

Louisiana Boulevard, Albuquerque, NM Pedestrian Road Safety Assessment Report



July 8-9, 2020

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Introduction

Background

The purpose of this study was to complete a road safety assessment (RSA), focusing on pedestrian safety, for Louisiana Boulevard from Gibson Boulevard SE to Lomas Boulevard NE (hereafter “study area”). The Federal Highway Administration (FHWA) supported the RSA through the Safe Transportation for Every Pedestrian (STEP) program. STEP is an innovation of the Every Day Counts (Rounds 4 and 5) initiative. Louisiana Blvd was selected per the request of the City of Albuquerque and in consultation with the FHWA New Mexico Division. The City of Albuquerque is home to approximately 560,000 people, and the City is responsible for operation and maintenance of the arterial corridor’s roadways.

RSA Site Locations

The corridor is under the jurisdiction of the City of Albuquerque. Posted speed limits are 35MPH along Louisiana Blvd throughout the study area, 25MPH along residential cross streets, 40MPH on the Lomas and Gibson Blvd cross streets, and 30MPH and 35MPH for the major cross streets at Zuni Road and Central Ave, respectively. Land uses, traffic volumes, and pedestrian activity vary significantly from the southern, middle, and northern ends of the study area. Data describing reported pedestrian-involved crashes was provided by the New Mexico Department of Transportation (NMDOT), and the high frequency of reported pedestrian crashes reinforced the need to address safety within the study area.

The RSA reviewed the following nine segments of Louisiana Blvd (Figure 1) . Each segment is approximately .25 mile long, or two city blocks.

- Segment 1 – Gibson Blvd SE to Ross Ave SE
- Segment 2 – Ross Ave SE to Kathryn Ave SE
- Segment 3 – Kathryn Ave SE to Trumbull Ave SE
- Segment 4 – Trumbull Ave SE to Zuni Rd SE
- Segment 5 – Zuni Rd SE to Central Ave SE
- Segment 6 – Central Ave SE to Copper Ave NE
- Segment 7 – Copper Ave NE to Marquette Ave NE
- Segment 8 – Marquette Ave NE to Lomas Blvd NE
- Segment 9 – Lomas Blvd NE Northward



Figure 1 - Study Area Map Segments

RSA Process

RSA Team

The RSA team comprised the following people:

- Terra Reed – City of Albuquerque Planning Department/Vision Zero Coordinator
- Pat Montoya –City of Albuquerque (COA) Department of Municipal Development (DMD) Director
- Melissa Lozoya – COA DMD Deputy Director
- Johnny Chandler – COA DMD Communications
- Debbie Bauman – COA DMD Engineering Division
- Paula Dodge-Kwan – COA DMD Engineering Division Manager
- Tim Brown – COA DMD Traffic Division Manager
- Officer David Munoz – City of Albuquerque Police Department (APD) Metro-Traffic Division
- Commander Donovan Rivera – APD (Report reviewer)
- Doug Goff – City of Albuquerque Transit Department
- Willy Simon – Mid-Region Council of Governments Metropolitan Planning Organization (MRCOG)
- Sarah Ijadi – Mid-Region Council of Governments / Healthy Here
- Kalyn Finnell – Albuquerque Public Schools
- Shannon Glendenning – New Mexico Department of Transportation (NMDOT)
- Rosa Kozub – NMDOT
- Nancy Perea – NMDOT
- Neala Krueger – NMDOT
- Rebecca Bolen – City of Albuquerque Planning Department (Observer)
- Bernadette Hardy – Community Liaison (International District Healthy Communities Coalition / Healthy Here)

- Aaron Sussman – Bohannon Houston (Supporting Consultant on nearby safety project)
- Melanie Bishop – Bohannon Houston (Supporting Consultant on nearby safety project)
- Commander Donovan Rivera,
- Elissa Goughnour – VHB, on behalf of STEP & FHWA
- Joe Seymour – VHB, on behalf of STEP & FHWA

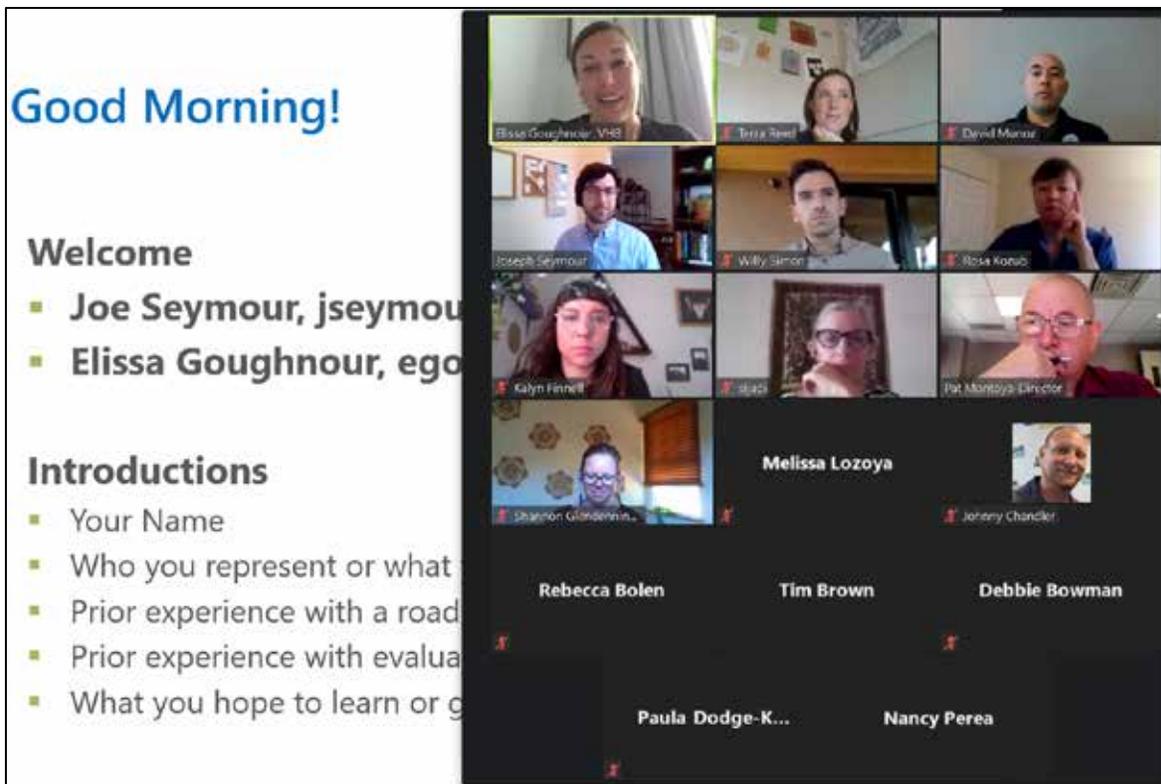
RSA Agenda

The RSA was conducted over a two-day period. Due to travel and group size restrictions from COVID-19, the traditional STEP RSA format was modified to three virtual meetings that was supplemented with field work from local RSA team members. The general activities conducted by the RSA are as follows:

Day 1: The RSA team conducted a kick-off meeting and discussed crashes for each of the study area segments and overall conditions. After the kick-off meeting, the RSA team began a review of the corridor's segments with the assistance of aerial imagery and drone footage. Following the conclusion of Day 1's virtual session, local RSA team members walked along the corridor and reviewed traffic conditions, and they remained in the field to complete their nighttime corridor review.

Day 2: The RSA team reconvened to continue discussing the corridor, including new field work and the nighttime field review. Discussion included a review of the STEP countermeasures and potential applications.

The RSA team met virtually several weeks afterward to discuss the RSA observations and preliminary recommendations. The Appendix includes the RSA's daily agendas, background briefing materials, and other supporting items.



Above: Day 1 Virtual Introductions During Louisiana Blvd Pedestrian RSA

Assessment Findings

Area-Wide Positive Features

The study area includes numerous features that promote pedestrian safety. These include marked crosswalks and pedestrian signal heads with countdown timers at signalized intersections. Sidewalk is present along both sides of the corridor, and intersection curb ramps were recently upgraded and include detectable warning strips. The City operates transit service along the corridor, with transfers to other routes such as the Albuquerque Rapid Transit (ART) service along Central Ave. Nearly 75% of the stops within the study area have benches, and approximately 50% have shelters. Overhead lighting is present throughout the corridor, there are gaps and operational issues. The area also demonstrates high pedestrian demand and activity through the combination of multifamily housing, schools, parks, retail, grocers, and restaurants. These land uses, when combined with lower income and vehicle ownership levels relative to the City, present support for improving and expanding the existing pedestrian facilities.

Area-Wide Reported Pedestrian Crashes

The corridor had 52 reported pedestrian crashes from 2014 through 2018 (Figure 2). NMDOT provided the data in advance of the RSA to support analysis and preparation of the field materials and presentation. The City provided police reports to supplement details regarding crash locations and contributing factors.

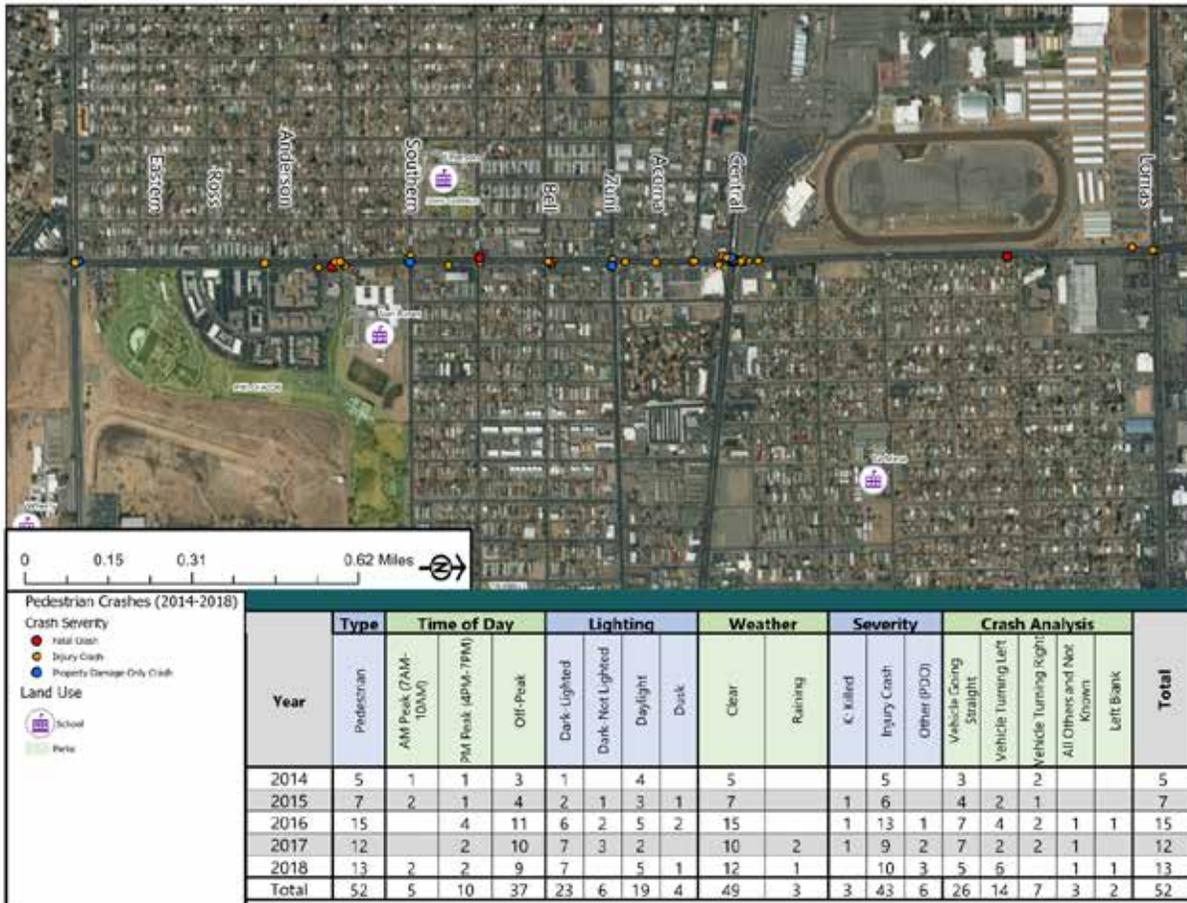


Figure 2 - Reported Pedestrian Crashes, 2014-2018

The majority of the reported pedestrian crashes occurred near signalized intersections with marked crosswalks and pedestrian signal heads. Crash clusters (locations with three or more crashes) occurred in Segments 2, 3, 4, and 5, which are all areas with pedestrian-oriented land uses, transit access, and higher density multifamily housing (relative to the rest of the corridor). Most crashes occurred outside of peak traffic hours, during dry and clear roadway conditions, and in dark or lowlight conditions (63% dark/lighted/unlighted vs 37% daytime). However, while most of the non-daylight crashes were reported as Lighted Roadway, the nighttime field review revealed low to non-existent pedestrian-focused lighting throughout the corridor. Non-fatal injury crashes were the most common at 82%, with 12% as Property Damage Only (PDO) crashes, and 6% Fatal. The reported Crash Analysis indicated *Vehicle Going Straight* as the most frequent vehicle movement during the crash (50%), followed by Left Turns (27%), and Right Turns (13%). This indicates issues with pedestrians finding sufficient gaps and opportunities to cross the roadway as well as visibility at intersections with turning vehicles.

Area Relevant Policies

During the RSA, City and MRCOG MPO staff shared insights into pedestrian facility decision making. While the design of the corridor dates back to the 1950's, the City is in the process of updating its land use and transportation guidance. One such document, the City's Development Process Manual (DPM), provides

guidance and clarity for implementing the City's adopted plans. The manual includes guidance on topics such as sidewalks, designated pedestrian crossings, and signalized intersections.¹ Relevant DPM guidance is identified and summarized below:

- Characteristics by Location (DPM Table 7.4.41)
 - For the area from Gibson Ave SE to Central Ave (Other Areas/Local Streets), the manual recommends $\leq 600'$ block lengths, $\leq \frac{1}{2}$ mile signalized pedestrian crossing spacing, and designated pedestrian crossings every $\leq 400-600'$.
 - For the area around Central Ave to Lomas Blvd NE (identified as an Activity Center and Main Street Corridor in the Albuquerque / Bernalillo County Comprehensive Plan), the manual recommends 300-600' block lengths, $\leq \frac{1}{8}-\frac{1}{4}$ mile signalized pedestrian crossing spacing, and designated pedestrian crossings every $\leq 400-600'$.
- Recommended Distance between Signalized Intersections by Corridor Type (DPM Table 7.4.42)
 - The study area is considered a Major Transit Corridor, and the manual recommends $\frac{1}{4}-\frac{1}{2}$ mile spacing between signalized intersections and $\frac{1}{4}$ mile spacing between signalized pedestrian crossings.
- Midblock Crossings (DPM 7-4(A)(5)(i)6)
 - Mid-block crossings shall be considered and are strongly encouraged for new streets in the following circumstances:
 - § a. Downtown and Urban Centers and along Main Street Corridors where block lengths exceed 400 feet. The mid-block crossing shall be located at the middle of the block to the greatest extent feasible. This guidance would apply to the portion of the corridor north of Central Ave
 - § b. Other areas and any new development where block lengths exceed 600 feet. The mid-block crossing shall be located at the middle of the block to the greatest extent feasible. This guidance would apply to the portion of the corridor south of Central Ave to Gibson Ave SE.

Other relevant policies and practices shared during the RSA team's discussion included the following:

- Crosswalk striping is not typically done at unsignalized intersections or driveway locations. Stop controlled locations only receive warning signs and crosswalk markings if an engineering study demonstrates need.
- An emergency vehicle cannot preempt a signal until the Walk Phase has concluded. Current City practice provides preference to emergency vehicles, therefore automatic pedestrian recall is not in use.
The City restricts movements from side streets to right-in/right-out (RIRO) when implementing PHBs at intersections. Mid-block locations are preferred so as to maintain full access at intersections.
- Right turn on red (RTOR) restrictions are allowed in locations with dedicated right turn lanes, and the City is planning to pilot using a blank out sign for RTOR restrictions during periods of high pedestrian crossings.

¹ City of Albuquerque, Development Process Manual, 2020,
http://documents.cabq.gov/planning/development-process-manual/DPM-2020-06-02_signed.pdf

- Any proposed reduction in lane capacity on an arterial street is required to be modeled by MRCOG to determine if adjacent parallel roadways can accommodate overflow volumes. Risk of neighborhood cut through traffic should also be evaluated.

Area-Wide Issues

The RSA observed the following issues affecting pedestrian safety along the study corridor.

- *Wide, Multilane Road with Long Crossing Distances* – The corridor has two northbound and three southbound thru lanes, with left turn lanes at intersections and a two-way left turn lane (TWLTL) throughout. There are right turn lanes for northbound traffic at Central Ave and Lomas Blvd. Lanes are 10-12' wide, and AADT ranges from 13,000 on the southern end of the corridor to 24,000 on the northern end. Daily roadway volumes have decreased significantly in part to access changes to access to Kirtland Air Force Base and the reconstruction of the I-40/I-25 interchange. This wide roadway width provides motorists with reduced horizontal friction (i.e. wide open roadway) and likely encourages travel speeds higher than posted.
- *High Vehicle Speeds* – Despite 35MPH posted speeds, vehicles were observed operating 10-15MPH in excess of the posted limit.

Gaps in Network and Quality of Pedestrian Facilities – The corridor's standard block length is 600', and sidewalks are present on both sides of the roadway with widths ranging from 3'-6'. There are no marked mid-block, uncontrolled crossing locations or raised medians throughout the study area; there are distances of 1,200', 2,600', and 4,000' between marked crossings. Pedestrian generators and attractors are present on both sides of the corridor in these locations. There are also frequent curb cuts for driveway access to commercial and multifamily properties; and most driveways do not meet ADA cross slope requirements. The lack of a furnishing strip throughout most of the corridor makes walking uncomfortable, and obstructions and overhangs from private property (e.g. fencing, vegetation) further reduce pedestrian comfort and use of the sidewalk.

- *Transit Amenity Locations* – Existing transit stop locations are constrained by apparent available right-of-way – where sidewalks are narrow, there is not sufficient space for transit shelters, benches, or other amenities – and do not appear to be coordinated with marked crossing opportunities.
- *Pavement Marking Quality* – Pavement markings, including crosswalks, appeared faded despite recent installation. Oil and the summer asphalt mix contribute to the dirtying and smudging of pavement markings, reducing their visibility and partial reflective properties. There are also locations where pavement markings are in need of replacement.
- *Lack of Adequate Facilities for Vulnerable Road Users* – The area abutting the corridor consists of residential, institutional, commercial, and recreational land uses that often necessitate crossing the roadway. There are two 100 percent walk schools in the area (no bussing is offered for students who attend these schools) and average vehicle ownership and senior populations are higher than average for the rest of the city, which are all factors that contribute to higher anticipated walking trips and potentially slower crossing speeds. Several of the signalized

intersections include potentially confusing movements and phases and long crossing distances without pedestrian refuge islands. The combination of elevated and irregular vehicle speeds and wide crossing distances may make it more difficult for pedestrians to judge vehicle gaps for crossing between signalized intersections (see note above on distances between marked crossing locations). Stones, gravel, and debris were observed in curb ramp locations that can impede the mobility of those pedestrians with disabilities. Finally, there were visual and physical obstructions within the sidewalk area.

- *Intersection Conflicts* – Marked crossing locations are only at signalized intersections, and while pedestrian signal heads are present, turning vehicle Reported Pedestrian Crashes represent a significant portion of all Reported Pedestrian Crashes. Pedestrians were observed crossing outside of marked crossings beyond the immediate intersection. Common reported motorist behaviors include low yielding to pedestrians rates, stopping over stop bar on crosswalks, and turning right on red without first stopping.
- *Inconsistent and Inadequate Lighting* – Overhead street lighting is present throughout the corridor, however there are lighting gaps, inoperable lighting, lack of pedestrian-focused lighting, and differences in light activation timing that reduce motorist and pedestrian visibility during low-light conditions. Overhead lighting is neither pedestrian-focused nor frequent in the areas south of Trumbull Ave SE. During the summer months, pedestrians are observed walking at higher levels during the morning and evening hours; these periods correlate with increased reported pedestrian crashes.



*Left Image: A photo, looking north, showing the five travel lane and TWLTL median cross section. Credit – City of Albuquerque.
Right Image: A photo of one of the corridor's signalized intersections with sand and stone debris in the curb ramp area. Credit – City of Albuquerque.*

Area-Wide Suggestions

The following suggestions are recommended within three implementation timeframes to promote pedestrian safety throughout the corridor. These suggestions are dependent on funding availability, project feasibility, other local constraints, and coordination between local, state, regional, and private entities. Though these suggestions are recommended in a sequence, they should be revisited depending

on funding availability and for compatibility with concurrent improvement opportunities (e.g. roadway resurfacing, new development, intersection upgrades, and expanded park facilities).

Near-term (0-2 years)

- Redesign roadway to reconfigure from the existing imbalanced 5-lane to a 4-lane (or fewer) roadway with potential amenities such as marked crossings, pedestrian refuge islands, on-street parking, bus priority lanes, separated bicycle lanes, and expanded linear pedestrian facilities. These improvements could be made initially with pavement markings, bollards, or other temporary devices and implemented rapidly both as a cost-effective measure and as a way to test potential countermeasures. Reconfiguration would likely be preceded by community outreach, modeling, and a traffic study to determine alternative configurations.
 - Road Diets can reduce total crashes by 19 percent in urban areas and 47 percent in suburban areas.²
 - According to FHWA Road Diet guidance, lane reconfigurations are probably feasible if individual thru-lane volumes are at or below 750 vehicles per peak hour per direction (vphpd).³ Corridor data from MRCOG indicated that all segments of the corridor were below the 750 vphpd threshold per travel lane during the PM Peak Hour. See the Appendix for additional information on the vphpd estimates.

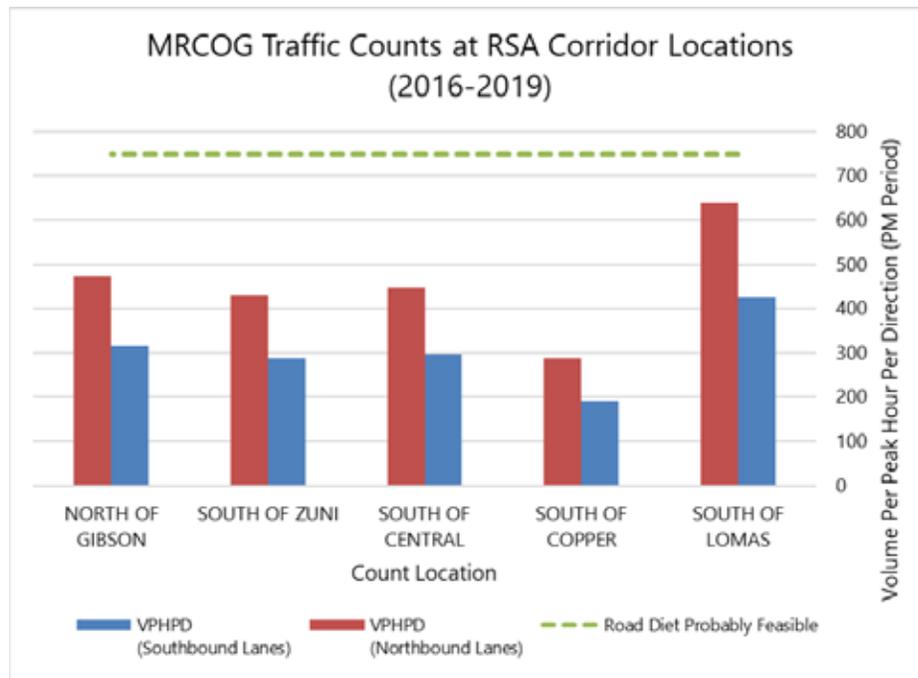


Figure 3 - Analysis of MRCOG Traffic Counts During PM Peak Hour (2016-2019)

² FHWA, Safe Transportation for Every Pedestrian, Road Diet Tech Sheet, 2018, https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RoadDiet2018.pdf

³ FHWA, "Road Diet Informational Guide," FHWA Safety Program, Nov. 2014, https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/rdig.pdf

- Remove sidewalk obstructions that reduce or impede pedestrian use of the existing sidewalk.
- Treat vegetation within City ROW and communicate with private property owners to trim vegetation to improve visibility for both pedestrians and motorists.
- Contact PNM to repair existing lighting fixtures and notify other street lighting operators to repair lighting.
- Investigate ability for street cleaners to remove debris from curb ramp area, review City policy for landscaping material near sidewalks, and review potential for driveway apron paving.
- Pursue targeted deployment of Leading Pedestrian Interval (LPI, sometimes referred to as a “ped jump”) and RTOR restrictions at signalized intersections with high pedestrian activity, history of pedestrian turning vehicle crashes, or those with vulnerable users.
 - LPIs can reduce pedestrian crashes by 13 percent.⁴
 - For LPI deployment at Kathryn Ave SE, Southern Ave SE, and Trumbull Ave SE, City staff would first evaluate green time to determine potential for vehicular backups. Conversely for deployment at Central Ave and Zuni Ave, an outside study may be necessary to conduct a complex evaluation on traffic flows.
 - RTOR could be implemented at the Central Ave and Zuni Ave intersections due to shorter signals shorter and current congestion. For the Kathryn Ave, Southern Ave, and Trumbull Ave intersections, an LPI-actuated RTOR blankout sign could supplement the LPI. A “turning vehicles yield to pedestrian sign” could serve as a lower-cost substitute for a blankout sign.
- Investigate current thermoplastic type and alternatives that may mitigate smudging due to oil and asphalt paving mix.
- Review the amount and placement of existing posted speed signage to determine if additional signage if necessary.⁵
- Review corridor ROW in anticipation of future roadway improvements and potential acquisition needs.
- Identify constraints and opportunities and cost estimates for proposed improvements.

Intermediate (2-8 years)

- Use results from the roadway redesign rapid implementation to implement additional hardscape improvements, which may include:
 - Expanded sidewalks;
 - Midblock crossings, considering pedestrian refuge islands and countermeasures like Pedestrian Hybrid Beacons (PHBs) and Rectangular Rapid Flashing Beacons (RRFBs);
 - § Pedestrian Refuge Islands can reduce pedestrian crashes by 32 percent⁶
 - § PHBs can reduce pedestrian crashes by 55 percent⁷

⁴ FHWA, Safe Transportation for Every Pedestrian, LPI Tech Sheet, 2019,

https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa19040.pdf

⁵ The FHWA Guide, “Methods and Practices for Setting Speed Limits,” (2012) provide guidance from states on frequency and spacing of speed limit signage, https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa12004/

⁶ FHWA, Safe Transportation for Every Pedestrian, Pedestrian Refuge Islands, 2018, https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_PedRefugeIsland2018.pdf

⁷ FHWA, Safe Transportation for Every Pedestrian, Pedestrian Hybrid Beacons, 2018, https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa18064.pdf

§ Rectangular Rapid Flashing Beacons can reduce pedestrian crashes by 47 percent (for multilane roadways up to 15,000 AADT)⁸

- Incorporate pedestrian-focused lighting;
- Transit stop relocation to areas near enhanced designated marked pedestrian crossings.
- Study access management improvements to condense driveway access points and reduce the amount of entry and exit points along the corridor. The study process would likely include ROW acquisition estimates and public involvement with the area’s communities. This may support the continued expansion of sidewalks.
- Identify constraints and opportunities and cost estimates for proposed improvements.

Segment 1, Gibson to Ross

Reported Pedestrian Crashes

There were two reported pedestrian crashes within Segment 1 (Table 1). One crash was a PDO under dark-lighted conditions, and the other was an injury crash during daylight. Both crashes occurred near a signalized intersection with pedestrian facilities.

Table 1 - Segment 1 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710449263	11/22/2017	5:43 PM	Dark-Lighted	Property Damage Only Crash	Vehicle Turning Left	None
710456269	6/23/2018	9:00 AM	Daylight	Injury Crash	All Others and Not Known	Other Improper Driving

Observations and Countermeasure Recommendations

- Land Use
 - Most of the housing abutting the corridor segment is high density multi-family, often with combined driveway and parking pads adjacent to the sidewalk.
 - The New Mexico Veterans Memorial Park (hereafter “Veterans Park”) is on the east side of Louisiana Blvd, and a shared-use path behind the park connects north to Phil Chacon Park near Southern Ave SE.
- Vehicle Speed
 - The intersection at Eastern Ave SE near Veterans Parks experiences elevated vehicle speeds.
 - The recent reconfiguration of Gibson Blvd SE and the entrance to the Kirtland Airforce Base has likely contributed to reduced vehicle volumes in this segment.
- Pedestrian Facilities

⁸ FHWA, Safe Transportation for Every Pedestrian, Rectangular Rapid Flashing Beacons, 2018, https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RRFB_2018.pdf

- Sidewalks are wider on the eastern side (estimated 6') and narrower on the western side (estimated 3.5-4') – Veterans Park is a newer development than the housing on the west side, and that development allowed for the addition of wider sidewalks, as well as the installation of buffer landscaping strips and improved transit shelters.
- Aside from the signalized intersection at Gibson Ave SE, there are no other designated pedestrian crossings to Veterans Park from the west side of Louisiana Blvd. Members of the RSA Team considered the lack of crossings in this segment as a barrier to access to that community amenity.
- There is an unmarked crossing location at Eastern Ave SE and an ABQ transit stop with reported higher ridership at Veterans Park.
- Eastern Ave SE and Ross Ave SE were both identified as midblock crossing locations in the 2018 International District Pedestrian Safety Action Plan (IDPSAP).
- Frequent driveway cuts are not ADA compliant nor level.



Above Image: A photo, looking east from Ross Ave SE, showing an uncontrolled crossing location during the nighttime field review. Credit – City of Albuquerque.

Recommendations

Near-term (0-2 years)

- Consider the need for a marked crossing with crossing enhancements to connect Veterans Park to adjacent neighborhoods as part of the rapid implementation of the road reconfiguration of Louisiana Blvd.

Intermediate (2-8 years)

- Make hardscape improvements based on rapid implementation in the near-term, including crossing enhancements
- Incorporate pedestrian-focused lighting with a priority near unmarked and newly implemented crossing locations.

Segment 2, Ross to Kathryn

Reported Pedestrian Crashes

There were eight reported pedestrian crashes in Segment 2 (Table 2). Seven were injury crashes, and the remaining was a fatal crash. A majority of the crashes occurred during daylight conditions. Six of the eight crashes occurred within proximity of the signalized Kathryn Ave SE intersection, and five of the eight crashes involved a turning vehicle. The higher frequency of turning vehicle crashes at Kathryn Ave SE may indicate poor visibility of crossing pedestrians during the WALK phase and may be related to noncompliance with signals (i.e. turning right on red without stopping).

Table 2 - Segment 2 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710235856	2/6/2015	7:41 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710190037	2/23/2015	8:30 AM	Daylight	Injury Crash	Vehicle Turning Left	Failed to Yield Right of Way
710272241	11/12/2015	10:15 PM	Dark-Not Lighted	Fatal Crash	Vehicle Going Straight	Pedestrian Error
710276013	3/23/2016	5:51 PM	Daylight	Injury Crash	Vehicle Turning Right	Driver Inattention
710258977	5/6/2016	8:20 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Alcohol/Drug Involved
710279778	10/17/2016	3:50 PM	Daylight	Injury Crash	Vehicle Turning Left	Pedestrian Error
710538207	3/9/2018	7:44 AM	Daylight	Injury Crash	Vehicle Going Straight	Pedestrian Error
710554416	11/26/2018	4:10 PM	Daylight	Injury Crash	Vehicle Turning Left	Driver Inattention

Observations and Countermeasure Recommendations

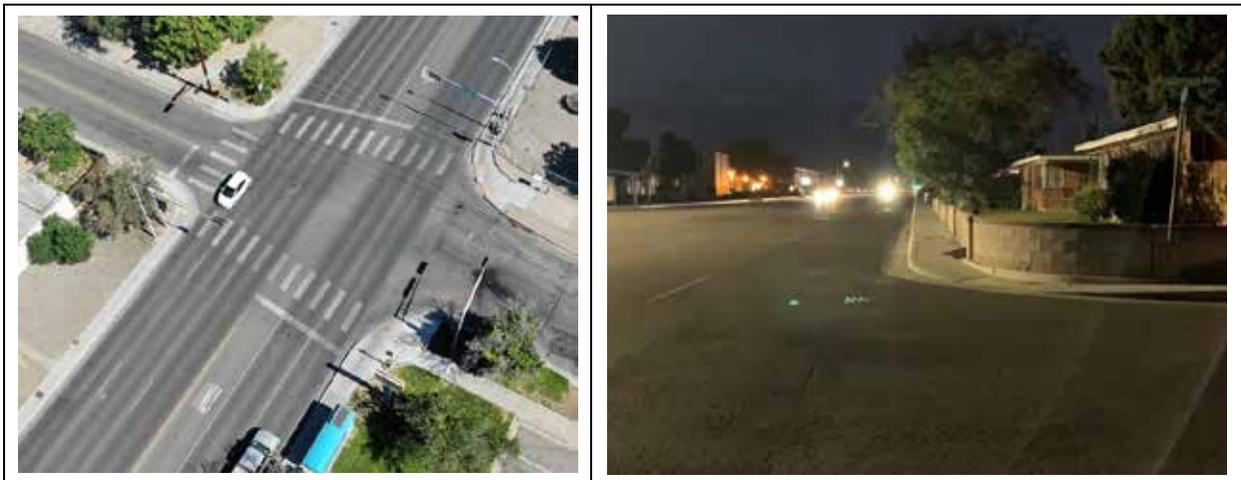
- Land Use
 - The police substation will be expanded with Kathryn Ave SE as the access point over the next ~2 years.
 - Kathryn Ave SE provides access to Phil Chacon Community Center, located east of Van Buren Middle School.
 - High-density apartments line the eastern side are close to the street and medium-density apartments (3-6 units) line the western side.
 - Just east of the multi-family housing is the greenspace that connects Veterans Park and Phil Chacon Park. There are often homeless encampments in this greenspace and there is not clear access from the apartment buildings to the greenspace.

- The Cesar Chavez Community Center is to the east of the Van Buren Middle School between Southern Ave SE and Kathryn Ave SE.
- Pedestrian Facilities
 - Transit stops are located nearside to the intersections of Continental Loop (the northern leg of the loop) and Kathryn Ave, and ABQ Transit is considering moving them to farside given sufficient ROW.
 - Anderson Ave SE was identified as a mid-block crossing location with a PHB in the IDPSAP.

Kathryn Ave SE Intersection

Observations and Countermeasure Recommendations

- Signalization
 - The intersection is a two-phased signal, with no LPI, nor left turn arrows.
- Pedestrian Facilities
 - All crosswalk legs are marked with continental pattern and curb ramps with truncated domes, and there are pedestrian signal heads with countdown timers.
 - The crosswalks were faded at the intersection; dirt and oil may indicate smudging and not functionally faded, except on the east side, which provides access to the police substation and the community center, where the markings have been almost entirely faded.
 - The transit stop at Kathryn Ave SE was reported as high use.



Left Image: A photo, above the Kathryn Ave SE intersection, showing the marked crosswalks. This intersection had numerous turning vehicle crashes, and the expansion of the police substation is likely to increase vehicle and pedestrian conflicts. Credit – City of Albuquerque.

Right Image: A photo at Anderson Ave SE , looking south, showing the uncontrolled crossing location during lowlight conditions. There is no marked crossing at this location, and one overhead streetlight is operating opposite Anderson Ave SE. Credit – City of Albuquerque.

Recommendations

Near-term (0-2 years)

- Evaluate a designated pedestrian crossing with crossing enhancements to connect the greenspace to adjacent neighborhoods at current uncontrolled crossing locations are part of the corridor-wide planning and design effort.
- Restripe crosswalk at Kathryn Ave SE, particularly the east edge of the crosswalk that is most faded.
- Implement and evaluate potential for LPI and RTOR restriction at Kathryn Ave SE intersection.
- Contact private property owners to request trimming vegetation along roadway to improve visibility.

Intermediate (2-8 years)

- Install a designated pedestrian crossing at a location identified in the near-term based on surrounding land uses, pedestrian generators, and feasibility given existing/updated street configuration and curb cuts.
- Incorporate pedestrian-focused lighting with a priority near unmarked and newly implemented crossing locations, such as Anderson Ave SE.

Segment 3, Kathryn to Trumbull

Reported Pedestrian Crashes

There were five reported pedestrian crashes in Segment 3 (Table 3). Most of the crashes were injury crashes, occurred during dark conditions, and occurred at the signalized Southern Ave SE intersection. Additionally, turning vehicle crashes were the most frequent, which may indicate the need to improve pedestrian visibility during the WALK phase and may be related to noncompliance with signals (i.e. turning right on red without stopping).

Table 3 - Segment 3 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710369115	10/26/2016	5:45 PM	Daylight	Injury Crash	Vehicle Turning Left	Made Improper Turn
710369807	11/3/2016	8:09 PM	Dark-Lighted	Injury Crash	Vehicle Turning Right	Failed to Yield Right of Way
710367409	12/9/2016	8:00 PM	Dark-Not Lighted	Injury Crash	Vehicle Turning Left	Driver Inattention
710402387	2/13/2017	7:47 PM	Dark-Lighted	Injury Crash	Vehicle Turning Left	Driver Inattention
23452418	10/16/2017	11:00 PM	Dark-Not Lighted	Property Damage Only Crash	All Others and Not Known	Alcohol/Drug Involved

Observations and Countermeasure Recommendations

- Land Use

- The RSA team reported that the area has low car ownership relative to the rest of the City.
 - Two schools are located on opposing sides of the corridor: Van Buren Middle School is on the east side south of Southern Ave SE, and Emerson Elementary is one block to the west of Trumbull Ave SE. Emerson Elementary School is both a summer school site and 100 percent walk school. Emerson Elementary School and Van Buren Middle School are community schools, meaning they are community hubs where community members are regularly accessing services.
 - Phil Chacon Park is accessed from Southern Ave SE.
- Pedestrian Facilities
 - Sidewalks are narrow (~42") on the west side with frequent driveway curb cuts that can create a generally unpleasant and potentially dangerous walking experience, while sidewalks on the east side (~6' wide) over capacity during school start and release time. Vehicles backing from parking pads onto Louisiana Blvd create additional conflicts.
 - The sidewalk between Southern Ave SE and Kathryn Ave SE has a 6' tall fence immediately abutting the sidewalk next to school (east side). The fence placement along eastern side of Louisiana Blvd does not offer much space to pass and can make walking along the roadway uncomfortable especially during health requirements to maintain 6' distance from other individuals.
 - Children and other residents walk through this area due to the schools on either side of Louisiana Blvd and the convenience store at the NW corner of the Trumbull intersection (Sais Market, pedestrian generator in an area considered a food desert).
 - School zone beacons are present above the approach lanes, 220' to the north and south of the Southern Ave SE intersection, with pavement markings. The school zone speed is 20MPH
 - There is an exposed guidewire pin that is obstructing the west side sidewalk, south of Trumbull Ave SE just north of the school crossing beacon.
 - Vegetation was reported as obscuring pedestrian and vehicular sight distance



Left Image: A photo showing an exposed guidewire pin that is obstructing the west side sidewalk, south of Trumbull Ave SE. Credit – City of Albuquerque.

Right Image: A photo of south of Trumbull Ave SE, looking north, showing vegetation that reduces the visibility of pedestrians to turn vehicles. Credit – City of Albuquerque.

Bottom Image: A photo along Louisiana Blvd SE, looking north, showing the fencing along Van Buren Middle School that limits passing and can create an uncomfortable experience walking in close proximity to northbound traffic. Credit – City of Albuquerque.

Southern Intersection

Observations and Countermeasure Recommendations

- Vehicle Speed
 - Speed humps are present on Southern Ave east of Louisiana Blvd near the entrances to Van Buren Middle School and Phil Chacon Park.
- Signalization
 - The intersection has a two-phase signal with no LPI, nor left turn arrows, and vehicle compliance with signals was reported as low.
 - Temporary painted curb extensions had been implemented at this location as part of CiQlovía, the annual local open streets event.
- Pedestrian Facilities

- All crosswalk legs are marked with continental pattern and curb ramps with truncated domes, and there are pedestrian signal heads with countdown timers.
- A “plazuela” was created by neighborhood residents on the SE corner of the intersection with the removal of a cactus to create space for students waiting to cross; benches have since been partially disassembled.
- Lighting and Visibility
 - Untreated landscaping on the western side of Louisiana Blvd south of Trumbull Ave SE was reported as impeding motorist visibility.

Recommendations

Near-term (0-2 years)

- Remove obstructions in the sidewalk [Update: As of July 20, 2020, the City had removed the guidewire that was observed].
- Coordinate with Van Buren Middle School to reconsider placement of the fence to expand walkable area.
- Evaluate potential for LPI and RTOR restriction at Southern Ave SE intersection.
- Contact private property owners to request trimming vegetation along roadway to improve visibility.

Intermediate (2-8 years)

- Incorporate pedestrian-focused lighting with a priority near unmarked and newly implemented crossing locations.
- Coordinate with APS on the redesign of Van Buren Middle School (planned for the next 5-10 years depending on funding) to address interaction between the school and the roadway.

Long-term (8+ years)

- Evaluate the placement of raised crosswalks at uncontrolled crossing locations across Southern Ave SE and similarly situated local streets to support safer crossings and reduced vehicle speeds. Raised crosswalks are best applied to two or three-lane roadways with speed limits of 30MPH or less and AADT below 9,000, and they can reduce pedestrian crashes by 45 percent.⁹

Segment 4, Trumbull to Zuni

Reported Pedestrian Crashes

There were seven reported pedestrian crashes in Segment 4 (Table 4). Six were injury crashes, and one was a fatal crash. Three crashes (including the fatal crash) occurred at the signalized Trumbull Ave SE intersection, and the remaining four were near the uncontrolled Bell Ave SE intersection. The crashes at Bell Ave SE may indicate that intersection as a location preferred by pedestrians for crossing Louisiana

⁹ FHWA, Safe Transportation for Every Pedestrian, Raised Crosswalk, 2018, https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RaisedCW2018.pdf

Blvd, however elevated corridor speeds and the crossing distance can make judging sufficient crossing gaps difficult.

Table 4 - Segment 4 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710256825	10/9/2015	10:43 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710265202	1/31/2016	12:01 PM	Daylight	Injury Crash	Vehicle Going Straight	Pedestrian Error
710271337	8/15/2016	10:00 PM	Dark-Lighted	Injury Crash	Vehicle Turning Left	Driver Inattention
710362997	10/16/2016	8:49 PM	Dark-Not Lighted	Injury Crash	Vehicle Going Straight	Driver Inattention
710404083	4/3/2017	6:11 PM	Daylight	Injury Crash	Vehicle Going Straight	Other - No Driver Error
710441729	8/31/2017	8:11 PM	Dark-Lighted	Fatal Crash	Vehicle Going Straight	None
710370378	3/9/2018	5:24 PM	Dusk	Injury Crash	Vehicle Turning Left	Pedestrian Error

Observations and Countermeasure Recommendations

- Land Use
 - There are commercial strip mall properties with numerous driveway curb cuts on both sides of the roadway and higher-density residential along the corridor.
 - Sais Market, a convenience store located on the northeast corner of the Louisiana/Trumbull Ave SE intersection, is a pedestrian generator.
- Pedestrian Facilities
 - School zone beacons are present above the approach lanes, ~170' before the Trumbull Ave SE intersection, with pavement markings. Crossing guards are stationed at the signalized intersection during the school year before and after school hours, and vehicle compliance during school operational hours was reported as high. The school zone is 15MPH.

Trumbull Intersection

Observations and Countermeasure Recommendations

- Signalization
 - The intersection has a two-phased signal with no LPI, nor left turn arrows.
- Pedestrian Facilities
 - All crosswalk legs are marked with continental pattern and curb ramps with truncated domes, and pedestrian signal heads have countdown timers.
 - Pedestrians and bicyclists were observed crossing north and south of the intersection.

Bell Intersection

Observations and Countermeasure Recommendations

- Roadway Configuration

- There is neither a raised median nor pedestrian crossing accommodations at the uncontrolled crossing location. The intersecting street, Bell Ave SE, is stop-controlled.
- Pedestrian Facilities
 - Transit stops are midblock; property owners were reported as hesitant on allowing stops closer to Bell Ave SE because of the potential for trash and drug paraphernalia.
 - RSA participants reported that it was difficult to judge gaps in the traffic at Bell Ave SE. Signal timing at the Southern Ave and Zuni intersection appear to create gaps for pedestrian crossings; crossings were observed after platooning of vehicles had passed.
- Visibility and Lighting
 - Vegetation on the NE corner of Bell Ave SE was reported as obstructing visibility.



Left Image: A photo of the Trumbull Ave SE intersection showing the smudged marked crosswalks, signal heads, and overhead lighting. The intersection's lighting was improved after the pedestrian fatality in 2017. Credit – City of Albuquerque.
Right Image: A photo of Bell Ave SE, looking north, showing a pedestrian (circled) crossing during dusk at an uncontrolled crossing location Credit – City of Albuquerque.

Recommendations

Near-term (0-2 years)

- Evaluate a designated marked pedestrian crossing with crossing enhancements to connect the adjacent neighborhoods at the Bell Ave SE uncontrolled crossing location.
- Implement LPI and RTOR restriction at Trumbull Ave SE intersection.
- Contact private property owners to request trimming vegetation along roadway to improve visibility.

Intermediate (2-8 years)

- Consider relocation of existing transit stops in coordination with midblock or intersection crossing enhancements.

Segment 5, Zuni to Central

Reported Pedestrian Crashes

There were 25 reported pedestrian crashes in Segment 5 (Table 5). The majority were injury crashes, occurred during dark-lighted conditions, and at the Central Ave intersection. Three combined crashes were reported at the uncontrolled intersections of Acoma and Cochiti. Most of the crashes at the Central Ave intersection indicated that the vehicle was going straight at the point of conflict, and this may indicate that pedestrians are crossing against the signal and or away from the intersection to reduce delay or avoid turning vehicles.

Table 5 - Segment 5 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710137537	5/31/2014	6:34 PM	Daylight	Injury Crash	Vehicle Going Straight	Failed to Yield Right of Way
710188639	8/19/2014	12:57 PM	Daylight	Injury Crash	Vehicle Going Straight	Pedestrian Error
710212140	11/20/2014	10:57 AM	Daylight	Injury Crash	Vehicle Turning Right	Avoid No Contact - Vehicle
710211113	12/14/2014	7:08 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	None
710265592	11/3/2015	5:53 PM	Dusk	Injury Crash	Vehicle Turning Right	Alcohol/Drug Involved
710272095	11/6/2015	2:05 PM	Daylight	Injury Crash	Vehicle Going Straight	None
710269765	5/28/2016	12:23 AM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710291777	8/4/2016	9:01 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Avoid No Contact - Other
710369811	11/9/2016	5:14 PM	Dusk	Injury Crash	All Others and Not Known	Made Improper Turn
710280502	12/18/2016	3:16 PM	Daylight	Injury Crash	Vehicle Going Straight	Alcohol/Drug Involved
710371062	6/5/2017	12:38 AM	Dark-Lighted	Injury Crash	Vehicle Turning Right	Pedestrian Error
710204672	6/29/2017	10:21 PM	Dark-Not Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710405043	6/30/2017	12:08 PM	Daylight	Injury Crash	Vehicle Turning Right	Failed to Yield Right of Way
710367762	7/10/2017	9:01 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710365319	8/3/2017	10:32 PM	Dark-Not Lighted	Injury Crash	Vehicle Going Straight	Failed to Yield Right of Way
710402451	9/18/2017	7:30 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Alcohol/Drug Involved
23450276	3/11/2018	9:30 PM	Dark-Lighted	Property Damage Only Crash	Left Blank	Failed to Yield Right of Way

710543426	5/15/2018	10:25 PM	Dark-Lighted	Property Damage Only Crash	Vehicle Turning Left	Driver Inattention
710543690	5/26/2018	11:24 PM	Dark-Lighted	Injury Crash	Vehicle Turning Left	Driver Inattention
710537779	7/12/2018	12:35 AM	Dark-Lighted	Injury Crash	Vehicle Turning Left	Pedestrian Error
710459552	8/18/2018	5:50 AM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710538701	9/23/2018	2:30 PM	Daylight	Injury Crash	Vehicle Going Straight	Disregarded Traffic Signal
710292812	10/13/2018	3:30 PM	Daylight	Property Damage Only Crash	Vehicle Turning Left	Alcohol/Drug Involved
710456022	11/20/2018	12:59 AM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710543609	12/14/2018	6:22 AM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error

Observations and Countermeasure Recommendations

- Pedestrian Facilities
 - The RSA team described that many pedestrians cross Louisiana Blvd near the uncontrolled crossing locations at Acoma Rd SE and Cochiti Rd SE.
 - Fencing with barbed wire between Acoma Rd SE and Cochiti Rd SE on the western side is encroaching onto the sidewalk.
 - Crosswalk markings were described as faded, particularly at the Zuni Rd intersection.
- Land Use
 - The market on the SE corner of Louisiana and Central (Talin Market) is a popular destination that is accessed by both vehicular, transit, and pedestrian modes; transit riders will reportedly cross midblock to access the market and the opposing transit stop.
 - The primary land uses immediately adjacent the corridor are commercial and light industrial.
- Lighting and Visibility
 - Lighting was described as decent compared to other corridor locations.

Zuni Intersection

Observations and Countermeasure Recommendations

- Signalization
 - The intersection is a standard 8 phase signal with leading protected/permitted lefts, all crosswalk legs are marked with continental pattern and curb ramps with truncated domes, and there are pedestrian signal heads with countdown timers.
- Pedestrian Facilities
 - The pedestrian push buttons are on the base of the traffic signal mast arms, ~20' from the sidewalk curb ramp.
 - There was interest from the RSA team for implementing automatic pedestrian recall. This improvement should be considered for other signalized crossing locations.
- Roadway

- Zuni Rd SE was modified from a 4-lane undivided to a 2-lane with a TWLTL in 2016, and bike counts and walking counts went up after the reconfiguration. A current project is using ITS for passive pedestrian and bicycle detection, and dissemination of that information to motorists via DSRC for properly equipped vehicles or via a hands free COA traveler information app to be available for Android or iPhone.
- Pavement conditions are perceived as worse in this area compared to other areas.
- There is limited right of way (ROW) along Zuni for improvements outside of the curb.
- Lighting and Visibility
 - Lighting was reported as adequate in all four quadrants.

Central Ave Intersection

Observations and Countermeasure Recommendations

- Signalization
 - The intersection is signalized with protected lefts for Central traffic, and protected/permitted lefts for Louisiana traffic; all crossing legs are marked with continental crosswalks and have pedestrian signal heads with countdown timers. The RSA team reported that that the intersection can be confusing for pedestrians during the flashing DON'T WALK phase. However, a MRCOG representative noted that there has been an initial reduction in vehicular crashes since the addition of protected lefts to the signal phasing.
 - There are neither LPI nor RTOR restrictions at the intersection.
 - ART signals operate at the same time as the thru movement; ART BRT buses receive a queue jump to turn left, then the signal serves left turns.
- Pedestrian Facilities
 - The RSA team reported that the WALK Phase felt short, but the addition of the clearance time (flashing DONT WALK) felt adequate for crossing both Central and Louisiana.
 - Many pedestrians observed during the evening crossed away from the intersection.
- Roadway
 - Recent updates to the intersection (reconfiguration in 2018-2019), including the median area on the western side of Central (introduction of the ABQ ART transit station), have made the crossing the western leg of the wide intersection more comfortable.
 - MRCOG staff reported that vehicular crashes post-intersection upgrades had decreased.



Left Image: A photo along Louisiana Blvd SE, looking north beyond Acoma Rd SE, showing the sidewalk flanked by fencing topped with barbed wire. Credit – City of Albuquerque.

Right Image: A photo of Central Ave, looking north, showing the signalized intersection with recently improved pedestrian refuge island and ART transit access. Credit – City of Albuquerque.

Below image: A photo of Louisiana Blvd at Cochiti Rd SE, looking west, showing uncontrolled crossing location, existing transit stop, and location of reported pedestrian crossings to the market (lower right). Credit – City of Albuquerque.

Recommendations

Near-term (0-2 years)

- Contact private property owners to request removal of barbed wire that is encroaching in to the sidewalk area.
- Evaluate potential for LPI and RTOR restriction at Zuni and Central intersections. LPIs increase the visibility of crossing pedestrians to turning vehicles (a significant crash type at this location), leading to a reduction in pedestrian crashes. RTOR can also reduce potential conflicts between pedestrians and turning vehicles.
- Evaluate extending the WALK phase to accommodate vulnerable road users at the Zuni and Central Ave intersection locations. The extension may allow pedestrians with slower walking speeds or those who did not begin at the start of the WALK phase
- Consider the need for a designated marked midblock pedestrian crossing with crossing enhancements to connect the transit stops and pedestrian generators between Acoma and Cochiti Rd SE. A marked crossing with visibility enhancements and a pedestrian refuge island

(among other improvements like a PHB or RRFB) can reduce midblock crashes at this location where pedestrians demand to cross is expected.

Intermediate (2-8 years)

- Consider relocation of transit stops coordinated with midblock or intersection crossing enhancements.
- Incorporate pedestrian-focused lighting with a priority near unmarked and newly implemented crossing locations.

Segment 6, Central to Copper

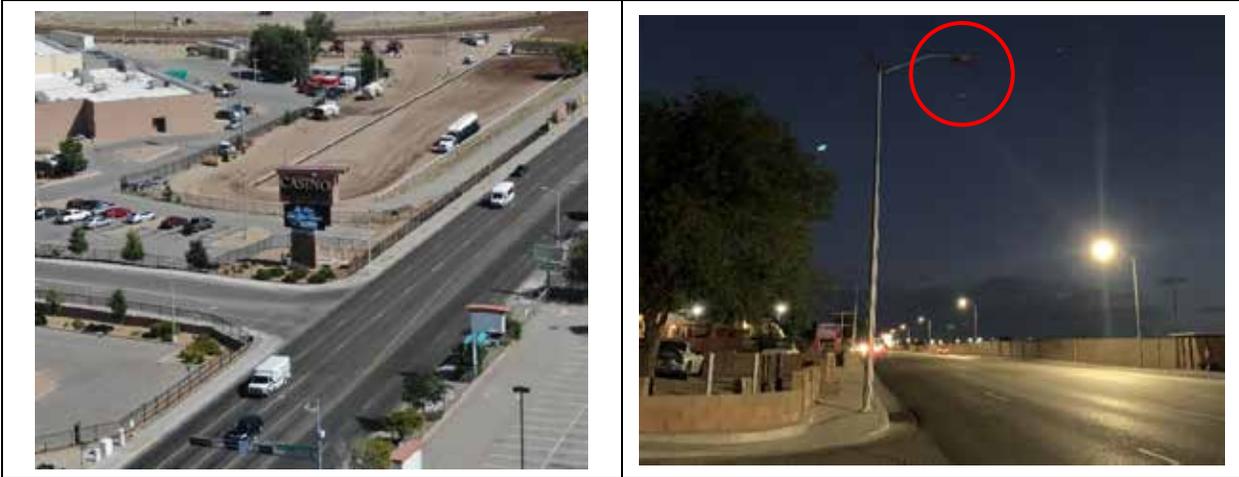
Reported Pedestrian Crashes

Crashes to the north of Central Ave—but within the intersection’s area of influence—were included in the crash analysis for Segment 5 above. These include pedestrian crashes at the entrance to the fairgrounds and casino ~180’ north of the Central Ave intersection.

Observations and Countermeasure Recommendations

- Land Use
 - This segment primarily has residential land uses to the east of Louisiana Blvd and pedestrian generators such as the La Mesa Elementary (100 percent walk school five block to the east) and food bank associated with La Mesa Presbyterian Church. The fairgrounds continue along the western side of Louisiana Blvd with a barrier wall.
- Roadway
 - Vehicle volumes increase to the north of the Central Ave intersection, due in part to volumes to and from Central Ave and the entrance to the fairgrounds and casino on the western side of Louisiana Blvd. The DMD requested guidance on managing access to the site due to the high levels of pedestrian and vehicular crashes from vehicles entering and exiting the site; two pedestrian and 36 vehicular crashes were attributed to this fairgrounds access point during the 2014-2018 analysis period. While the road is under the jurisdiction of the City, the State manages the fairgrounds.
 - The City is considering hardening the center TWLTL with pin curb or flexible delineators to promote right-in right-out vehicle movements for the entrance to the casino just north of Central. There was interest from the RSA Team in marking a crosswalk across the driveway entrance of the casino just north of Central Ave. This is a high-conflict area that would benefit from increased pedestrian visibility improvements.
- Pedestrian Facilities
 - There is a 10’ high block barrier on the western side of Louisiana abutting the sidewalk with openings only at two driveway access points. Murals are planned for the wall along as part of the City’s Vision Zero effort.
 - Sidewalk is present on both sides of the roadway; there are frequent curb cuts along the eastern sidewalk (~4’ wide) and few along the western side (6’ wide).
 - There are no marked crossings in this section, and there are transit stops on both sides of the roadway. Stops along the western side have benches and shelters.

- Lighting and Visibility
 - Street lights along the eastern side of Louisiana Blvd from Central northbound to Lomas Blvd were not operating; these lights were reported to be maintained by the utility PNM.



Left Image: A photo along Louisiana Blvd SE, looking north towards the access to the fairgrounds. This entrance and exit was reported as high frequency vehicle and pedestrian crash location. Credit – City of Albuquerque.

Right Image: A photo of Louisiana Blvd at Marquette Ave NE, looking south showing the existing street lighting along the eastern side of the roadway (circled in red) not in operation during the nighttime field review.

Recommendations

Near-term (0-2 years)

- Contact PNM to repair existing lighting from Central northbound to Lomas Blvd NE.
- Work with the adjacent landowner for the Fairgrounds/The Downs Casino (The State of New Mexico) to reconfigure access from full access to Right-in, Right-out for the entrance to the Downs Casino just north of Central Ave. Near-term implementation could include pin curb or flexible delineators. Reconfiguring access would significantly reduce conflict points for both vehicles and pedestrians at this high crash section. RSA team members clarified that 38 intersection crashes were inaccurately attributed to the Central Ave location instead of this access point.
- Consider opportunities for a designated marked pedestrian crossing at an uncontrolled location to connect transit stops to the adjacent neighborhoods. There are three transit stop pairs over a 4,000' length of corridor between Central Ave and Lomas Blvd without a marked crossing location.

Intermediate (2-8 years)

- Incorporate pedestrian-focused lighting with a priority at newly enhanced crossing locations.
- Consider relocation of transit stops coordinated with midblock or intersection crossing enhancements.

Segment 7, Copper to Marquette

Reported Pedestrian Crashes

There was one reported pedestrian crash in Segment 7 (Table 6). The fatal crash occurred during lighted dark conditions and reportedly involved a pedestrian in a wheelchair entering the roadway to avoid a sidewalk obstruction and was struck by an impaired motorist. This indicates issues with the existing sidewalk facility's ability to accommodate users.

Table 6 - Segment 7 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710279459	9/29/2016	11:20 PM	Dark-Lighted	Fatal Crash	Vehicle Going Straight	Alcohol/Drug Involved

Observations and Countermeasure Recommendations

The section was omitted due to time constraints. Observations pertaining to sidewalk, curb cuts, and transit stops are similar to Segments 6 and 8.

Segment 8, Marquette to Lomas

Reported Pedestrian Crashes

There were three reported pedestrian crashes in Segment 8 (Table 7). The majority of crashes occurred during daylight, at the signalized Lomas Blvd NE intersection, and were turning vehicle crashes. These crashes may indicate reduced visibility of the pedestrian during the WALK phase.

Table 7 - Segment 8 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710210586	10/3/2014	7:07 AM	Daylight	Injury Crash	Vehicle Turning Right	Driver Inattention
710237671	3/30/2015	9:58 AM	Daylight	Injury Crash	Vehicle Turning Left	Driver Inattention
710441731	9/13/2017	9:33 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error

Observations and Countermeasure Recommendations

- Land Use
 - This segment primarily has residential land uses followed by commercial properties along the eastern side, and the fairgrounds continue along the western side with a barrier wall.
 - The area has low pedestrian activity levels compared to other corridor segments.
 - During fairground events, there are significantly higher levels of turning vehicles into the site at the entrance north of Marquette Ave NE.
- Pedestrian Facilities
 - Two PNM light posts were observed encroaching into the sidewalk on the east side of the roadway near the reported pedestrian fatality: ~230' south and ~450' south of Marquette Ave NE.
 - Sidewalks along the eastern side of the roadway were described as narrow.

- Transit stops within the segment have low ridership, likely because there are relatively few generators to access.
- Roadway
 - The roadway lane configuration changes to 6-lanes median divided north of Lomas Blvd NE with a higher speed limit, and motorists are reported as increasing speed to beat the signal change. The speed limit increases north of the intersection, and motorists were reported as trying to beat the lights to reach I-40 interchange.
- Lighting and Visibility
 - All street lights were off from Central Ave to Lomas Blvd NE along the eastern side of the roadway during nighttime hours.

Lomas Intersection

Observations and Countermeasure Recommendations

- Signalization
 - The signalized intersection is an 8-phase intersection with protected permitted lefts all around, three of the four crosswalk legs are marked with continental patterns, and pedestrian signal heads have countdown timers. There is no LPI nor turning vehicle restrictions.
- Land Use
 - Pedestrian levels are lower in this area.



Left Image: A photo along Louisiana Blvd SE, looking south towards the northmost access to the fairgrounds. This entrance and exit was also reported as a location with turning vehicle conflicts. Credit – City of Albuquerque.

Right Image: A photo of the Lomas Blvd NE intersection, looking southwest, showing the signalized intersection and existing marked crosswalks. Credit – City of Albuquerque.

Bottom Image: A photo of Louisiana Blvd NE, looking east, showing a lighting post encroaching into the sidewalk.

Recommendations

Near-term (0-2 years)

- Evaluate reconfiguring access from full access to Right-in, Right-out for the fairgrounds driveway along Louisiana Blvd NE south of Lomas Blvd. Near-term implementation could include pin curb or flexible delineators. Reconfiguring access would significantly reduce conflict points for both vehicles and pedestrians. While this is not currently a high crash location, the reconfiguration would provide consistent access along Louisiana Blvd.
- Contact PNM to repair existing lighting.
- Contact PNM or light post owner to remove or relocate obstructions that extend into the sidewalk

- Evaluate segment for designated pedestrian crossing opportunity to connect transit access to the adjacent neighborhoods.

Intermediate (2-8 years)

- Incorporate pedestrian-focused lighting with a priority at newly enhanced crossing locations.
- Consider relocation of transit stop coordinated with midblock or intersection crossing enhancements.

Segment 9, Lomas Northward

Observations and Countermeasure Recommendations

The section was omitted due to time constraints, and observations pertaining to sidewalk, curb cuts, and transit stops are similar to Segment 8.

Next Steps

The findings of the RSA should be revisited on a recurring basis. The City, ABQ Transit, MRCOG, and NMDOT may choose to review the RSA report with the original RSA team on an annual basis, for up to five years. The City may consider refreshing or revising the RSA process every 5 years. By developing performance measures for ongoing evaluation and review or utilizing those in place through its Vision Zero initiative, the City can track progress made at sites discussed by the RSA. Metrics can include the number of sites improved or the percent change in pedestrian crash rates over three or more years. The City, NMDOT, and MRCOG may also consider short-term and pilot projects to demonstrate and further evaluate concepts noted within this report. These may include creating curb extensions with pavement markings and vertical delineators and reconfiguration and reduction of travel lanes within the existing curb and gutter to reduce vehicle speeds and accommodate other roadway uses such as bicycle and pedestrian facilities.

Funding Opportunities

The City, NMDOT, MRCOG, and other parties should also consider funding opportunities—like transit route and facility updates and spot safety improvements—and the long-range planning process to coordinate project development of safety measures.

Highway Safety Improvement Program (HSIP)- The goal of the federally-funded Highway Safety Improvement Program (HSIP) as authorized in the FAST Act is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. Approximately \$22 million is available to the NMDOT per federal fiscal year. Eligible entities include NMDOT Districts, and Tribal and Local Public Agencies (T/LPAs). T/LPAs with completed RSAs may work with their local NMDOT District to complete an application for HSIP funds.

Congestion Mitigation and Air Quality Improvement (CMAQ) Non-Mandatory Program- CMAQ is a Federal reimbursement program authorized through the FAST Act and administered by NMDOT. The CMAQ Program provides a flexible funding source to NMDOT and T/LPAs for transportation projects and programs that help meet the requirements of the Clean Air Act. CMAQ Non-Mandatory funding is administered by NMDOT and is available statewide for projects and programs that improve air quality and reduce congestion. Application information and the program guide are distributed by the NMDOT through the MPOs and RTPOs.

Transportation Alternatives Program (TAP)- TAP is a Federal reimbursement program authorized through the FAST Act. TAP-Large Urban (for population areas >200,000) funds are administered and awarded through MRMPO. TAP-Flex (available statewide) funds are administered by NMDOT. TAP funds can generally be used for bicycle, pedestrian, and transit infrastructure and activities. Application information and the program guide for TAP-Flex are distributed by NMDOT through the MPOs and RTPOs.

Local Government Transportation Project Fund (LGTPF)- LGTPF is a state funded program created to assist local entities with the development of transportation infrastructure, which includes highways, streets, roadways, bridges, crossing structures and parking facilities, including all areas for vehicular use for travel, ingress, egress and parking. T/LPAs work with their MPO or RTPO for application and funding processes.

Local Government Road Fund (LGRF)- The LGRF Program was created to provide state funds to projects where Local Entities take the lead in developing and contracting construction and maintenance projects. T/LPAs may work with their local NMDOT District and MPO or RTPO for application and program information. The program is based on the following allocations:

- 42% for the Cooperative Program
- 16% for the Municipal Arterial Program
- 16% for the School Bus Routes Program
- 26% for the County Arterial Program

Appendix

- RSA Agenda
- Presentation
- VPHPD

Agenda

Day 1

- | | |
|-----------------------|--|
| 8:30–9:30 AM | RSA Kick-off Meeting <ul style="list-style-type: none">• Introduction of stakeholders and RSA team• Introduction to the RSA process• Pedestrian safety overview |
| 9:30–11 AM | Review Background Data and input from neighborhood/schools |
| 11:15–11:15 AM | Break |
| 11:15—12:30 PM | Begin to document the issues collectively, assign homework (to document potential solutions) |
| 6:30-7:30 PM | Nighttime Site Review (optional field visit for locals) |

Day 2

- | | |
|-----------------------|---|
| 8:30–11:30 AM | Brainstorming – reviewing homework and potential countermeasures

<i>Break as needed</i> |
| 11:30—12:30 PM | Finalize the potential countermeasures for each of the issues |

Louisiana Blvd Pedestrian Road Safety Assessment

Presentation

July 8-9, 2020

Good Morning!

Welcome

§ Joe Seymour, jseymour@vhb.com

§ Elissa Goughnour, egoughnour@vhb.com

Introductions

§ Your Name

§ Who you represent or what you do

§ Prior experience with a road safety audit/assessment?

§ Prior experience with evaluating sites for pedestrian safety?

§ What you hope to learn or gain from this process

Agenda – Day 1

- | | |
|-----------------------|--|
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Agenda – Day 2

8:30–11:30 AM **Brainstorming – reviewing homework and potential countermeasures**

Break as needed

11:30—12:30 PM **Finalize the potential countermeasures for each of the issues**

Overall Objectives for the RSA

- § Enhance understanding about crash risk and unique vulnerabilities of pedestrians
- § Engage with a variety of stakeholders to expand perspectives on pedestrian safety needs
- § Identify and prioritize specific locations, along a set of select roadways in the area, where crash risk may be highest for pedestrians
- § Discuss potential countermeasures and safety improvements for priority locations
- § Increase staff confidence and skills for future road safety assessments, focused on pedestrian safety



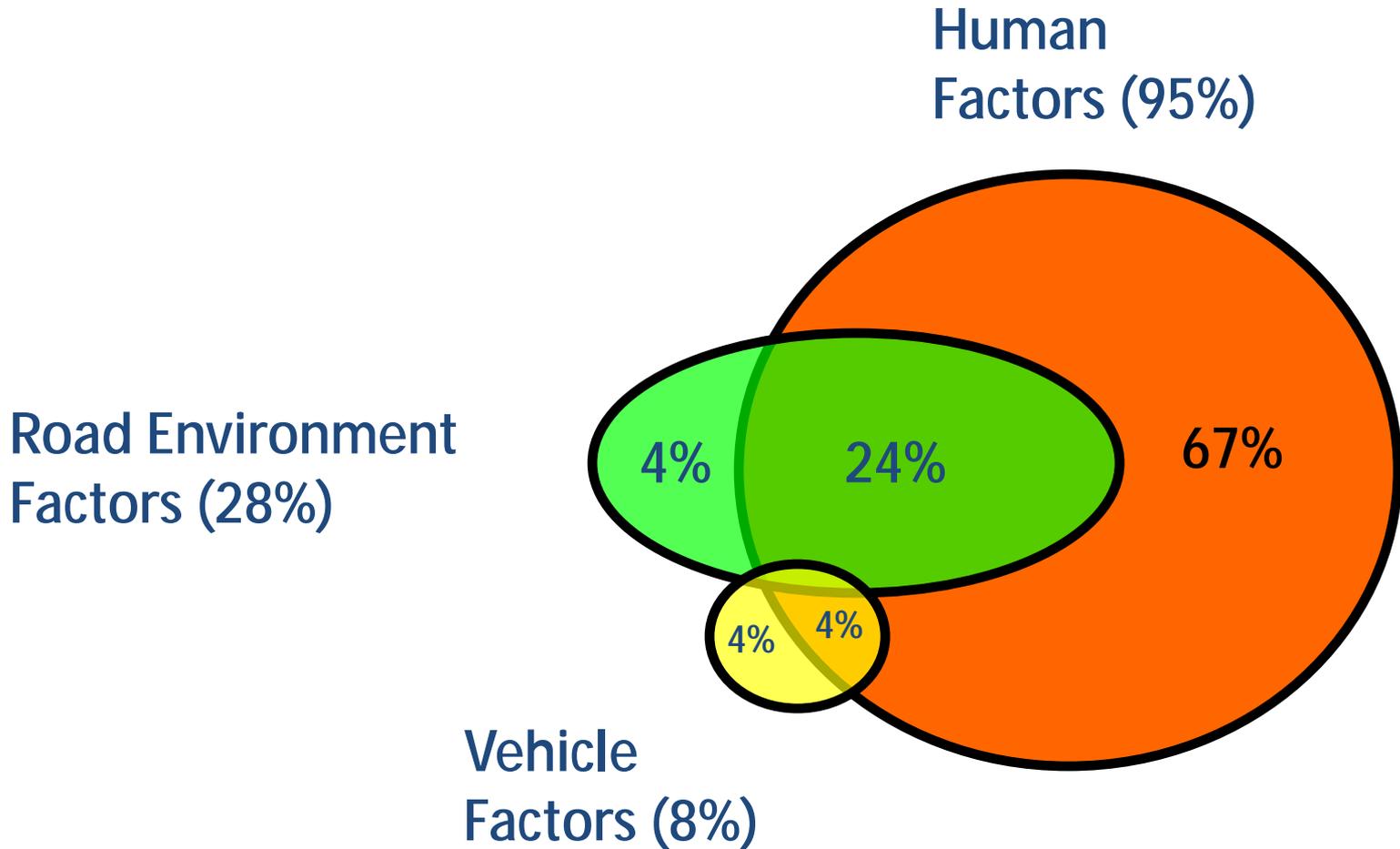
What is an RSA?

What is a Road Safety Audit / Assessment (RSA)?

A formal safety performance evaluation of an existing or future road or intersection by an independent, multidisciplinary team.

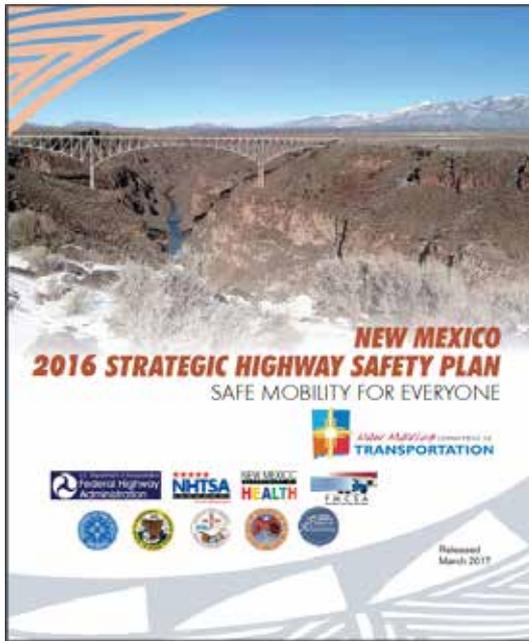


Why do we need RSAs?



TYPICAL REPORTED CRASH CAUSES

RSAs Support Other Goals



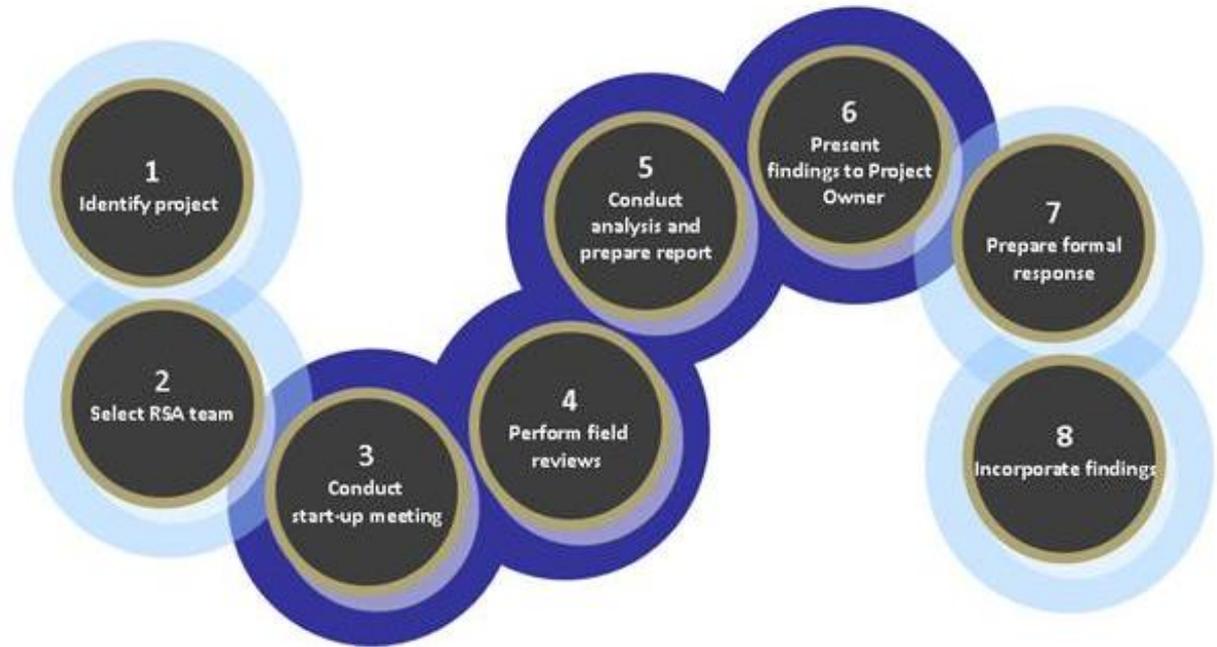
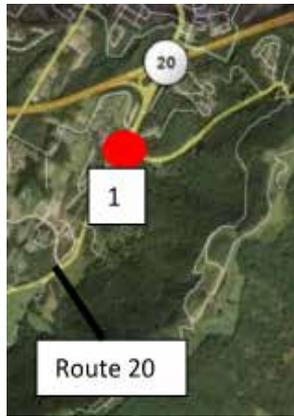
VISION ZERO for ONE ALBUQUERQUE

<p>equity</p>  <p>Prioritize safety + accessibility in areas most impacted by traffic violence.</p> <p>Engage people in planning and decision making.</p>	<p>education + encouragement</p>  <p>Promote a culture that prioritizes safe travel options for all residents + visitors.</p> <p>Collaborate with community groups + government agencies to encourage safe travel.</p>
<p>engineering</p>  <p>Build streets for all users to drive, bike, walk, and roll.</p> <p>Use data to design + redesign roadways to be safe, convenient, and comfortable.</p>	<p>enforcement</p>  <p>Ensure that all road users understand + follow traffic laws.</p> <p>Reduce traffic speeds in areas where crashes are common + most dangerous.</p>

How are RSAs conducted?

Responsibilities

-  RSA Team
-  Design Team / Project Owner



RSA Prompt Lists

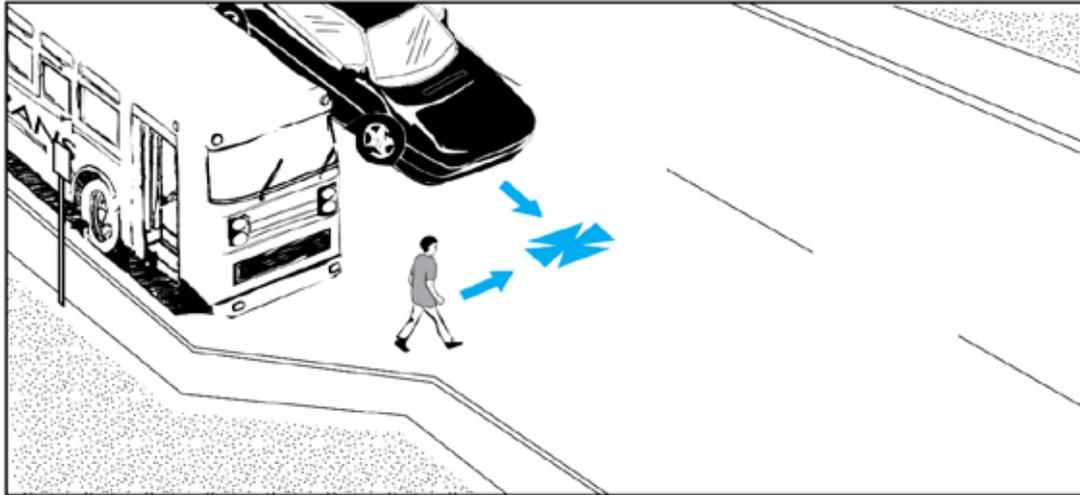
- q Presence of accommodations (bike, ped, and transit)
- q Quality of facilities (bike, ped, and transit)
- q Obstructions/continuity across network
- q Overhead lighting
- q Visibility of the crossing, pedestrians, and cyclists
- q Driveways and conflicts
- q Signs
- q Pavement markings
- q Signals (ped/bike accommodations)
- q Destinations
- q Traffic: speeds, gaps, turning movements

Crash Types

Multiple Threat Crash

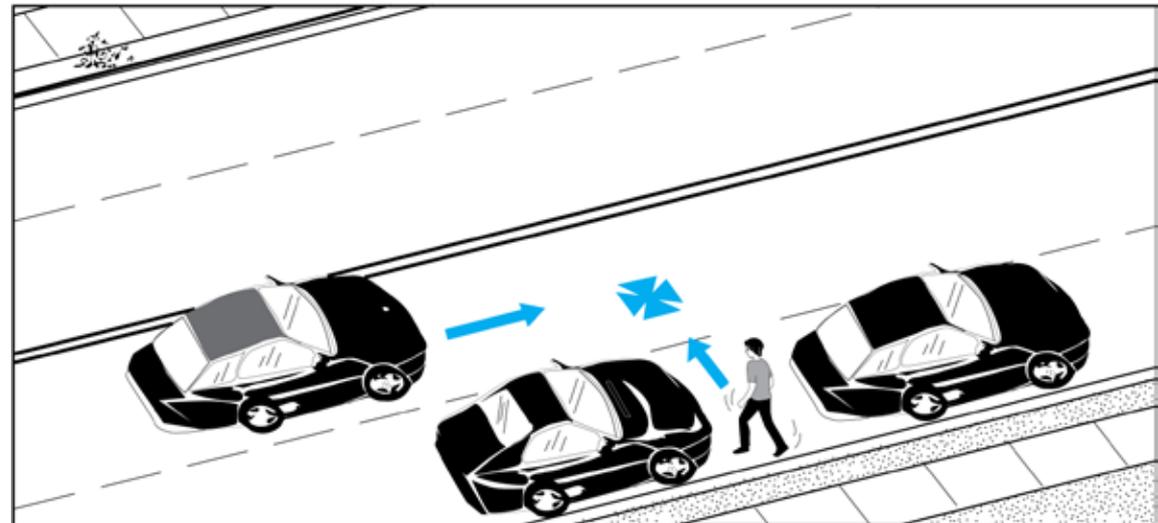


Multiple Threat Crash

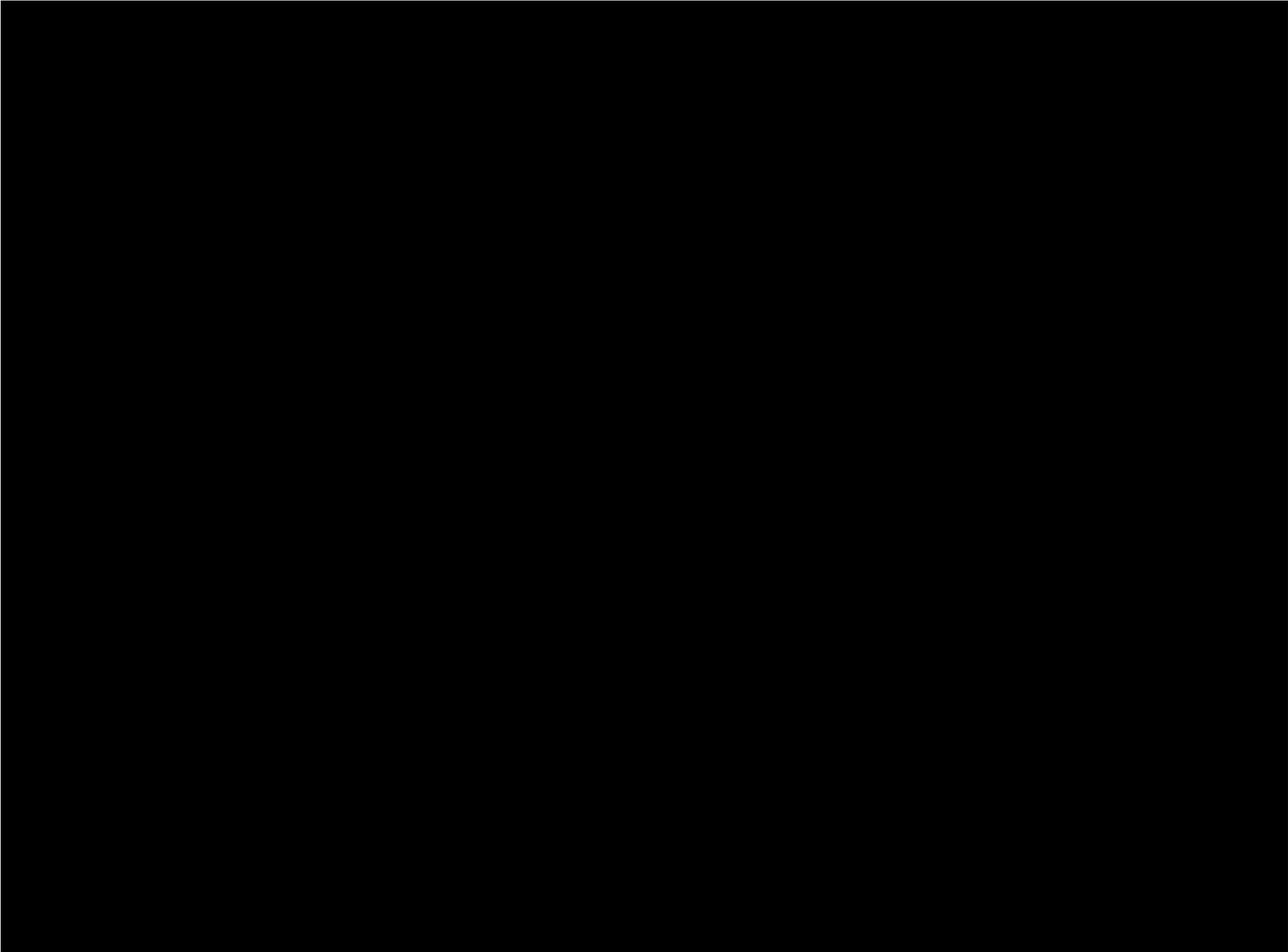


Multiple Threat-
Commercial Bus

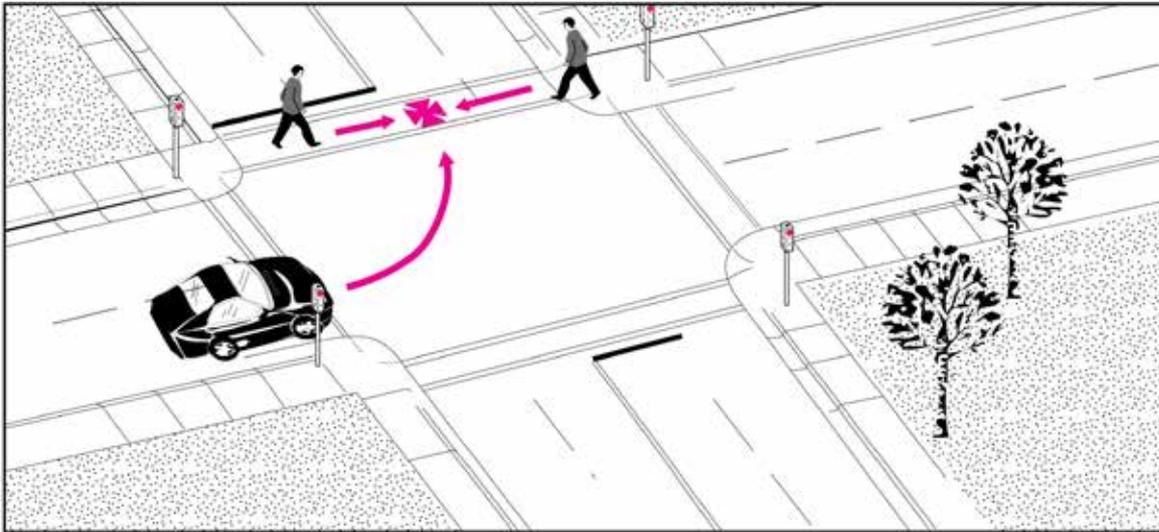
Multiple Threat- Trapped



Left Turn into Pedestrian Crossing Crash

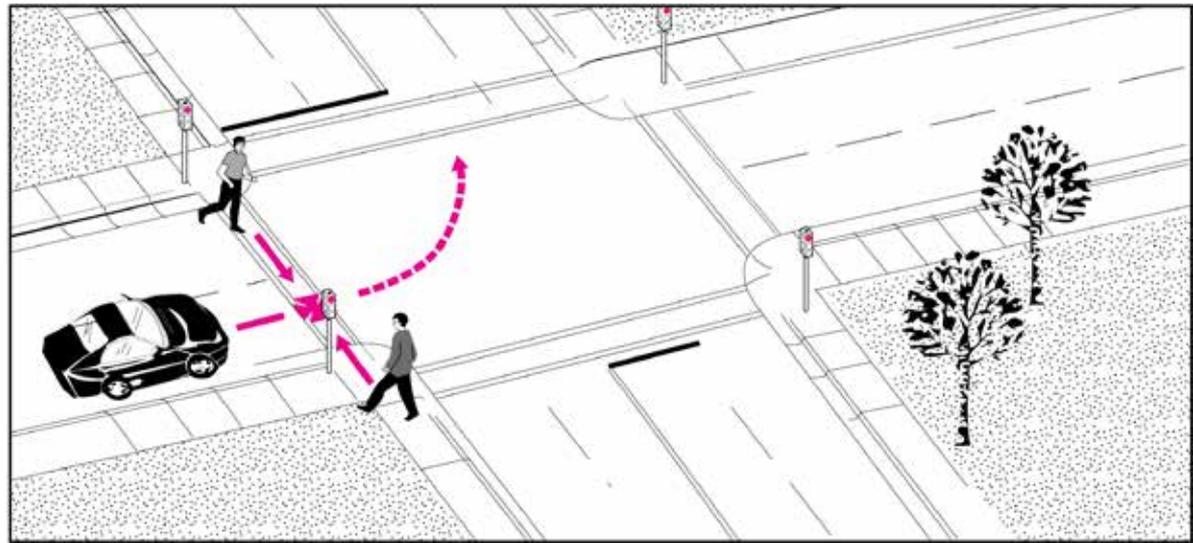


Left Turn into Pedestrian Crossing Crash

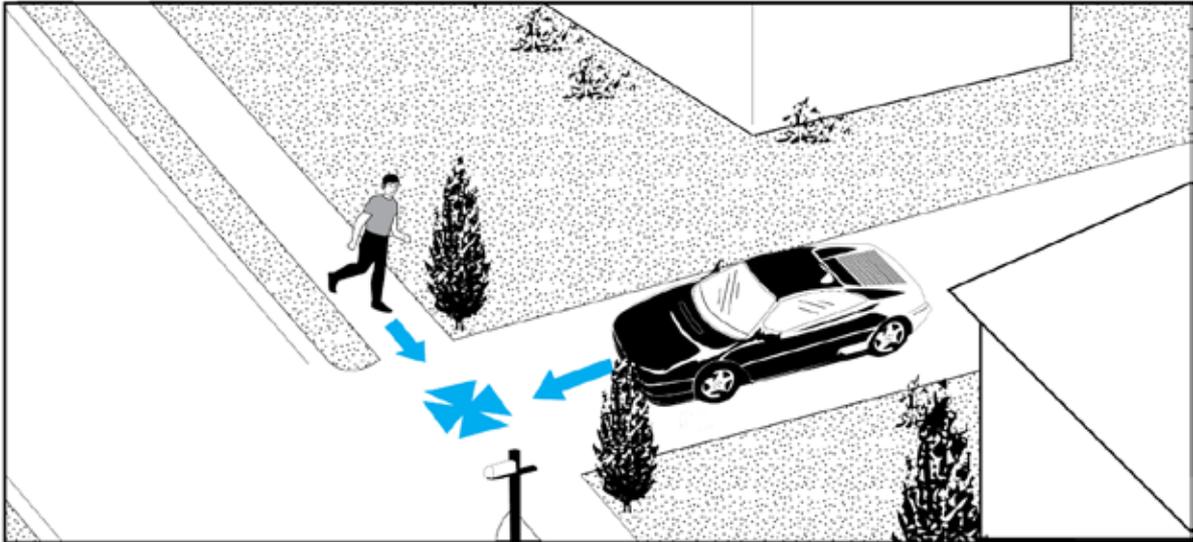


Motorist Left Turn-
Parallel Paths

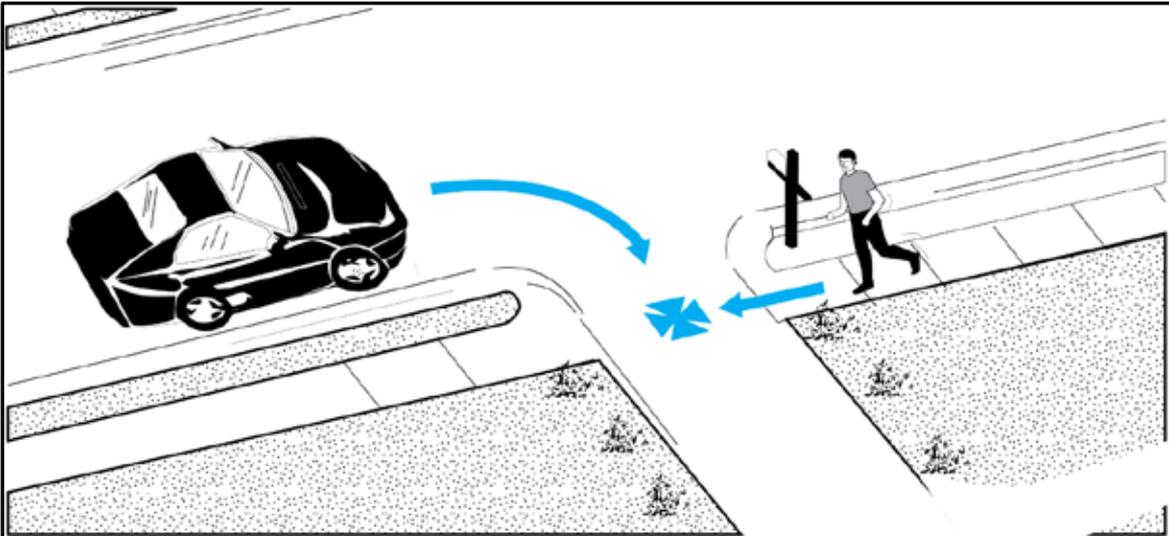
Motorist Left Turn-
Perpendicular Paths



Crossing Driveway

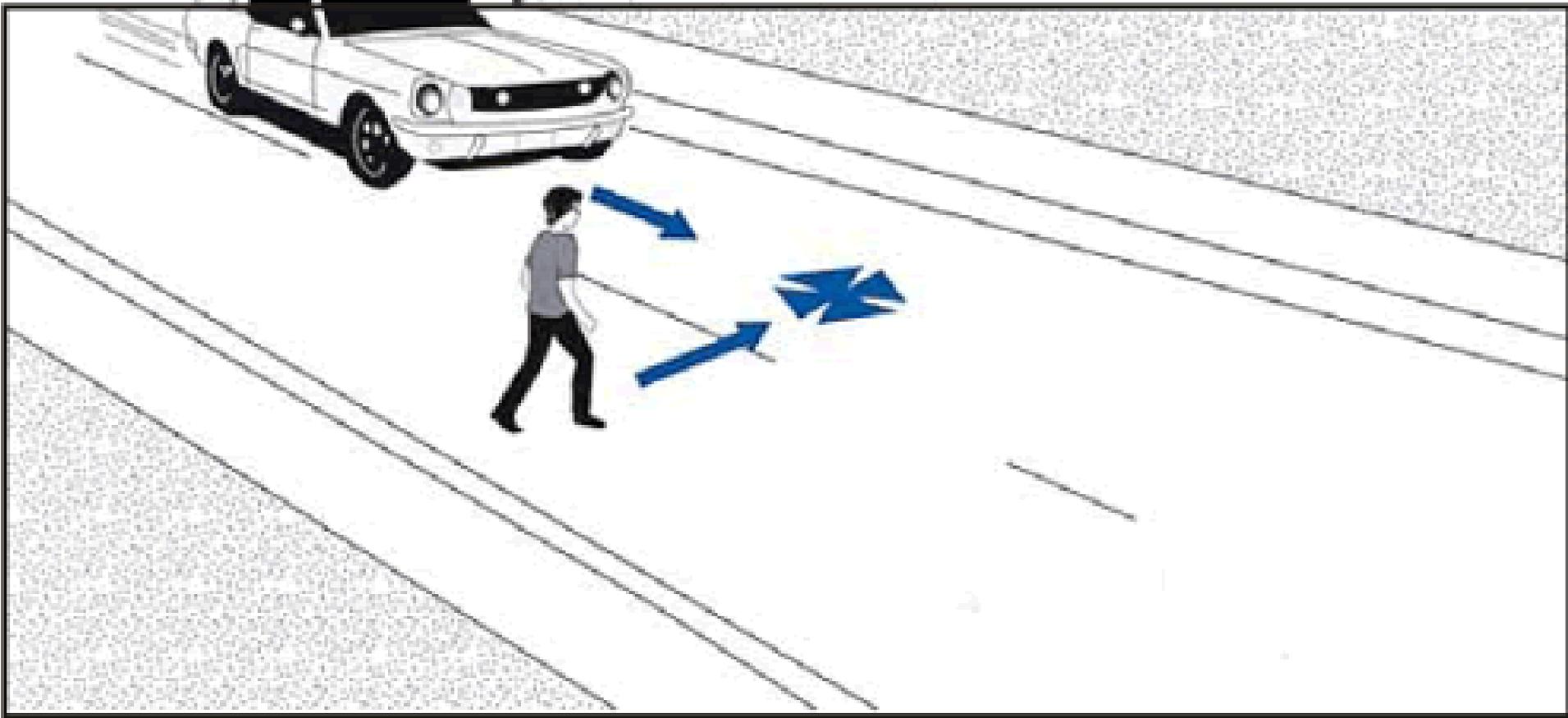


Motorist Exiting Driveway

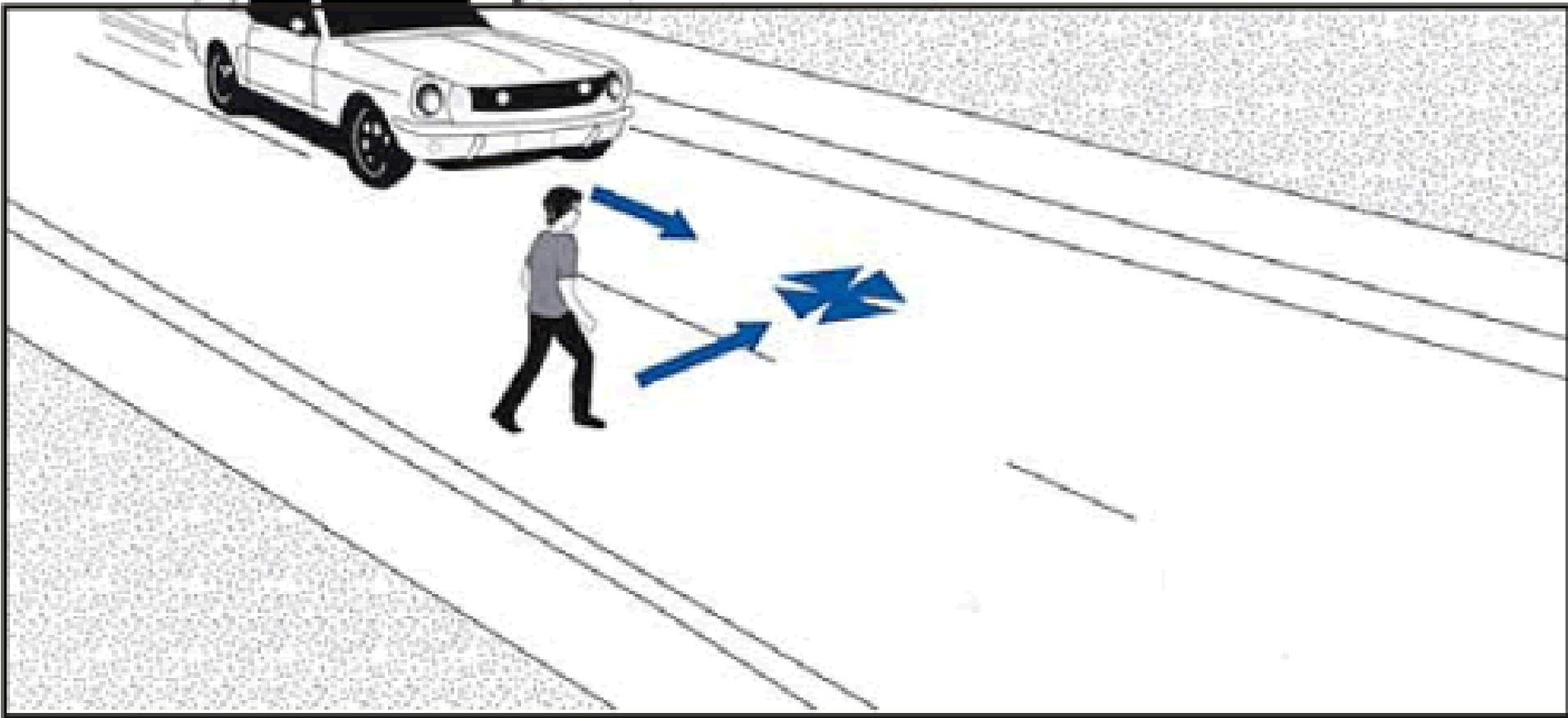


Motorist Entering Driveway

Crashes Due to Excessive Speed



Crashes Due to Excessive Speed



— PEDESTRIAN FATALITY & SERIOUS INJURY RISK +

18%



50%



77%



20
MPH

30
MPH

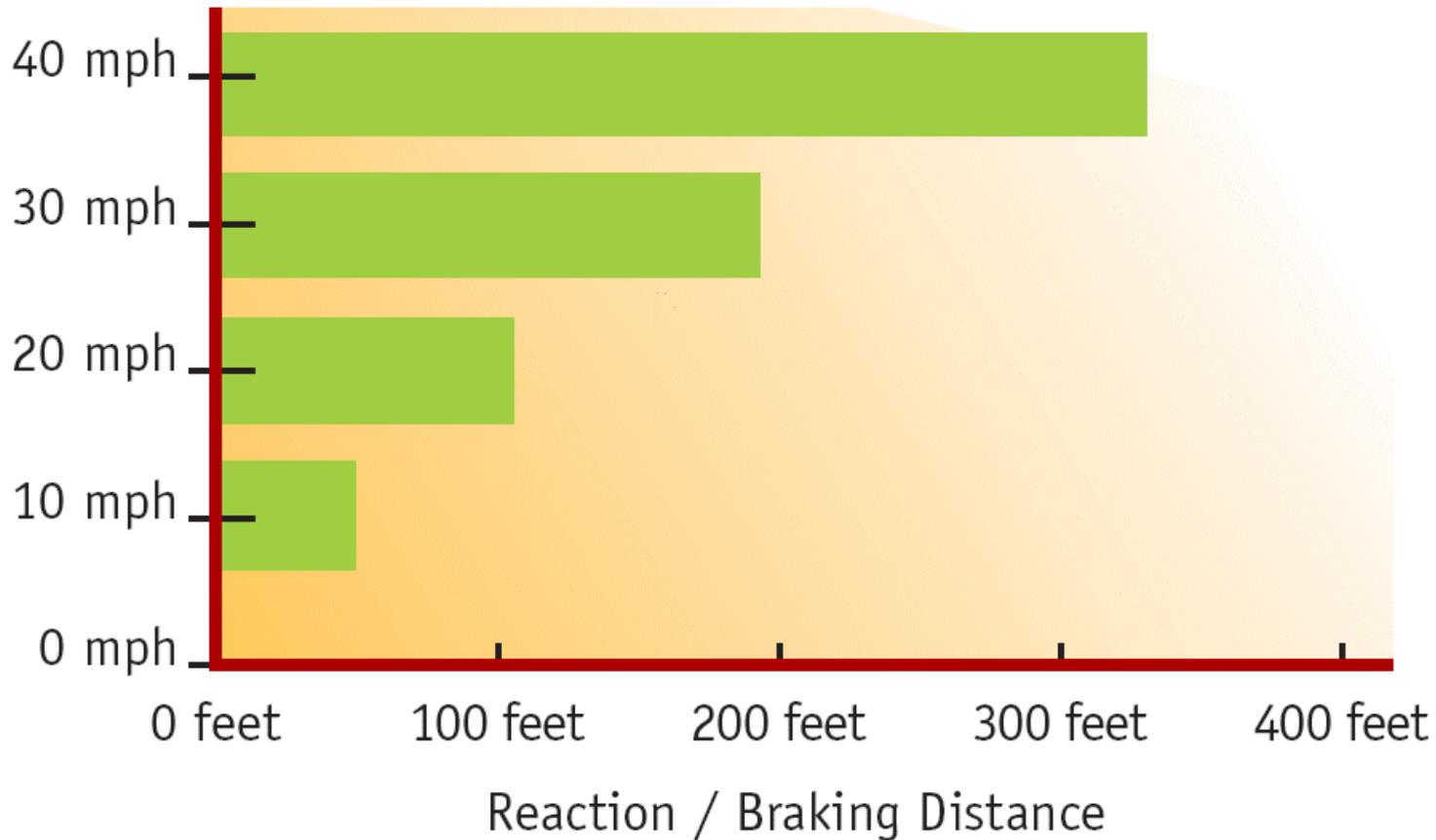
40
MPH



CONE OF VISION

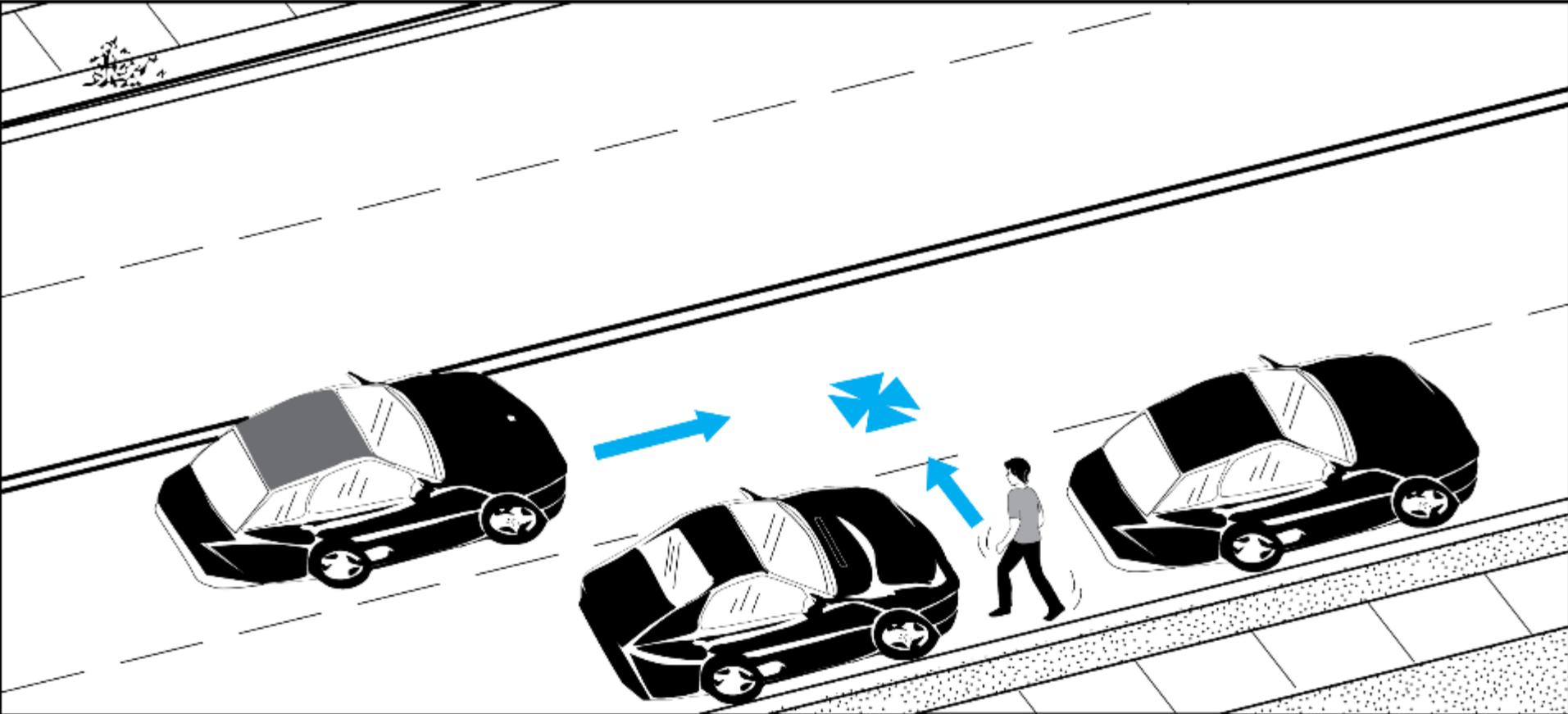
As motor vehicle speeds increase, the risk of serious injury or fatality for a pedestrian also increases (AARP Impact Speed and a Pedestrian's Risk of Severe Injury or Death 2011, p. 1). Also, motorist visual field and peripheral vision is reduced at higher speeds.

Speed Affects Crash Avoidance

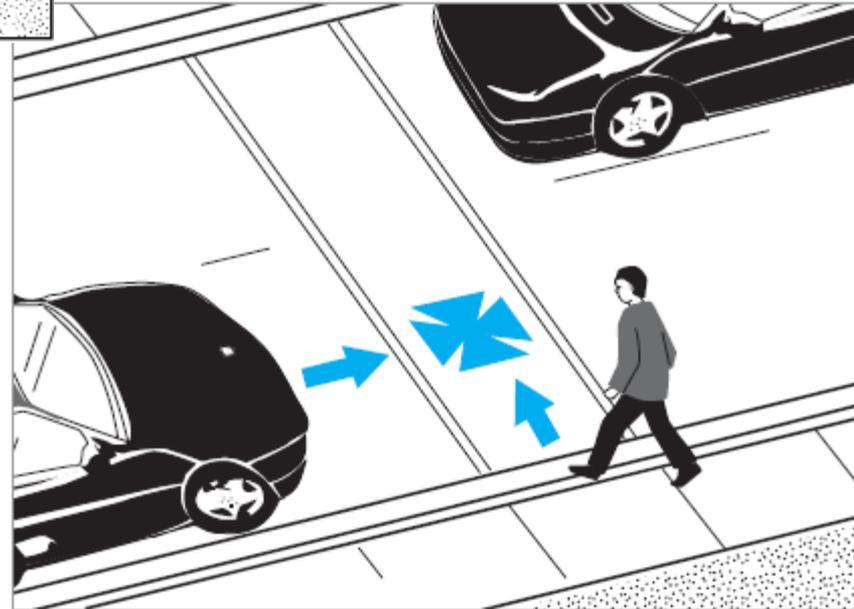
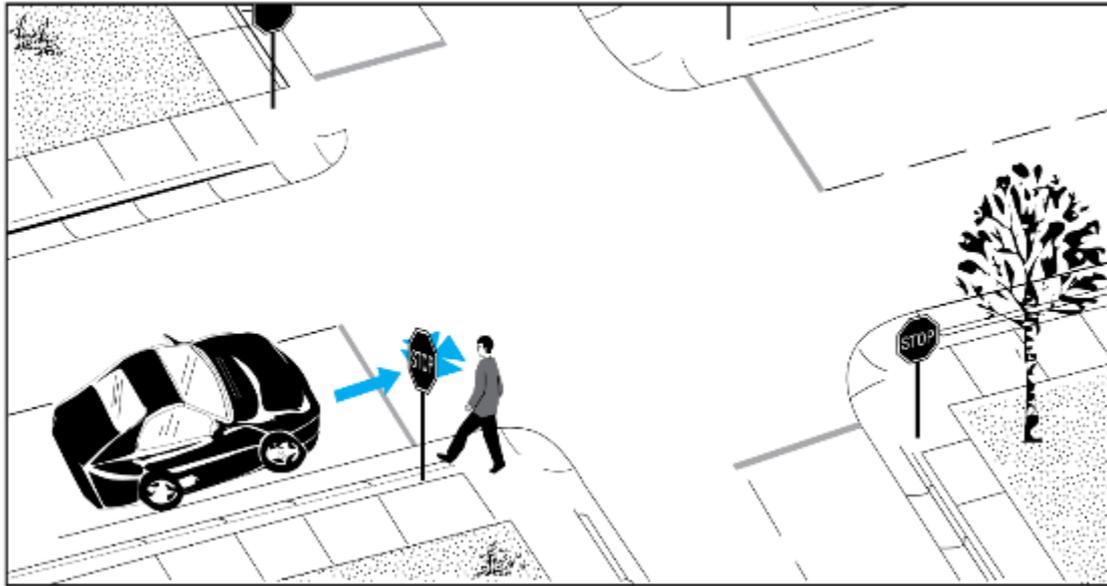


High speeds equate to greater reaction and stopping distance

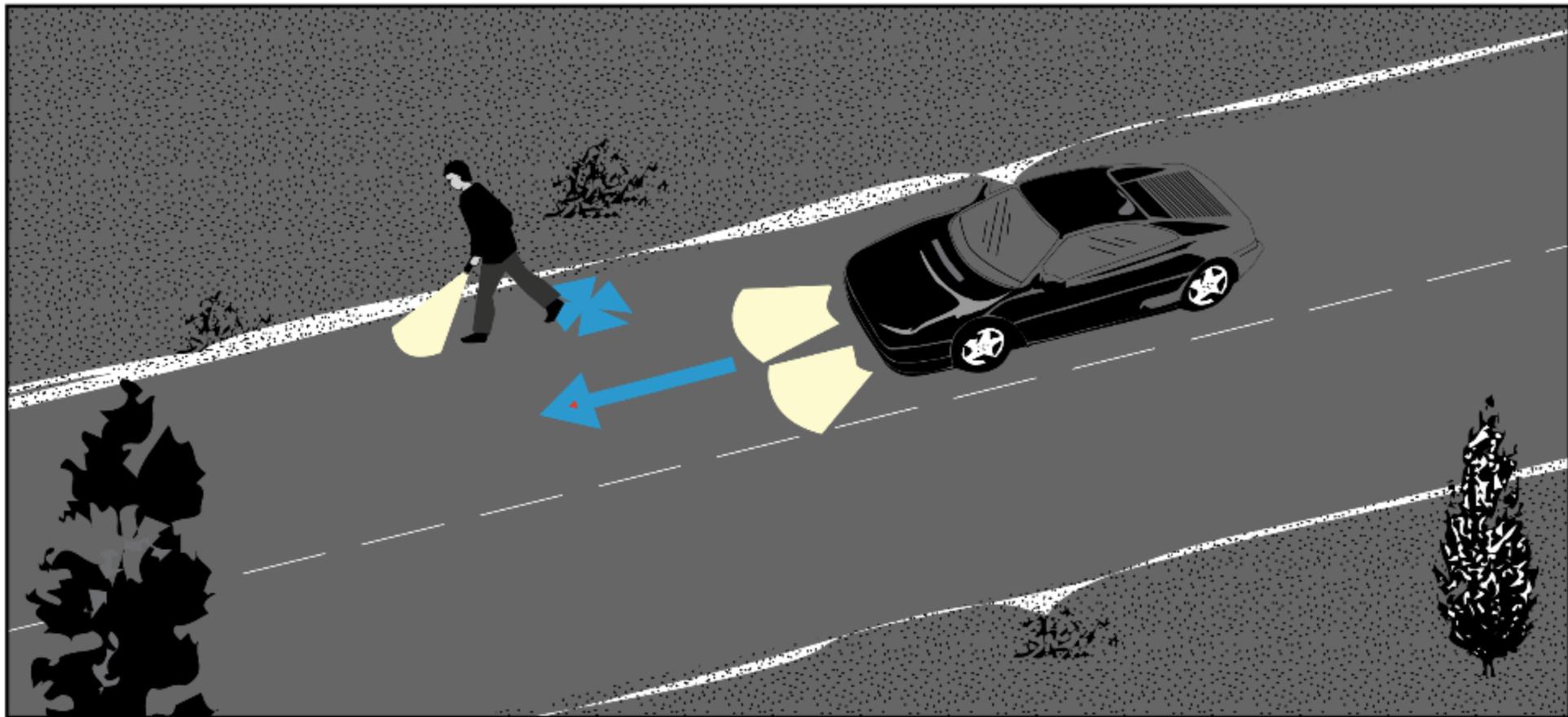
Crashes due to Limited Visibility



Crashes Resulting from Poor Yielding

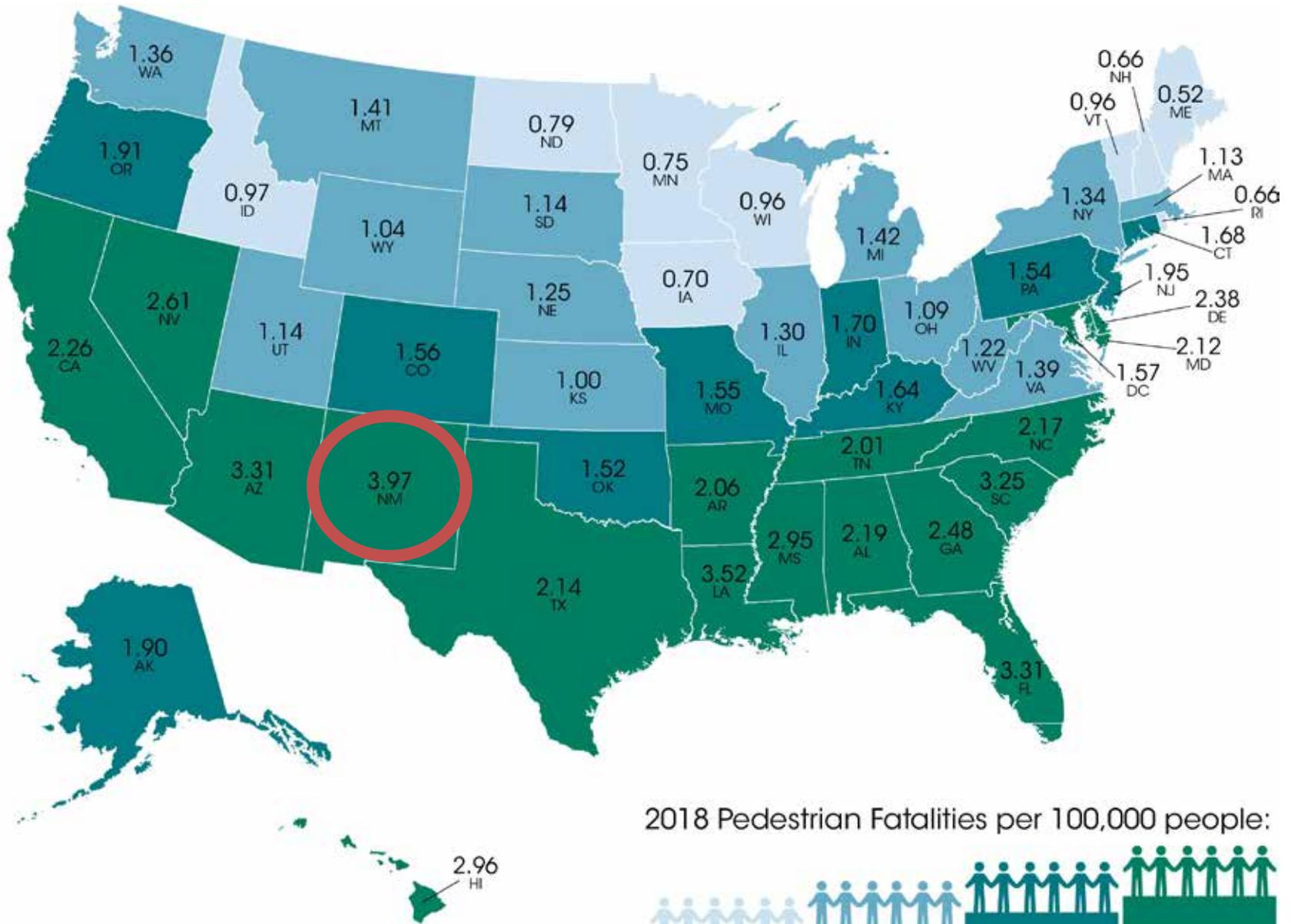


Crashes Due to Limited Separation

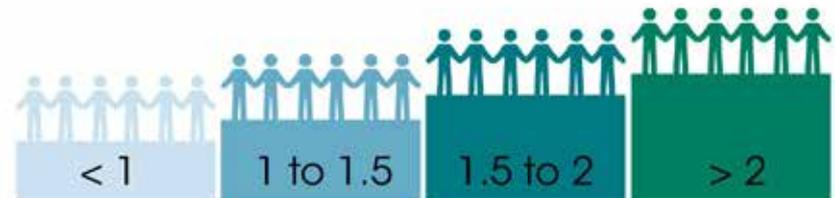


Louisiana Blvd RSA Site Overview

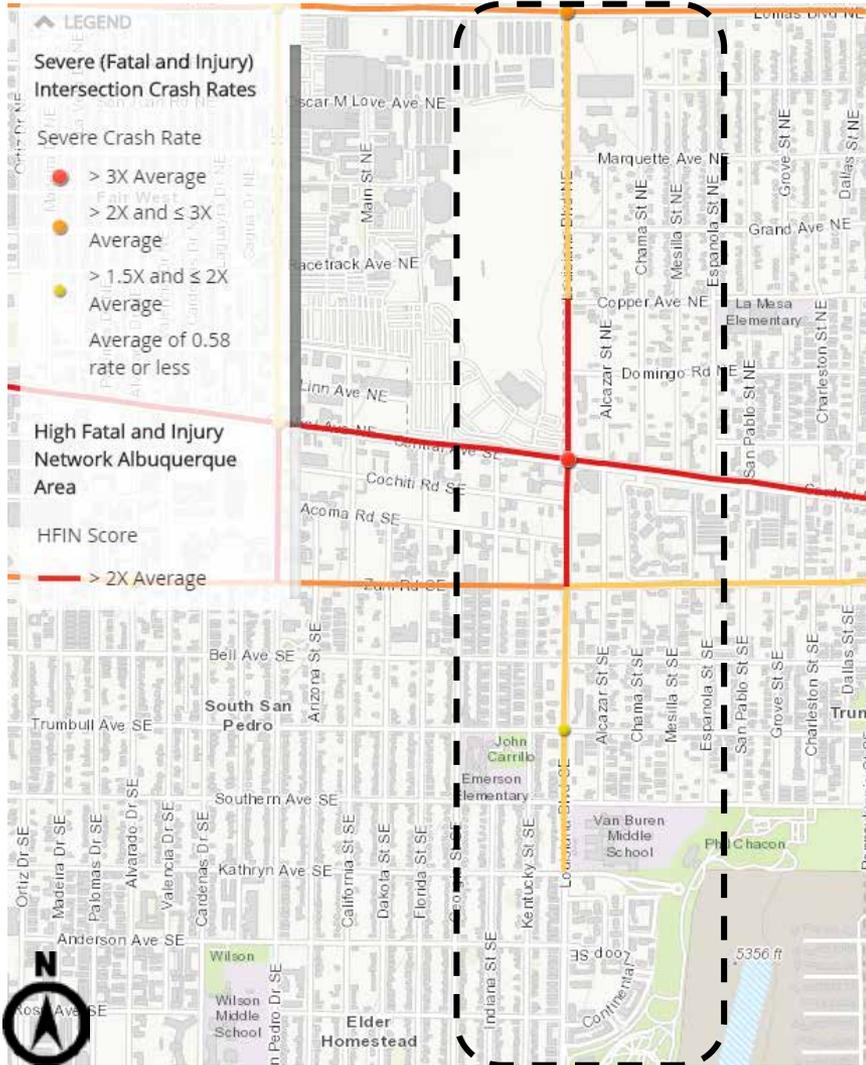
Which States? Pedestrian Fatalities per 100k: 2018



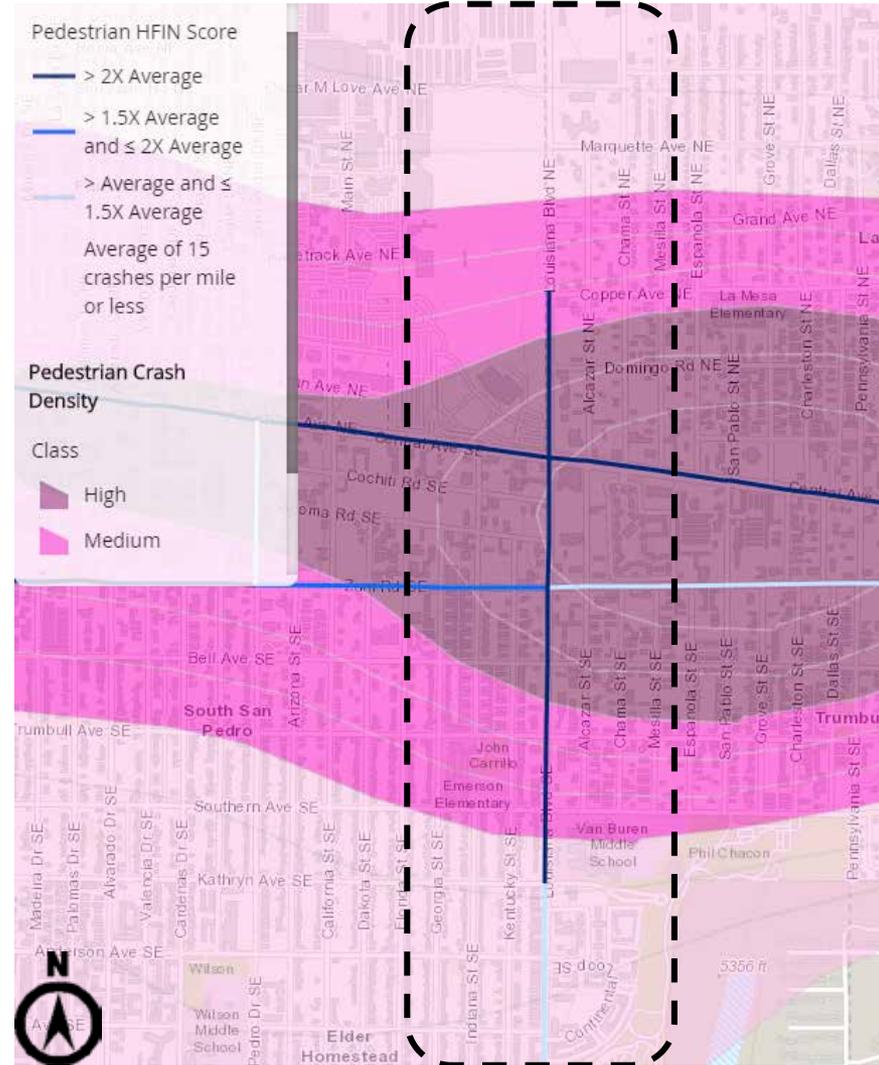
2018 Pedestrian Fatalities per 100,000 people:



Vision Zero Plan



§ Corridor has HFIN links (all modes)

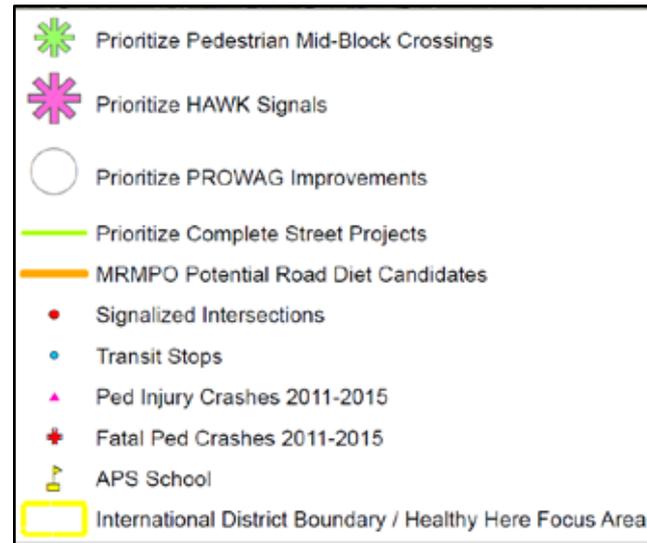


§ Corridor has elevated pedestrian crash rates

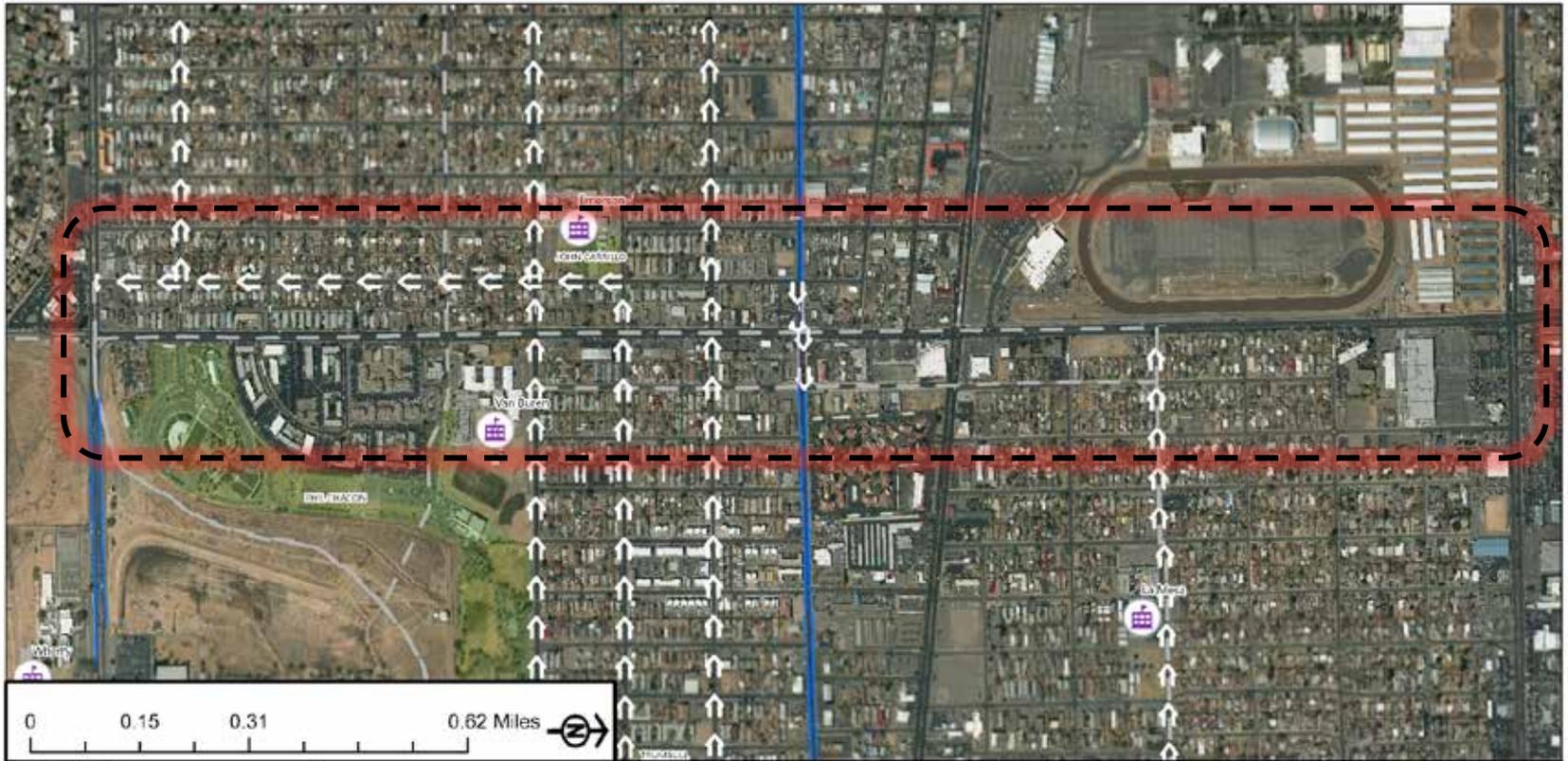
International District PSAP (2018)



- § Similar pedestrian crash locations
- § Midblock and PHB recommendations at Eastern, Ross, Anderson and Bell
- § Many cross streets as Complete Streets



Bicycle Network



Path Type

- Proposed Bike Facility
- Bike Blvd
- Bike Lane
- Shared Lane
- Buffered Lane

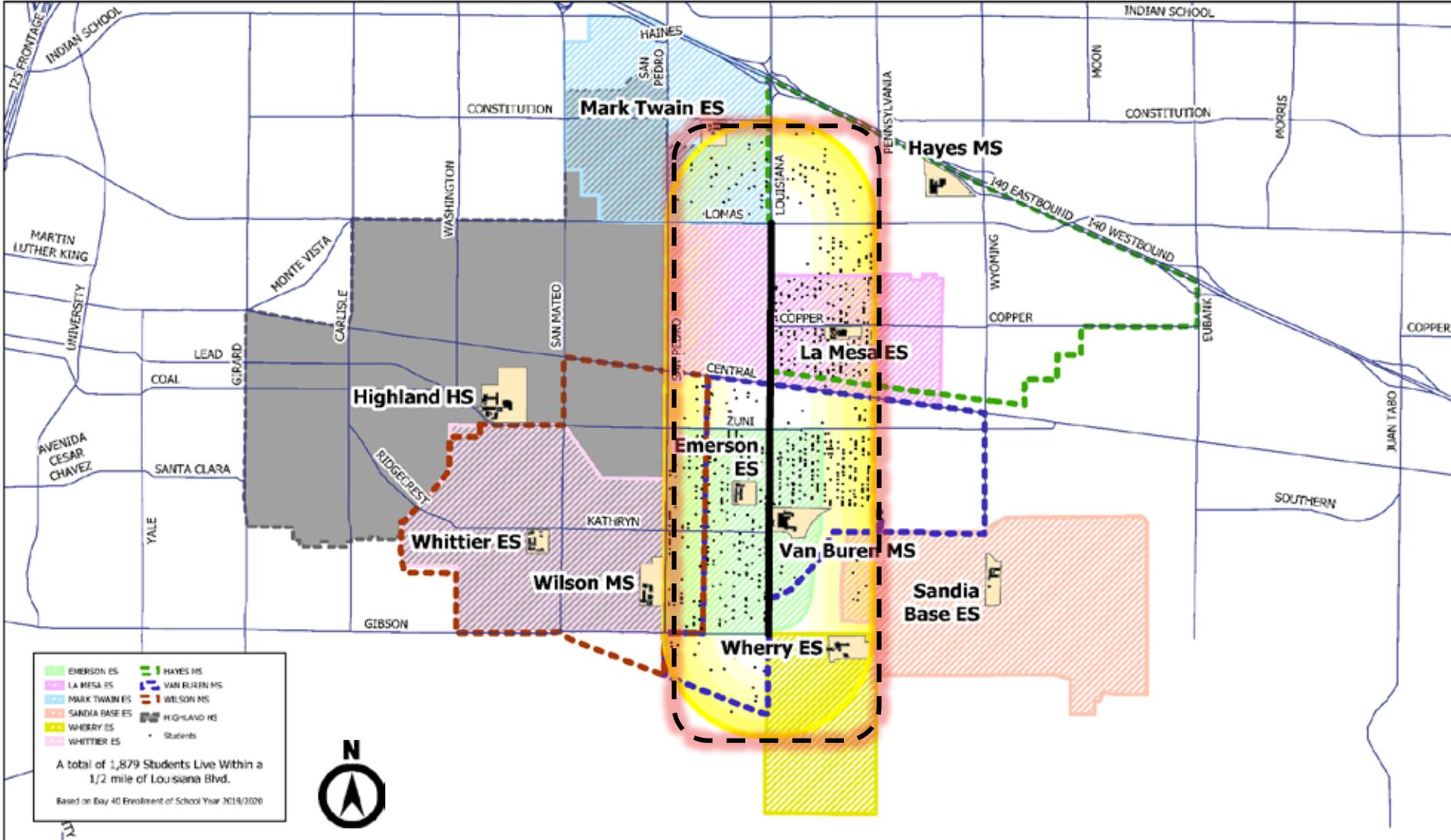
Land Use

- School
- Parks

- § Existing lanes on Zuni and Gibson (partial)
- § Shared lanes on parallel and cross streets
- § Proposed bike lanes on Louisiana and Kathryn
 - No space with existing lane configuration
 - Preferred separated or buffered facility

Local Schools

Walk Zones within 1/2 mile of Louisiana Corridor School Year 2019 - 2020



Placeholder for Other Relevant Plans



Pedestrian Crashes Along Corridor (2014-2018)



Pedestrian Crashes (2014-2018)

Crash Severity

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Land Use

- School
- Parks

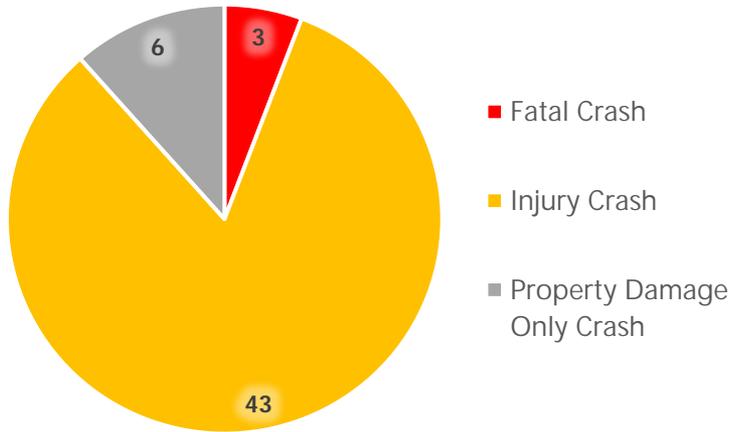
§ 52 reported crashes: 3 fatalities

§ Highest frequency locations: Kathryn, Southern, Trumbull, Bell, and Central

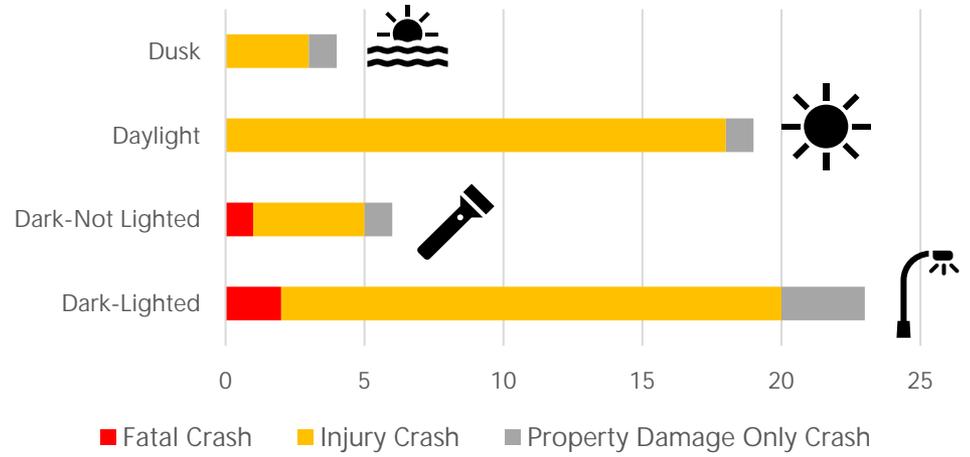
§ Most crashes located at or near intersections

Pedestrian Crashes – Severity, Lighting, and Alcohol (2014-2018)

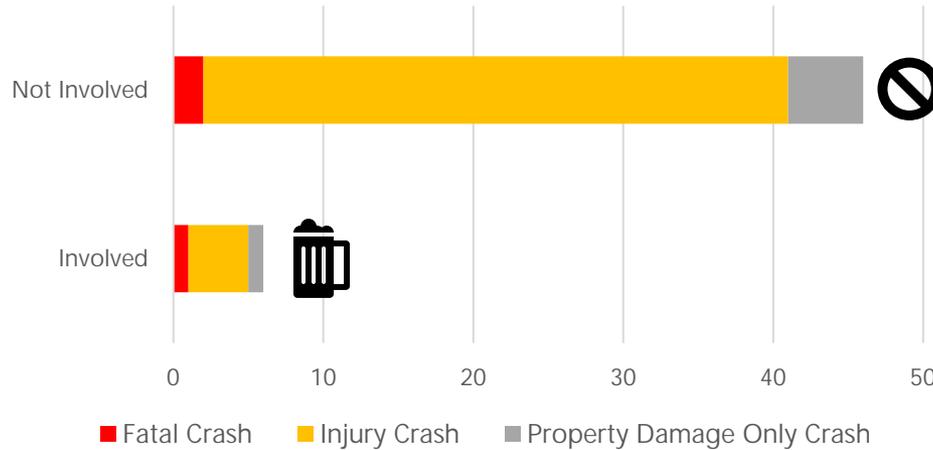
Pedestrian Crashes by Severity



Crash Severity by Lighting Condition



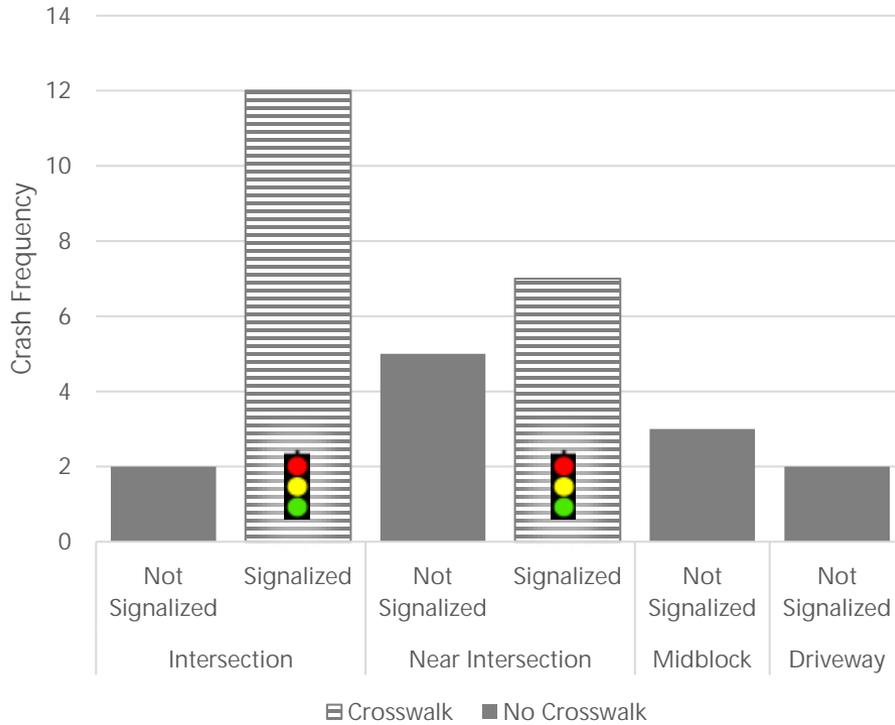
Crash Severity by Alcohol Involvement



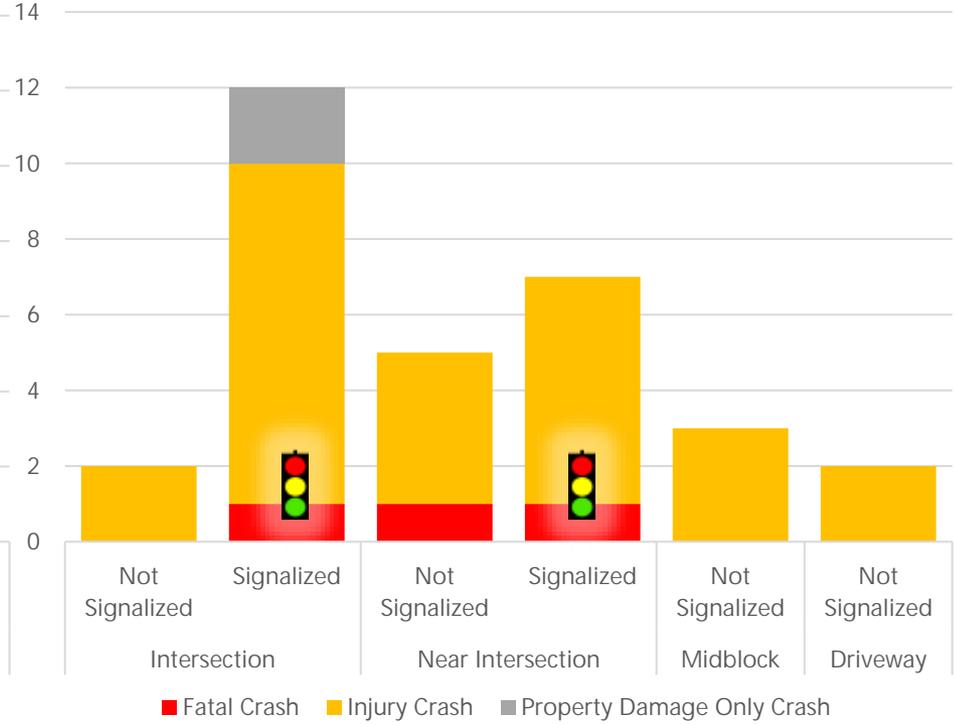
n=52

Pedestrian Crashes – Location, Markings, and Severity (2014-2018)

Crash Location by Crosswalk Marking and Traffic Control

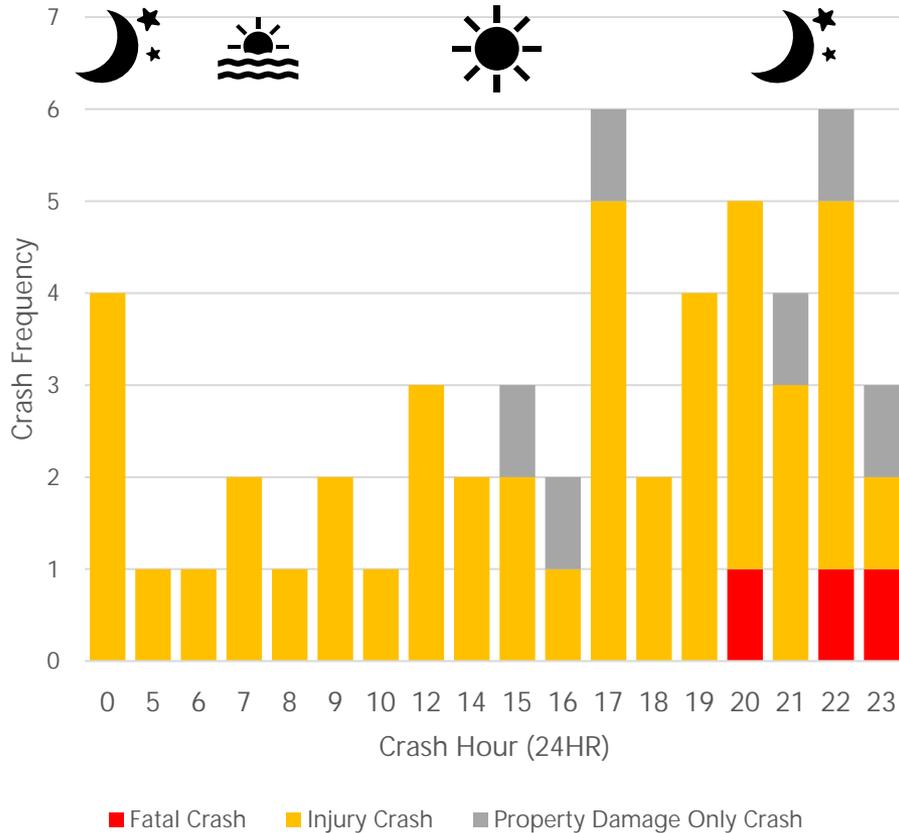


Crash Severity by Location and Traffic Control

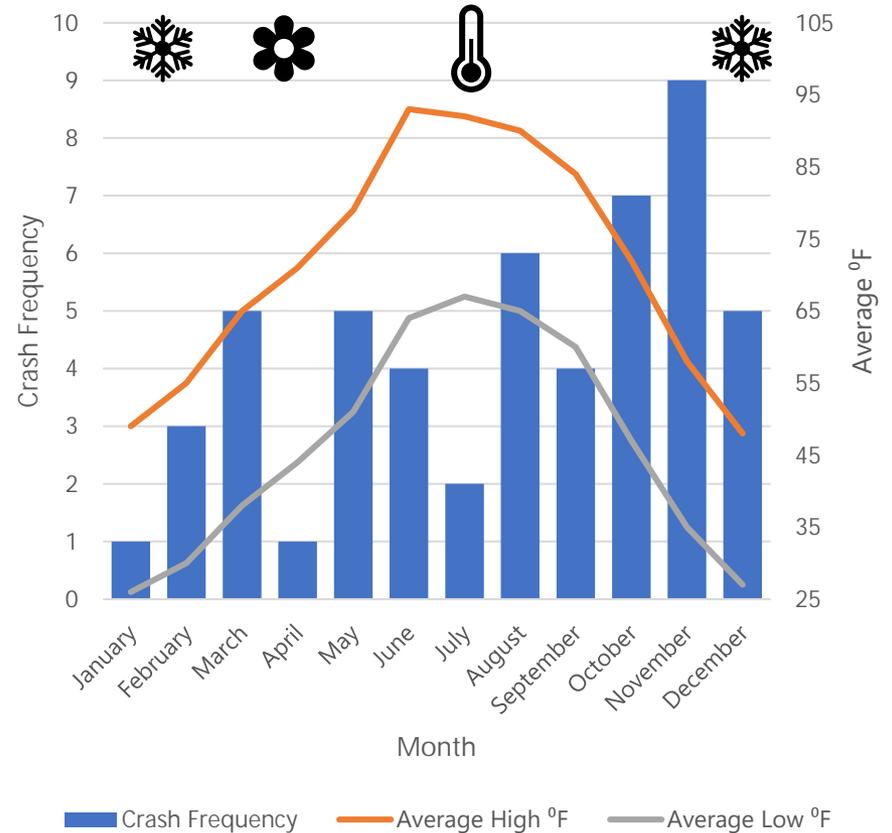


Pedestrian Crashes – Severity, Date, and Time (2014-2018)

Injury Severity by Hour



Crash Frequency by Month and Avg. Outdoor Temperature



n=52

Injury Status by
 Contributing Factor

Contributing Factor	Injury Severity			Grand Total
	Fatal Crash	Injury Crash	Property Damage Only Crash	
Alcohol/Drug Involved	1	4	2	7
Avoid No Contact - Other		1		1
Avoid No Contact - Vehicle		1		1
Disregarded Traffic Signal		1		1
Driver Inattention		9	1	10
Failed to Yield Right of Way		5	1	6
Made Improper Turn		2		2
Missing Data			1	1
None	1	2	1	4
Other - No Driver Error		1		1
Other Improper Driving		1		1
Pedestrian Error	1	16		17
Grand Total	3	43	6	52

Vehicle Action by
 Contributing Factor

Contributing Factor	Vehicle Action				Grand Total
	Vehicle Going Straight	Vehicle Turning Left	Vehicle Turning Right	Unknown	
Alcohol/Drug Involved	4	1	1	1	7
Avoid No Contact - Other	1				1
Avoid No Contact - Vehicle			1		1
Disregarded Traffic Signal	1				1
Driver Inattention	1	7	2		10
Failed to Yield Right of Way	2	1	2	1	6
Made Improper Turn		1		1	2
Missing Data				1	1
None	3	1			4
Other - No Driver Error	1				1
Other Improper Driving				1	1
Pedestrian Error	13	3	1		17
Grand Total	26	14	7	5	52

n=52

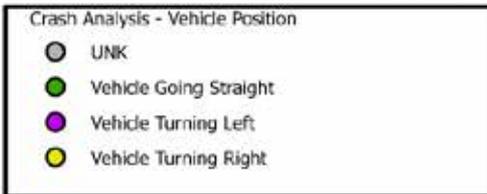
Pedestrian Crash Analyses/Vehicle Position (2014-2018)



§ Vehicle Position

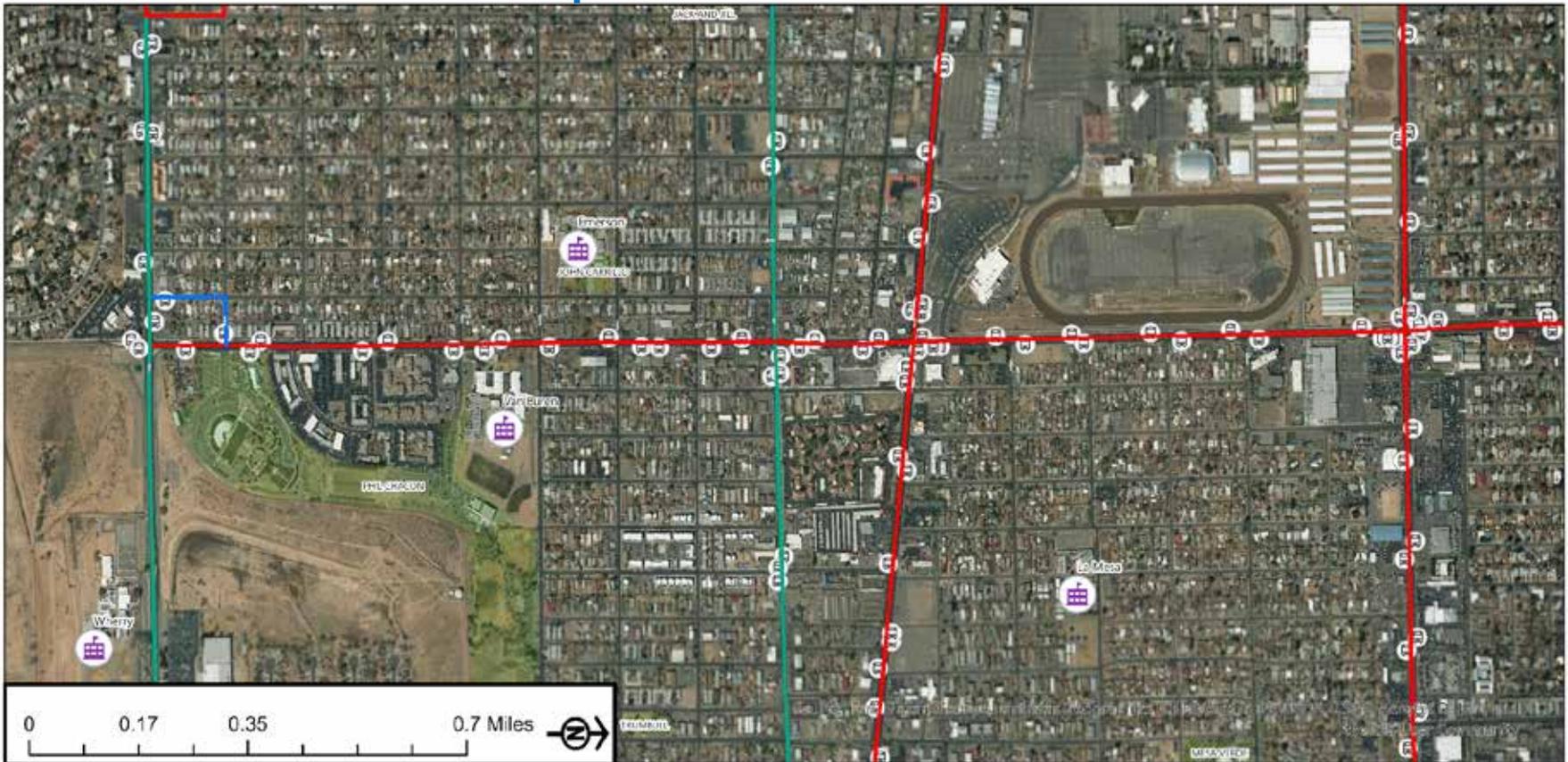
- Vehicle **going straight** (50%)
- Vehicle **turning left** (27%)
- Vehicle **turning right** (13%)
- Unknown or **blank** (10%)

§ Hit and Run (27%)



n=52

Transit Routes & Stops



Peak Headways

- <30 min
- 30-45 min
- 60 min+

§ Several routes along and intersect corridor

- Fixed Route Bus Services: 97, 96, 157, 11, 66, 16, 766
- Along corridor: 157, 766, 16
- Stop placement before and after intersections and at midblock
- No data at this time on boardings or BRT impacts

Other Corridor Attributes



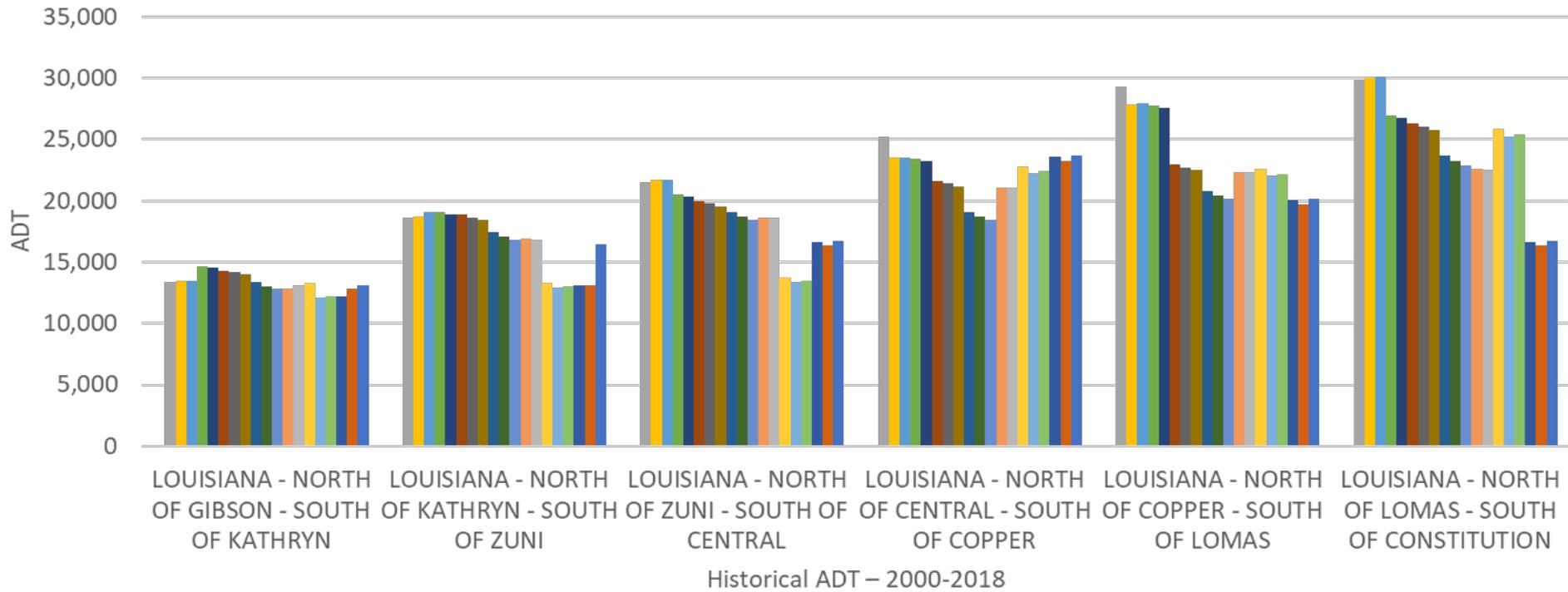
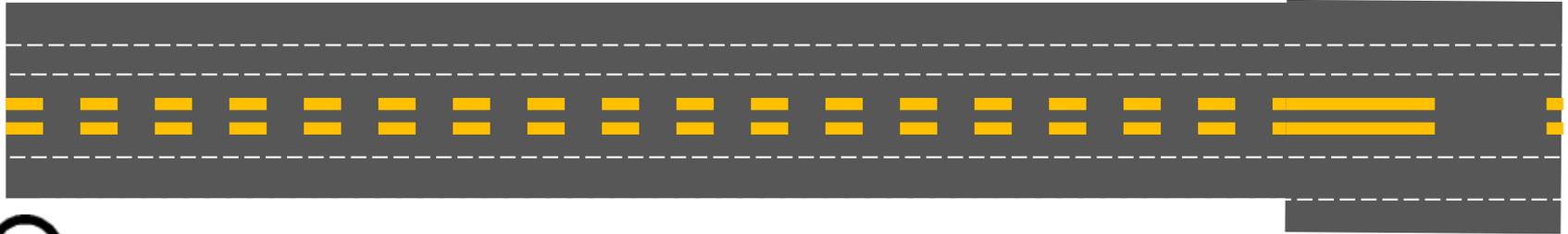
§ Signalized intersections: Gibson, Kathryn, Southern, Trumbull, Zuni, Central, and Lomas

- Pedestrian signal heads; LPI?
- No marked midblock or uncontrolled crossings
- City policies related to treatments?

§ Sidewalks along sections

§ Posted speed = 35MPH for most of corridor. Terra's informal speed study showed 85 per speeds above posted, higher near Trumbull

Historical AADT (2000-2018)



Break



Prompt Lists for “In the—Virtual—Field”

- § What do you see?
- § Who is travelling along or crossing the roadway(s)?
- § Where are people going?
- § What stands out to you as potential safety issues?

Location	Physical Environment / Infrastructure					
	Presence/Placement	Quality/Condition	Connectivity/Consistency	Visibility	Lighting	Transit
Universal Considerations for Study Area	<ul style="list-style-type: none"> Do facilities address ped and bike needs, including those with disabilities? If future changes are proposed to the transportation system or surrounding land use, will those needs still be met? 	<ul style="list-style-type: none"> Are ped and bike facilities in good condition and accommodate users with disabilities? 	<ul style="list-style-type: none"> Are safe, continuous, and convenient ped and bike routes provided throughout the study area? 	<ul style="list-style-type: none"> Do obstructions block the view of roadway users? What obstructions block the view of pedestrian and bicycle facilities (e.g., crosswalks, traffic control devices, signs)? Does the sun create visibility issues at certain times of day? 	<ul style="list-style-type: none"> Are ped and bike facilities well-lit? Can peds and bikes be seen by motorists during dark conditions? 	<ul style="list-style-type: none"> How does transit infrastructure interact with ped and bike facilities?
Along Street (including driveways)	<ul style="list-style-type: none"> How are peds and bikes accommodated on both sides of the road? Are facilities shared, separate, or buffered? What is the comfort level for users? Are ped and bike facilities appropriate for the adjacent land use? Do parked vehicles obstruct ped paths? Does parking adversely affect bike safety? 	<ul style="list-style-type: none"> Are the bike/ped facilities in good condition and well-maintained? Are there obstacles (e.g. utility poles or signs) in the middle of the sidewalk? Are the sidewalks wide enough for two people to walk together? Does vegetation or debris infringe on pedestrian or bicyclists facilities? Is the pavement free of obstacles (e.g., potholes, drainage grates, longitudinal joints)? 	<ul style="list-style-type: none"> How are peds accommodated at driveways/ access points? Are ped walkways continuous? Are bike routes continuous? 	<ul style="list-style-type: none"> Are there obstructions blocking the driver's view of peds and bikes? Are driveways designed with peds and bikes in mind (e.g., less driveway density, access management, proper signage, pavement markings, etc.)? 	<ul style="list-style-type: none"> Are sidewalks and bicycle facilities adequately lit? 	<ul style="list-style-type: none"> Are there sufficient boarding areas (5 feet along curb, 8 feet perpendicular to curb line) and visibility at transit stops? Do ped and bike facilities connect to transit stops?

Location	Physical Environment / Infrastructure					
	Presence/Placement	Quality/Condition	Connectivity/ Consistency	Visibility	Lighting	Transit
Mid-Block Crossing (marked)	<ul style="list-style-type: none"> • Are there crossing enhancements? • What are the distances between the mid-block crossing and other marked crosswalks? 	<ul style="list-style-type: none"> • Are signs and pavement markings in good condition and visible/legible? 	<ul style="list-style-type: none"> • Does this crossing lead to/from a ped/bike generator? 	<ul style="list-style-type: none"> • Are there obstructions blocking the view of signs or pavement markings? • Do horizontal or vertical curves impede adequate sight distance between drivers and peds/bikes? 	<ul style="list-style-type: none"> • Are pedestrian crossings adequately lit? 	<ul style="list-style-type: none"> • Is there a transit stop located mid-block? • Are transit users crossing mid-block to get to/from the transit stop?
Observed Mid-Block Crossings (unmarked)	<ul style="list-style-type: none"> • Are crossings isolated or a frequent route used by pedestrians or bicyclists? 	N/A	<ul style="list-style-type: none"> • How far is it to the nearest controlled crossing? • Why are peds/ bikes crossing mid-block and not at the closest marked crossing? • Are there generators that lead to pedestrians and bicyclists crossing mid-block? 	<ul style="list-style-type: none"> • Are there obstructions blocking the view of pedestrians and bicyclists? 	<ul style="list-style-type: none"> • Does this section of roadway have lights? 	<ul style="list-style-type: none"> • Are mid-block crossings occurring near transit stops?

Location	Physical Environment / Infrastructure					
	Presence/Placement	Quality/Condition	Connectivity/ Consistency	Visibility	Lighting	Transit
Intersections	<ul style="list-style-type: none"> • How are peds and bikes accommodated (e.g., accessible ped signal, bike box, high-vis crosswalks, bike signal)? • What intersection characteristics increase/decrease ped and bike safety (e.g., channelized right turns, large curb radii, wide crossing distances, right-turn-on-red)? 	<ul style="list-style-type: none"> • How many legs have a crosswalk and what is the condition? • Are ped push buttons accessible, with a locator tone, properly located and connected to the walkway, and functioning correctly? • Are curb ramps in good condition and ADA-compliant for each crosswalk or does a single curb ramp serve both crosswalks? 	<ul style="list-style-type: none"> • Are intersection enhancements to signs, pavement markings, and signals consistent across intersections in the study area? • Do crosswalks line up with sidewalks? 	<ul style="list-style-type: none"> • Can peds, bikes, and drivers see each other at all intersection legs? • Are there utility poles, signs or other objects blocking the view of traffic? • Do skewed intersections direct drivers' focus away from peds? 	<ul style="list-style-type: none"> • Is the lighting adequate at all corners of the intersection? 	<ul style="list-style-type: none"> • Do ped and bike facilities connect to transit stops? • Are transit stops on the near or far side of the intersection?
Shared Use Paths and Grade-Separated Crossings	<ul style="list-style-type: none"> • Do bicyclists have adequate space to ride comfortably (e.g., horizontal and vertical clearance at tunnels and bridges, construction zones, guardrails, fences)? • Do pedestrians have sufficient width to walk comfortably and is access to the facility accessible to individuals with disabilities? 	<ul style="list-style-type: none"> • Does the condition of the facility promote personal safety? • What material is the structure (freeze/thaw)? • Are the grades and cross slopes accessible to individuals with disabilities? • Is there adequate drainage? • Does wildlife affect comfort levels? • Are sideslopes adequate for bicycles to return to the roadway in the event of a lane departure? • Are facilities properly maintained (free of vegetation, snow)? 	<ul style="list-style-type: none"> • Are bike facility transition areas designed appropriately with logical termini or do they end abruptly, potentially contributing to sudden and difficult merges, uncontrolled crossings, or behaviors such as wrong-way riding? • How is access provided to destinations if grade-separated? • Is the facility connected to other ped facilities in the area? 	<ul style="list-style-type: none"> • Does poor visibility compromise personal safety? • Does the speed of users affect their ability to see and react to shared use path connections? 	<ul style="list-style-type: none"> • Is adequate lighting provided? 	<ul style="list-style-type: none"> • Are connections to transit provided?

Location	Traffic Control Devices		
	Signs and pavement markings	Signals	Compliance?
Universal Considerations for Study Area	<ul style="list-style-type: none"> • Are signs and pavement markings for pedestrian and bicycle facilities present and effective? 	<ul style="list-style-type: none"> • Are pedestrians and bicyclists accommodated at signals through adequate signal timing and phasing? • Are pedestrian push buttons accessible, with a locator tone, properly located and connected to the walkway, and functioning correctly? 	<ul style="list-style-type: none"> • Do motorists, pedestrians, and bicyclists follow traffic laws?
Along Street (including driveways)	<ul style="list-style-type: none"> • Are bicycle pavement markings adequate? 	N/A	N/A
Mid-Block Crossing (marked)	<ul style="list-style-type: none"> • Are crossing points for pedestrians properly signed and/or marked? Are curb ramps provided? • Are there signage enhancements for the crossing, such as RRFBs or flashing beacons? 	<ul style="list-style-type: none"> • Are there any devices (i.e., PHB or signalization) to control the crossings? • If so, are pedestrian push buttons accessible, with a locator tone, properly located and connected to the walkway, and functioning correctly? 	<ul style="list-style-type: none"> • Are drivers, pedestrians, and bicyclists compliant with traffic control devices? • Are drivers yielding to pedestrians? • Are bicyclists yielding to pedestrians?
Intersections	<ul style="list-style-type: none"> • Is paint on stop bars and crosswalks worn, or are signs worn, missing, or damaged? • Are there sign or pavement marking enhancements? 	<ul style="list-style-type: none"> • How long is the pedestrian or bicycle signal? Is there enough time to cross? • Is there a pedestrian countdown and/or bicycle signal? • Do pedestrians and bicyclists use push buttons to actuate a crossing? • Is there a leading pedestrian interval (LPI)? Is it accessible to pedestrians with vision disabilities? Are bikes allowed to utilize the early start? • Are there restrictions on turning-movements, like no right-turn-on-red? • How long do pedestrians have to wait in between signals? • Do vehicles have protected or permitted left-turn control? 	<ul style="list-style-type: none"> • Are drivers, pedestrians, and bicyclists compliant with traffic control devices? • Are drivers yielding to pedestrians (especially at right-turn)? • Are bicyclists yielding to pedestrians?
Shared Use Paths and Grade-Separated Crossings	<ul style="list-style-type: none"> • Do signs provide wayfinding or advance warning of at-grade intersections? 	N/A	N/A

Location	Operations / Interactions / Behaviors		
	Characteristics	Mode Behavior	Interactions of Modes
Universal Considerations for Study Area	<ul style="list-style-type: none"> • Are design, posted, and operating traffic speeds compatible with pedestrian and bicyclist safety? • Is the safety of children in school zones adequately considered? 	<ul style="list-style-type: none"> • Do pedestrians or motorists regularly misuse or ignore pedestrian facilities? • Are drivers, pedestrians, and bicyclists behaving in a safe, compliant manner? • Are behaviors systemic across the network or at isolated locations? 	<ul style="list-style-type: none"> • Do roadway users look/scan for other travel modes? • Are drivers and bicyclists yielding to pedestrians at crossings? • Do drivers allow extra space or reduce speeds when overtaking or driving near bicyclists? • How do pedestrians and bicyclists interact with transit facilities?
Along Street (including driveways)	<ul style="list-style-type: none"> • Do scooters, bicycles, skateboards, or non-motorized vehicles create hazards for pedestrians (e.g., operating or parking on sidewalk)? • Are vehicles traveling at appropriate speeds? 	<ul style="list-style-type: none"> • If available, are bicyclists using their dedicated facilities? 	<ul style="list-style-type: none"> • Are drivers yielding to pedestrians at driveways? • Are there conflicts between bicycles and pedestrians on sidewalks?
Mid-Block Crossing (marked)	<ul style="list-style-type: none"> • What are vehicle speeds? • What are traffic volumes? 	<ul style="list-style-type: none"> • Are people using the mid-block crossing? • Are drivers yielding to pedestrians or bicyclists in the crosswalk? 	<ul style="list-style-type: none"> • Are the physical environment and traffic control devices adequate for a safe crossing?
Observed Mid-Block Crossings (uncontrolled)	<ul style="list-style-type: none"> • What are vehicle speeds? 	<ul style="list-style-type: none"> • Are pedestrians and bicyclists waiting for gaps? 	<ul style="list-style-type: none"> • Are drivers expecting crossing pedestrians or bicyclists?
Intersections	<ul style="list-style-type: none"> • What are vehicle speeds? • What are vehicle, pedestrian, and bicycle volumes at the intersection? 	<ul style="list-style-type: none"> • Are drivers stopping in the crosswalk? • Are pedestrians crossing with or against the pedestrian signal, if present? • Do pedestrians and bicyclists use push buttons to actuate a crossing? 	<ul style="list-style-type: none"> • Is it clear between roadway users who has the right-of-way and is there compliance? • Do drivers yield to pedestrians and bicyclists when turning right or left?
Shared Use Paths and Grade-Separated Crossings	<ul style="list-style-type: none"> • Is there a mix of grade-separated and at-grade crossings? 	<ul style="list-style-type: none"> • Do pedestrians walk in a way that blocks the path for other users? • Are bicyclist speeds too fast for conditions? • Does a mix of grade-separated and at-grade intersections influence behavior (e.g., higher speeds, less expectancy of crossing conflicts)? 	<ul style="list-style-type: none"> • Are there pavement markings that separate users? How are such separations communicated to pedestrians with vision disabilities? • What are the levels of comfort for users?

Map Segments – Louisiana Blvd



Pedestrian Crashes (2014-2018)

Crash Severity

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments

XXXX 2018 ADT

Year	Type	Time of Day			Lighting				Weather		Severity			Crash Analysis					Total	
		Pedestrian	AM Peak (7AM-10AM)	PM Peak (4PM-7PM)	Off-Peak	Dark-Lighted	Dark-Not Lighted	Daylight	Dusk	Clear	Raining	K: Killed	Injury Crash	Other (PDO)	Vehicle Going Straight	Vehicle Turning Left	Vehicle Turning Right	All Others and Not Known		Left Blank
2014	5	1	1	3	1		4		5			5		3		2				5
2015	7	2	1	4	2	1	3	1	7		1	6		4	2	1				7
2016	15		4	11	6	2	5	2	15		1	13	1	7	4	2	1	1		15
2017	12		2	10	7	3	2		10	2	1	9	2	7	2	2		1		12
2018	13	2	2	9	7		5	1	12	1		10	3	5	6		1	1		13
Total	52	5	10	37	23	6	19	4	49	3	3	43	6	26	14	7	3	2		52

Segment 1 – Gibson to Ross



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes

Segment 2 – Ross to Kathryn



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes



Louisiana and Kathryn, Southward towards Anderson



Segment 3 – Kathryn to Trumbull



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes



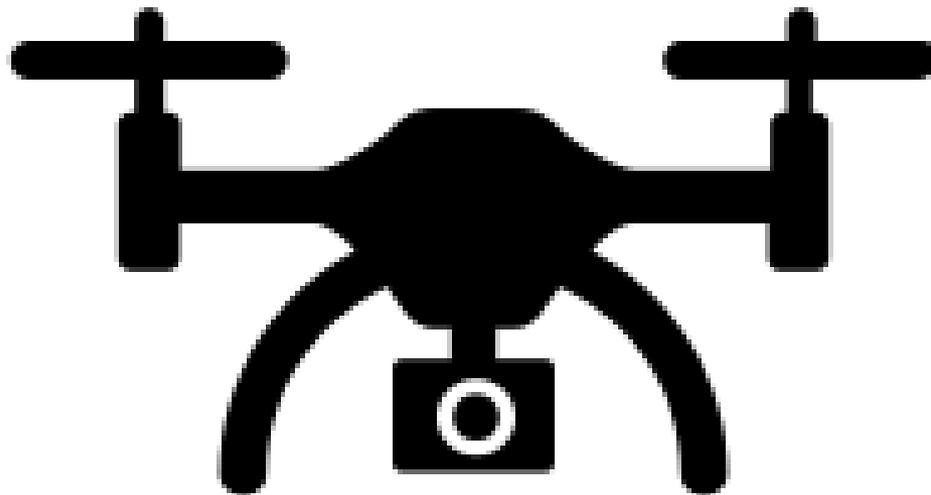
Kathryn Intersection





Kathryn and Louisiana, Looking North 

Drone
Footage



Segment 4 – Trumbull to Zuni



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- ☒ Transit Stops

Land Use

- 🏫 School
- 🌳 Parks
- ☒ RSA Segments
- XXXX 2016 ADT

Field Notes



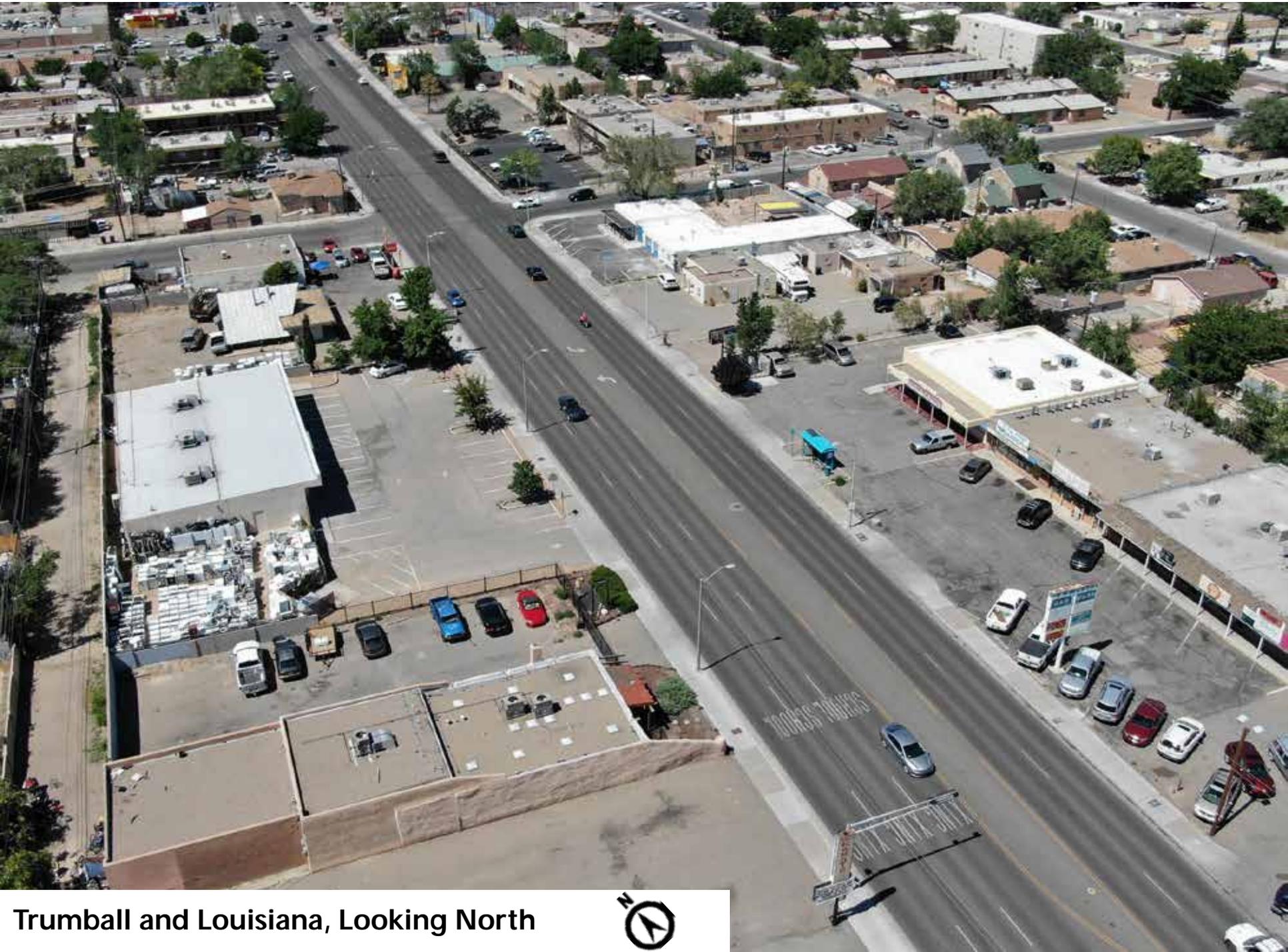
Trumbull Intersection, Looking South





Trumbull Intersection





Trumbull and Louisiana, Looking North



Segment 5 – Zuni to Central



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes



Zuni, Looking South 



Zuni Intersection

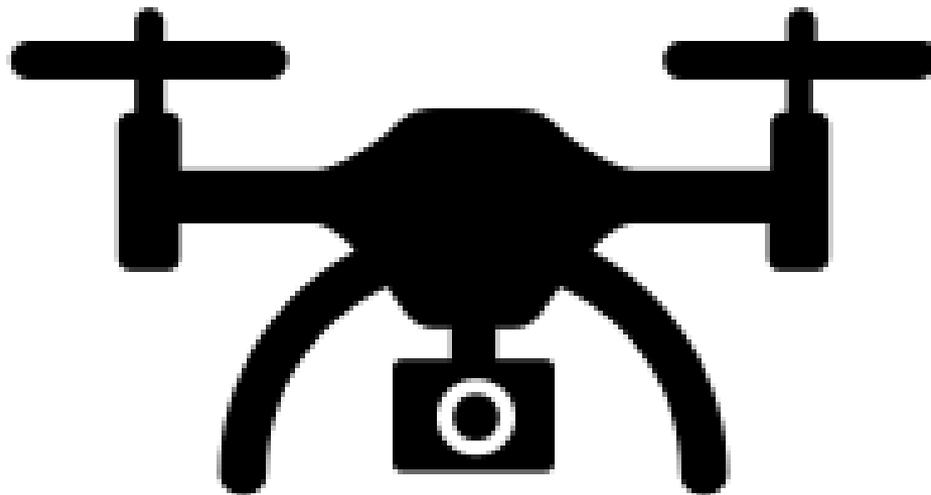




Zuni and Louisiana, Looking North



Drone
Footage



Segment 6 – Past Central to Copper



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- ☒ Transit Stops

Land Use

- 🏫 School
- 🏟️ Parks
- ☒ RSA Segments
- XXXX 2016 ADT

Field Notes

Segment 7 – Copper to Marquette



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes

Segment 8 – Marquette to Lomas



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes

Segment 9 – Lomas Northward



Pedestrian Crashes (2014-2018)

- Fatal Crash
- Injury Crash
- Property Damage Only Crash

Transit

- Transit Stops

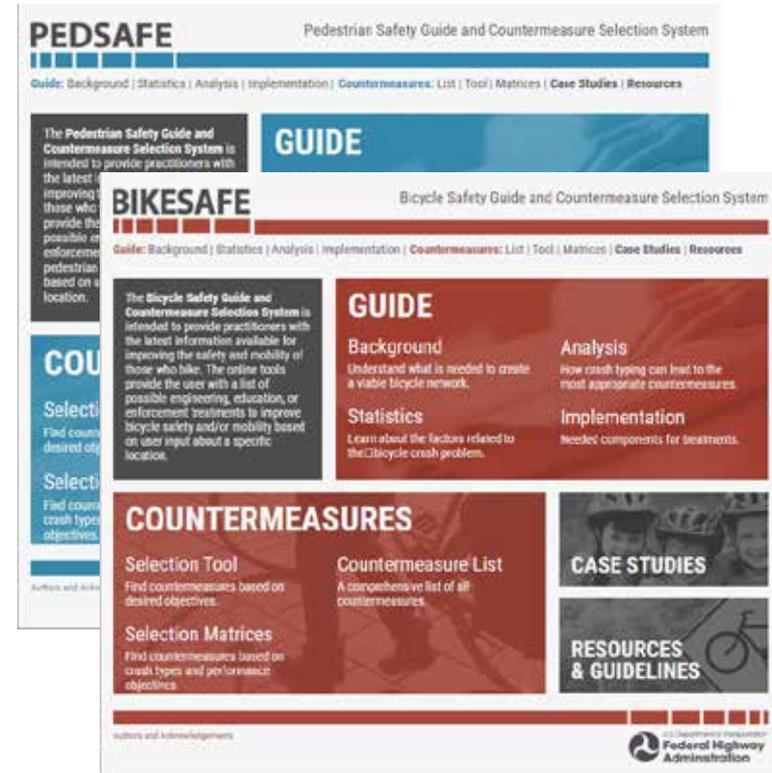
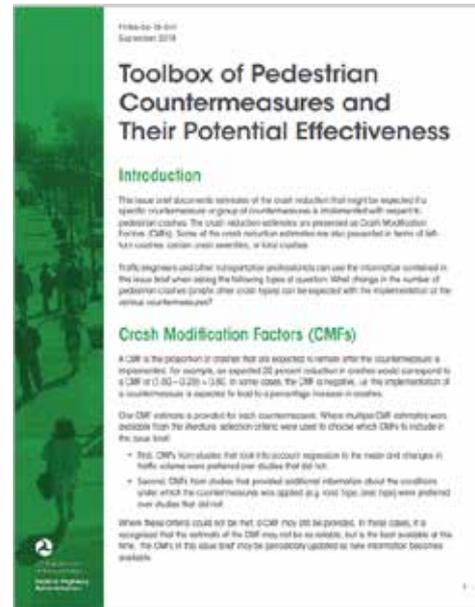
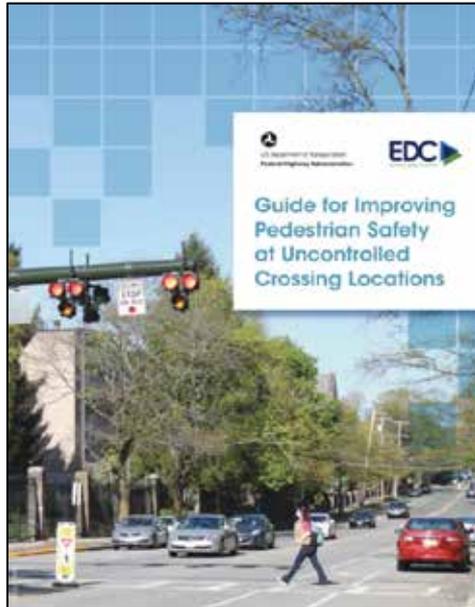
Land Use

- School
- Parks
- RSA Segments
- XXXX 2016 ADT

Field Notes

Countermeasures

Resources for Countermeasure Selection



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB



Road Diets



LPI

Crosswalk Visibility Enhancements

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURES TO HIGH SPEED

Example 1: This example combines curb extensions, high-visibility markings, and in-street signs on a two-lane roadway.

Example 2: This example combines advance markings and signage, overhead lighting, parking restrictions, and high-visibility markings on a multi-lane roadway.

Benefits:

- Poor lighting conditions, obstructions such as parked cars, and horizontal or vertical roadway curvatures can reduce visibility of crosswalks, contributing to higher crash rates.
- Crosswalk visibility enhancements help make crosswalks and/or pedestrians more visible and can help pedestrians decide where to cross.
- Crosswalk visibility enhancements can reduce crashes by **23-48%**.

FEATURES:

- High-visibility markings improve visibility of the crosswalk compared to the standard parallel lines.
- Parking restriction on the crosswalk approach improves the sightlines for motorists and pedestrians.
- Advance STOP or YIELD markings & signs reduce the risk of a multiple-barrel crash.
- Curb extension improves sight distance between drivers and pedestrians and narrows crossing distance.
- In-street STOP or YIELD signs may improve driver yielding rates.

Logos: Department of Transportation, EDC

Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6 7 9	① 5 6 7 9	① 5 6 ⑨
3 lanes with raised median (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	① 3 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑦ ⑨	① ③ 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑨
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑨ 7 9	① 3 4 5 6 7 9	① ③ 5 6 ⑦ ⑨	① ③ 5 6 ⑨ 7 9	① ③ 4 5 6 7 9	① ③ 5 6 ⑨ 7 9	① ③ 5 6 ⑨
4+ lanes with raised median (2 or more lanes in each direction)	① ③ 5 7 8 9	① ③ 5 7 8 9	① ③ 5 8 ⑨	① ③ 5 7 8 9	① ③ 5 ⑦ 8 ⑨	① ③ 5 8 ⑨	① ③ 5 ⑦ 8 ⑨	① ③ 5 8 ⑨	① ③ 5 8 ⑨
4+ lanes w/o raised median (2 or more lanes in each direction)	① ③ 5 6 7 8 9	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ 8 ⑨

Given the set of conditions in a cell,

Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.

○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning sign

2 Raised crosswalk

3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line

4 In-Street Pedestrian Crossing sign

5 Curb extension

6 Pedestrian refuge island

7 Rectangular Rapid-Flashing Beacon (RRFB)**

8 Road Diet

9 Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.

**The PHB and RRFB are not both installed at the same crossing location.

Table 2. Safety issues addressed per countermeasure.

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement					
High-visibility crosswalk markings*					
Parking restriction on crosswalk approach*					
Improved nighttime lighting*					
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*					
In-Street Pedestrian Crossing sign*					
Curb extension*					
Raised crosswalk					
Pedestrian refuge island					
Pedestrian Hybrid Beacon					
Road Diet					
Rectangular Rapid-Flashing Beacon					

Urban/suburban Environments: Sidewalks



88% Reduction
in Pedestrian Crashes

Reduce/Condense Access Points



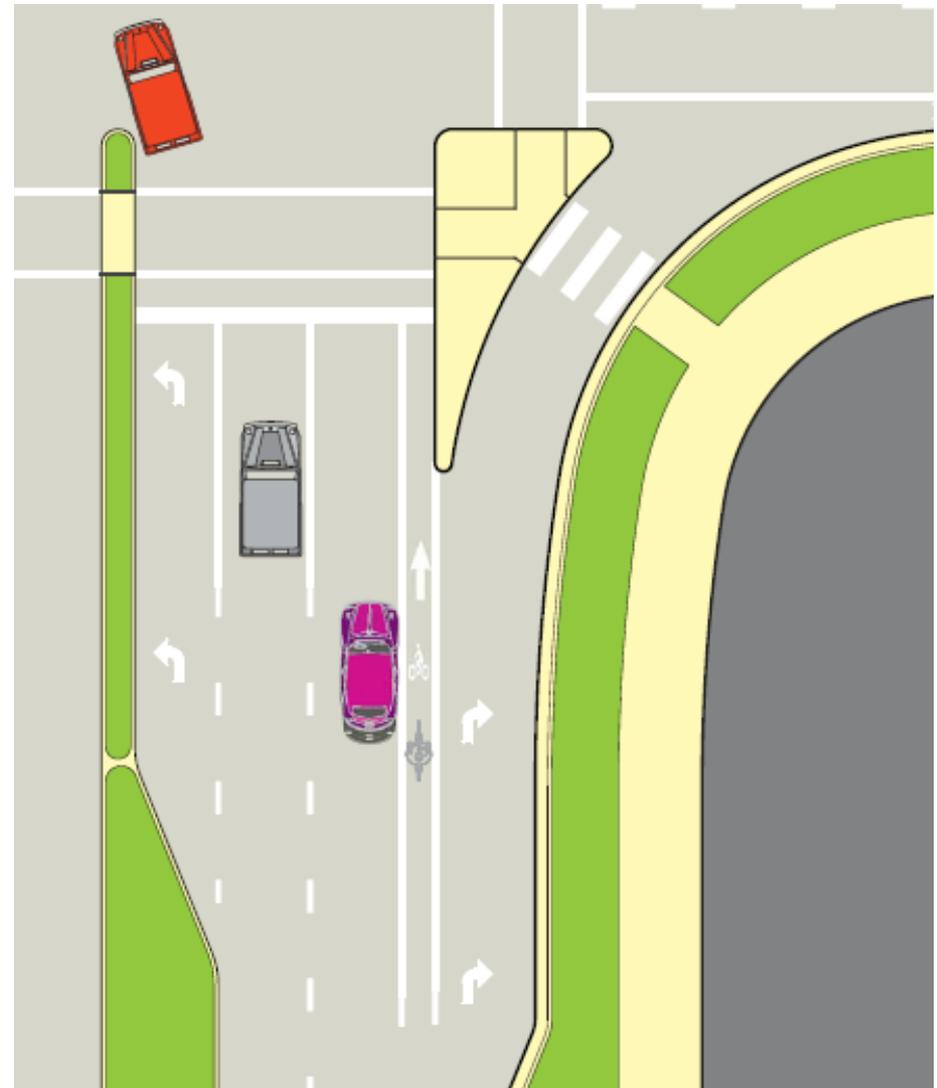


Separated sidewalk keeps sidewalk level at driveways

Islands at Intersections

Benefits:

- § *Separate conflicts and decision points*
- § *Reduce crossing distance*
- § *Improve signal timing*
- § *Reduce crashes*

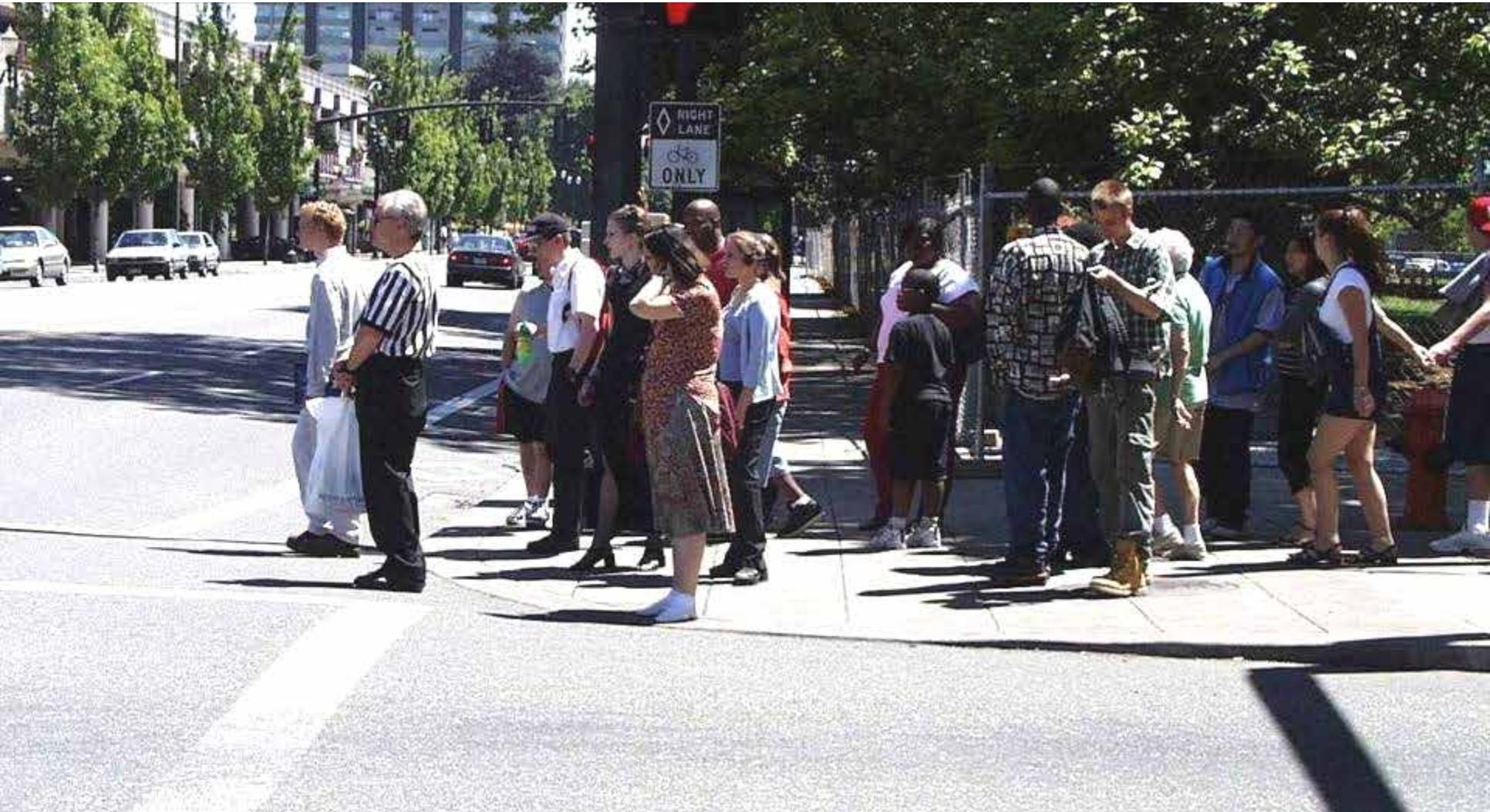


Pedestrian Countdown Signal



25% Reduction
in Pedestrian Crashes

Use Short Signal Cycle Length

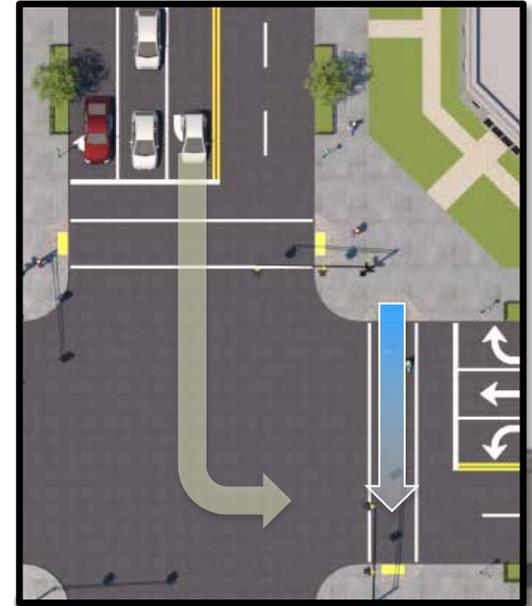


Long wait causes stacking: pedestrians wait in street, or don't wait and cross against the signal

Leading Pedestrian Interval



3+ Second
Advance Start



13% Reduction
in Pedestrian Crashes



Leading Pedestrian Interval

WALK comes on 3 seconds prior to the vehicular green; pedestrians can enter crosswalk before turning vehicles arrive there.



Rectangular Rapid Flashing Beacon

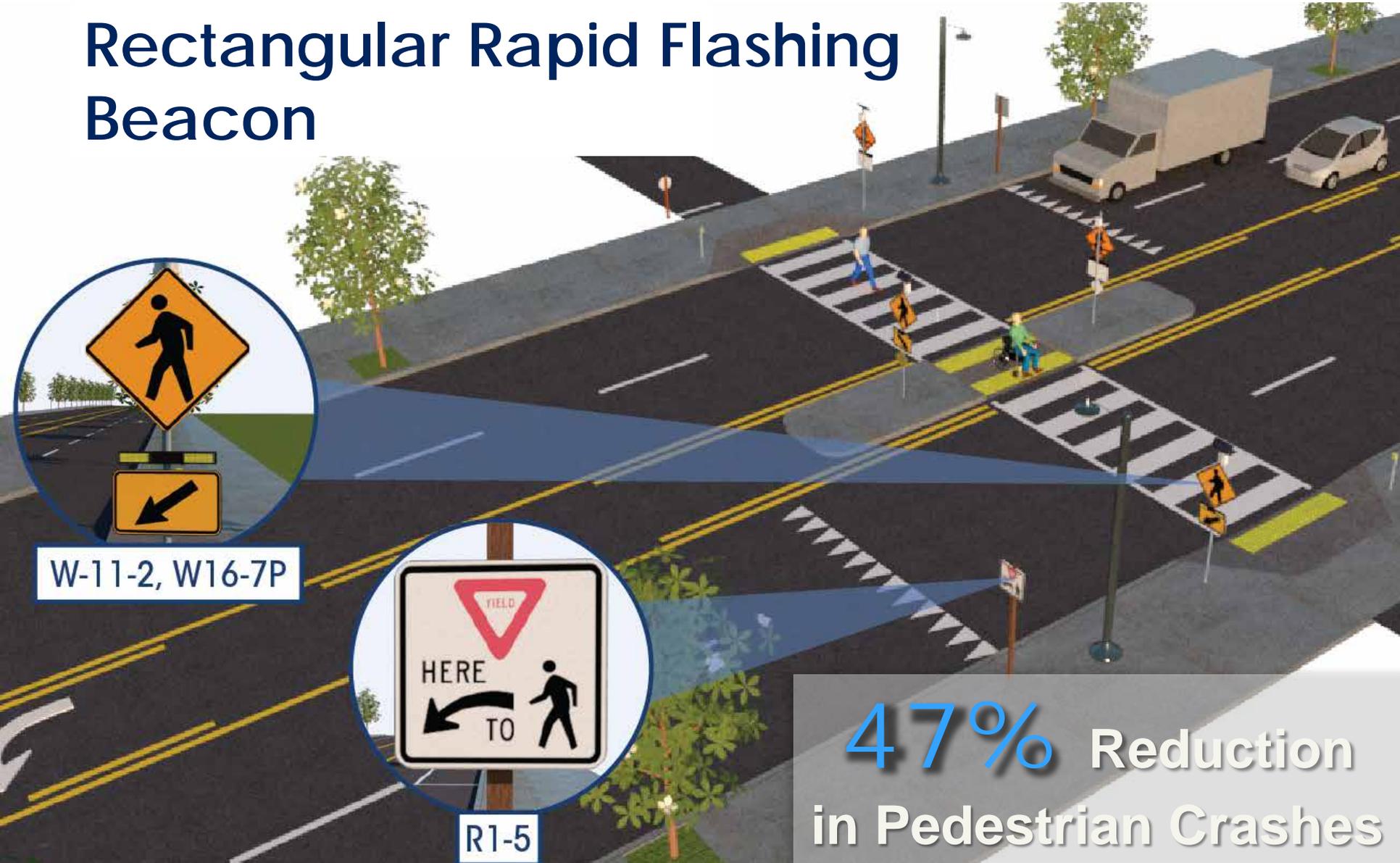


W-11-2, W16-7P



R1-5

47% Reduction
in Pedestrian Crashes



Rectangular Rapid Flash LED Beacon

- Studies indicate motorist yield rates increased from about 20% to 80%
- Higher yielding rates sustained even after two years of operation and no identifiable negative effects
 - St. Petersburg FL research report 2008



Rectangular Rapid Flashing Beacon New IA-21

**Memorandum**

Correction issued 3/21/2018

Subject: **INFORMATION:** MUTCD – Interim Approval for Optional Use of Pedestrian-Actuated Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks (IA-21)

Date: MAR 20 2018

From: Martin C. Knopp *Martin C. Knopp*
Associate Administrator for Operations

In Reply Refer To: HOTO-1

To: Federal Lands Highway Division Directors
Division Administrators



Figure 1. Example of an RRFB dark (left) and illuminated during the flash period (center and right) mounted with W11-2 sign and W16-7P plaque at an uncontrolled marked crosswalk.

https://mutcd.fhwa.dot.gov/res-interim_approvals.htm#valid09

- Must request and receive permission to use this new Interim Approval (1A-21) even if prior approval had been given for Interim Approval 1A-11
- A State may request Interim Approval for all jurisdictions in that State.

Interim Approval – Allowable Uses

- Function as **pedestrian-actuated conspicuity enhancement**
- Shall only be used to supplement post-mounted Pedestrian, School, Trail Crossing warning sign with diagonal downward arrow, plaque, or overhead-mounted warning sign located at or immediately adjacent to an uncontrolled marked crosswalk
- If deemed necessary by the engineer, in event of sight distance, additional RRFB may be installed in advance of crosswalk. Shall supplement not replace.



St. Petersburg FL

IA-21 3.a For any approach two RRFB required, One on right-hand and one on left-hand of roadway. If divided highway left-hand should be installed on median if practical rather than far left-hand.

RRFB Video IA-21Flash Pattern

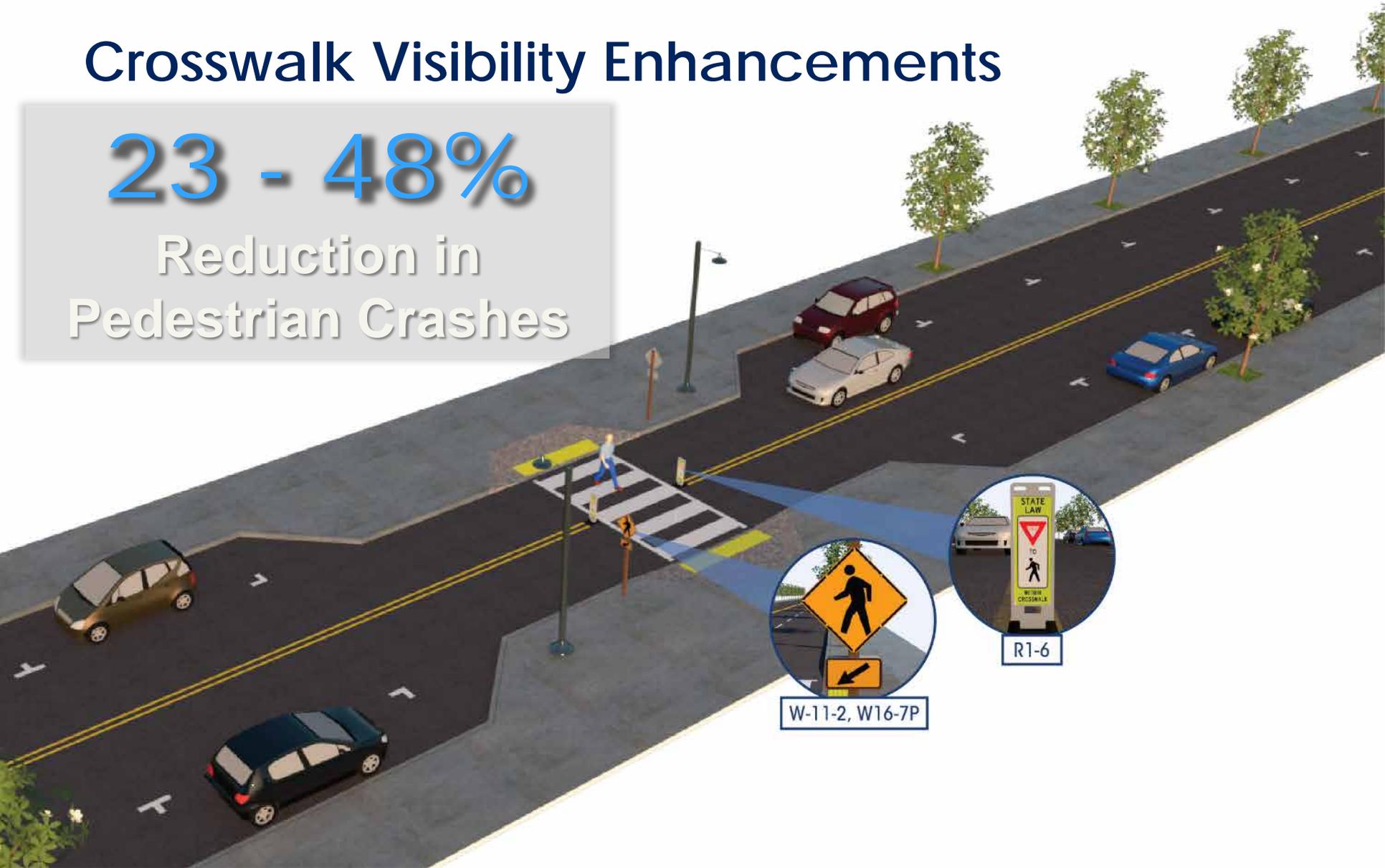




Crosswalk Visibility Enhancements

23 - 48%

Reduction in
Pedestrian Crashes



Crosswalk Visibility Enhancements

High Visibility Crosswalk

What Pedestrians See



Photo Source all 4: Michael Ronkin

What Drivers See

In-street pedestrian crossing signs



R1-6



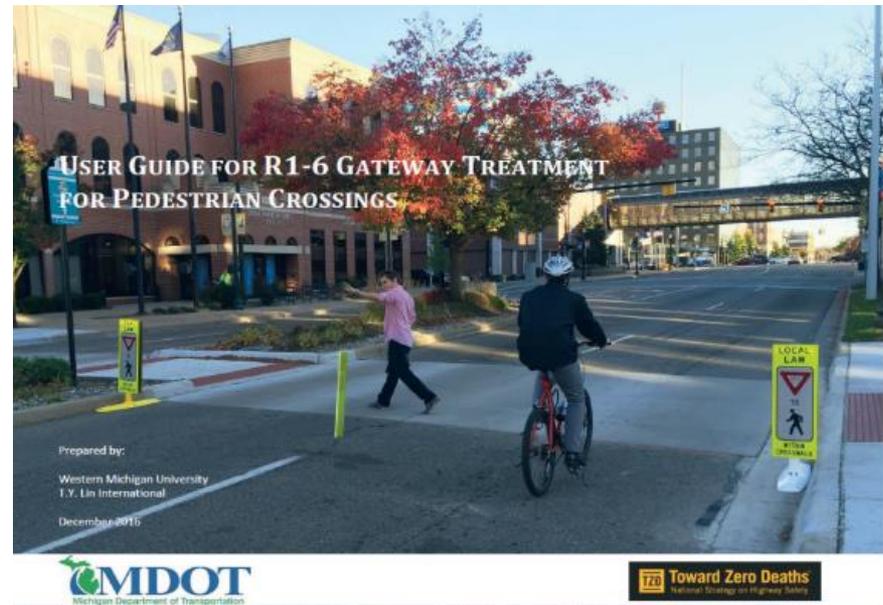
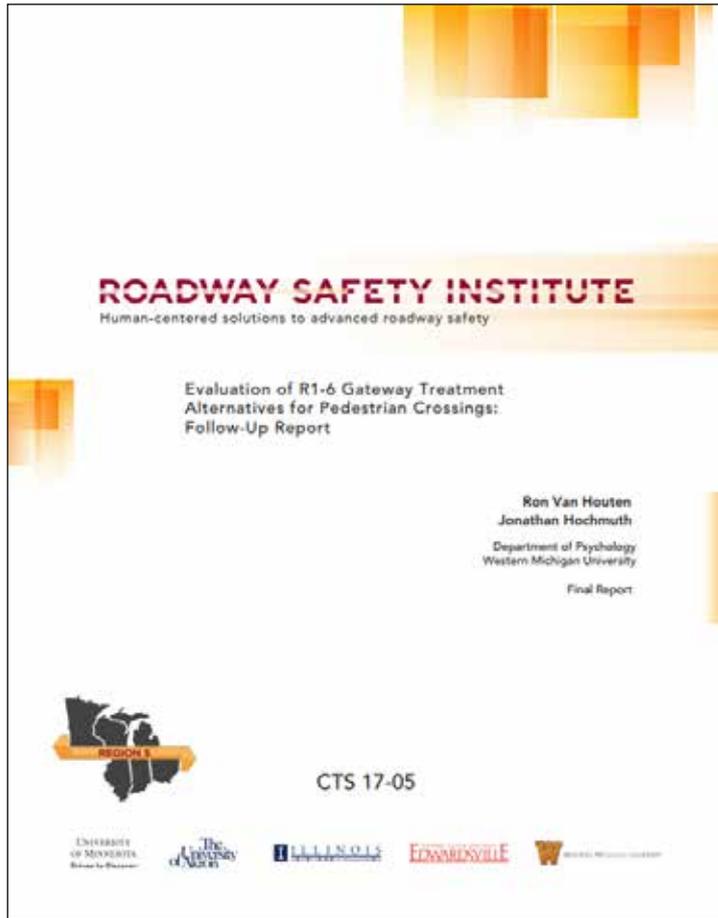
R1-6a

MUTCD signs

Yield or Stop depends
on state law

2009 MUTCD Section 2B.12 and Figure 2B-2

In Street Gateway Treatment



https://mdotcf.state.mi.us/public/tands/Details_Web/mdot_user_guide_gateway_treatment.pdf

<https://conservancy.umn.edu/bitstream/handle/11299/189957/CTS%2017-05.pdf?sequence=1&isAllowed=y>

Gateway Treatment, Three-Lane Configuration Without Refuge Island

Travel Lanes	2
Passing/Turn Lanes	1
R1-6 Signs	4
Flexible Delineators	0
Yielding Compliance	Between 60% and 90% compliance rate if speed limit is 30mph or less for ADT up to 25,000. If the speed limit is 35 mph expect similar results if ADT is 12,000 or less. UNKNOWN above 12,000 ADT.



Figure 6a

Approximate Cost	\$1,200 for materials 20-minute installation 8 minutes to remove for winter 8 minutes to reinstall in spring
------------------	---

General Description:
 Note: By installing the gateway on the near side of the intersection, both crosswalks are covered with only four signs. Data show that a gateway at the near side crosswalk continues to be effective for the far side of the intersection, as the motorist on the far side has already passed through a gateway on the near side.

The signs on the curb side in the gutter pan would have a better chance of survival if they are moved placed between 3 and 50 feet in Advance of the crosswalk markings. This would reduce the chance of the sign being struck by a turning vehicle. Figure 6b shows a typical installation.

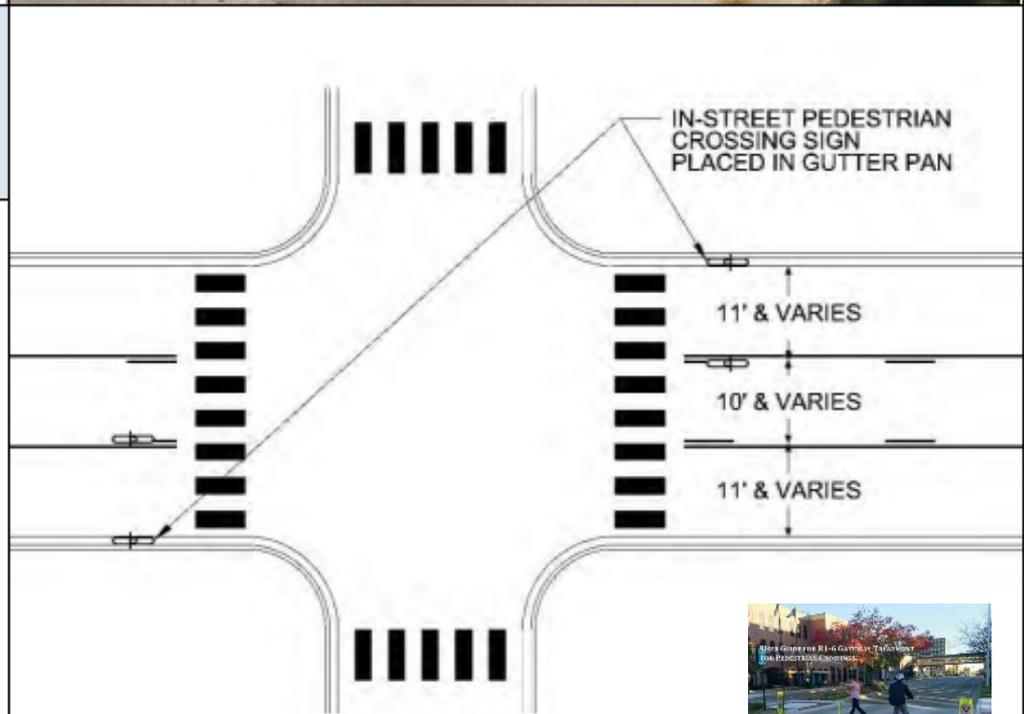


Figure 6b



Crosswalk Visibility Enhancements

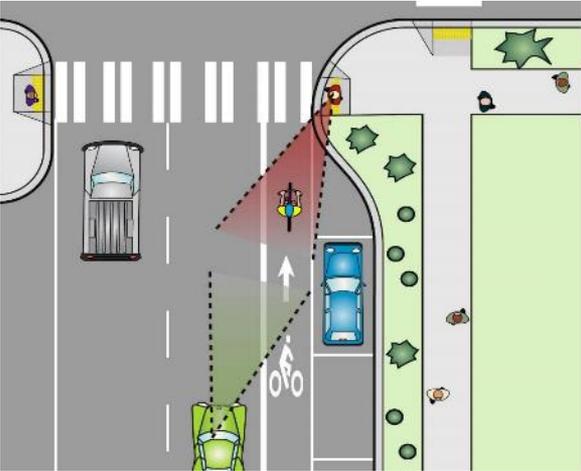
Pedestrian Crossing signs



2009 MUTCD Sec. 2C.50 & Fig. 2C-11

Crosswalk Visibility Enhancements

Curb Extensions



Advance Signage and Markings



R1-5



R1-5a



R1-5b



R1-5c

(Use where local law says
yield to pedestrians)

(Use where local law says stop
for pedestrians)



- Advance yield line & sign
- Consider double white lines for no passing

2009 MUTCD Section 3B.16 and Figure 3B-17

Crosswalk Visibility Enhancements

Crosswalk Lighting

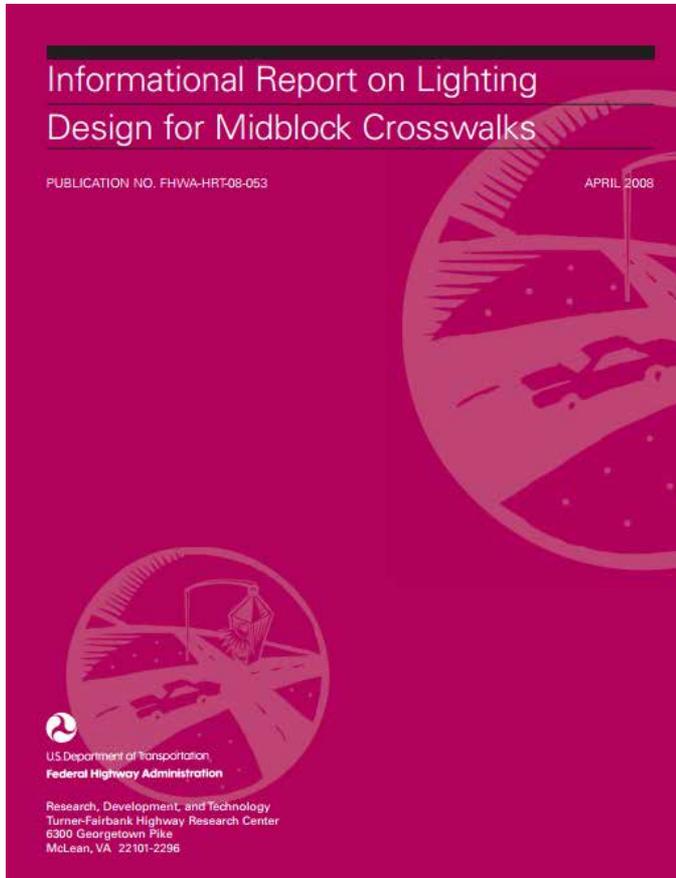


- CRF 42% to 59%
- Lighting at intersections
- 4 star rating
- Vehicle/ped crashes

Photo source: Youtube screen capture SWARCO

Informational Report on Lighting Design for Midblock Crosswalks

- § Vertical illuminance of 20 Lx in the crosswalk, measured at a height 5 ft from the road surface, provided adequate detection distances in most circumstances



<https://www.fhwa.dot.gov/publications/research/safety/08053/>



Lighting Over Crosswalks

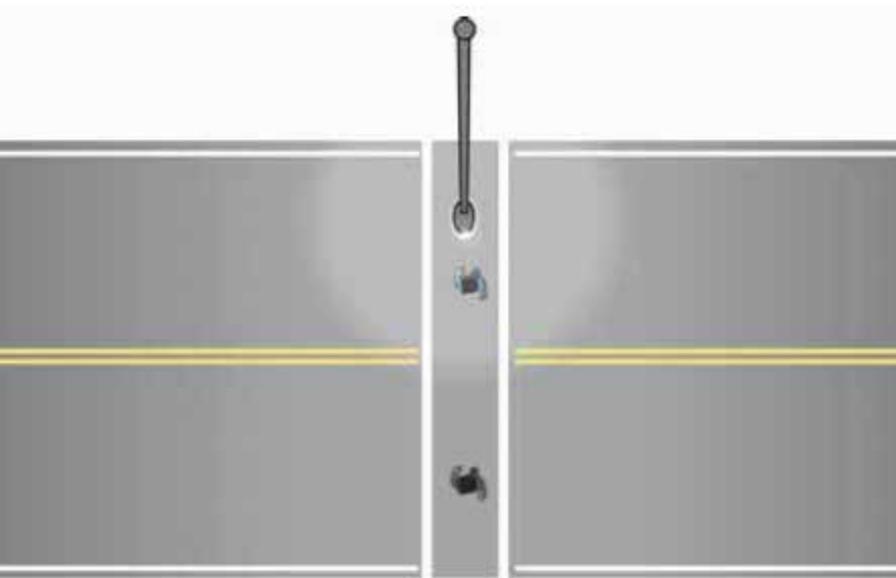


Fig 11. Traditional midblock crosswalk lighting layout

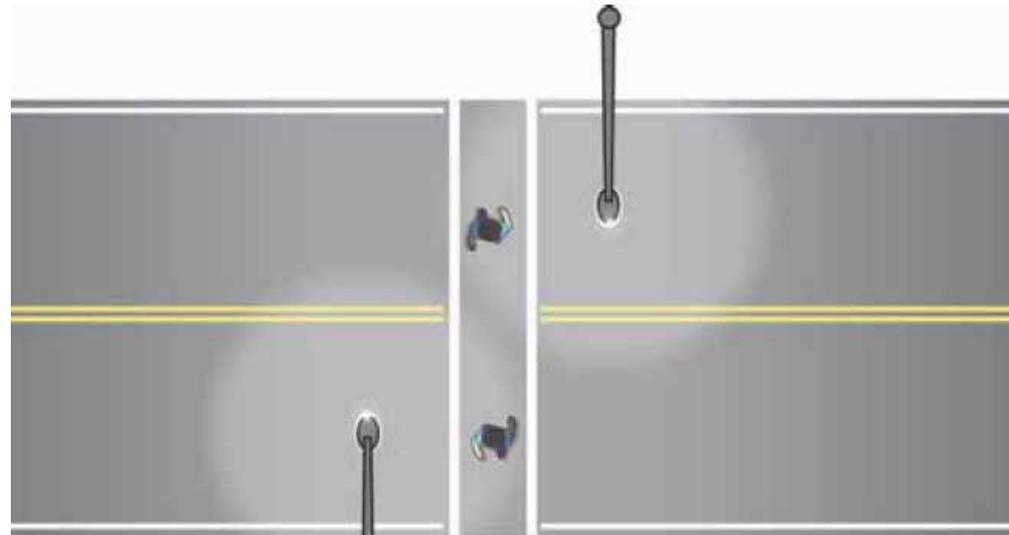


Fig 12. New design for midblock crosswalk lighting layout



Recommended lighting level: 20 lux at 5' above pavement

Raised Crosswalks



45% Reduction
in Pedestrian Crashes

Raised Crosswalks

- Typically installed on 2-lane or 3-lane roads
- Speed limits of 30 mph or less
- AADT below about 9,000
- May be candidate treatment for side streets



Photo Source: SRTS Guide



Considerations

- Bus route
- EMS
- Snow Plowing
- Drainage
- ADA
- Curves or steep roadway grades



Figure 3.14.6. Raised Crosswalk with Bicycle Lane
(Source: Scott Batson)



Figure 3.14.4. Raised Crosswalk at Intersection
(Source: City of Cambridge, Massachusetts)

Pedestrian Refuge Islands



R1-6

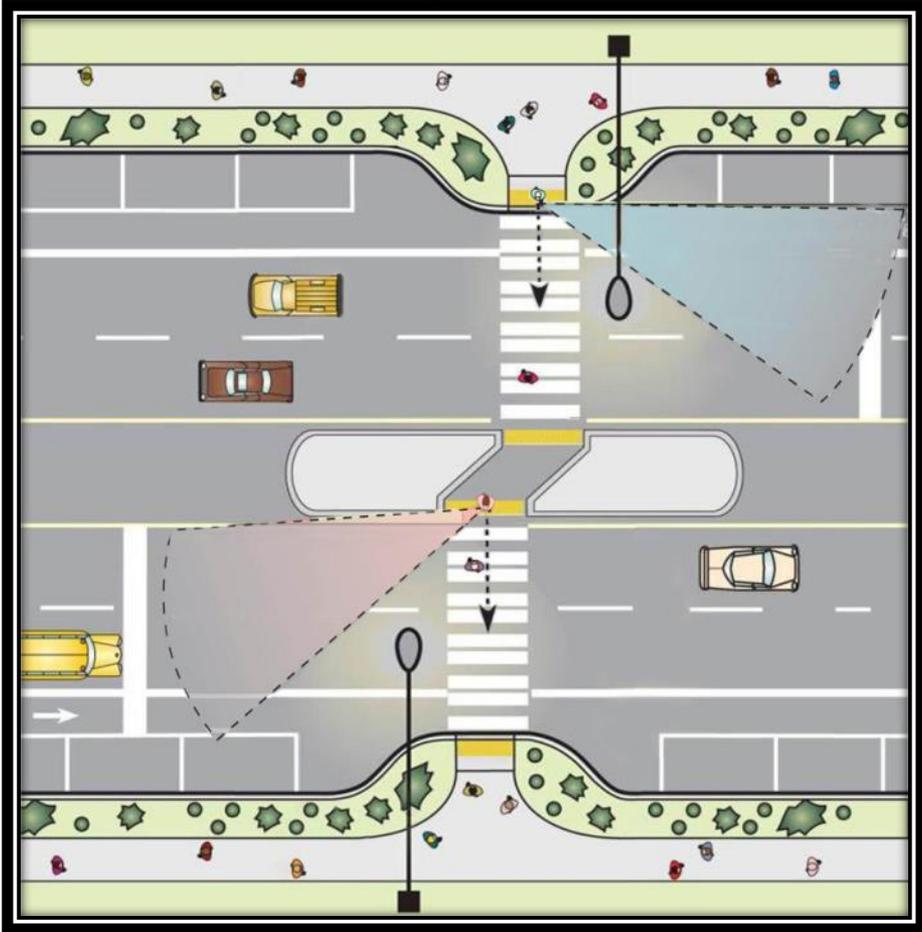


W-11-2, W16-7P



32% Reduction
in Pedestrian Crashes

Raised median- Breaks complex crossing into two simpler crossings

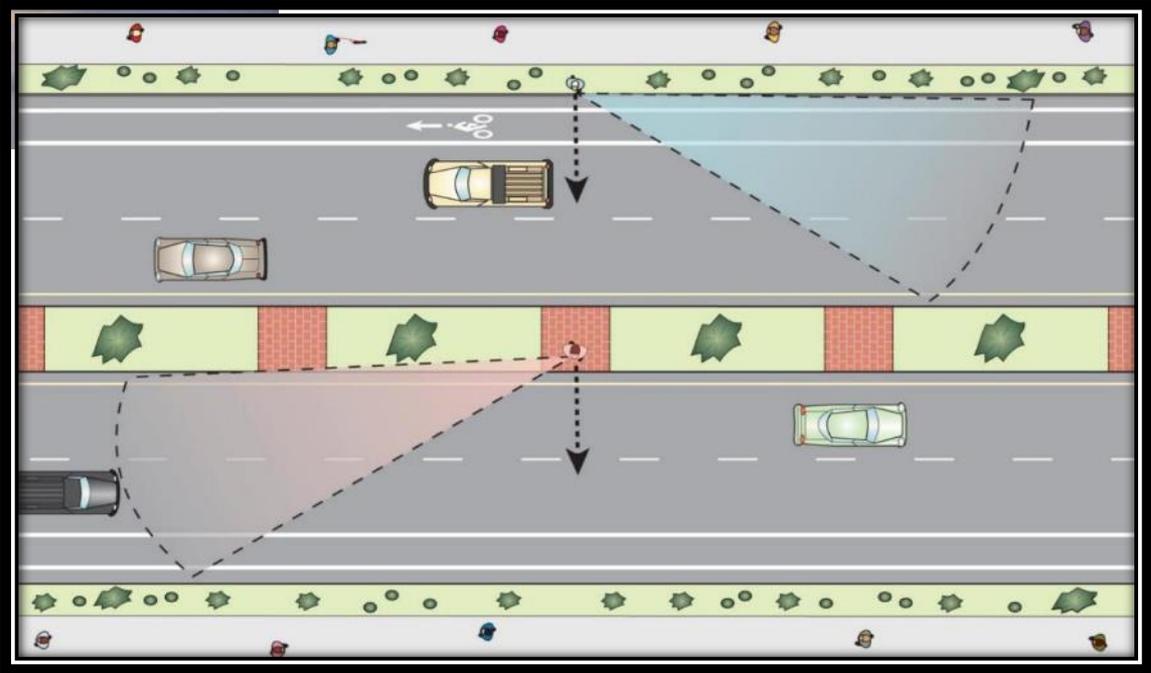


CRF: 39% unmarked crosswalks (uncontrolled)

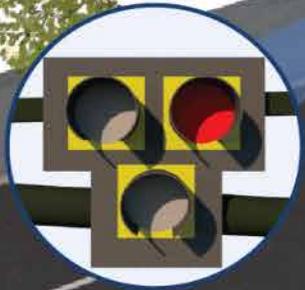
CRF: 46% marked crosswalks (uncontrolled)



Continuous Raised Median



Pedestrian Hybrid Beacons (PHB)



55% Reduction in
Pedestrian Crashes

Pedestrian Hybrid Beacons (PHB)



1
Blank for
drivers



2
Flashing
yellow



3
Steady yellow



4
Steady red



5
Wig-Wag



Return
to 1



2009 MUTCD mandated sign

Standard:

A CROSSWALK STOP ON RED (symbolic circular red) (R10-23) sign shall be mounted adjacent to a PHB face on each major street approach.

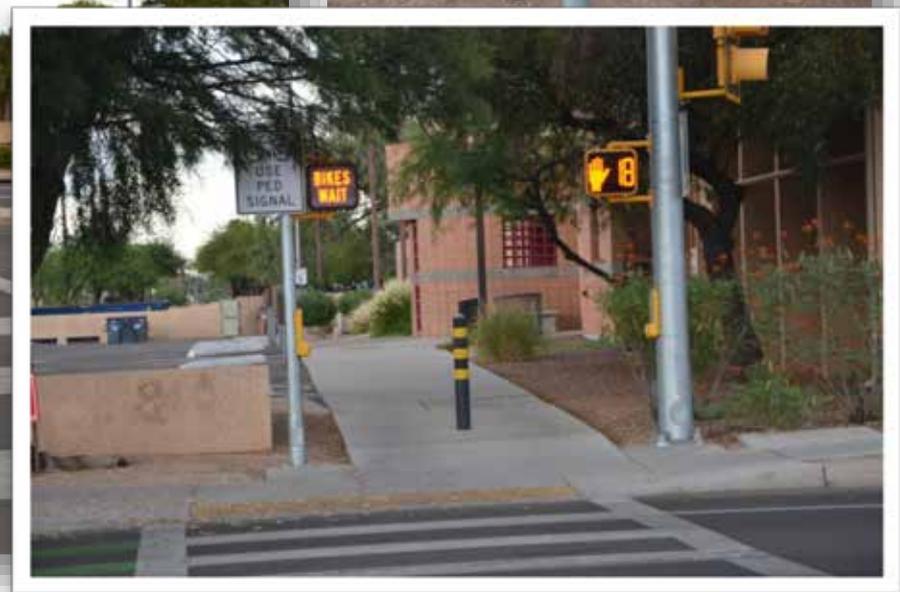
Option:

State MUTCD's may allow other appropriate MUTCD approved ped, bike or school crossing signs



Bike "Hawk" PHB

- § First installation Tucson, AZ
- § "BIKES WAIT"/"BIKES OK"



Road Diet: Before



Road Diet: After



W-11-2, W16-7P

R1-6

19 - 47%

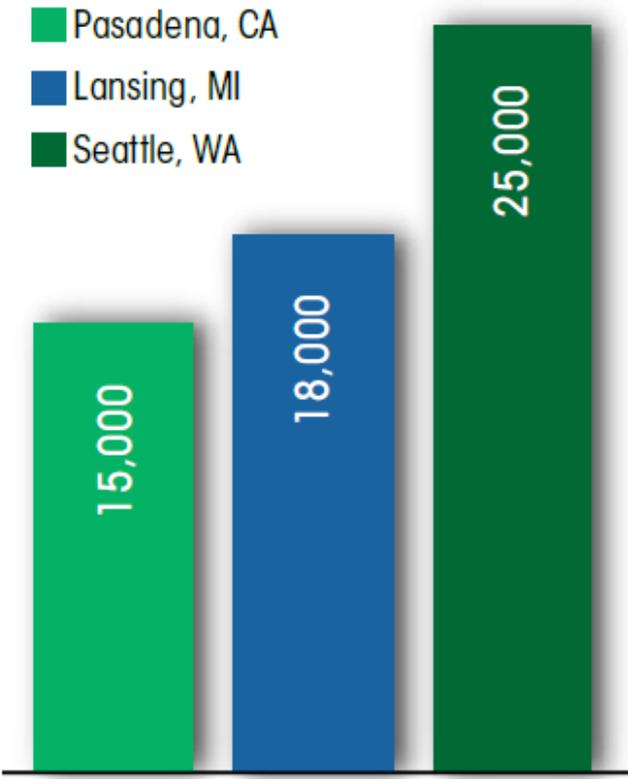
Reduction in
Total Crashes

Road Diet / Roadway Reconfiguration



- Reduce crossing distance
- Eliminate /reduce “multiple threat” crash types
- Install crossing island to cross in 2 simple steps

Road Diets



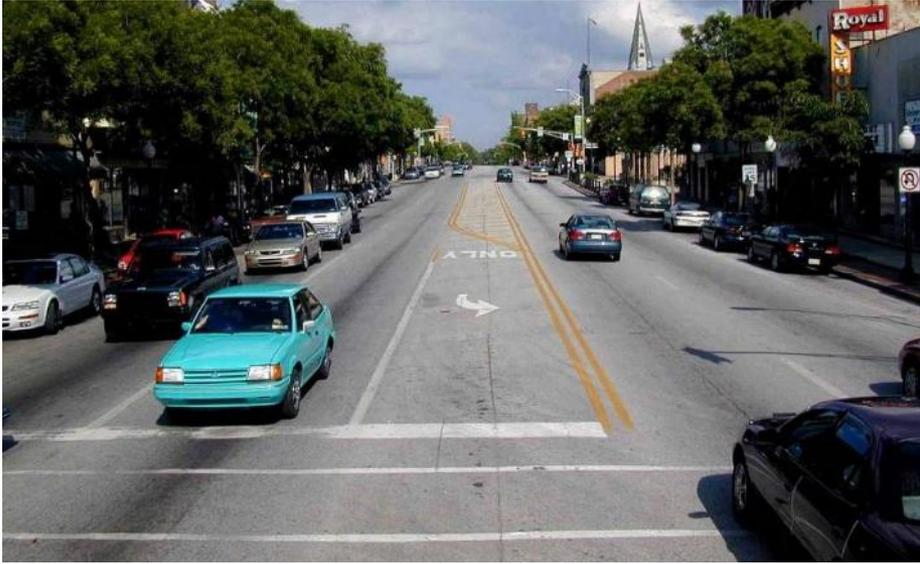
Maximum Volume for Road Diet (ADT)

Figure 12. Road Diet Implementation Maximum Volume Thresholds by Agency

Considerations

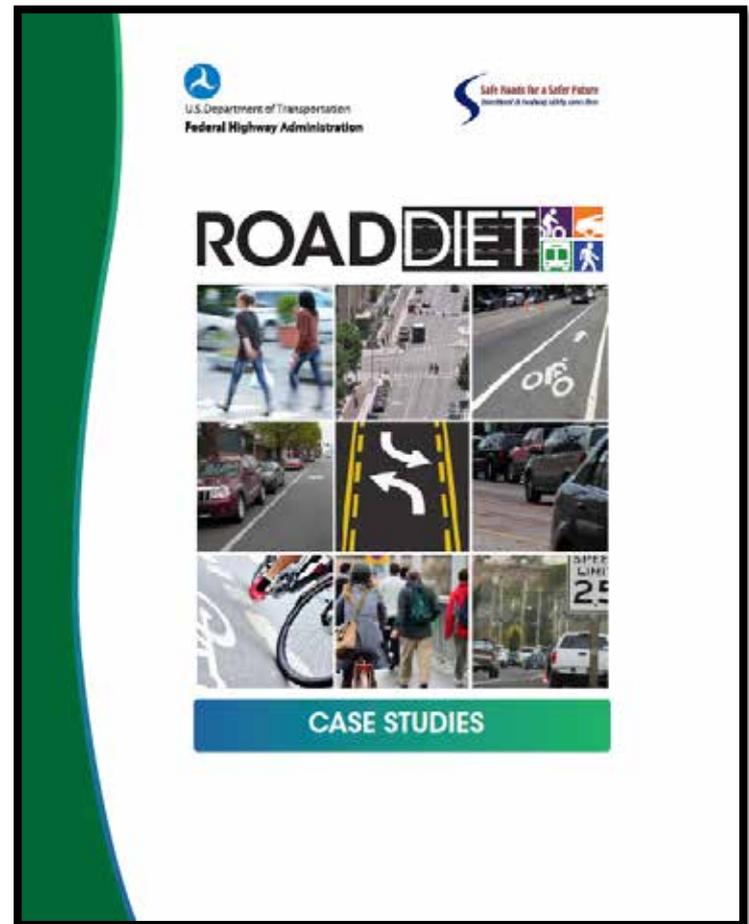
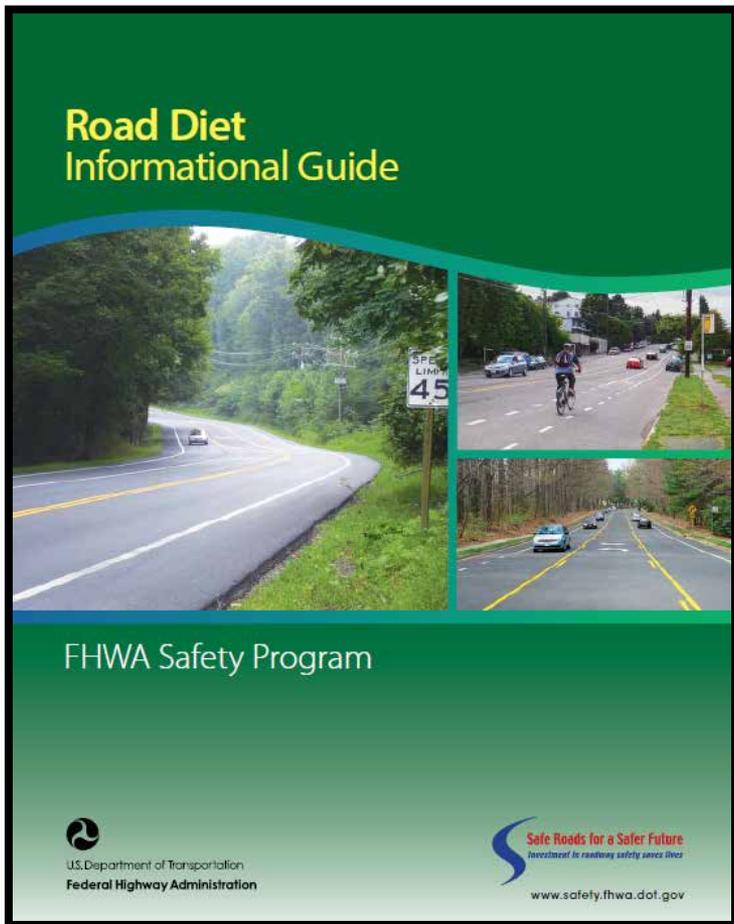
- Safety
- Operations
 - Peak Hour
- Design
 - Signalized Intersection Adjustments
- Resurfacing
- Context Sensitive Solutions/Complete Streets

Road Diet / Roadway Reconfiguration



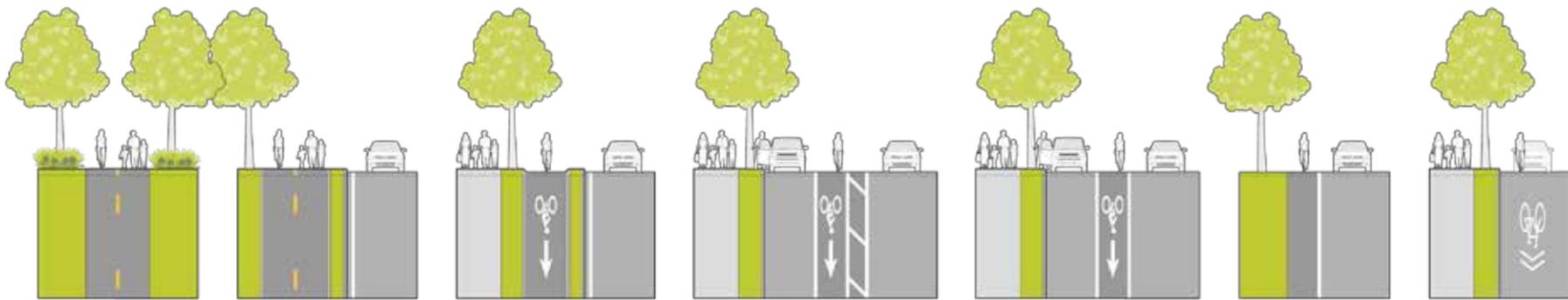
- Reduce top end travel speeds
- Buffer sidewalk from travel lanes (parking or bike lane)
- Reclaim street space for “higher and better use” than moving peak hour traffic

Road Diet Informational Guide & Road Diet Case Studies



<https://www.fhwa.dot.gov/innovation/everydaycounts/edc-3/roaddiets.cfm>

https://safety.fhwa.dot.gov/road_diets/



Shared-Use Path

Side Path

Separated Bike Lane

Buffered Bike Lane

Bike Lane

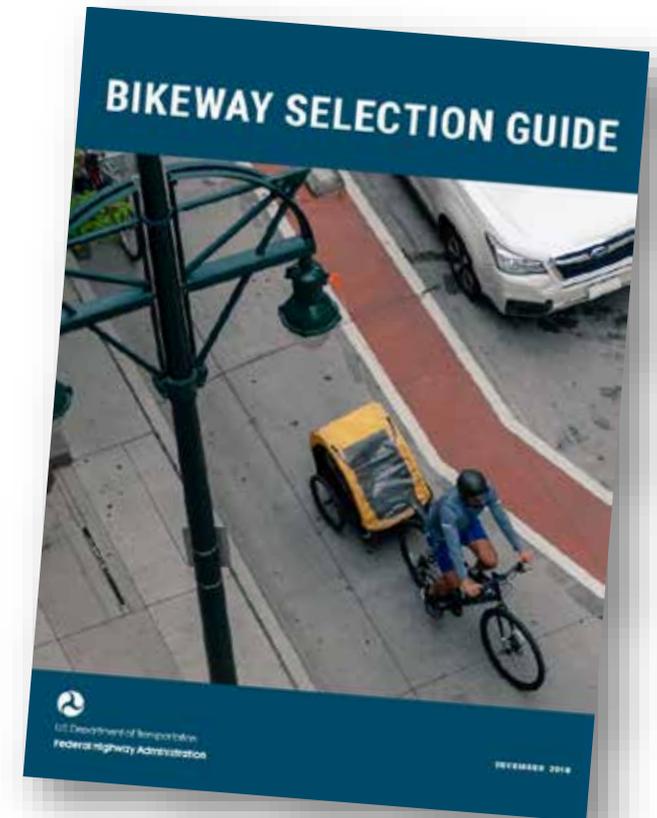
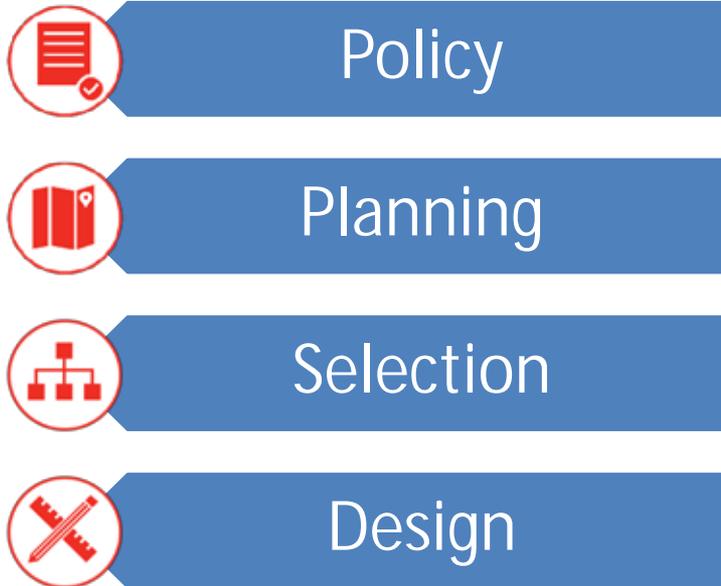
Shoulder

Shared Lane

+ SEPARATION FROM TRAFFIC **-**



Chapter 2: Bikeway Selection Process



MRCOG Traffic Counts

Summary Statistics

2/13/2020 3:23:00 PM

See notes, bottom of report

COGID	Route Name	Location Description	Count Date	Total Volume	Direction 1		Direction 2		AM Peak Hour					PM Peak Hour					Count Quality	Count Type	VPHPD (Southbound Lanes)	VPHPD (Northbound Lanes)
					Daily Volume	Dir	Daily Volume	Dir	Time Begin	Volume	% Daily	Dir Split	Pk Dir	Time Begin	Volume	% Daily	Dir Split	Pk Dir				
253602	LOUISIANA	SOUTH OF LOMAS	4/30/2019	27,112	13,872	N	13,240	S	700	1,647	6.07	0.59	S	1630	2,210	8.15	0.58	N	T	Vol	427	641
256562	LOUISIANA	SOUTH OF COPPER	7/12/2016	26,616	10,736	N	15,880	S	700	1,426	5.36	0.65	S	1630	2,213	8.31	0.74	S	T	Vol	192	288
258162	LOUISIANA	SOUTH OF CENTRAL	3/29/2016	18,942	9,178	N	9,764	S	700	1,022	5.40	0.62	S	1630	1,570	8.29	0.57	N	T	Vol	298	447
262242	LOUISIANA	SOUTH OF ZUNI	10/30/2018	18,796	9,234	N	9,562	S	715	1,417	7.54	0.64	S	1530	1,486	7.91	0.58	N	T	VC	287	431
264881	LOUISIANA	NORTH OF GIBSON	4/24/2017	14,875	7,034	N	7,841	S	715	1,120	7.53	0.77	S	1600	1,370	9.21	0.69	N	T	VC	315	473

Notes:

1. Daily volumes are averages for a 24 hour period.
2. AM Peak Period: 6 AM to 9 AM; PM Peak Period: 3 PM to 6 PM.
3. Peak **hours** are defined by the maximum hourly 2-way volume occurring during the peak **period**.
4. 'Time Begin' is the beginning time of the peak hour (24 hour military time)
5. Peak hour % is the percentage of 2-way volume appearing in the peak hour.
6. 'Dir Split' is the directional split: the percentage of the 2-way peak hour volume traveling in the peak direction.
7. 'Pk Dir' indicates the peak direction. E.g., 'E' means "Eastbound".
8. 'Count Quality' is defined by NMDOT and MRCOG count standards. 'T' indicates a good count. 'Q' indicates a count that meets NMDOT standards but does not meet MRCOG standards. 'F' indicates a bad count.
9. 'Count Type': 'Vol' refers to a regular volume tube count; 'VC' refers to a vehicle classification count.
10. 'VPHPD': vehicles per peak hour per direction calculated as follows: PM Peak Hour Volume x Dir Split / # of Travel Lanes that Direction