



STRATEGIES AND RECOMMENDATIONS

EMPHASIS AREAS

The safety analysis, stakeholder input, and public outreach were all used to identify four emphasis areas that address the most frequent and most severe crashes in the county. This method of incrementally addressing safety provides the county the ability to utilize resources responsibly, monitor the efficacy of countermeasures and strategically work towards a zero-fatality transportation system. Each of the four emphasis areas addresses a unique safety concern that can be individually assessed and then independently or collectively addressed. The four emphasis areas selected are unrestrained occupants, intersection related incidents, lane departure, and speeding.

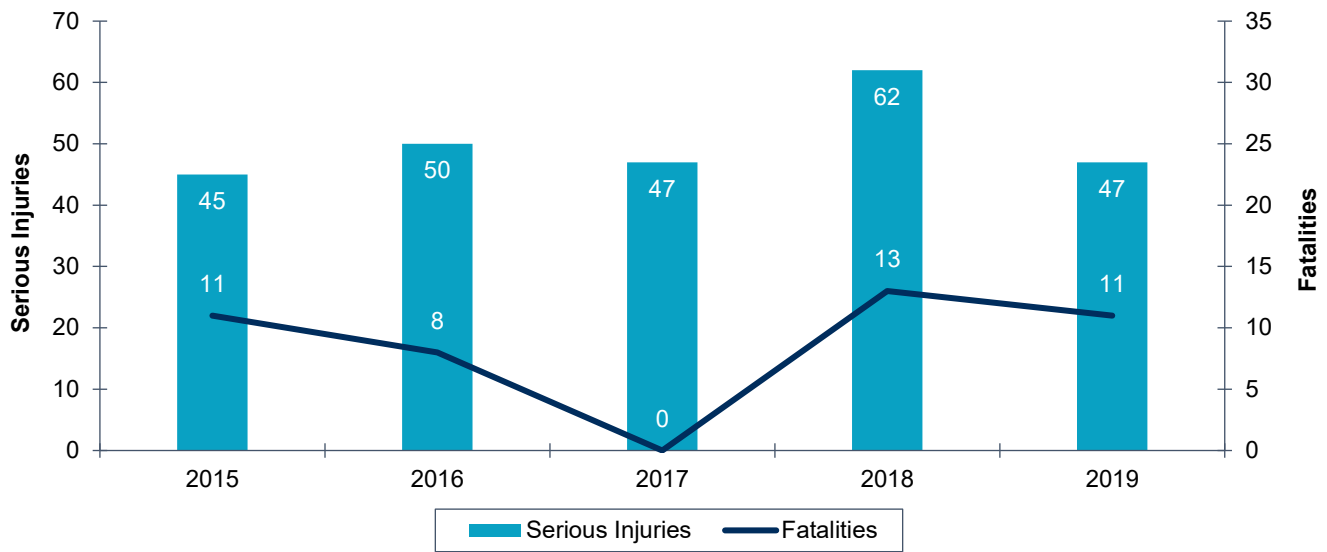
EMPHASIS AREAS ANALYSIS

This section describes the analysis of the four emphasis areas and presents the rationale behind selecting them as focal points for roadway safety improvements. The Stakeholder Group selected these four emphasis areas based on their understanding of key safety concerns and data-driven evidence of their prevalence and contribution to severe crashes in El Paso County.

Unrestrained Occupants

The phrase “unrestrained occupants” refers to the behavioral condition of drivers and passengers not wearing seatbelts. This is a significant safety concern because unbelted individuals are at a higher risk of sustaining more severe injuries or death in the event of a crash. Figure 12 shows the number of unrestrained serious injuries and fatalities in unincorporated El Paso County from 2015 to 2019. Generally, unrestrained serious injuries and fatalities have been stable, except for 2018 in which there were the highest recorded number of both metrics for the five-year period. More work can be done to reduce fatalities, which have been in the double digits since 2018 after zero were recorded in 2017.

Figure 12. Unincorporated Area Unrestrained Injury Severity by Year (2015 – 2019)



In unincorporated El Paso County, the most common type of unrestrained crash is a broadside crash. Thirty-three (33) percent of unrestrained fatalities and 61 percent of unrestrained serious injuries happened at intersections where broadside crashes are most common. Unrestrained fatalities and serious injuries also primarily occur on roadways classified as “Principal Arterials/Exp¹” (71 percent of fatalities and 61 percent of serious injuries) while this roadway classification only represents 7 percent of Unincorporated area in El Paso roadways. Additionally, 30 percent of unrestrained fatalities occur on dark-unlighted roads, 24 percent of unrestrained fatalities occur on vertical or horizontal curves, and 46 percent of unrestrained fatalities occur on Sundays and Thursdays.

Intersection Related

Intersections are important to focus on because they are the locations on roadway networks at which conflicting movements are most likely to occur, including conflicting bicycle and pedestrian traffic on shared right of way (ROW). Figure 13 shows the number of intersection-related serious injuries and fatalities in unincorporated El Paso County from 2015 to 2019. There has been a slight decline in intersection related serious injuries and fatalities over the five-year period from 2015 to 2019, with 2015 and 2017 as high years for fatalities and serious injuries.

¹ Functional classification definitions can be found here [dg18-ch-01-hwy-functions \(codot.gov\)](https://www.codot.gov/roadways/functional-classification/).

Figure 13. Unincorporated Area Intersection Injury Severity by Year (2015 – 2019)

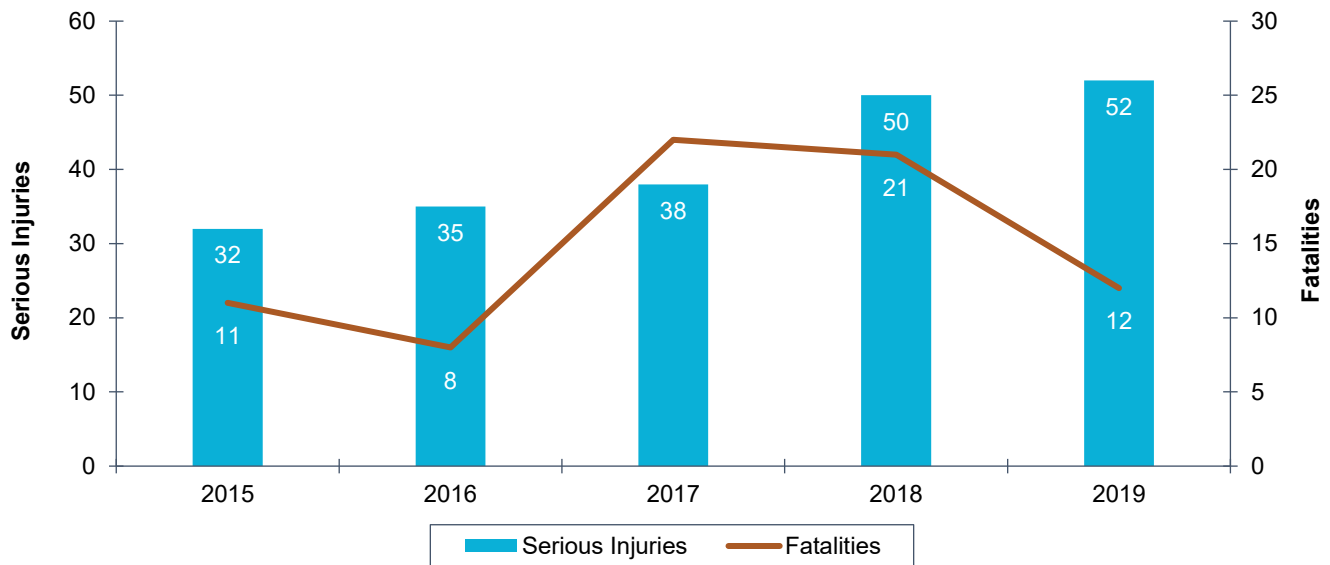


In unincorporated El Paso County, the most common type of intersection related incident is a broadside crash, which makes sense given that intersections are inherently designed to manage conflicting traffic demand. 51.5 percent of intersection fatalities involved speeding and 82 percent were reported unrestrained (not necessarily both simultaneously). Similarly, 78 percent of intersection serious injuries were reported unrestrained. 29 percent of intersection fatalities occur on roadways classified as “Minor Arterials” though they only represent 3 percent of El Paso County roadways. Additionally, 17 percent of intersection fatalities and 14 percent of intersection serious injuries occurs at dark-unlighted intersections. Intersection fatalities commonly occur at stop-controlled intersections (79 percent of intersection fatalities) and vertical or horizontal curves (26 percent).

Lane Departure

Lane departure incidents characterize those crashes in which a vehicle on a roadway departs their travel lane and strikes another vehicle or crashes after leaving the roadway. Lane departure crashes are dangerous because they can involve vehicles across lanes of traffic. Figure 14 shows the number of lane departure serious injuries and fatalities in unincorporated El Paso County from 2015 to 2019. There has been an increase in lane departure related serious injuries and fatalities over the five-year period from 2015 to 2019, with 2018 and 2019 having high numbers for fatalities and serious injuries.

Figure 14. Unincorporated Area Lane Departure Injury Severity by Year (2015 – 2019)

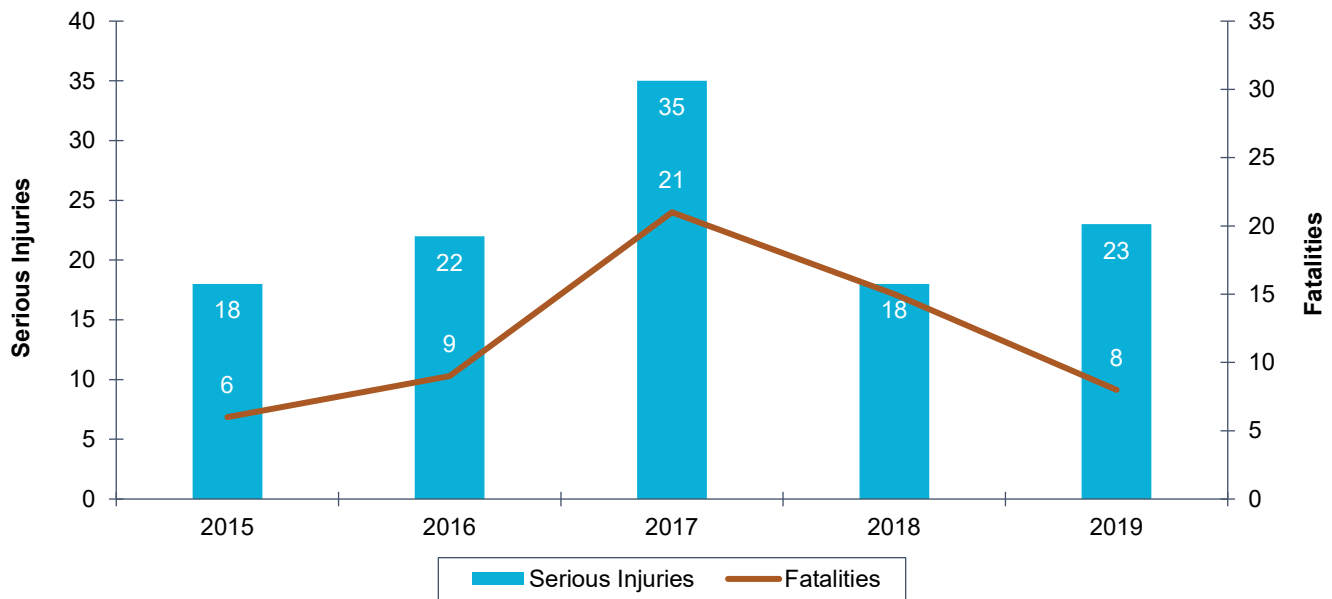


In unincorporated El Paso County, more than 63 percent of lane departure fatalities and 60 percent of serious injuries occur on roadways classified as “Principal Arterial/Exp” which comprise only 7 percent of unincorporated area in El Paso County roadways. In corresponding with the other emphasis factors, 78 percent of lane departure fatalities were reported as unrestrained, and 52 percent were speeding-related. A substantial share of lane departure incidents reported impairment, with 42 percent of lane departure fatalities and 30 percent of serious injuries reporting impairment. In examining roadway conditions and time of day, 34 percent of lane departure fatalities and 29 percent of lane departure serious injuries occurred on dark-unlighted roads, 26 percent of lane departure fatalities and 32 percent of lane departure serious injuries occurred on vertical or horizontal curves, and 37 percent of lane departure fatalities and 37 percent of serious injuries occurred on Sundays and Tuesday.

Speeding

Speeding incidents are those when one or more vehicles involved in the incident have exceeded the posted speed limit. These are particularly dangerous crashes because impacts at higher speeds are more damaging. Speeding can also increase other types of crash severity if speeding was also a factor. Figure 15 shows the number of speeding serious injuries and fatalities in unincorporated El Paso County from 2015 to 2019. There has been a slight increase in speeding related serious injuries and fatalities over the five-year period from 2015 to 2019, with 2017 as a year with higher numbers of fatalities and serious injuries.

Figure 15. Unincorporated Area Speeding Injury Severity by Year (2015 – 2019)



In unincorporated El Paso County, the most common types of speeding crashes are broadside and overturning. Approximately 47 percent of speeding related fatalities and 48 percent of serious injuries occur on roadways classified as “Principal Arterial/Exp,” which represent 7 percent of El Paso County roadways. In comparing speeding with other emphasis areas, it was determined that 64 percent of speeding related fatalities also reported being unrestrained. Additionally, more than a third of speeding related fatalities and serious injuries were also reported as impaired driving. In examining roadway conditions and time of day, 25 percent of speeding related fatalities occurred on dark-unlighted roads, 27 percent of speeding related fatalities and 28 percent of speeding related serious injuries occurred on vertical or horizontal curves, 27 percent of speeding related fatalities occurred on Sundays, and 49 percent occur between 10 am and 6 pm.

BEST PRACTICES TOOLKIT

The best practices toolkit provides information on resources related to tasks included in the El Paso County Local Road Safety Plan. The toolkit includes descriptions and information regarding crash analysis emphasis areas, the El Paso County data dashboard, network screening methodology, road safety audits and Towards Zero Deaths/Vision Zero resources. The toolkit documentation serves as a compendium of the steps and resources utilized to develop and implement the El Paso County Local Road Safety Plan. The toolkit is shown in Appendix F. Best Practices Toolkit.

PRIORITY PROJECT LIST

For the past year, El Paso County has conducted a Road Safety Plan to:

- Understand the factors that contributed to fatal and serious injury crashes in El Paso County.
- Determine where crashes on the local road network are over-represented.
- Provide the county with specific suggestions to improve safety.






- Inform future program and project efforts in El Paso County.
- Move toward zero deaths/have a vision of zero deaths.







The following is a list of prioritized projects and actions that can, when implemented where appropriate, reduce the number of people killed or seriously injured throughout El Paso County. These projects and actions were identified through research, data analysis, road safety audits, stakeholder outreach, and feedback from the public. The data analysis focused specifically in four emphasis areas that represent serious road safety issues in the county: intersection related crashes, speeding related crashes, unrestrained related crashes (unbelted), and lane departure related crashes. The road safety audits completed a comprehensive analysis of five segments and five intersections with severe crashes that were diverse in location, road or intersection type, and in safety issues to determine what improvements could be made to make those areas safer. The approach of using a diverse set of intersections and segments was chosen so that improvements identified would be appropriate for other like areas and therefore produced benefits for many more locations than just the ones studies. Comments from stakeholder meetings, the project interactive map, and ones that came in through email were also incorporated into developing this list of projects.

This list of projects should be viewed as options for consideration to improve safety for the type and location of higher than expected crashes. It should be noted that not all of these projects should be implemented everywhere as engineering, maintenance and planning expertise will determine the most appropriate actions for the location being considered.

The list of priority projects below is organized by the five E's: Engineering, Education, Encouragement, Evaluation, and Enforcement. The time frame is also indicated (ongoing, short-term, mid-term, or long-term) and the estimated cost (based on a relative scale and not representing an exact dollar figure, \$ = Low; \$\$ = Medium; \$\$\$ = High).

LEGEND

 Engineering	 Education	 Encouragement	 Evaluation	 Enforcement
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		Timeframe	Cost
Design and Operate Safer Infrastructure			
	Install pedestrian hybrid beacon and advanced yield signs, stop markings and signs, high visibility crosswalk markings.	Mid-term	\$
	Conduct pedestrian road safety audits in areas with a higher than average pedestrian crashes. Ensure sidewalks and facilities meet ADA requirements.	Ongoing	\$
 	Reduce motor vehicle speeds by using data driven, effective, and equitable enforcement methods that utilize available technology.	Long-Term	\$\$
 	Reduce motor vehicle speeds by utilizing other traffic calming strategies such as narrower lanes, adding roundabouts, reducing the number of traffic lanes, planting trees, and implementing roadway reconfiguration.	Ongoing and Long-Term	\$\$\$

		Timeframe	Cost
	Continue to install pedestrian countdown signals and refuge islands and evaluate and include where prudent different options for pedestrian signal countdown technology (touchless, audible, etc.).	Ongoing and Long-Term	\$
	Evaluate the geometry of pedestrian and bicycle facilities at signalized intersections with high frequencies of pedestrian and/or bicycle crashes and on routes serving schools or other generators of pedestrian and bicycle traffic. Make improvements as needed, this can include installing pedestrian refuges.	Ongoing and Mid-Term	\$\$
	Replace intersections that have high numbers of fatalities and serious injuries with roundabouts, a circular intersection configuration with channelized approaches and a center island that results in lower speeds and fewer conflict points, wherever feasible.	Ongoing Long-Term	\$\$\$
	Utilize a protected left, improving the sight distance, positive off-sets, or multiphase signal operation at signalized intersections with a high frequency of angle crashes involving left turning and opposing through vehicles as well as rear-end and sideswipe crashes.	Mid-Term	\$\$\$
	Evaluate uncontrolled intersections where a high crash rate is observed and recommend improvements based on evaluation results.	Short-Term/ Ongoing	\$-\$\$\$\$
	Improve left-turn channelization (providing definite paths for vehicles to follow) at signalized intersections where left-turn crashes are an issue and increase left turn lane offsets for increased visibility at intersections where visibility is an issue. Implement left-turn traffic calming (left turn hardening) to reduce left turn speeds and provide for safe turning behavior at intersections that show a pattern of pedestrian-related left turn crashes and intersection geometry that facilitates high speeds. Consider installing Dilemma Zone (Smart Sensor Advance Radar) to reduce rear-end and sideswipe crashes.	Mid-Term/ Long-Term	\$\$-\$\$\$
	Ensure intersections are built with appropriate design standards to allow adequate drainage at intersections and conduct regular intersection drainage evaluation and recommend improvements if needed.	Ongoing	\$-\$\$\$
	Continue to install LED heads and reflective backplates (reflective borders around traffic lights that make them more visible) in locations with high numbers of signalized intersection fatal and serious injury crashes.	Short-Term/ Ongoing	\$
	Continue to update plans for connected bicycle and pedestrian (sidewalk) networks in the county.	Ongoing/ Mid-Term	\$
	Install LED-enhanced stop signs or stop signs with larger beacons or enhanced conspicuity supplemental beacons, vertical retroreflective strips on sign support, post reflectors, solid yellow strip of retroreflectivity, etc. at unsignalized intersections where there are a higher-than-average number of fatal and serious injury crashes and enhanced signage does not already exist. Consider Intersection Conflict Warning Systems (ICWS) if signal warrants are not met or an all-way stop is not appropriate.	Short-Term	\$\$-\$
	Continue improved striping for all roads (one year for higher volume and bi-annually for general roads), expand epoxy restriping for high-volume roads, and consider including tape for skips. Update edgelines to six-inch edgelines. Evaluate the striping schedule to determine if striping should be updated with more frequency.	Ongoing	\$\$
	Implement roadside design improvements such as clear zones, slope flattening, and adding or widening shoulders to improve ability for drivers to safely recover if they leave the travel lane where roadway departure crashes are observed.	Ongoing	\$\$-\$\$\$

		Timeframe	Cost
	Continue to implement enhanced delineation treatments to alert drivers in advance of the curve including pavement markings; post-mounted delineation; larger signs and signs with enhanced retro-reflectivity; and dynamic advance curve warning signs and sequential curve signs.	Ongoing	\$\$
	Continue to implement improvements including installation of cable barriers, guardrails, and concrete barriers to reduce the severity of roadway departure crashes.	Short-Term	\$\$
	Install high friction surface treatment (HFST) in locations where the available pavement friction is not adequate to support operating speeds at a sharp curve, inadequate cross-slope design, wet conditions, polished roadway surfaces, or driving speeds in excess of the curve advisory speed.	Mid-Term	\$
	Install longitudinal (edgeline and center line) rumble strips and stripes in locations where run-off-the-road crashes are high and in the middle of the road to prevent entry into opposing lane.	Long-Term	\$
	Review traffic count data and intersection counts to identify if traffic control changes are warranted due to traffic increases at intersections experiencing growth to monitor changes in local traffic.	Short-Term	\$
	Install the Safety Edge to eliminate the vertical drop-off at the pavement edge, allowing drifting vehicles to return to the pavement safely.	Ongoing	\$\$-\$\$\$
	Develop a regional Safety Checklist or template as a tool for local jurisdictions to use during planning and project identification efforts.	Ongoing/ Short-Term	\$
Encourage Safer Behavior			
	Include pedestrian safety and the risks of impairment for pedestrians and drivers in alcohol related media campaigns.	Mid-term	\$\$
	Implement a regional Street Smart Campaign focusing on bicycle, pedestrian, and motorcycle awareness.	Mid-term	\$\$
	Create an official Road Safety Audit team to visit major accident and fatality sites.	Ongoing	\$
	Implement a telework policy and encourage regional jurisdictions to create their own telework policies.	Short-term	\$
	Provide public information, education, and training for older and younger drivers on risks associated with signalized intersections such as red-light running, speeding, not yielding to pedestrians, and difficulty judging speed and distance of approaching vehicles when making left turns.	Mid-term	\$\$
	Implement safety awareness campaigns specifically for low seat belt use groups to include diverse and underserved communities. Use data to determine which population groups are at highest risk for not wearing safety belts, determine why if possible.	Short-term	\$\$
	Support enacting a state primary seat belt enforcement legislation for adult drivers and front-seat passengers and increased seat belt use law penalties.	Mid-term	\$
	Conduct high-profile “child restraint inspection” events at multiple community locations.	Short-term	\$\$

		Timeframe	Cost
	Conduct seat belt educational and awareness campaigns to educate the public on the importance of using seat belts and include social media and messaging to reach diverse communities.	Short-term	\$\$
	Support a helmet law for motorcycle riders.	Mid-term	\$
	Implement and enhance server training programs to enable servers to identify underage customers and prevent overserving.	Short-term	\$\$
	Increase use of ignition interlocks for first-time impaired driving offenders, impose limits on diversion and plea agreements, increase requirements for alcohol problem assessment and treatment.	Mid-term	\$
	Provide and encourage use of ride sharing programs (like SoberRide) to reduce impaired driving.	Mid-term	\$
	Conduct well-publicized compliance programs and sobriety checkpoints aimed at impaired drivers and motorcyclists.	Short-term	\$\$
	Encourage citizens to submit service requests when they see safety concerns at https://citizenconnect.elpasoco.com/#/homepage .	Short-term	\$
	Lobby for increased DWI offender monitoring and lower BAC limit for repeat offenders.	Mid-term	\$

PRIORITY LOCATIONS—ROAD SAFETY AUDITS AND RECOMMENDATION

The El Paso County process to develop a Road Safety Plan is to make driving, bicycling, and walking safer in the County with a focus on reducing the number of deaths and serious injuries on El Paso County roads. The Plan includes a detailed data analysis of current trends. These trends helped to identify a set of prioritized locations for safety evaluations to identify potential improvements. The improvement recommendations include well-established and innovative countermeasures and program-related recommendations for the County. The Road Safety Audit (RSA) documents the review and development of recommendations for sites with safety concerns to assist with prioritizing road safety priority improvements.

While many projects conduct RSAs for locations with the highest number or most severe crashes, in reviewing the data it was determined that most of the highest crash locations already underwent improvements or were in design or construction for improvements. This is a testament to DPW's staff and their knowledge of the road system, safety issues and addressing them proactively. Therefore, the Team looked to locations that were diverse and could be representative of safety improvements that could be made on other locations with similar characteristics. For example, suggestions for an urban intersection with two lanes crossing a four-lane road could be used on other similar intersections.

ROAD SAFETY AUDIT PROCESS

The RSA process is a formal examination of the safety performance of a roadway by an independent audit team that seeks to qualitatively report on road safety issues and suggest potential safety improvements for all road users. This process typically involves reviewing crash data and reports, conducting a pre-assessment meeting to review project information, conducting a field review to observe both daytime and nighttime roadway conditions and traffic operations, performing a safety-focused assessment, report preparation documenting the analysis and findings, and developing a formal response and action plan. It should be noted that the crash summary does not analyze potential causes of these crashes. The RSA should not be interpreted as determining the cause of any particular crash.

Improvement Strategies

Both standard and targeted improvement strategies are included among recommended location-specific countermeasures. In each case, the intent is to provide either a method or a recommendation. In some cases, such as striping and pavement marking maintenance, it is recommended that the County investigate how a targeted approach could be used for specific intersections and roadway segments based on propensity to experience a higher level of wear. This recommendation embraces a location-specific approach to applying and maintaining pavement marking using variations in maintenance schedules, application techniques and types of materials used. It is recognized that it is difficult to keep striping in good condition in some locations due to wear from snow plowing and/or exceptionally high volumes. At these locations, the County could increase paint thickness by using “high build” techniques to get thicker stripes. Alternatively, the County could contract out putting down epoxy pavement markings in high-volume and/or unusually high wear locations. Another programmatic approach might be used for compliance improvements such as for sidewalks or Americans with Disabilities Act (ADA) paths. These types of remedies could be incrementally implemented as part of an ADA Transition Plan, with improvements programmed to address location-specific issues as identified in this report.

The full list of recommendations from each RSA can be found in Appendix D. RSA Data and Diagrams.