	0	0	0	0	1	0	4	0	0
Ave 46 & Shields Rd	**6**	0.38	6	0	0	1	1	4	0	0	0	4	2	0	0	0	0	1	0	2	0	0
Monroe St & Ave 46	**6**	0.10	6	0	0	1	1	4	0	1	2	1	1	0	0	2	0	3	0	2	0	0
Fargo St & Hwy 111	**6**	0.21	6	0	0	0	2	4	1	2	1	0	2	0	0	0	0	1	0	1	0	0
Shadow Palm Ave & Unnamed Rd	**6**	0.15	6	0	0	0	1	5	2	3	0	1	0	0	0	0	0	0	0	0	0	0
Hwy 111 & Youngs Ln	**5**	0.02	5	0	0	0	2	3	3	0	1	1	0	0	0	0	0	0	0	3	1	0
Calhoun St & Capricorn Ave	**5**	0.14	5	0	0	0	2	3	4	0	0	1	0	0	0	0	0	3	0	0	0	1
Calhoun St & Date Ave	**5**	0.10	5	0	0	1	1	3	2	0	1	0	2	0	0	0	0	2	0	0	0	0
King St & Hwy 111	**5**	0.35	5	0	0	0	2	3	0	2	1	1	1	0	0	0	1	1	0	0	0	0
Jackson St & Indio Blvd	**5**	0.02	5	0	0	1	2	2	0	0	1	0	3	1	0	0	0	1	0	2	0	0
Monroe St & Alley s/o Miles Ave	**5**	0.07	5	0	0	0	1	4	1	1	1	1	1	0	0	0	0	1	0	0	0	2
Indio Blvd & Smurr St	**5**	0.20	5	0	0	1	0	4	0	3	0	1	1	0	0	0	0	1	0	1	0	1
Clinton St & Francis Ave	**5**	0.18	5	0	0	1	1	3	1	1	1	1	0	0	1	0	0	2	0	0	0	0
Palo Verde St & Ave 45	**5**	0.09	5	0	0	0	3	2	2	1	0	1	1	0	0	0	0	0	0	0	0	0
Clinton St & Sirocco Ave	**5**	0.12	5	0	0	2	1	2	2	2	1	0	0	0	0	0	1	1	0	1	0	0
Yucca St & Ave 44	**5**	0.13	5	0	0	3	1	1	0	0	1	3	1	0	0	0	0	2	0	0	0	0
Circle Dr & Ave 44	**5**	0.09	5	0	0	1	1	3	1	1	1	2	0	0	0	0	0	0	0	2	0	1
43rd Ave & Monroe St	**5**	0.02	5	0	0	1	3	1	2	0	3	0	0	0	0	0	0	3	0	0	0	0
Indio Blvd & Madio St	**5**	0.04	5	0	0	0	2	3	2	2	0	1	0	0	0	0	0	1	0	0	0	1
Ave 48 & Keaton Way	**4**	0.08	4	0	0	1	3	0	1	2	1	0	0	0	0	0	0	1	0	1	0	0
Van Buren St & Corregidor Ave	**4**	0.12	4	1	0	0	1	2	1	1	1	0	0	0	0	1	0	2	0	0	0	0
Jackson St & Lexington Ave	**4**	0.10	4	0	0	0	2	2	1	0	2	0	1	0	0	0	0	1	0	1	0	0
Calhoun St & Vecino Way	**4**	0.13	4	0	0	1	3	0	0	1	2	0	0	0	0	1	0	2	0	1	1	0

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Intersection	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Monroe St & Las Palmas Rd	**4**	0.08	4	0	0	1	1	2	1	0	0	1	1	0	1	1	0	1	0	1	0	0
Arabia St & Plaza Ave	**4**	0.11	4	0	1	1	1	1	1	1	0	0	0	0	2	1	1	0	0	1	0	0
Calhoun St & Peach St	**4**	0.08	4	0	0	2	1	1	1	1	2	0	0	0	0	0	0	2	0	0	0	0
Indio Bl & Shopping ctr e/o Hwy 111	**4**	0.19	4	0	0	1	1	2	1	0	1	1	1	0	0	0	1	0	0	1	0	0
Salton St & Hwy 111	**4**	0.06	4	0	0	0	2	2	0	0	0	1	3	0	0	0	0	1	0	1	0	0
Clinton St & Capistrano Gate	**4**	0.17	4	0	0	0	1	3	0	1	1	2	0	0	0	0	0	2	0	1	0	0
Golf Ctr Pkwy & Alley n/o Highway 111	**4**	0.01	4	0	0	0	1	3	0	1	2	0	1	0	0	0	0	3	0	1	0	0
King St & Bliss Ave	**4**	0.09	4	0	0	0	2	2	2	0	2	0	0	0	0	0	0	1	0	0	0	0
Miles Ave & Sun Gold St	**4**	0.04	4	0	0	1	3	0	2	0	0	1	0	0	0	1	0	2	0	0	0	0
Ave 44 & Market St	**4**	0.09	4	0	0	1	1	2	2	0	0	0	2	0	0	0	0	1	0	1	0	0
Deglet Noor St & Ave 44	**4**	0.17	4	0	0	1	0	3	1	2	1	0	0	0	0	0	0	0	0	1	0	0
Smurr St & Ave 44	**4**	0.14	4	0	0	0	1	3	3	0	0	1	0	0	0	0	0	0	0	0	0	0
Ocotillo Ave & el Paseo Ave	**4**	0.09	4	0	1	1	0	2	1	0	0	2	0	0	1	0	0	0	0	1	0	0
Kenner Ave & King St	**4**	0.11	4	0	1	0	0	3	0	2	0	0	2	0	0	0	0	0	0	1	0	0
Kenner Ave & Oasis St	**4**	0.11	4	0	0	0	0	4	1	1	1	1	0	0	0	0	0	0	1	0	0	0
Towne St & Kenner Ave	**4**	0.09	4	0	1	0	2	1	1	0	2	1	0	0	0	0	0	2	0	2	1	0
Arabia St & Oleander Ave	**4**	0.08	4	0	0	0	0	4	1	0	1	0	2	0	0	0	0	2	0	1	0	0
43rd Ave & Indio Blvd	**4**	0.01	4	0	0	0	2	2	0	0	1	1	2	0	0	0	0	1	0	0	0	0
Jackson St & 43rd Ave	**4**	0.07	4	0	0	0	2	2	0	0	4	0	0	0	0	0	0	3	0	0	0	0
Jackson St & Ave 43	**4**	0.03	4	0	0	0	3	1	0	0	4	0	0	0	0	0	0	4	0	0	0	0
Via Estacio & Ave 49	**3**	-0.01	3	0	0	1	1	1	2	0	0	0	1	0	0	0	0	1	0	0	0	0
de Coronado Dr & Ave 48	**3**	0.01	3	0	0	0	1	2	1	0	1	0	1	0	0	0	0	0	0	1	0	0
Ave 48 & Desert Grove Dr	**3**	0.03	3	0	0	0	3	0	1	0	0	2	0	0	0	0	1	0	0	0	0	0
Monroe St & Milpita Ct	**3**	0.03	3	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Monroe St & Sundance Gate	**3**	0.02	3	0	0	0	1	2	1	0	0	1	0	0	1	0	1	0	0	0	0	0
Austin Dr & Ave 48	**3**	0.09	3	0	0	1	0	2	0	1	0	0	2	0	0	0	0	0	0	0	0	0
Taft St & Phoenix St	**3**	0.05	3	0	0	0	0	3	0	0	1	1	1	0	0	0	0	0	0	2	0	0
Jackson St & Via Venecia	**3**	0.04	3	0	0	0	0	3	2	0	0	0	1	0	0	0	0	0	0	1	0	0
47th Ave & Janet Ave	**3**	0.03	3	0	0	0	2	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0
Bristol St & 47th Ave	**3**	0.06	3	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0
Jackson St & Plaza Ave	**3**	0.01	3	0	0	0	0	3	0	0	0	0	3	0	0	0	0	1	0	0	0	0
Aladdin St & Ave 46	**3**	0.01	3	0	0	1	0	2	1	1	0	0	0	0	0	1	0	0	0	0	0	0
Ave del Mar & Ave 46	**3**	0.02	3	0	0	0	1	2	0	1	0	1	1	0	0	0	0	0	0	1	0	0
Old Hwy 111 & Ave 46	**3**	0.08	3	0	0	0	2	1	1	0	1	0	0	0	1	0	0	2	0	0	0	0
Flower St & Old Hwy 111	**3**	0.03	3	0	1	0	0	2	1	0	0	2	0	0	0	1	0	0	0	0	0	1
Aladdin St & Apartments	**3**	0.03	3	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Golf Center Pkwy & Indio Blvd	**3**	0.00	3	0	0	2	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0
Park St & Requa Ave	**3**	0.09	3	0	0	0	1	2	0	0	1	0	1	0	0	0	1	1	0	0	1	0
Grace St & Requa Ave	**3**	0.01	3	0	0	0	0	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0
Sun Gold St & Bliss Ave	**3**	0.07	3	0	0	1	0	2	0	0	1	1	1	0	0	0	0	0	0	1	0	0
Paseo Real Ave & Monroe St	**3**	0.03	3	0	0	0	1	2	0	0	2	0	1	0	0	0	0	3	0	0	0	1
Swingle Ave & Francis Ave	**3**	0.03	3	0	0	0	2	1	1	1	0	1	0	0	0	0	0	1	0	1	0	0
Indio Blvd & Towne St	**3**	0.06	3	0	0	0	1	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Jackson St & Lupine Ave	**3**	0.02	3	0	0	0	0	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0
Palm St & Valencia Ave	**3**	0.05	3	0	0	0	0	3	0	1	0	1	0	0	1	0	0	1	0	0	0	0
Indio Blvd & Biskra St	**3**	0.01	3	0	0	1	0	2	1	0	1	0	1	0	0	0	0	1	0	1	0	0
Jackson St & Ruby Ave	**3**	0.04	3	0	0	0	1	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0
Fred Waring Dr & Caravan Way	**3**	-0.01	3	0	0	0	3	0	1	0	0	1	1	0	0	0	0	2	0	0	0	1
Sola St & Ave 44	**3**	0.05	3	0	0	1	0	2	2	0	0	1	0	0	0	0	0	0	0	1	0	0
Burr St & Liberia Pl	**3**	0.04	3	0	0	0	0	3	0	0	2	1	0	0	0	0	0	1	0	1	0	0
44th Ave & Adobe Rd	**3**	0.05	3	0	0	0	0	3	2	0	0	0	1	0	0	0	0	2	0	2	0	0

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