



SCOTTSDALE TRANSPORTATION COMMISSION Notice and Agenda

Date: Thursday, October 15, 2026

Time: 5:15 P.M.

Location: Kiva – City Hall

3939 N. Drinkwater Boulevard

Scottsdale, AZ 85251

Call to Order

Roll Call

Kerry Wilcoxon, Chair	Kyle Davis, Commissioner
Emmie Cardella, Vice-Chair	Bob Baker, Commissioner
Robert Marmon, Commissioner	Gerry Conover, Commissioner
Mailen Pankiewicz, Commissioner	

One or more members of the Transportation Commission may be attending the meeting by telephone, video, or internet conferencing, pursuant to A.R.S. §38-431(4)

Public Comment

Citizens may address the members of the Transportation Commission during Public Comment. This “Public Comment” time is reserved for citizen comments regarding non-agendized items. Arizona State law prohibits the Transportation Commission from discussing or taking action on an item that is not on the prepared agenda. Citizens may complete one Request to Speak “Public Comment” card per meeting and submit to City Staff. Public testimony is limited to three (3) minutes per speaker.

Written public comment for both agendized and non-agendized items may be submitted in-person by completing a yellow written public comment card or electronically by completing a Written Public Comment Form. Written public comment submitted after public testimony has begun will be provided to the members of the Transportation Commission at the conclusion of the testimony for that item. Written comments that are submitted electronically at least 90 minutes before the meeting’s scheduled start time will be provided to members of the

Transportation Commission. A written public comment may be submitted electronically at the following link: <https://ww2.scottsdaleaz.gov/boards/transportation-commission>

- 1. Approval of Meeting Minutes----- Discussion and Action**
Regular Meeting of the Transportation Commission – September 17, 2026
- 2. Welcome New Commissioner-----Information**
Introduction of the new Transportation Commissioner – Gerry Conover
- 3. Appoint New Commissioner to the Paths & Trails Subcommittee-----Action**
Appoint a new Transportation Commissioner to the Paths & Trails Subcommittee –
Transportation Commission
- 4. Strategic Transportation Safety Plan: First Draft-----Information and Possible Action**
Review of the draft of the plan including the High Injury Network and recommendations –
Nathan Domme, Senior Transportation Planning Manager
Ryan Wozniak, Senior Transportation Planner at TYLin
- 5. Projects and Programs Update-----Information and Discussion**
Nathan Domme, Senior Transportation Planning Manager
- 6. Transportation Commission Identification of Future Agenda Items-----Discussion**
Commissioners may identify items or topics of interest for future Transportation Commission meetings

Adjournment



PERSONS WHO REQUIRE A REASONABLE MODIFICATION BASED ON LANGUAGE OR A DISABILITY MAY REQUEST A REASONABLE ACCOMMODATION BY CONTACTING SUSAN CONKLU AT 480-312-2308. REQUESTS SHOULD BE MADE 24 HOURS IN ADVANCE, OR AS EARLY AS POSSIBLE, TO ALLOW TIME TO ARRANGE THE ACCOMMODATION. FOR TTY USERS, THE ARIZONA RELAY SERVICE (1-800-367-8939) MAY ALSO CONTACT SUSAN CONKLU AT 480-312-2308.

FOR ADDITIONAL INFORMATION VISIT: <https://ww2.scottsdaleaz.gov/boards/transportation-commission>



**CITY OF SCOTTSDALE
TRANSPORTATION COMMISSION
DRAFT REGULAR SUMMARIZED MEETING MINUTES**

Thursday, September 17, 2026

City Hall Kiva Forum
3939 N. Drinkwater Boulevard
Scottsdale, AZ 85251

PRESENT: Kerry Wilcoxon, Chair
Emmie Cardella, Vice-Chair
Kyle Davis, Commissioner
Robert Marmon, Commissioner
Bob Baker, Commissioner (Absent)
Lee Kaufheil, Commissioner (Absent)
Mailen Pankiewicz, Commissioner

STAFF: Alison Tymkiw, Senior Director – City Engineer
Nathan Domme, Transportation Planning Manager
John Hoang, Senior Traffic Engineering Manager
Helayne Dominguez, Senior Traffic Engineer
Susan Conklu, Senior Transportation Planner
Greg Davies, Principal Transit Planner
Satanay Hallac, Senior Transportation Planner
Cristina Lenko, Public Information Officer

Call to Order

Chair Wilcoxon called the meeting of the Scottsdale Transportation Commission to order at 5:18 p.m.

Roll Call

A formal roll call was conducted, confirming members present as listed above.

Public Comment – Non-Agendized Items

There were no members of the public who wished to speak on Non-Agendized Items.

1. Approval of Minutes

Commissioner Marmon made a motion to approve the August 20, 2026 regular meeting minutes as amended. Seconded by Commissioner Davis. The motion passed unanimously by a vote of five (5) to Zero.

2. FY 27/28 Capital Improvement Plan Overview

Overview of the CIP process for Fiscal Year 2027/28 was presented by Nathan Domme, Senior Transportation Planning Manager.

No action was taken.

3. Projects and Programs Update

Transportation Planning Manager Nathan Domme conducted a presentation and reviewed the following topics:

- Transportation Programs
- Annual Presentation to City Council
- Project Highlights – Thompson Peak Parkway Bridge
- Upcoming Public Meetings

No action was taken.

4. Transportation Commission Identification of Future Agenda Items

A request was made regarding sequencing traffic signals and locations for a possible future agenda item.

The next Transportation Commission meeting is scheduled for October 15, 2026.

Adjournment

Commissioner Davis moved to adjourn the meeting. Commissioner Marmon seconded the motion which carried five (5) to zero (0).

With no further business to discuss, the regular session of the Transportation Commission adjourned at 6:01 p.m.

SCOTTSDALE TRANSPORTATION COMMISSION REPORT



To: Transportation Commission
From: Nathan Domme, Transportation Planning Manager
Subject: City of Scottsdale Strategic Transportation Safety Plan
Meeting Date: October 15, 2026

ITEM IN BRIEF

Action: Information and Possible Action

Purpose: Provide an overview of the draft of the Strategic Transportation Safety Plan next steps for the plan.

Background:

The Scottsdale Transportation and Streets Department is currently developing a citywide Strategic Transportation Safety Plan to guide safety improvements, programs, and strategies for all transportation modes, especially for the most vulnerable users. The goals of the plan include the following components:

- An Education Component (public safety messaging)
- An Enforcement Component
- Evaluation tools to monitor progress
- Workforce Safety in the Right-of-way
- Build off our program successes

We aim to reduce the likelihood of traffic crashes resulting in fatal or serious injuries.

The Plan focuses on creating policies to help improve safety in several key components, including Workforce in the Right of Way, development of the High Injury Network, Education, Enforcement, and countermeasures identification. City staff and the consultant collected traffic and crash data and analyzed the data to determine the results. The HIN and toolbox of countermeasures is the core component of the plan.

Completed Transportation Commission Updates

Staff presented the action items to several Transportation Commission meetings to provide sufficient opportunities to develop and review the Strategic Transportation Safety Plan. A series of meetings is provided below:

January 16, 2025 Meeting:

Overview of the Plan was presented.

February 20, 2025 Meeting:

Item 1: *Common Practices and Department's Successes*. Staff and a consultant presented the draft common practices document. This document identifies best practices by other cities and regional partners. Staff will also present on practices the city of Scottsdale has conducted over the past twenty years and how they have been effective.

April 17, 2025 Meeting:

Item 3: *Data Analysis and High-Risk Locations*. Staff and the consultant presented the Crash Data Analysis to ultimately develop a high-injury network, including identifying intersections, segments, and corridors that exhibit possible safety issues.

Item 4: *Strategies/Countermeasure Identification*. Staff and the consultant presented Safety Countermeasures and Solutions identified in the Plan.

August 21, 2025 Meeting:

Item 5: *Data Analysis and High-Risk Locations*. Staff and the consultant presented the updated Crash Data Analysis and high-injury network.

Item 6: *Strategies/Countermeasure Identification*. Staff and the consultant presented updated Safety Countermeasures and Solutions identified in the Plan.

September 18, 2025 Meeting:

Item 7: *Education Component* ---Staff presented an overview of the education goals for the Plan

November 20, 2025 Meeting:

Item 8: *Police Department Traffic Enforcement and Education*. Staff presented the current traffic enforcement and public education work of the Scottsdale Police Department including Traffic Enforcement/ Photo Enforcement, DUI Enforcement and the Public Information Office efforts. These include coordination within the police department and other city government teams for crash reduction.

Item 9: *Workforce and Emergency Responder Safety in the Right-of-Way*. Staff presented an overview of the existing Safe System, preventative framework to protect employees, contractors, emergency responders, and the traveling public during all work occurring within the public right-of-way (ROW), including roadways, alleys, multi-use paths, unpaved trails, and frontages.

Public Outreach Plan:

Public outreach included:

- Pop-Up Virtual Reality Experience showing video clips of bicycle riders' perspective (complete)

- Walking Audits for pedestrian perspective- planned for 3-4 locations day/ night (complete)
- Stakeholder meetings through the Transportation Advisory Working Group (complete)
- [Plan website](#) (ongoing)
- Taking the draft plan to the public

Next Steps:

The next steps for the plan include:

- Share the draft plan with the public, including updates posted on the website and a public open house.
- Revise the draft plan.
- Present the final plan to the Transportation Commission at the January 21, 2027 meeting, and request approval of the plan and recommendation to City Council.
- Present the Final Plan to City Council in winter/ spring 2027 including requesting adoption of the plan.

Contacts:

Nathan Domme, 480-312-2732, ndomme@scottsdaleaz.gov

Attachment A: Draft Transportation Safety Plan

City of Scottsdale Transportation Safety Plan Draft

TRANSPORTATION COMMISSION

October 15, 2026



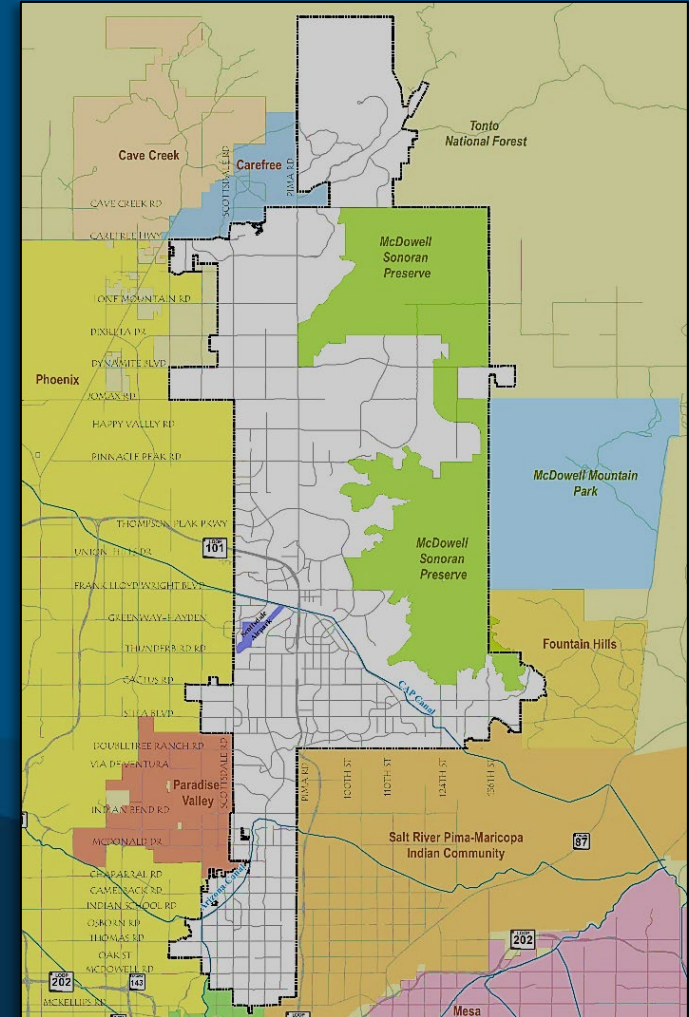
Strategic Transportation Safety Plan Overview

The city of Scottsdale acquired TYLin for consultant services to help prepare the Strategic Transportation Safety Plan.

Transportation Safety is a shared responsibility, and this plan will guide safety improvements, programs, and strategies for all transportation modes, especially the most vulnerable users.

Goals for the plan include:

- Education Component (safety messaging)
- Enforcement Component
- Evaluation tools to monitor progress
- Workforce Safety in the Right-of-Way
- Build off our program successes



Strategic Transportation Safety Plan

- The plan purpose is to reduce serious and fatal injuries from traffic crashes.
- High Injury Network (HIN) – crash analysis
 - All Modes
 - Vulnerable Road Users (VRUs) – Bicyclists and Pedestrians
 - HIN Maps include segments and intersections
- Identification of Countermeasures – Toolbox for each crash type

Work and Progress

- October 1, 2024, Project Kick-Off meeting with city staff and consultants, TYLin.
 - Started analysis of collision data (multimodal), speed studies, network information, other plans and studies (underway).
 - Started Common Practice Assessment of peer cities and regions.
- Public Participation Plan
 - Outreach Events
 - Website
 - Technical Advisor's Working Group (TAWG) – comprised of internal and external stakeholders, including decision makers
 - Community Questionnaire

Transportation Commission Meetings

- January 16, 2025 Meeting
 - Overview of Plan
- February 20, 2025 Meeting
 - Item 1: *Common Practices and Department's Successes.*
- April 17, 2025 Meeting
 - Item 3: *Data Analysis and High-Risk Locations*
- August 21, 2025 Meeting
 - Item 5: *Data Analysis and High-Risk Locations.*
- September 18, 2025 Meeting
 - Item 7: *Education Component*
- November 20, 2025 Meeting
 - Item 8: *Police Department Traffic Enforcement and Education.*
 - Item 9: *Workforce and Emergency Responder Safety in the Right-of-Way*

Public Outreach

- Plan website
- Spring and fall 2025 - Pop-Up Virtual Reality Experience showing video clips of bicycle rider's perspective
- October 2025 – Interactive Walking Community Assessments of 4 locations day/ night
- Fall 2025 - Public Questionnaire
- March – December 2025 - Technical Advisor's Working Group (TAWG) – comprised of internal and external stakeholders, including decision makers



Next Steps

- Update Webpage and share plan with the public
- Public Open House
 - Tentatively in December
- Transportation Commission presentation of final plan
 - January 21, 2027
- Present final plan to City Council in winter/ spring 2027
 - Staff will request adoption of the plan

Draft Plan Document Section by Section

1. Safety Action Plan Overview

A. Commitment to Measurable Outcomes

B. Further Aspirations

C. Steps To Keep This Plan Relevant

2. Introduction & Vision

A. Purpose

B. Alignment with Agency Partners

C. Vision: Safety is Priority #1

D. Safe System Principles

3. Emphasis Areas

A. Human Behavior

B. Implications of Older Populations on Transportation Safety

C. Vulnerable Road Users (VRUs)

D. Intersections

E. Access Management

F. Speed Management

G. Nighttime/Visibility

H. Heat Context

4. Plans, Policies & Programs

- A. Relationship with other adopted policies
- B. Evaluating countermeasures in use
- C. Partners for Advancing Safety Practices
- D. Federal and State policy alignment

5. Community Engagement & Localized Strategies

A. Scottsdale's Advisors and Local Voices

B. Neighborhoods

C. Collaboration: Schools, Parks, Business

D. Education and Campaigns



6. Leadership Commitments & Roles

A. City Council resolutions and leadership statements

B. Cross-Departmental Coordination

C. Regional Policy and Programs

D. Commitment to Ongoing Public Reporting

7. Data-Driven Problem Identification

- A. Crash data methodology
- B. High Injury Network (HIN) Identification
- C. Analysis by Mode, Severity, Time of Day, Context
- D. Economic Cost and Societal Harm Estimates
- E. Mapped Data and Guided Implementation
- F. Trends
- G. Metrics tied to SS4A eligibility
- H. Annual Public Reporting
- I. Performance measures
- J. Collision Factors Summary
- K. Roadway/operational factors

8. Safety Countermeasures & Strategies

A. Scottsdale's Safety Challenges and Opportunities

B. Engineering

C. Education

D. Enforcement

E. Policy & Legislation

F. Post-Crash Care

G. Culture of Safety

H. Keeping Design Standards and Guidelines Current

I. Countermeasure Toolkit

J. Countermeasure Recommendations



9. Funding & Implementation

A. SS4A grants and eligibility

B. MAG and ADOT

C. Scottsdale's Budget Priorities



Appendices

- A. Data tables and maps (HIN, crash trends)
- B. Data and HIN Calculation – Detailed Report
- C. Crossing Guidelines & LPI policies
- D. Intersection Safety for VRUs
- E. Technical Advisory Feedback
- F. Transportation Commissioner Feedback Summary
- G. Community Questionnaire and Engagement Results
- H. Grant Preparation Checklists

Questions?

Thank you





Safe Streets Scottsdale

Full Report Recommendation

SS4A-Compliant | Safe System Approach | Safety Action Plan

Resolution to City Council: XXXXX



Definitions & Acronyms

AADT	Average Annual Daily Traffic, a measure of the total volume of vehicle traffic on a roadway per year divided by 365 days.	NHTSA	National Highway Traffic Safety Administration, the U.S. agency responsible for enforcing vehicle performance standards and safety programs.
ADOT	Arizona Department of Transportation, responsible for design, construction, and maintenance of SR 101 in Scottsdale.	Pedestrian Hybrid Beacon (PHB)	A special traffic signal used that assists pedestrians in safely crossing busy streets using flashing and steady lights.
AoPP	Area of Persistent Poverty, a census-defined area with sustained high poverty rates, used for equity-based federal funding eligibility.	Public Right-of-Way	Land reserved for public transportation use, such as streets, sidewalks, and bike lanes.
CMF	Crash Modification Factor, a quantitative estimate of the safety effect of a countermeasure or roadway treatment.	Road Diet	A roadway reconfiguration that repurposes travel lanes to improve safety and accommodate more modes of travel.
Complete Streets	A design approach that ensures streets are safe and accessible for all users, including pedestrians, bicyclists, motorists, and transit riders.	RRFB	Rectangular Rapid Flashing Beacon, a pedestrian crossing device that uses flashing yellow lights to alert drivers of pedestrians.
Context-Sensitive Design	An approach to roadway design that considers the surrounding environment, land use, and community needs.	Safe System Approach	A safety framework that anticipates human mistakes and designs the system to prevent fatal outcomes.
Crash Rate	A measure of the number of crashes per unit of exposure, such as per million vehicle miles traveled.	Safe Streets for All (SS4A)	A USDOT program to fund and support the reduction of fatalities and serious injuries on public roadways.
DUI	Driving Under the Influence, the offense of operating a motor vehicle while impaired by alcohol or drugs.	Scottsdale Police Department (SPD)	The local law enforcement agency responsible for traffic enforcement and public safety in Scottsdale.
FHWA	Federal Highway Administration, the U.S. agency responsible for supporting state and local governments in highway construction and safety.	SHSP	Strategic Highway Safety Plan, a statewide safety plan that identifies key emphasis areas and strategies to reduce crashes.
GIS	Geographic Information System, a computer-based tool for mapping and analyzing spatial data.	Speed Management	A set of strategies to align vehicle speeds with safe conditions for all road users.
HIN	High-Injury Network, a map and dataset identifying priority concentrations of severe or fatal crashes.	Stakeholder	An individual or organization with an interest in or affected by transportation planning and safety outcomes.
HSIP	Highway Safety Improvement Program, a federal funding program focused on reducing traffic fatalities and serious injuries.	Streetlight Improvement Program	A municipal initiative to improve roadway lighting and nighttime visibility for safety.
ITS	Intelligent Transportation Systems, technologies used to improve the safety and efficiency of transportation networks.	Systemic Safety	An approach to safety that identifies and treats risk factors across an entire roadway network, not just crash hotspots.
KABCO	An injury severity scale in crash reports: K (Fatal), A (Serious Injury), B (Minor Injury), C (Possible Injury), and O (Property Damage Only).	Traffic Calming	Physical design measures that slow motor vehicle speeds and improve safety for all users.
KSI	Killed or Seriously Injured, a common performance measure used in transportation safety analysis.	Transportation Action Plan (TAP)	A City of Scottsdale plan that sets goals and strategies for improving the transportation system.
Leading Pedestrian Interval (LPI)	A traffic signal timing strategy that provides pedestrians a head start to be visible in the crosswalk before vehicles receive a green light.	USDOT	United States Department of Transportation.
MAG	Maricopa Association of Governments, the regional planning agency for the Phoenix metropolitan area.	VRU	Vulnerable Road Users

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1. Safety Action Plan Overview

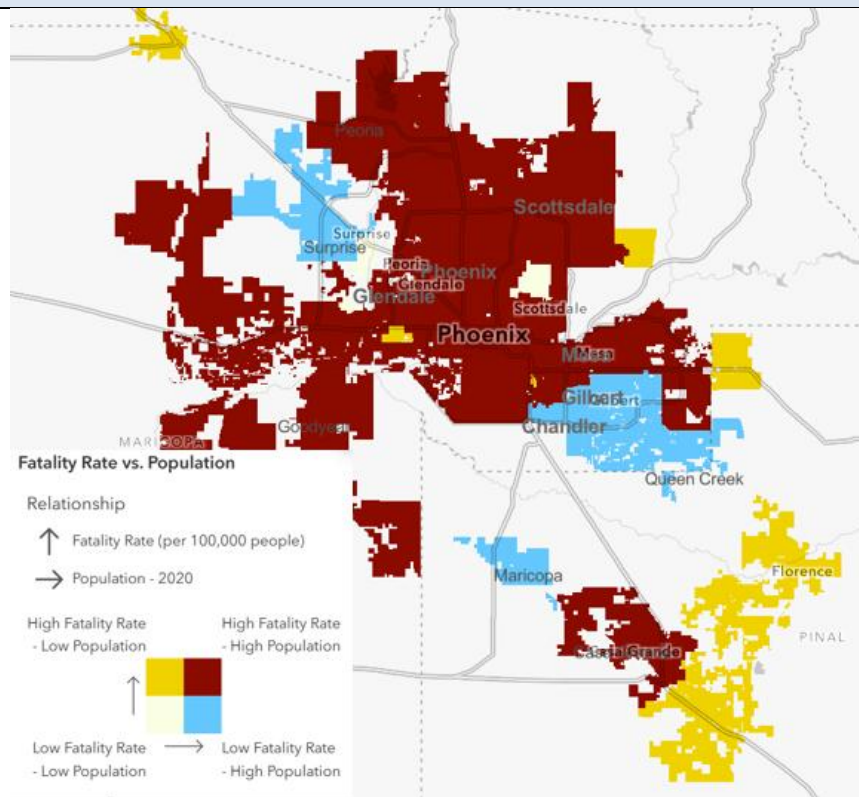


Figure 1 – Map: USDOT Fatality Rate vs. Population Concentration

When the Infrastructure Investment and Jobs Act became law in November 2021, the U.S. Department of Transportation (USDOT) launched the Safe Streets and Roads for All (SS4A) program to empower cities, towns, and tribal communities to address this safety crisis through comprehensive and data-driven safety planning. *The City of Scottsdale received an SS4A Planning Grant to evaluate existing practices, identify opportunities for improvement, and develop a*

strategy to reduce fatalities and serious injuries on all public roads within the city.

Safe Streets Scottsdale, the City's Safety Action Plan (*this plan*), fulfills this purpose. It builds on Scottsdale's strong foundation of safety-conscious planning, engineering, and enforcement to establish measurable goals and coordinated strategies. This plan emphasizes:

- Systemwide risk reduction with prioritization strategies
- Proven safety countermeasures
- A community-wide culture of shared responsibility for safety
- Shared investment in transportation safety
- Recognition of human bodily vulnerability in crashes
- Safe System redundancies that reduce the likelihood of fatal and serious injuries

Jump to [COMMITMENT TO MEASURABLE Outcomes](#).

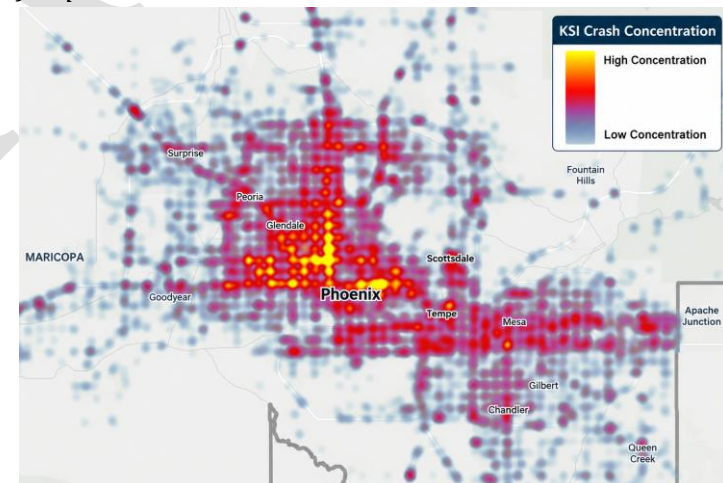


Figure 2 – Map: ADOT Fatal and Serious Injury Heat Map

› High Injury Network (HIN) – Methods and Assessment

The HIN methodology was developed to evaluate roadway safety conditions through multiple lenses rather than relying solely on crash frequency. The analysis differentiated roadway segments from intersections and further distinguished systemwide crash patterns from Vulnerable Road User (VRU)-specific concerns. This produced four complementary HIN layers:

- All-Modes HIN – Intersections
- All-Modes HIN – Segments
- VRU HIN – Intersections
- VRU HIN – Segments

The overlap among these HIN layers helps identify locations where multiple risk conditions converge and where implementation strategies may warrant elevated priority.

A. Commitment to Measurable Outcomes

Pragmatically, targeted outcomes can be reverse engineered based on an assumed number of improvements and programs with determined crash modification factors for those interventions. Scottsdale staff can orient those priorities and goals with thorough coordination.

› Significant Reduction Commitment

Scottsdale commits to a 40% reduction in fatal and serious injury (KSI) crashes by 2035.

Aspirational leadership and partnership can bolster this reduction factor. The power of positive safety culture can improve the City's performance beyond what can be predicted by applying statistical

crash modification factors through the **Safe System Approach**. A safe system embraces redundancy in safety. Where one layer of protection is fallible, a systemic series of protections is diverse and comprehensive.

› Projects and Programs Priorities

This plan prioritizes projects where safety needs, implementation opportunity, and community benefit overlap. The High-Injury Network (HIN) provides the foundation for this approach by identifying intersections and roadway segments with elevated fatal and serious injury crash risk. The analysis evaluates both all-mode crash patterns and VRU crash patterns, recognizing that pedestrians and bicyclists experience disproportionately severe outcomes when crashes occur.

Project priority will be highest where multiple safety concerns converge. Locations that appear on both the all-modes HIN and VRU-focused HIN should receive elevated consideration because they indicate both systemwide crash risk and heightened risk for people walking or biking. Priority should also increase where HIN locations overlap with Areas of Persistent Poverty, transit access, schools, activity centers, senior destinations, nighttime crash concentrations, or community-identified safety concerns. Lastly, the prioritization framework should emphasize projects that can reduce fatal and serious injury crashes most effectively.

Project readiness should also influence implementation sequencing. A project may move forward sooner if it is located on the HIN, aligns with an upcoming pavement, signal, drainage, development, or capital project, and uses proven countermeasures that are feasible within the existing right-of-way. This allows the City to make safety gains incrementally while continuing to plan for larger reconstruction needs.

Scottsdale's prioritization process should therefore use the HIN as a standing decision-making tool. Each year, candidate projects should be screened for their relationship to HIN scores, crash severity, VRU risk, community vulnerability, countermeasure effectiveness, cost, and delivery opportunity. This will help ensure that safety investments are directed first to the places where they are most likely to prevent deaths and serious injuries and where they can provide measurable public benefit.

B. Further Aspirations

Note transportation safety practice, foreseeably, will remain a work in progress. When the reduction goals are met and more risk of serious injury and death remain, renewed commitments are likely.

As the City develops intentional partners and leaders with clear focus areas for reduced harm and reduced stress imposed by fatal risk, the City can revisit the long-term goals and strategies to further save lives and protect residents, businesses, and visitors from harm.

C. Steps To Keep This Plan Relevant

1. **Prioritize safety projects** within capital improvement planning annually with a factor of worthiness relative to the High Injury Network (HIN) score.
2. **Update [countermeasure toolkit](#)** every 5-10 years, depending on technology advancements offering safety benefits.
3. **Update the Safety Action Plan** every 10-12 years.
4. **Program Community Walking Assessments** annually to areas of interest, navigating solutions that are community-supported.

2. Introduction & Vision

A. Purpose

Safe Streets Scottsdale is the City of Scottsdale's roadway Safety Action Plan. Its purpose is to measurably reduce traffic deaths and serious injuries by identifying Scottsdale's most significant safety risks, prioritizing high-impact strategies and projects, and aligning implementation across City departments and regional partners. This plan is intended to be compliant with USDOT's Safe Streets and Roads for All (SS4A) framework so that Scottsdale can pair a locally tailored safety program with competitive eligibility for federal implementation funding.

B. Alignment with Agency Partners

Coordination is a big commitment. It means alignment with national, state, and local partners to form a set of strategies that are more effective as they compound.

› Nationally

Safety Action Planning can leverage federal safety dollars relevant to priorities published by USDOT and through grant funding.

The USDOT is not only a funding partner, but a repository of evidence-based solutions that have been peer-reviewed and validated.

› State

Safe Streets Scottsdale complements the [ADOT STRATEGIC HIGHWAY SAFETY PLAN \(SHSP\)](#) by translating statewide priorities into a locally tailored, implementable program. The plan explicitly positions Scottsdale as a partner in the state's safety effort, aligning emphasis areas, data-driven prioritization, and proven countermeasures with

SHSP strategy categories. It also strengthens the SHSP's intent through corridor- and intersection-specific action—e.g., “reduce high-risk movements” by modifying intersections and tracking measurable outputs—while supporting consistent messaging and collaboration across jurisdictional boundaries.

› Regionally

Scottsdale has shown leadership by using MAG's Road Safety Program as a practical regional partnership to study high-risk intersections, bring outside technical support to local problems, and position the City to implement evidence-based safety improvements as part of a broader Safe System strategy. The City has effectively engaged the program to deliver repeatable capital improvements. Nearly \$2.8 million in safety-prioritized capital improvements have been made in Scottsdale since 2019. The fiscal responsibility to the local government is substantial with only 10.2% of that investment shouldered by the City directly.

› Locally

Scottsdale Unified School District (SUSD) representatives responsible for Safe Routes to School (SRTS) initiatives provided critical feedback emphasizing that “school safety” must be treated as a **network access** and **neighborhood street safety** issue and as a set of point improvements at crossings immediately adjacent to school property. They expressed strong interest in safer neighborhood streets and route continuity so that students can travel safely **from home to school** across the full trip (applicable to all schools across the district).

Scottsdale Transportation Safety Planning coordination has an opportunity to improve Safe Routes initiatives that offer ongoing organizational support and coordination beyond one-off projects.

C. Vision: Safety is Priority #1

Safe Streets Scottsdale builds upon longstanding transportation policies already adopted by the City that prioritize safety, accessibility, and quality of life for all roadway users. The City's Transportation Action Plan (TAP) 2022 established a policy direction that transportation decisions should "prioritize people, safety and livability over motor vehicles and travel speed" and that the transportation network should "maximize travel route choices, travel mode choices, and access and mobility for all ages and abilities."

Consistent with these adopted policies, Scottsdale affirms that roadway safety is a core transportation priority and that fatal and serious injury crashes are preventable through coordinated, systemic action. Safe Streets Scottsdale advances this commitment by applying a Safe System Approach, which acknowledges concepts in Figure 3 (right).

The City recognizes that transportation safety is not solely the responsibility of individual roadway users. Safety outcomes are influenced by roadway design, land use patterns, operating speeds, visibility conditions, access management, signal operations, education, enforcement, and emergency response coordination. Accordingly, Scottsdale commits to advancing a transportation system that is increasingly self-explaining, context-sensitive, and forgiving of predictable human error.

This vision does not eliminate the importance of mobility, access, or economic vitality. Rather, it recognizes that long-term community prosperity depends upon a transportation system where residents, employees, and visitors can travel safely regardless of age, ability, or mode of transportation.

Safe System Approach



Figure 3 - Safe System Approach Principles

Safe Streets Scottsdale therefore commits the City to:

- Prioritizing reduction of fatal and serious injury crashes in transportation decision-making
- Applying data-driven safety analysis to roadway investments and operations
- Advancing safer conditions for people walking, bicycling, rolling, taking transit, and driving

- Supporting context-sensitive speed management strategies
- Continuing coordination among transportation, public safety, planning, parks, and regional partners
- Maintaining transparency and accountability through ongoing public reporting and evaluation

This Safety Action Plan serves as Scottsdale's framework for advancing these commitments over time through measurable, implementable, and continually evolving safety practices.

D. Safe System Principles

Safe Streets Scottsdale is grounded in the Safe System Approach that anticipates human mistakes, a transformational shift in traditional practice. This shift is meaningful for designing a transportation system that is more predictive to prevent crashes where possible and reduce the likelihood of death or serious injury when crashes occur. Consistent with national direction, the plan treats roadway fatalities and serious injuries as more preventable than traditionally acknowledged and supports the cultural and operational shift needed to sustain safety improvements over time.

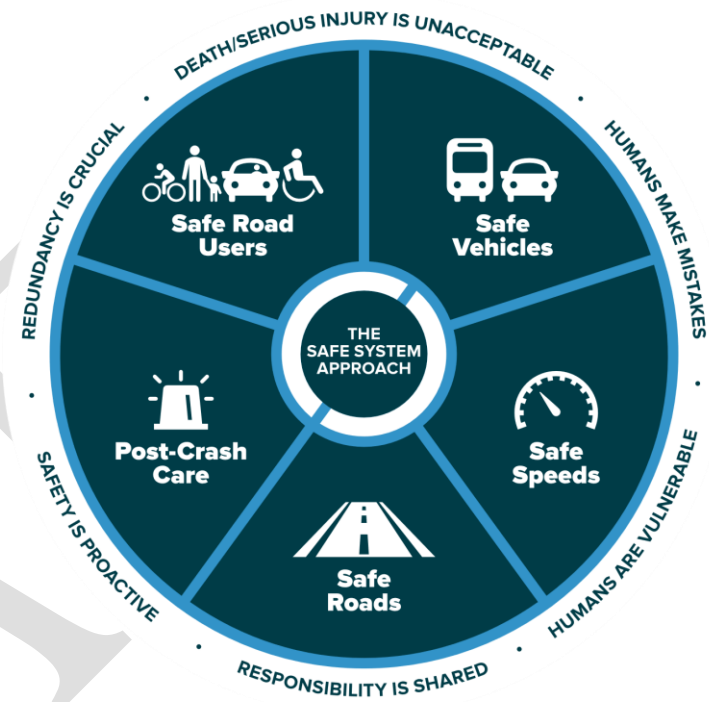


Figure 5 - Safe System Approach (FHWA)

› Human Error, Injury Tolerance, Shared Responsibility

In contrast to traditional safety practice that over-relies on perfect behavior, a Safe System explicitly recognizes that people make mistakes and that the human body has limits. This recognition requires a transportation system with **layers of protection** that prevent mistakes from becoming tragedies.

Implementing this plan means **treating common errors** (missed detection, distraction, misjudgment, wrong-way turns, failure to yield) **as foreseeable and/or inevitable**. Recognizing foreseeable user failure, the transportation professionals shall redesign or see



Figure 4 - Safe system shared responsibility

upstream solutions to prevent those errors from occurring or, when errors do occur, a potential crash results without high-energy conflicts.

In practice, “forgiving” design under a Safe System is not permissive of unsafe behavior, instead it is **protective of human life**. As the Safe System guidance describes, a Safe System “anticipate[s] and accommodate[s] errors by drivers and other road users,” including through strategies like **separating vulnerable road users from traffic by space or time where possible** and reducing the likelihood that predictable mistakes lead to deadly outcomes.

This commitment reflects the Safe System principle that **humans are vulnerable** and have physical limits for tolerating crash forces; therefore, the system must be “human-centric” and designed to accommodate those vulnerabilities. This is the core rationale for Safe System focus areas like **speed management, conflict reduction, and separation**.

Responsibility is shared across the entire transportation community that includes government at all levels, industry, advocacy, researchers, and the public. A Safe System succeeds only when every layer contributes to prevention and protection.

3. Emphasis Areas

A. Human Behavior

Safe Streets Scottsdale applies a Safe System lens to human behavior. the Safe System Approach that anticipates human mistakes. **Some emphasis areas require more time and resources.**



Figure 6 – Human Factors in Transportation

› Speeding

Speed is a consistent amplifier of crash severity and is a recurring theme in both the data and community feedback. Scottsdale’s approach is to manage operating speeds so inevitable errors do not translate into catastrophic crashes. This focus is especially important along higher-speed arterial corridors that serve commuter travel and include frequent turning movements, access points, and crossings. Speed Management is addressed in detail in **Section 3E**, including context-based strategies for arterials and neighborhoods and Scottsdale’s strong practice of coordinating automated photo enforcement for speed and red-light running with engineering-led location selection.

› Attention (Distraction and Inattention)

Community feedback highlighted distracted driving as a concern and expressed a desire for strategies that demand attentive driving. In Scottsdale’s crash patterns, severe outcomes are strongly associated with turning conflicts and intersection activity. Common errors

include missed detection, misjudgment, or late decision-making resulting in serious consequences. The plan prioritizes countermeasures that reduce the reliance on perfect attention by:

- **Reducing conflict complexity** (e.g., safer signal phasing, clearer turn control, reduced conflict points)
- **Improving visibility and predictability** (e.g., lighting, conspicuity, intuitive lane and crossing guidance)
- **Designing for safer turning speeds** using calming features to limit high-speed turning behavior.
 - See **Section 3C**
 - This highlights disparities in access to safe walking and bicycling facilities, particularly along routes to essential destinations such as schools, transit stops, parks, and commercial areas. In some locations, gaps in infrastructure and aging facilities may contribute to increased exposure to risk, even where crash data is limited or absent.

Vulnerable populations, including older adults and those with limited mobility options, may be disproportionately affected by these conditions. Scottsdale will prioritize investments in safety improvements along high-injury corridors and in areas with demonstrated need, ensuring that all residents have safe, reliable, and equitable access to essential destinations.

› **Designing for All Ages and Abilities**

Feedback suggests that existing infrastructure does not consistently provide comfortable experiences for users of all ages and abilities.

Many residents report being deterred from walking or bicycling due to perceived or actual safety risks, including high vehicle speeds, wide crossings, and limited separation from traffic.

Scottsdale will continue to advance an All Ages and Abilities framework to guide facility design, supporting children, older adults, and less confident users through low-stress, intuitive, and protected environments. This approach recognizes many different categories of vulnerable road users including older adults, who represent a significant share of Scottsdale's population, may experience reduced visibility, slower walking speeds, and increased injury risk. Designing for these users improves safety outcomes for all roadway users and aligns with the Safe System principle of accommodating human vulnerability.

› **Motorcycle Use and Vulnerabilities**

Motorcyclists face substantially higher fatality and serious injury risk than occupants of passenger vehicles because they lack the protective structure of an enclosed vehicle. However, motorcycle safety characteristics differ significantly from those of pedestrians and bicyclists, particularly in terms of roadway operations, crash patterns, and applicable countermeasures.

FHWA guidance defines vulnerable road users within the context of pedestrian, bicyclist, and other non-motorized users who operate outside the motor vehicle stream and are more susceptible to injury during conflicts with vehicles. Pedestrians and bicyclists generally travel at lower speeds and rely heavily on crossing treatments, separation from traffic, and reduced vehicle speeds for safety. In contrast, motorcycles operate as motor vehicles within the traffic stream, travel at speeds similar to other vehicles, and exclusively utilize general-purpose travel lanes.

As a result, motorcycle crashes are typically associated with factors such as roadway departure, speed, curve negotiation, sight distance, pavement conditions, and interactions with other motor vehicles. FHWA pedestrian and bicycle safety guidance focuses on

countermeasures such as protected intersections, curb extensions, refuge islands, separated bikeways, pedestrian crossings, and bicycle signal treatments that are specifically intended to reduce conflicts involving non-motorized users. These treatments do not directly address the predominant crash mechanisms associated with motorcycles.

FHWA guidance also distinguishes between vulnerable road user safety analysis and broader motor vehicle safety analysis. Current FHWA Vulnerable Road User safety assessment guidance focuses primarily on pedestrians, bicyclists, and other non-motorized users, while motorcycle safety is generally addressed through systemic roadway safety strategies applicable to motor vehicle operations.

Accordingly, **Scottsdale's Vulnerable Road User (VRU) High Injury Network (HIN) analysis focuses on pedestrians and bicyclists because their exposure characteristics, infrastructure needs, and applicable safety countermeasures are distinct from those of motorcycles.** Motorcycle safety remains an important component of the City's overall roadway safety program but is more appropriately evaluated within motor vehicle crash analysis and systemic roadway safety initiatives rather than within the VRU-specific framework.

B. Implications of Older Populations on Transportation Safety

Scottsdale's demographic profile is notably older than both the region and national averages, which has important implications for transportation safety planning and investment. Based on American Community Survey (ACS) 5-year estimates, **approximately 26.2% of Scottsdale residents are age 65 or older, compared to 17.4% in the Phoenix-Mesa-Chandler metropolitan area, and the city**

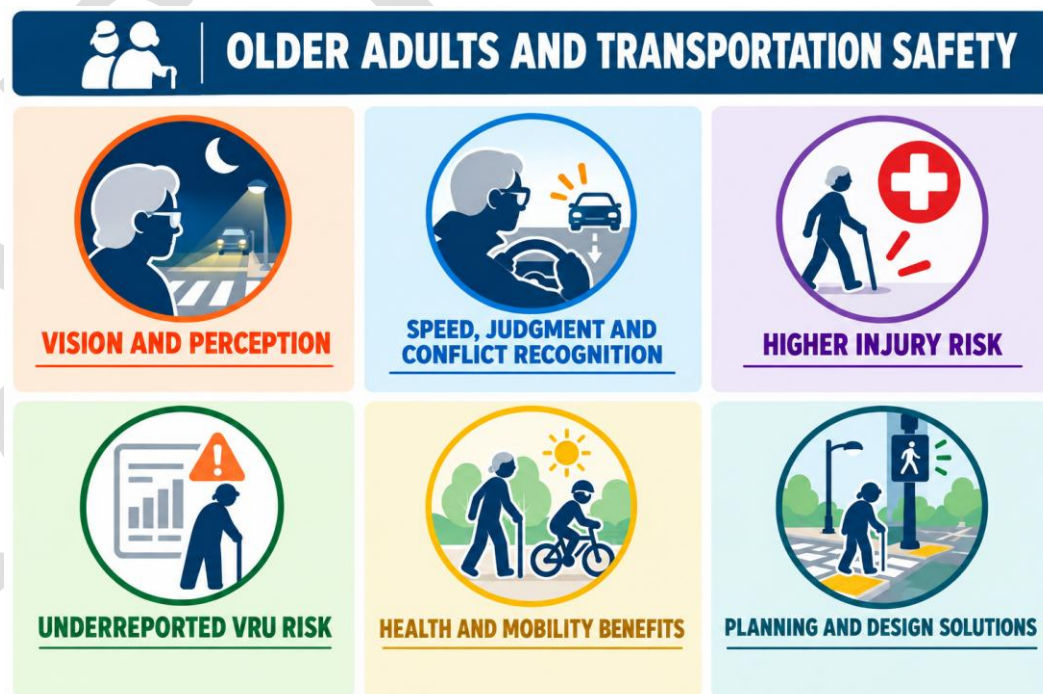


Figure 7 – Considerations for Older Adults

has a median age of 48.2 years, more than a decade higher than the regional median of 37.5 years. In total, this represents more than 63,000 older adults living in Scottsdale. This elevated share of older residents means a larger proportion of roadway users experience age-related physiological and perceptual changes that

affect how they interact with the transportation system as drivers, pedestrians, and bicyclists. These factors must be considered within the Safe System framework to ensure that roadway design and operations account for increased vulnerability and support safe, accessible mobility for all users.

› **Age-Related Changes in Vision and Perception**

Aging is associated with measurable declines in visual performance that directly affect roadway safety. Research from the Federal Highway Administration (FHWA) indicates that older adults experience reduced pupil size and lens transparency, which decreases the amount of light reaching the retina and reduces visibility, particularly under low-light conditions (FHWA). Older adults also have diminished contrast sensitivity, making it more difficult to detect pedestrians, bicyclists, and other roadway users against complex or low-contrast backgrounds (FHWA).

In addition, sensitivity to glare increases with age, and recovery from glare takes longer. These factors can significantly impair the ability to identify hazards at night or in environments with oncoming headlights or bright lighting. As a result, visibility-related challenges are most pronounced during nighttime conditions, when pedestrian fatality risk is substantially higher than during daytime conditions (NHTSA). Collectively, these changes reduce the margin for error in detecting and responding to conflicts, particularly at intersections and along corridors with high activity levels.

› **Speed, Judgment, and Conflict Recognition**

Older drivers may also experience reduced ability to judge speeds and gaps in traffic, along with slower reaction times (NHTSA; CDC). These changes can increase the likelihood of conflicts during turning movements, gap acceptance, and interactions with pedestrians and

bicyclists. At the same time, older pedestrians often walk at slower speeds and require longer crossing times, which increases exposure within intersections and midblock crossings.

These conditions are particularly relevant in the context of Scottsdale's identified high-risk environments, including wide arterial roadways, complex intersections, and locations with frequent turning movements. Without design accommodations, these environments can place disproportionate risk on older users.

› **Increased Injury Severity and Fatality Risk**

In addition to increased exposure to risk, older adults are more likely to experience severe outcomes when crashes occur. National research indicates that age-related physical fragility is a primary factor in elevated fatality rates, accounting for a substantial share of increased mortality among older roadway users (NHTSA). Older adults have higher fatal crash rates per mile traveled compared to most other age groups and are more likely to die from injuries sustained in similar crash conditions (CDC).

For vulnerable road users, this increased fragility is particularly critical. Even at lower vehicle speeds, crashes involving older pedestrians or bicyclists are more likely to result in serious injury or fatality. These outcomes are not fully captured through crash frequency alone, reinforcing the need to consider severity risk and user vulnerability in safety analysis and prioritization.

› **Relationship to Underreported VRU Risk**

The limitations of crash data further compound these challenges. As described in the preceding section, many pedestrian and bicyclist incidents, particularly those that are non-fatal or occur outside the roadway, are not captured in police-reported datasets. Older adults may be disproportionately affected by these gaps, as falls, near-

misses, and lower-severity incidents can still have significant health consequences but may not be recorded in traditional crash data systems.

This reinforces the importance of a systemic approach to safety that identifies risk based on roadway characteristics, user context, and exposure, rather than relying solely on reported crash history.

› **Public Health and Mobility Benefits**

While older adults face increased safety risks, safe and accessible walking and bicycling environments provide substantial health and mobility benefits. Physical activity is associated with improved strength, balance, and coordination, which can reduce fall risk and support independent living as people age (CDC). Access to safe active transportation options also supports overall health outcomes and can help reduce long-term healthcare burdens associated with inactivity and chronic disease.

From a planning perspective, investments in safer pedestrian and bicycle infrastructure serve not only as safety interventions but also as public health strategies that support aging in place and improve quality of life.

› **Planning and Design Implications**

Recognizing these factors, Scottsdale's Safety Action Plan emphasizes design and operational strategies that account for the needs of older users and reduce systemic risk. Key considerations include:

- Enhanced roadway lighting and visibility treatments to address reduced nighttime detection
- High-contrast markings and improved delineation of crossings and conflict areas

- Longer crossing times and accessible signal timing at intersections
- Reduced turning speeds through geometric design and signal control strategies
- Speed management along corridors with high pedestrian activity
- Proactive identification of risk through systemic analysis, including the High Injury Network

By incorporating the needs of older adults into safety planning, Scottsdale advances a Safe System approach that reduces the likelihood and severity of crashes while supporting safe, active, and independent mobility for a growing segment of the population.

› **Benefits for Safety Analysis**

By grouping crash locations into broader functional categories, the analysis better reflects the underlying safety problems:

- Intersections → turning and crossing conflicts
- Access points → entering/exiting conflicts
- Segments → speed and exposure-related risks

This allows for clearer identification of dominant crash patterns. Tables on the following pages provide a snapshot of data for the following analysis.

Simplifying the original junction-related crash codes into broader functional categories improves the usefulness of the crash analysis for prioritization. Rather than treating each coded crash location type as a separate category, the simplified framework groups locations by the type of conflict environment they represent. This makes the results easier to interpret and more directly tied to countermeasure selection.

The data indicate that **intersections are the dominant crash environment for both all-mode crashes and VRU crashes**, particularly for non-incapacitating and possible injury crashes. In the all-modes dataset, intersections account for **55.1 percent of KA crashes** and **67.8 percent of B-injury crashes**, with more than 10,700 total crashes assigned to the intersection category. This suggests that a substantial portion of the systemwide injury burden is associated with turning, crossing, merging, yielding, and signal-control conflicts. This finding is consistent with national safety guidance, which identifies intersections as planned points of conflict and emphasizes their importance in pedestrian and bicyclist safety analysis.

For VRU-only crashes, the pattern is more nuanced. Intersections still represent the largest single category, accounting for **42.7 percent of KA VRU crashes** and **56.5 percent of B-injury VRU crashes**. However, **segments also account for a very large share of severe VRU crashes**, representing **38.5 percent of KA VRU crashes**. This indicates that VRU risk is not limited to crossings or signalized locations. Midblock exposure, high operating speeds, inadequate separation, limited crossing opportunities, poor lighting, and gaps in pedestrian or bicycle networks may also be contributing to the most severe VRU outcomes.



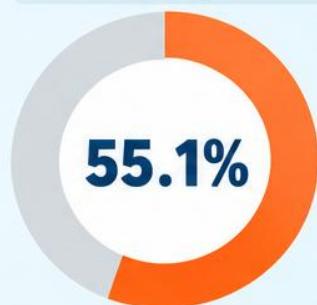
INTERSECTIONS ARE THE DOMINANT CRASH ENVIRONMENT



ALL-MODES CRASHES

KA CRASHES

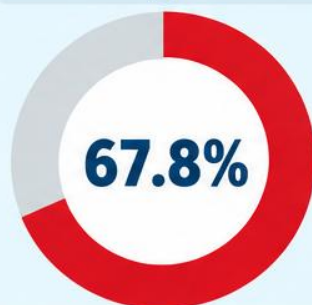
Fatal & Serious Injury
(K or A)



occur at intersections

B CRASHES

Suspected Minor Injury
(B)



occur at intersections



55.1%

Intersection



5.9%

Interchange/
Ramp



4.4%

Access
(Driveway/Alley)



31.3%

Segment
(Non-Intersection)



9.7%

Unknown/
Other

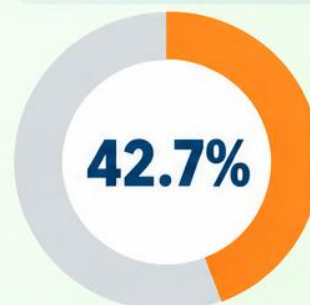
10,737 total crashes at intersections



VRU-ONLY CRASHES (PEDESTRIANS AND BICYCLISTS)

KA CRASHES

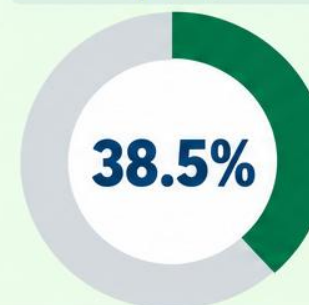
Fatal & Serious Injury
(K or A)



occur at intersections

KA CRASHES

Fatal & Serious Injury
(K or A)



occur on segments
(non-intersection roadways)



42.7%

Intersection



15.6%

Interchange/
Ramp



2.1%

Access
(Driveway/Alley)



38.5%

Segment
(Non-Intersection)



18.8%

Unknown/
Other

Figure 8 – Intersection Crashes, All Modes vs VRU

Table 1 - Simplified Junction-Related Categories

Original Category	Simplified Category
INTERSECTION_	Intersection
INTERSECTION_NON_INTERCHANGE	Intersection
INTERSECTION_RELATED_	Intersection
INTERSECTION	Intersection
ENTRANCE_EXIT_RAMP*	Interchange/Ramp
FRONTAGE_ROAD_INTERCHANGE	Interchange/Ramp
DRIVEWAY_OR_ALLEY	Access
ALLEY_ACCESS_RELATED	Access
NOT_JUNCTION_RELATED	Segment
THRU_ROADWAY	Segment
FRONTAGE_ROAD_NON_INTERCHANGE	Segment
CROSSOVER_RELATED	Segment
MEDIAN_CROSSOVER_RELATED	Segment
RAILWAY_GRADE_CROSSING	Segment
WRONG_WAY_DRIVING	Segment
UNKNOWN_NON_INTERCHANGE	Segment
UNKNOWN_JUNCTION	Unknown/Other
OTHER	Unknown/Other
Not Reported	Unknown/Other

Table 2 - Crash Share per Category, All-Modes (KSI, KA emphasis)

Simplified Categories	KA	B	C	O	Crash Counts
Intersection	55.1%	67.8%	66.6%	59.5%	10737
Interchange/Ramp	5.9%	5.6%	6.2%	3.6%	753
Access (Driveway/Alley)	4.4%	1.6%	2.5%	2.1%	377
Segment	31.3%	25.2%	24.8%	33.1%	5333
Unknown/Other	9.7%	3.8%	2.0%	1.0%	308
<i>Full Share Check</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	
Crash Counts per Injury Severity	454	2643	2551	11761	17409

Table 3 - Crash Share per Category, VRU-only (KSI, KA emphasis)

Simplified Category	KA	B	C	O	Crash Counts
Intersection	42.7%	56.5%	56.3%	54.5%	320
Interchange/Ramp	15.6%	17.3%	27.1%	24.2%	122
Access (Driveway/Alley)	2.1%	2.7%	3.5%	3.0%	17
Segment	38.5%	30.6%	31.3%	36.4%	196
Unknown/Other	18.8%	11.0%	9.0%	7.1%	66
<i>Full Share Check</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	
Crash Counts per Injury Severity	96	255	144	99	594

› Impairment (Alcohol and Drug Involvement)

Impairment remains a high-severity risk factor, particularly in nighttime and nightlife contexts. Scottsdale’s emphasis is twofold: (1) targeted enforcement and prevention programs that are fair, data-driven, and coordinated with operations; and (2) engineering that reduces the consequences of impaired errors through speed management, safer intersection design, and improved nighttime visibility.

While drug involvement is evenly split between daylight and dark conditions, alcohol involvement is more prevalent in after dark. Statistically, alcohol risks shift to evenings and nights.

Table 4 - KSI Crashes, Impairments

Impairments	KSI Crash Counts	KSI % Share
Drug Involvement	14	3.1%
Alcohol Involvement	56	12.3%
Not Impaired/Unknown	384	84.6%
Total	454	100.0%

Table 5 - KSI with Alcohol Involvement, Daylight and Dark Conditions

	KSI Daylight	KSI Dark
Alcohol Involvement	17 (30%)	39 (70%)

Nighttime risk and visibility strategies are addressed in **Section 3H**.

› Scottsdale Context and Direction

The plan’s engagement findings and existing practices reinforce the following priorities for behavior-related risk reduction:

- **Excessive speeds and turning movements** are repeatedly identified as a danger to all road users, especially in urban development areas and along key walking and biking routes and crossings.
- **Data-informed enforcement** is already a strong practice (photo enforcement coordinated with engineering), and the plan supports expanding this model where warranted.
- **Behavioral risks are best addressed systemically**—by pairing enforcement and education with design changes that make safe behavior more natural and expected.

C. Vulnerable Road Users (VRUs)

› Pedestrians & Bicyclists

Questionnaire and stakeholder feedback consistently identified a need for improved continuity, safety, and comfort within Scottsdale’s pedestrian and bicycle networks. These concerns are reinforced by national research indicating that traditional crash data does not fully capture the risks experienced by vulnerable road users. Many pedestrian and bicyclist incidents, particularly those that are non-fatal or occur outside the roadway such as in parking lots, driveways, or shared-use paths, are not included in police-reported datasets (FHWA; NHTSA). As a result, reliance on reported crash history alone may underrepresent the true extent and distribution of risk, underscoring the importance of a systemic and context-sensitive approach to improving conditions for people walking and bicycling.

Specific to the crash trends and severity of injuries, Table 15 - Crash Count by Injury Severity & Mode Comparison (2019 – 2023)Error! Reference source not found. in the [Safety Countermeasures and Strategies](#) captures the risk multipliers of the VRU category. See below for abbreviated version.

Table 12 [Abbreviated] – Crash Count by Injury Severity & Comparison (2019-2023)

Injury Severity	All Modes		VRU-Only		Comparison
	Crash Counts	Percent Share	Crash Counts	Percent Share	VRU Overrepresentation Multiplier
Fatal (K)	76	0.4%	20	3.4%	7.71 <i>771% increased share</i>
Serious Injury (A)	378	2.2%	76	12.8%	5.89 <i>589% increased share</i>

VRU Overrepresentation Multiplier: The ratio of vulnerable roadway users’ share of injury outcomes compared to overall transportation-system ratio of the same injury outcome per crash. A value greater than 1.0 indicates that the group experiences severe crashes disproportionately relative to all crash records collected with injury data.

As a mathematical expression:

$$\text{VRU Overrepresentation Multiplier} = \frac{\text{VRU Percent Share of Injury (i.e. fatality)}}{\text{All Modes Share of Same Injury}}$$

› Closing Network Gaps and Improving Connectivity

Community feedback indicates that gaps in pedestrian and bicycle infrastructure, particularly at intersections, crossings, and along major corridors, create barriers to safe and convenient travel. Disconnected facilities reduce usability and can increase exposure to traffic conflicts as users navigate incomplete or inconsistent routes.

These risks may not always be reflected in crash data but are frequently identified through community input and field observations.

Scottsdale should continue to prioritize closing network gaps, improving transitions between facilities, and ensuring continuous routes that connect neighborhoods to schools, parks, transit, and commercial destinations. Walk audits and community engagement activities also highlighted strong appreciation for grade-separated facilities such as underpasses, which reduce conflicts with motor vehicles and provide a higher level of comfort and safety for users of all ages.

› Reducing Exposure to Traffic and Managing Conflicts

Respondents identified vehicle speeds, turning movements, and conflicts with motor vehicles as major safety concerns, particularly at intersections and along high-volume roadways. These conditions are well-established contributors to severe pedestrian and bicyclist crashes but may be underrepresented in crash frequency data alone, especially in locations where near-misses or unreported incidents occur.

A Safe System approach emphasizes reducing speeds, separating users where feasible, and managing conflict points to minimize both crash risk and severity. Scottsdale can build on its existing practices by advancing design strategies such as traffic calming, protected crossings, intersection visibility improvements, and turn management treatments. These approaches are particularly important in addressing nighttime visibility challenges and age-related limitations in perception, which can affect both drivers and pedestrians.

› Advancing Access to Essential Destinations

Community input highlights disparities in access to safe walking and bicycling facilities, particularly along routes to essential destinations such as schools, transit stops, parks, and commercial areas. In some locations, gaps in infrastructure and aging facilities may contribute to increased exposure to risk, even where crash data is limited or absent.

Vulnerable populations, including older adults and those with limited mobility options, may be disproportionately affected by these conditions. Scottsdale will prioritize investments in safety improvements along high-injury corridors and in areas with demonstrated need, ensuring that all residents have safe, reliable, and equitable access to essential destinations.

D. Intersections

The crash records (see Appendix A: Data tables and maps (HIN, crash trends) included a wide range of detailed intersection, or junction-related, descriptors representing various roadway contexts, including multiple intersection subtypes, interchange conditions, access points, and non-junction roadway segments. While these detailed categories are useful for raw data collection, their level of granularity introduces complexity and limits their effectiveness for systemic safety analysis and countermeasure selection.

To improve clarity and analytical usefulness, the junction-related variables were consolidated into five simplified categories, as prioritized:

1. **Intersection**
2. **Interchange/Ramp**
3. **Access (Driveway/Alley)**
4. **Segment (Non-Intersection Roadway)**

5. Unknown/Other

This consolidation groups similar roadway contexts based on how crashes occur and the types of conflicts present, rather than preserving highly specific but analytically redundant distinctions.

Both questionnaire feedback and crash data show a desire for safety improvements at intersections. See the focused intersection HIN prepared for prioritizing these improvements where needs and crash severity show the highest need. See Table 6 - All-Mode HIN Intersections below.

Table 6 - All-Mode HIN Intersections

Rank	Roadway 1	Roadway 2	All-Mode HIN Tier
1	East Thomas Road	North Hayden Road	1
2	East Pinnacle Peak Road	North Scottsdale Road	1
3	East Camelback Road	North Goldwater Boulevard	1
4	East McDowell Road	North Hayden Road	1
5	North Silverbell Road	North Frank Lloyd Wright Boulevard	1
6	East Shea Boulevard	North Scottsdale Road	1
7	East Shea Boulevard	North 96th Street	1
8	East Osborn Road	North 68th Street	1
9	East McKellips Road	North Miller Road	1
10	East McDowell Road	North Granite Reef Road	1
11	East 2nd Street	North Goldwater Boulevard	1
12	East Thomas Road	North 64th Street	1
13	East Pinnacle Peak Road	North Pima Road	1
14	East Carefree Highway	North Scottsdale Road	1
15	East McCormick Parkway	North Hayden Road	1

Rank	Roadway 1	Roadway 2	All-Mode HIN Tier
16	East McDowell Road	North Miller Road	2
17	East Osborn Road	North Drinkwater Boulevard	2
18	East Indian School Road	North Scottsdale Road	2
19	East Shea Boulevard	North 124th Street	2
20	East Cactus Road	North Hayden Road	2
21	East McDonald Drive	North Hayden Road	2
22	East Earll Drive	North Miller Road	2
23	Bartlett Dam Road [FR 205]	North Cave Creek Road	2
24	East Shea Boulevard	North 69th Street	2
25	North Pima Road	North 87th Street	2
26	East Oak Street	North Scottsdale Road	2
27	East Osborn Road	North Miller Road	2
28	Arriba Dr	North North sight Boulevard	2
29	North Frank Lloyd Wright Boulevard	North Thompson Peak Parkway	2
30	East Indian School Road	North 68th Street	2
31	East Osborn Road	North Scottsdale Road	3
32	East Jomax Road	North Pima Road	3
33	East Chaparral Road	North Scottsdale Road	3
34	East Happy Valley Road	North Scottsdale Road	3
35	East Williams Drive	North Miller Road	3
36	East Virginia Ave	North Scottsdale Road	3
37	East Frank Lloyd Wright Boulevard	North Hayden Road	3
38	East Via Linda	East San Salvador Drive	3
39	East Indian School Road	North Buckboard Trail	3
40	East Thomas Road	North 68th Street	3
41	East Indian Bend Road	North Scottsdale Road	3

Rank	Roadway 1	Roadway 2	All-Mode HIN Tier
42	North Silverbell Road	North 114th Street	3
43	East Camelback Road	North Marshall Way	3
44	East Dynamite Boulevard	North Pima Road	3
45	East Indian Bend Rd	North Hayden Rd	3

Scottsdale has a history of roundabout-first intersection approach. This fits the well in most of the suburban context of the City. The intersection does raise some opposition, as noted in 2025 design decisions and within the responses to the questionnaire. Even so, the safety data is quite conclusive and is congruent with other stated priorities from a majority of sentiments coming from both the public and key advisors.

› Key Features of Safe Intersection Design

The key to safe intersection is reducing kinetic energy, improving angles of potential crashes to be more acute (small angle, far less than 90 degrees), and reducing points of conflict where those factors are greatest. Kinetic energy relates to vehicles operating speeds and their weight.

A roundabout, for example, significantly reduces these factors by navigating the curves in contrast with vehicles taking a straight path through the traditional 4-way intersection. The curves not only inspire reduced speeds but also promote driver attentiveness as the geometry challenges navigation and comprehension more than a straight route. Furthermore, a roundabout reduces the likelihood of collisions as it has only eight vehicle conflict points, while a traditional intersection has 32. Upholding a “roundabout first” design priority is fitting for the commitments described in [SAFE SYSTEM PRINCIPLES](#). Transportation engineers are to consider the

roundabout as an intersection design solution as an intersection design option for the safety benefits it provides (among other liability benefits).

Ongoing evaluation processes will be important for future updates to this plan. The 5-year crash analysis (2019-2023) evaluating intersections (or junctions) for crash concentrations and injury severity, we can see intersections with a roundabout design statistically performed better on safety. The HIN maps identify intersections of concern. See both the All-Mode and VRU-specific HIN analysis for the list of intersections with high concentrations of crashes and crash severity.

There are design details that are important to pedestrian and bike safety. Survey results echo this concern as did the walk audit. More nuanced guidance will be provided in the countermeasure toolkit.

› **Pedestrian Crossing Treatments**

A recognized safety concern at signalized intersections involves the right- and left-turning vehicles present a danger to pedestrians crossing during the WALK interval, and crash statistics reveal that pedestrians are especially vulnerable to crashes involving left-turning vehicles. This holds true for Scottsdale, as supported by the crash analysis.

The City has implemented crossing treatments with guidelines effective as of January 2020. In terms of intersection design, this is a relatively new document, as intersection reconfigurations are a process that often take multiple years of planning, funding, design, and construction procedures before realized. To recognize this means these policies are not mature enough to offer a significant evaluation period.

To complement the City's guide, an additional important resource that is advisable for VRU safety efforts is the [FHWA Toolbox of Pedestrian Countermeasures and Their Potential Effectiveness](#). Of these countermeasures, this plan will utilize the crash analysis findings to recommend and formally make the case for their implementation and the VRU HIN offers prioritized locations for design and installation to occur. Referring to FHWA documentation is advisable when pursuing implementation funds from federal and state agencies.

A recommended adaptation to the policy is to incorporate a Leading Pedestrian Interval (LPI) into the guidelines to better address a crash and conflict type that is disproportionately represented in **pedestrian conflicts with turning vehicles at signalized intersections** (per analysis findings) and to align Scottsdale's practice with peer-reviewed Arizona research and national best practice. The attached draft guide frames LPIs as a practical, operations-focused countermeasure that complements the City's existing crossing guidelines, while offering an approach to screening, implementation, and evaluation (e.g., conflict-based screening such as PET/near-miss review, typical LPI timing ranges, consideration of turning movement operations, and before/after monitoring). In doing so, the update strengthens Scottsdale's ability to deploy a proven, low-cost safety treatment as part of Safe Streets Scottsdale implementation without waiting for a long evaluation cycle of major capital intersection reconstructions. This is specifically targeting pedestrian-priority contexts such as school and transit environments and VRU High-Injury Network segments.

According to reports on CMF Clearinghouse, a **reduction of 13% to 19% is expected between vehicle-pedestrian crashes** when changing the condition from a signalized intersection to a newly

deployed LPI. An additional [case study, published by TRB \(Publication No. 1734, 2000, p. 86-91\)](#), suggests that there are added benefits for the elderly population of which Scottsdale has a larger concentration relative to the MAG region on average.

HIN maps identify the top 30 most concerning intersections (or junctions), one with a special focus on VRU-involved crashes.

Table 7 - VRU HIN Intersections

Rank	Roadway 1	Roadway 2	VRU HIN Tier
1	East Camelback Road	North Goldwater Boulevard	1
2	East Granada Road	North Scottsdale Road	1
3	East Camelback Road	North Parkway Avenue	1
4	East Shea Boulevard	North Scottsdale Road	1
5	East Virginia Ave	North Scottsdale Road	1
6	East McDowell Road	North Granite Reef Road	1
7	East Osborn Road	North Scottsdale Road	1
8	East Camelback Road	North Scottsdale Road	1
9	East Via Linda	North 100th Street	1
10	North Pima Road	North 87th Street	1
11	East Earll Drive	North Miller Road	2
12	East Cochise Road	North Scottsdale Road	2
13	East McDowell Road	North Scottsdale Road	2
14	East Royal Palm Road	North Hayden Road	2
15	East Via Camello	North Hayden Road	2
16	East Queens Wreath Lane	North 105th Street	2
17	East Shea Boulevard	North 128th Street	2

Rank	Roadway 1	Roadway 2	VRU HIN Tier
18	East Joan De Arc Avenue	North Scottsdale Road	2
19	East Indian School Road	North Buckboard Trail	2
20	East Mountain View Road	North 107th Street	2
21	East Thomas Road	North Scottsdale Road	3
22	East SkySong Boulevard	North Scottsdale Road	3
23	East 3rd Avenue	North Scottsdale Road	3
24	East 3rd Avenue	North Scottsdale Road	3
25	East McDowell Road	North Hayden Road	3
26	East McCormick Parkway	North Hayden Road	3
27	East Osborn Road	North Drinkwater Boulevard	3
28	East Monterey Way	North Miller Road	3
29	East McDowell Road	North 79th Street	3
30	East Legacy Boulevard	North 94th Street	3

› Turning Movements

Given the proportion of KSI crashes between VRUs and turning vehicles, modifying right-turning and left-turning geometry is a worthy safety countermeasure to consider in the scoping of any intersection design project.

According to the analysis from **turning movement crash analysis** (See Appendix A: Data tables and maps (HIN, crash trends)) prioritization, the findings support a **tiered approach**. First priority

indicated a benefit from an **intersection emphasis** that prioritizes high-crash and high-injury intersections for turn conflict reduction, signal timing improvements, visibility enhancements, leading pedestrian intervals, protected or separated bicycle crossings, centerline hardening, and curb extensions.

Overall, the data indicates that safety investments should not be limited to the locations with the highest total crash counts. A balanced prioritization process should consider **crash frequency, injury severity, user vulnerability, and conflict type**. This is consistent with FHWA practices, where agencies use crash severity and concentration to focus limited resources on locations with the greatest potential for fatal and serious injury reduction.

Vehicles making traditional turning movements in an intersection can misuse the generous geometry to turn at higher than safe speeds. For example, reducing right-turn radius from 40-feet to 10-feet is expected to result in a 39% reduction in pedestrian crashes due to a significant lowering of vehicle turning speeds. Best practice for an urban context promotes 15-feet or less for curb radii (per North American City Transportation Officials, NACTO).



Cement pillow, Portland (credit: Steven Vance)

Figure 9 – Right Turn Calming Treatment

Extending the nose of a physical median toward the intersection is an effective left-turn calming treatment that reduces sweeping, high-speed turns and improves yielding behavior. Often referred to as centerline hardening, the treatment narrows the effective turning path and encourages drivers to make slower, more perpendicular left turns through the conflict area. Where truck access is necessary, the median nose may include a mountable curb or apron so larger vehicles can encroach at low speed while still constraining passenger vehicle movements.

Collision injury analysis shows a sizable increase in the injury severity for left turns. This makes left turn calming important for all modes but especially at intersections identified in the VRU HIN for intersections.

NACTO guidance notes that “drivers yield more frequently to people walking and biking when speeds are low” and identifies centerline hardening as a strategy that can “reduce the speed of turns across the bikeway and shorten the conflict zone.” FHWA guidance similarly

emphasizes reducing turning speed and conflict severity as core Safe System strategies for intersection design. Supporting CMF research for **urban traffic calming treatments indicates an approximate CMF of 0.68, corresponding to a crash reduction of about 32 percent.** This treatment is especially effective at intersections with documented turning conflicts involving pedestrians, bicyclists, or opposing traffic.

Practical applications with VRU focus in Scottsdale include:

- Extending median noses into the intersection to tighten left-turn geometry.
- Using mountable curbs or aprons where bus, emergency, or truck access is required.
- Pairing the treatment with pedestrian refuge islands or protected bike facilities.
- Applying centerline hardening at skewed intersections to reduce “corner-cutting.”
- Using vertical delineation, curb extensions, or hardened centerlines to visually narrow the receiving roadway.
- Prioritizing installation at locations with high turning speeds, pedestrian activity, or recurring left-turn crashes.



Figure 10 – Centerline hardening in Chicago, IL
Credit: Chicago Department of Transportation

All-Mode HIN for intersections should take further care to tend to driver safety as well.

Practical applications with driver focus in Scottsdale include:

- Protected Left-Turn phases; something already very common in the region to provide dedicated time in the light cycle dedicated to left-turning drivers.

Note: Combining the 2 practical applications above, an all-red interval with a protected left-turn phase, rates well in the Crash Modification Factor (CMF) research. A combination of countermeasures can be a technical matter that a qualified road safety professional should assist with to properly forecast benefits.

- Left turn calming, while generally good for VRUs, may also address the single-vehicle KSI crash rate. Calming turning movements can impose safer driving decisions.

E. Access Management

With a common crash type being left turns at uncontrolled locations (such as driveways or local streets intersecting arterials), raised medians that limit left turns across multiple lanes can produce significant crash reductions for all severities (reductions of 32% to 47%). The trade-off requires acceptance of less frequent openings for left turn movements provided by the open two-way left turn lane (TWLTL) condition. These turns are often across 2-3 lanes of traffic moving at speeds in excess of 45 MPH, sometimes with stopped traffic obscuring the visibility of drivers to all lanes of traffic. Conversions have been successful in Scottsdale, converting TWLTLs to raised medians with left turns in designated locations with more restrictions and more likely forcing what previously was a left-turn into a right-turn followed by a U-turn.

A common concern is the business interest and potential impact to business or property value affected by access management. A operations study published by FHWA may serve as evidence to mitigate such concerns titled, ["SAFE ACCESS FOR EVERYONE IS GOOD FOR BUSINESS"](#) (FHWA, 2024) with Chapter 7 directly addressing Access Management.

F. Speed Management

Speed is the single most influential factor determining whether a crash results in a fatality or serious injury. Under a Safe System approach, the City's objective is not simply to post speed limits, but to manage operating speeds so that inevitable human errors do not produce catastrophic outcomes. This countermeasure is particularly applicable where people walking, biking, or using mobility devices are present.

Safety analysis indicates that the most severe injuries are disproportionately associated with higher-speed environments and higher-speed conflict points along arterial corridors that function as heavily traveled commuter routes. These facilities carry large traffic volumes and higher operating speeds, resulting in higher kinetic

energy impacts and fewer safe recovery options for all road users. In contrast, neighborhood streets often experience different speed-related risks associated with shorter trip lengths, higher driveway and local crossing activity, and greater exposure for people walking and biking. While the context differs, speed management remains essential in both settings with context-sensitive interests to weigh.

Crash trends also flag speeding as a recurring contributing factor, including crashes recorded as occurring **10+ mph over the posted speed limit**. While this indicator is useful for identifying patterns, it is an imperfect measure because it relies on reporting and may not capture actual operating speeds consistently. For that reason, crash-coded speeding indicators are simply one among many inputs to better target strategies and evaluate results.

Public engagement reinforces the importance of speed management as a priority safety strategy. Results from the project questionnaire indicate **significant community support for speed management countermeasures**, reflecting broad recognition that lower operating speeds improve safety and comfort for all road users. This support provides a strong foundation for implementation, particularly when



Figure 11 - Access Management & Intersection Improvements on Thomas Rd. (Courtesy of Google Street View)

paired with clear communication about expected safety benefits, trade-offs, and performance measures.

The City should celebrate the coordination between **automated camera enforcement** and the City's traffic engineering functions in place. Existing practices demonstrate a strong model in which enforcement resources are not deployed opportunistically, but are instead **prioritized through a collaborative, data-informed process** that considers operating speeds, crash history and severity, roadway context, and community concerns. This coordination supports transparent, defensible location selection, aligns enforcement with engineering-led speed management objectives, and improves the City's ability to evaluate outcomes and adjust deployments over time. **More deployments appear warranted.**

Speed management in this Safety Action Plan is implemented through a coordinated, context-based set of actions that align engineering, operations, and enforcement:

- **On commuter arterials:** prioritize self-enforcing speed outcomes through roadway design and signal operations that reduce conflict severity and limit high-risk maneuvers; pair with targeted enforcement and communications where warranted.
- **In neighborhoods and local streets:** prioritize context-appropriate speed reduction through traffic calming, gateway treatments, and design that supports safe yielding and crossing behavior.

Specific speed management treatments and related implementation considerations are detailed in the **Countermeasures** section (see cross-references to roadway reconfiguration, intersection safety, pedestrian crossing improvements, and neighborhood traffic

calming). Together, these approaches identify where speed is most strongly linked to severe injury risk, apply the most effective countermeasures for the roadway context, and measure progress using consistent operating-speed and crash outcome indicators.

G. Nighttime/Visibility

Dark conditions show a strong disproportionate risk to pedestrians, especially in Scottsdale's nightlife scene. The City is deploying streetlight improvement districts which is a sign of recognition to the problem with more work to be done.

Nightlife and evening entertainment contexts with a concentration of dark condition pedestrian crashes warrant more complementary countermeasures for compounding safety benefits beyond lighting. FHWA identifies modern roadway lighting as a **Proven Safety Countermeasure** and reports that, when appropriately applied, lighting can reduce **nighttime injury pedestrian crashes at intersections by up to 42%**.



[FHWA RECOMMENDS CROSSWALK LIGHTING](#) that creates **positive contrast**, so pedestrians appear brighter than the background. Place luminaires in forward locations (upstream of the crossing relative to approaching vehicles) to avoid silhouette effects and improve nighttime driver detection at midblock crosswalks.

In addition to documenting this safety benefit, FHWA recommends **targeted lighting investments** based on a history of nighttime crashes, traffic volume, the volume of non-motorized users, the presence of raised crosswalks, and the presence of transit stops and boarding activity—factors that often converge in nightlife districts.

In practice, this supports a “bundle” approach in Scottsdale’s nightlife settings: deploy lighting where risk and exposure are highest, while pairing it with speed management, high-visibility crossings, daylighting, and other crossing-focused treatments to address visibility, conflict, and operating speed simultaneously.

Furthermore, the **City can regulate countermeasures proactively in the event of future land use patterns emerging with a concentration of businesses supporting nightlife and evening entertainment focus.**

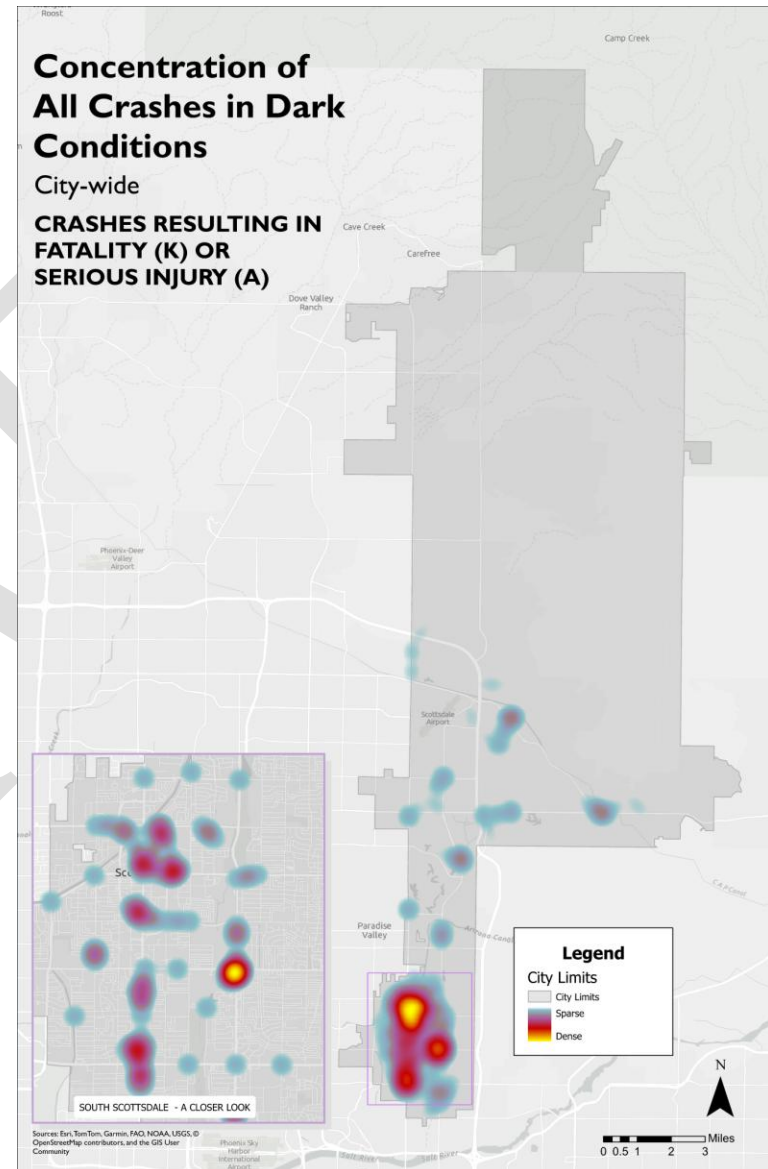


Figure 12 – Map: Nighttime Crash Concentrations

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H. Heat Context

› Extreme Heat as a Risk Multiplier in the Safe System

The Safe System approach recognizes that **humans are physically vulnerable, errors are inevitable, and safety must be proactively designed into the transportation system**. In Scottsdale, extreme heat is a critical environmental condition that amplifies these underlying risks, particularly for vulnerable road users (VRUs).

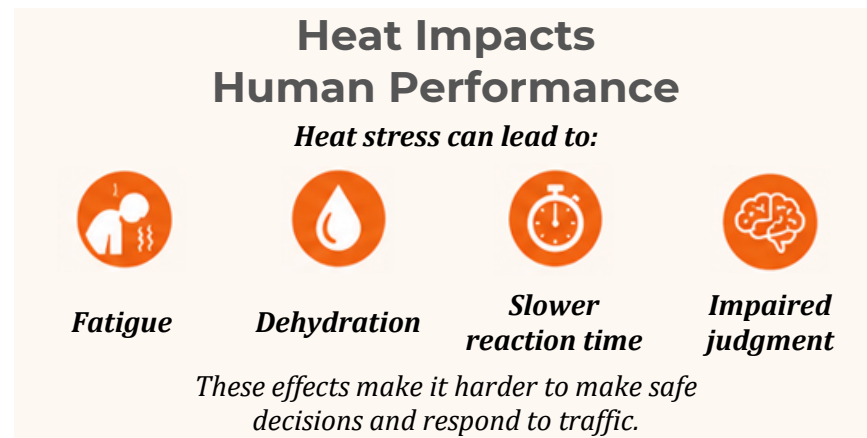


Figure 13 - Impacts of Heat

› Physiological Impacts and Human Performance

Extreme heat directly affects human performance and decision-making in the transportation environment. Heat exposure can lead to fatigue, dehydration, slower reaction times, and impaired judgment. These effects reduce a person's ability to safely navigate streets, judge gaps in traffic, and respond to conflicts. For pedestrians and bicyclists who are fully exposed to environmental conditions grow more vulnerable for both crash risk and injury severity.

› Heat, Urban Design, and Safe Access

Urban street design plays a critical role in mitigating or exacerbating heat-related safety risks. National design guidance emphasizes that **streets are public spaces that must support human activity safely and comfortably**, including through the integration of trees, shading, and heat-responsive design. Street trees and related landscape elements also provide important secondary safety benefits by visually narrowing the roadway, increasing enclosure, and encouraging lower vehicle speeds for proven traffic calming and reduced crash risk.

In high-heat environments, the absence of shade and thermal comfort can directly undermine safety by influencing user behavior. When routes lack shade or comfortable waiting areas, people are more likely to compromise their safety to avoid sun exposure.

Examples:

- Avoid designated crossings that lack refuge or shade
- Reduce compliance with signals due to discomfort during wait times
- Choose to cross anywhere that provides a direct path

These behavioral adaptations increase exposure to traffic conflicts and elevate crash risk.

› Disproportionate Risk in Extreme Heat Conditions

Traffic safety outcomes are not experienced uniformly across the population. National data consistently show higher rates of serious injury and fatality among pedestrians, bicyclists, older adults, people with disabilities and populations generally more reliant on walking, transit, or other non-driving modes.

*Heat is not just a comfort issue.
It elevates safety risk for specific populations and travel modes.*

This is particularly relevant given the city's **larger proportion of older adults**, who, with age, are more sensitive to heat-related stress and slower to react in complex traffic environments. At the same time, individuals who rely more heavily on walking or transit often experience greater exposure to outdoor conditions, including prolonged time in high-heat environments and limited access to shaded or comfortable routes.

As a result, heat should be understood not only as a comfort concern, but as a **factor that can elevate safety risk for specific populations and travel modes**.

› Implications for Planning Safe Streets

Recognizing heat as a safety factor reinforces the need to design a transportation system that accounts for real-world human limitations and environmental conditions. Incorporating shade, reducing exposure time at crossings, and improving the comfort and usability of pedestrian and bicycle infrastructure are essential strategies for advancing safety in Scottsdale's extreme heat.

Shade at intersections is of particular importance. Pedestrians are often forced to wait long periods in stagnant air before signals allow for a crossing interval. In the extreme heat that is common in Arizona, shade is essential for safe travel. Passive detection technologies could also be implemented in these areas to increase comfortable and compliant crossings for pedestrians.

What Safe Streets Scottsdale Can Do



Increase shade with trees, shade structures, and cool materials



Reduce exposure time with shorter crossings, refuge islands, and enhanced pedestrian intervals



Design comfortable transit stops with shade and seating



Consider land use planning, design, and infrastructure solutions

Figure 14 - Safe Streets Heat Mitigation Strategies

4. Plans, Policies & Programs

A. Relationship with other adopted policies

› Transportation Action Plan (TAP) 2022

The Safe System principle that **humans are vulnerable** and making decisions with this in mind is not new to Scottsdale. The following content shows a congruity to existing adopted policy:

- “The TAP 2022 prioritizes safe and accessible travel for all transportation users and supports active transportation for a healthier, more active lifestyle.” **TAP 2022, “Prioritizing People”**
- “Prioritize people, safety and livability over motor vehicles and travel speed.” **TAP 2022, Goals & Values**
- “Transportation network shall maximize travel route choices, travel mode choices, and access and mobility for all ages and abilities.” **TAP 2022, Guiding Policy**

B. Evaluating countermeasures in use

There are too many countermeasures in use currently to practically evaluate in the city’s first Safety Action Plan. The countermeasures that are promising in place and make great candidates for expansion of practice due to crash trends and competitive federal funding are:

- Lowering risks in intersection design for all users
- Corridor Access Management (with raised medians)
- Roadway Right-Sizing and repurposing underutilized curb lanes or unnecessary center turn lanes
- Pedestrian Hybrid Beacons (PHB)/HAWK or midblock pedestrian signal (*note below*)

- Separated bikeways from heavy, high-speed motorized traffic
- Streetlight improvements (further improve on the street lighting policy, especially where land uses support evening entertainment)
- Traffic calming on local streets using chicanes and mountable medians at intersections
- SafetyEdge in rural areas without curb and gutter
- Analytics for near-miss and red-light running evaluations at intersections, especially where vehicle-pedestrian crashes are prevalent

Note: Traditional traffic signals (Red-Yellow-Green lights) show slightly higher yielding rates and fewer overall conflicts compared to the PHB (Fitzpatrick et al., 2014; Ahsan et al., 2025).

C. Partners for Advancing Safety Practices

Plan development and implementation will be coordinated with regional partners to ensure cross-jurisdictional consistency in safety priorities, multimodal connectivity, and programming—particularly along shared corridors and at jurisdictional boundaries.

› Arizona Department of Transportation (ADOT)

- **Strategic Highway Safety Plan (SHSP)** and **Active Transportation Safety Action Plan (ATSAP)** to align Safe System strategies and statewide safety emphasis areas.
- **State Long-Range Transportation Plan (2050 LRTP)** to ensure consistency with statewide investment priorities and system needs.

› **Maricopa Association of Governments (MAG)**

MAG serves as the Metropolitan Planning Organization (MPO) for the Phoenix region, a role that necessitates the coordination of diverse municipal interests into a unified regional strategy. Within this structure, the Transportation Policy Committee (TPC) is tasked with overseeing the Regional Strategic Transportation Infrastructure Investment Plan (RSTIIP) and providing critical oversight for the implementation of the newly enacted Proposition 479 which is the dedicated sales tax funding to implement the regional plans and programs required to implement and coordinate a regional system.

- **MOMENTUM 2050 Regional Transportation Plan (RTP)** to align with the region's long-range multimodal vision and investment program.
- **MAG Strategic Transportation Safety Plan (STSP) – *Safe System in Action*** to align regional safety strategies, performance measures, and priority countermeasures.
- **MAG 2025 Regional Active Transportation Plan** to support a connected, safe, and active regional walking/biking network.
- **MAG Regional Travel Options and Optimization Study** can be used to expand travel choices and improve safe access across the City and meet the needs of VRUs who experience a disproportionate share of fatal and serious injuries.

The Mayor's role on this committee is pivotal, as she represents one of the largest municipalities. The TPC is composed of 29 members, including representatives from cities, towns, the Salt River Pima-Maricopa Indian Community (SRPMIC), the Arizona Department of Transportation (ADOT), and various business and transit interests. Political participation in TPC meetings has helped Scottsdale's

projects remain integrated into the regional Arterial Life Cycle Program (ALCP). This program is essential for the long-term viability of local thoroughfares, as it provides the mechanism for distributing regional funds for project phases ranging from design to construction.

› **Neighboring Jurisdictions (Safety Action Plans)**

- **City of Phoenix:** Vision Zero Road Safety Action Plan (RSAP).
- **City of Tempe:** Vision Zero Action Plan.
- **City of Mesa:** Comprehensive Safety Action Plan (CSAP) – Mesa Safer Streets.

Note all neighboring jurisdictions have been able to secure competitive implementation funding from the contents of their Safety Action Plans. Competitive funding opportunities for the SS4A program (and other safety improvements) are subject to extensions of the program until a comprehensive legislative package is developed to replace the IIJA.

D. Federal and State policy alignment

› **SS4A requirements**

An SS4A-compliant Safety Action Plan must be publicly available and include:

- Leadership commitment to reducing fatalities/serious injuries with measurable targets.
- An oversight/planning structure; data-driven safety analysis; inclusive engagement/collaboration and opportunity.
- Policy/process changes.

- Prioritized strategies/projects implementing the safe system approach.
- Performance measures for progress and transparency.

› **Safe System Approach**

Implementing the Safe System Approach requires a documented, organization-wide commitment to eliminate traffic deaths and serious injuries by accepting shared responsibility, prioritizing safety over speed, and continuously applying Safe System principles through policies, funding, projects, operations, and accountability.

This commitment can be best defined through incrementally working together intentionally with the multi-disciplined Technical Advisory Working Group formed for involvement in this plan.

Table 8 - Safe System Approach Recommendations

Recommendation	Intent
Formalize an interdepartmental Safe Streets coordination process. Convene Transportation, Police, Fire/EMS, Planning, Parks, Communications, Capital Projects, and other relevant departments on a recurring basis to coordinate Safe System implementation.	Moves Safe Streets Scottsdale from a plan document to an ongoing operating structure.

Recommendation	Intent
Use a maturity-based safety culture framework to guide implementation based on the degree of readiness and capability. Assess whether current practices are ad hoc, recognized, mainstreamed, or optimized, and identify desired maturity levels for priority safety practices. <i>External Resource:</i> FHWA ASSESSMENT TEMPLATE	Helps staff treat Safe System implementation as continuous organizational improvement rather than a one-time compliance exercise.
Apply Safe System review to non-safety projects. Evaluate resurfacing, drainage, utility, signal, development-review, parks-access, transit-access, and maintenance projects for opportunities to add low-cost or high-value safety improvements.	Captures safety benefits through routine capital and maintenance work, not only standalone safety projects.
Document collaborators, timelines, status, and metrics for each priority action. For each recommendation, identify key staff, partner agencies, implementation status, start date, target completion date, and progress measures.	Converts plan recommendations into trackable implementation commitments.
Establish recurring implementation check-ins. Hold regular staff-level reviews to monitor action progress, resolve interdepartmental issues, update priorities, and prepare annual reporting materials.	Maintains accountability and prevents implementation from becoming episodic.

Recommendation	Intent
Coordinate safety priorities with external partners. Continue structured coordination with ADOT, MAG, SUSD, neighboring jurisdictions, transit partners, emergency responders, and community stakeholders where corridors, funding, or safety issues cross boundaries.	Aligns Scottsdale's actions with regional, state, school, and jurisdictional safety priorities.
Standardize how staff document lessons learned. After implementation, record before/after results, operational issues, maintenance needs, community feedback, and transferability to other locations.	Builds an institutional knowledge base for future project scoping and countermeasure selection.
Incorporate Safe System training into staff development. Provide recurring training for technical and non-technical staff on Safe System principles, HIN use, VRU risk, speed management, accessibility, equity, and countermeasure selection.	Builds organization-wide capacity so safety is not limited to a few specialists.
Broaden public and staff reporting mechanisms for roadway safety concerns. Make it easy for staff and the public to report safety issues, and establish a process for routing, evaluating, and tracking those concerns.	Creates a feedback loop between community observations, field operations, and safety planning.

Recommendation	Intent
Continue / improve annual reporting to reinforce interagency accountability . Report progress on KSI outcomes, VRU outcomes, HIN project delivery, speed management deployments, lighting improvements, crossing upgrades, LPIs, sidewalk gaps, and other implementation measures.	Connects departmental work to measurable Safe Streets outcomes.
Institutionalize Safe Streets Scottsdale as a standing decision-making tool. Use the plan, HIN, countermeasure toolbox, and performance framework in CIP prioritization, grant applications, development coordination, and interagency project scoping.	Ensures the plan remains active, fundable, and operationally relevant after adoption.

5. Community Engagement & Localized Strategies

A. Scottsdale's Advisors and Local Voices

Scottsdale residents, officials, and appointed advisors were engaged meaningfully throughout the planning process in the makings of Safe Streets Scottsdale from summer 2025 into early 2026. Engagement with residents had three components:

1. An **online questionnaire** was held seeking how people meet their mobility needs and how their mobility corresponds to their impressions for safety and priorities for safety improvements.
2. Community events offered **virtual bike rides** offering immersive 360-degree video via VIRTUAL REALITY (VR) headset and stationary bike. People offered their impressions on the conditions experienced in the VR video: bikeway design and safety impressions from a variety of five existing bikeways throughout the City.
3. Open invitations went to residents to participate in **interactive walking assessments** where people could take a short route through four different neighborhoods, plotted in different locations and contexts, to have in-depth conversations with national experts about impressions of safety, especially from the perspective of vulnerable pedestrians on the road.

The planning process also included staff and official advising bodies. Engagement with these key stakeholders included:

1. **Transportation Commission Meetings** (Council-appointed advisors) to cover all components of a Safety Action Plan in accordance with USDOT standards of the Safe System Approach.

2. **Technical Advisory Working Group** involved multiple departments and partners to coordinate across systems that result in a comprehensive transportation safety practice.
3. **Staff and close partners participated in technical walk audits** with the same national safety experts who led the interactive walking assessments with residents. Three walk audits were conducted in three different locations with different contexts and safety design features for in-depth conversations about safe operations and behaviors of conditions from the perspective of vulnerable pedestrians on the road.

The Technical Advisory Working Group has all the representation needed to move forward as an implementation team moving this plan forward. Full details of the engagements with the Technical Advisory Group are captured in the appendices, E.

Table 9 - Phase 1 Strategic Milestones by 2035

Milestone	Description
High Injury Network – Tier 1 Countermeasures prioritized with engineered projects at these locations by 2035	Use a combination of countermeasures that will mitigate risks to the user profiles of the All-Modes and Vulnerable Road Users. Recommendations are found in the Countermeasure Toolkit.
Technical Advisory Working Group – Quarterly Meetings to assess progress of programs and funding opportunities which reduce fatal and serious injury crashes and track information about the safety program at USDOT and regional/state partners.	The working group advisors who contributed to the assessment of existing knowledge and practices should continue to meet quarterly. Each department should have leadership contacts who initiate and track safety-specific programs and effective spending. Every even year the team conducts “culture of safety” assessments (developed by FHWA).
Update all programs and design guidance with clearer understandings of crash types, crash victims, and crash concentrations.	Staff working across departments should take the opportunity of collaboration to acknowledge the lives impacted in the work.

› **Key engagement findings:**

Across all engagements, there is a consensus that **design should**

Distracted driving is a concern. People demand attentive driving and safer roadway behavior. Crash data confirms the perception of

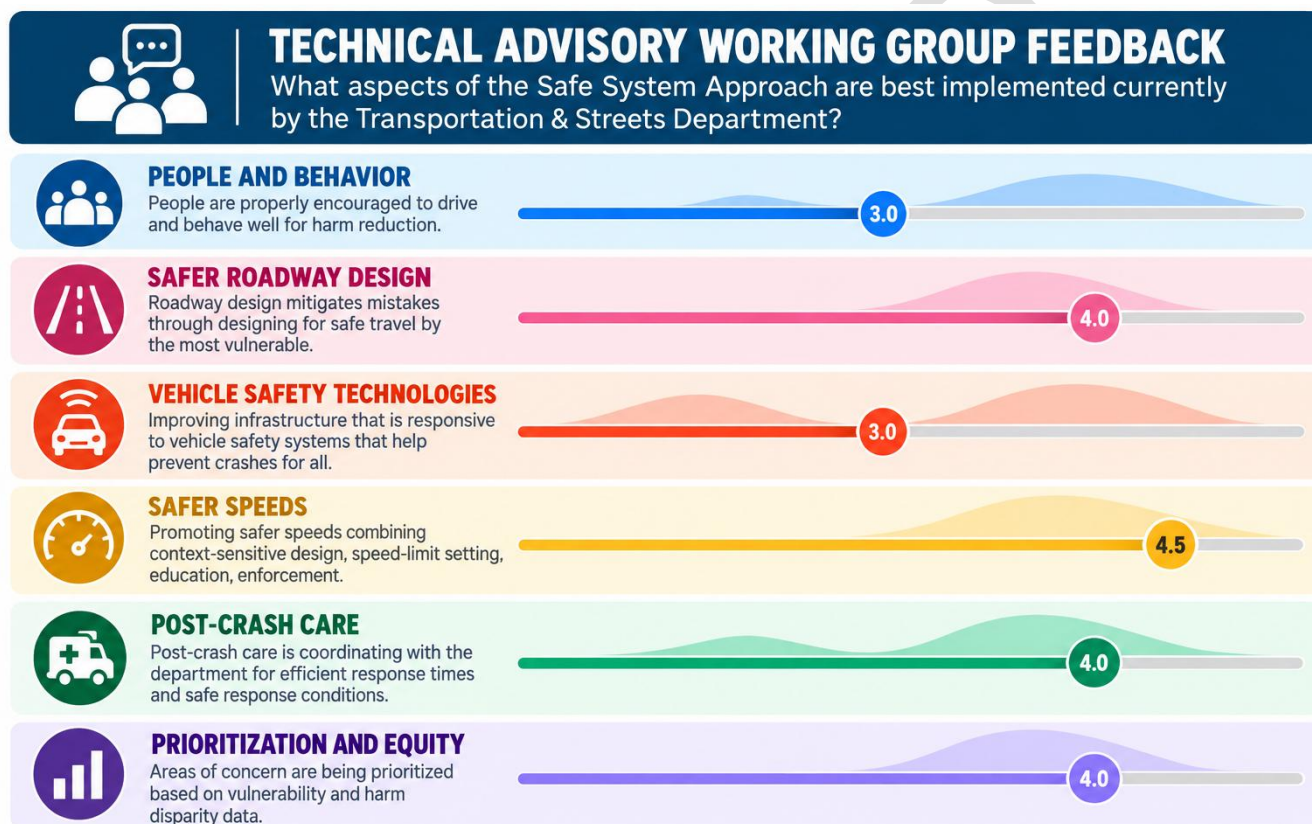


Figure 15 - Technical Advisory Working Group Feedback

remain a top priority, strengthening and updating minimum standards that improve safety of everyone.

Driving speeds and turning movements are key considerations for safety, especially in urbanized areas. High emphasis to assure safety for all users by decreasing the severity and likelihood of collisions.

users in collision trends and people have voiced preferences to safety strategies to deploy.

Safer pedestrian crossings and protected bikeways are desired. People who commonly travel outside of a vehicle are most likely to see the risk and potential barriers to connectivity on foot and by bike.

Interdepartmental coordination practices are well established and constructive. Data sharing and intentional practical improvements were acknowledged by members of Technical Advisory Working Group during meetings. For example, Scottsdale Fire Department were found to have more injury details to share for incorporation as the City's safety practices are updated. Intentional roles and responsibilities are a work in progress.

Crash pattern analysis is converted into High-Injury Networks (HINs) that can help locate projects and enforcement activities. These have been prioritized into three (3) tiers, representing the next 15-20 years of safety initiatives across the safe system approach.

B. Neighborhoods

Between the walks, virtual bike rides, and questionnaire, a variety of people in Scottsdale were reached and neighbors from different areas of Scottsdale were engaged.

The walks included seven walking routes. Those neighborhoods varied from south to north Scottsdale and included daytime and nighttime conditions. The crossings assessed during the walks included 4-way intersections, a roundabout, and an underpass. The virtual bike rides included dedicated trails, separated side path adjacent to traffic, local street, and busy arterial in a high-stress bike lane.

C. Collaboration: Schools, Parks, Business

The City can further the safety commitment by finding collaboration opportunities.

Scottsdale Unified School District (SUSD) already shows willing champions to be incorporated in the safety aspirations of this plan.



Figure 16 - Tavan Elementary Traffic Garden

Scottsdale's park system offers a world-class system of paths and trails with envious networks of underpasses to further celebrate. Continue to engage park plan updates and improvements on safe access and emerging e-mobility concerns.

Local businesses will be essential to partner with to improve local pedestrian safety and access management.

D. Education and Campaigns

› See Me AZ

For **FY2022–FY2023**, MAG reports that pedestrian and bicycle safety education was delivered primarily through paid media campaigns and regional outreach activities, while direct enforcement efforts were limited during that period. Campaign materials expanded substantially and included an updated See Me AZ logo,



multiple 30-second video advertisements, additional radio spots, digital billboards, web advertisements, bus kiosk posters, and light pole banner templates for use by member agencies.

The **See Me AZ program** ([MAG link](#)) was originally initiated in 2019 as part of the **MAG Strategic Transportation Safety Plan (STSP)** update process and was developed through a regional task force focused on pedestrian and bicycle safety education and enforcement. The program emphasizes shared responsibility among motorists, pedestrians, and bicyclists, while promoting awareness of laws, visibility, and behaviors associated with serious and fatal crashes involving vulnerable road users.

As part of implementation support, MAG also began participating in FHWA's Focused Approach to Safety (FAS) initiative. FHWA assigned the Rutgers University Alan M. Voorhees Transportation Center (VTC) to assist MAG with development of a more formalized See Me AZ Action Plan and evaluation framework. The Focused Approach to Safety initiative is intended to provide additional technical assistance, tools, and organizational support for regions addressing pedestrian and bicyclist safety challenges through data-driven and systemic approaches.

The evolving See Me AZ framework creates several opportunities for MAG member agencies to contribute to and support regional safety implementation efforts, including:

Deploying localized versions of See Me AZ educational materials and branding within community campaigns, schools, transit corridors, and special events.

- Coordinating targeted high-visibility enforcement and education efforts with local law enforcement partners.

Participating in regional crash analysis, Road Safety Assessments (RSAs), and High Injury Network (HIN) implementation efforts.

- Providing before-and-after project data, evaluation metrics, and local safety observations to support regional program evaluation.
- Integrating Safe System principles, vulnerable road user considerations, and opportunity-focused analysis into local transportation planning and project development.
- Supporting regionally consistent messaging related to yielding behavior, nighttime visibility, speed management, and pedestrian crossing compliance.
- Advancing demonstration projects and quick-build safety improvements that align with MAG Strategic Transportation Safety Plan priorities.
- Coordinating with MAG on future grant opportunities, including HSIP, SS4A, and Proposition 479-funded regional safety implementation programs.

MAG's broader transportation safety planning program continues to integrate Safe System principles, multimodal safety analysis, and opportunity-focused implementation strategies through the Strategic Transportation Safety Plan and related regional safety initiatives.

6. Leadership Commitments & Roles

A. City Council resolutions and leadership statements

Staff will present the plan to City Council for adoption.

The plan includes a targeted reduction of fatalities and serious injuries on Scottsdale's roadways. A reduction of 40% is feasible by 2035 through prioritized implementation. It is recommended to state this reduction to adhere to the commitments of the federal safety program.

B. Cross-Departmental Coordination

› Transportation, Police, Fire/EMS, Planning, Parks

Initial Technical Advisory Working Group (TAWG) input indicated a mix of participants where most had joined prior walk audits (8 yes/4 no), yet many reported limited past involvement in multidisciplinary street-safety engagement. Existing momentum centers on event-based safety efforts (e.g., Safe Routes to School, open streets, walk audits) and strong partnerships with advocates, police, nonprofits, schools, and public safety, while stakeholders want to strengthen ties with transportation, fire, elected officials, businesses, and community partners.

Concerns shared consistently pointed to the highest-risk contexts (busiest intersections and roads, and places with heavy walking access) along with specific design and enforcement themes (midblock crossings near destinations, turning radii, crosswalk timing, distracted driving, right-on-red behavior). City staff generally viewed interdepartmental agendas as impactful and felt public-opinion data is strongest around bicycle and pedestrian priorities.

Collectively, these initial insights set the stage for targeted analysis and future engagement, and their intuitive focus helped steer the project in a productive direction.

› Commissioners and Committees

Appointed citizens were involved in their respective recommendation areas. Robust presentations, findings, and recommendations were shared seeking feedback and opportunities for special amendments that shape the best practices into the context that only Scottsdale's dedicated servants know best.

C. Regional Policy and Programs

MAG's policies and programs have already been highlighted. Scottsdale has not merely participated in MAG's Road Safety Program; it has used the program as a repeatable safety-enhancing capital delivery tool. Staying up-to-date on MAG's latest programs and evaluation criteria should continue to serve the city well. The best way to position Scottsdale for these competitive dollars is to remain active on MAG's Technical Committees. Staff should continue to participate and lead in MAG committees and replicate the success of participating in the competitive funding approach.

Key Committees that support Safe Streets Scottsdale:

- Policy
 - *Regional Council Committee*
 - *Transportation Policy Committee*
- Technical
 - *Transportation Safety Committee*
 - *Active Transportation Committee*
 - *Elderly and Persons with Disabilities Transportation Committee*
 - *Intelligent Transportation Systems Committee*

- *Street Committee*
- *Transit Committee*
- *Transportation Review Committee*

D. Commitment to Ongoing Public Reporting

› Transparency

This report provides a framework for future roadway crash and injury maps. Planning and transportation data is moving to more digitized spaces to promote information sharing and collaboration. Collaboration will be aided by a transparent plan and programming.

Recommendation: The City established a page on the City's website to track progress of implementation of this plan, application of the countermeasure toolkit, engineering projects within the HIN segments and intersections, promote a culture of safety and continue to engage community members through walk audits and experiencing new safety practices as demonstration projects.

All departments should have a role to play.

Organize the content to align with the features of the Safe System Approach to continue to embed all practices with the guidance required for implementation funding and comprehensive practices.

7. Data-Driven Problem Identification

A. Crash data methodology

› Sources / Years

Crash data used for this Plan were compiled from two primary sources: ADOT and the City of Scottsdale. ADOT crash data served as the default source for vehicle-only crashes; however, due to potential concerns regarding vulnerable road user (VRU) crash reporting (e.g., pedestrian and bicycle crashes), the City's VRU crash dataset was used for all pedestrian/bicycle-involved crashes, and corresponding VRU records were removed from the ADOT dataset to avoid double-counting. The resulting combined dataset (vehicle-only from ADOT + VRU crashes from the City) covers five years (2019–2023) and represents the baseline crash history used for analysis and HIN development within Scottsdale city limits. Crashes occurring on Loop 101 were excluded because the City does not maintain that facility. The final data set for HIN development referenced 16,770 crash records.

Supporting data. To support exposure-aware and context-sensitive analysis, the crash dataset was paired with:

- **Roadway segments and intersections** from OpenStreetMap to create a complete, analysis-ready network.
- **AADT** from ADOT, linked to the roadway/intersection network to support rate-based screening.
- **Speed data** from Replica, including average speed and 85th percentile speed, collected networkwide (where available) across the 2024 calendar year and joined to roadway segments.
- **Transit ridership** indicators
- **Demographic and land use** characteristics

- **Persistent Poverty** Area Identification

B. High Injury Network (HIN) Identification

SS4A requires analysis of baseline fatal/serious injury crashes, contributing factors, and a geospatial identification of higher-risk locations (a HIN or equivalent) across (practically) all roadways regardless of ownership. This Safety Action Plan meets those expectations by: (1) using a five-year, citywide baseline crash dataset (2019–2023); (2) evaluating severity, mode, and contributing-factor proxies (e.g., alcohol, lighting, speed context); and (3) producing geospatial HIN layers, as follows:

- **All-Modes HIN – Intersections**
- **All-Modes HIN – Segments**
- **VRU HIN – Intersections**
- **VRU HIN – Segments**

The HIN maps and analysis are tailored to municipal priorities as defined through a series of working meetings with staff-centered technical meetings as well as meetings with the Transportation Commissioners.

All-Mode HIN. The All-Mode HIN (all crash types; segments and intersections) ranks locations using a severity-weighted crash score (AASHTO Highway Safety Manual-style weighting) multiplied by a rate-based term (square root of a KA crash rate), supporting both severity emphasis and exposure sensitivity.

- **AASHTO HSM Weight (Overall):** $(K \text{ crashes} \times 25) + (A \text{ crashes} \times 10) + (B + C + \text{PDO crashes})$.
- **Segments—KA crash rate:** calculated as KA segment crashes per **1M VMT**, using AADT and segment length, with

“5” years in the denominator to reflect the 2019–2023 study period.

- *Elimination criteria: lowest 10% AADT in Scottsdale*
- **Intersections—KA crash rate:** calculated as KA intersection crashes per **100M entering vehicles**, using entering AADT, again normalized across five years.
 - Elimination criteria: lowest 10% AADT in Scottsdale
- **Tiering approach:** the **top 45 segments** and **top 45 intersections** were selected for the Overall HIN and grouped into tiers (Tier 1 highest priority).
- **Exceptions: Eliminated for low HSM Weight score.**

VRU HIN. Recognizing that VRU crash occurrence can be sparse and that risk is influenced by exposure, land use, and access to transit, the VRU HIN (pedestrian/bicycle crashes; segments and intersections) uses the same severity-weighted crash foundation but augments it with indices representing transit activity, population density, and Areas of Persistent Poverty (AoPP, USDOT definition).

- **VRU HIN Weight:** AASHTO HSM weight × Transit Index × Population Density Index × AoPP Index.
- **Transit Index:** $1 + (\text{boardings at/near location} \div \text{maximum boardings})$.
- **Population Density Index:** $1 + (\text{local density} \div \text{maximum density})$.
- **AoPP Index:** 1.1 if in an AoPP; 1.0 otherwise (a 10% bonus).
- **Tiering approach:** the **top 30 VRU segments** and **top 30 VRU intersections** were selected, with tiers defined as top 10 (Tier 1), next 10 (Tier 2), and last 10 (Tier 3).

C. Analysis by Mode, Severity, Time of Day, Context

To ensure the plan is fully compliant with a data-driven approach, the analysis integrates **multivariate screening** across (1) severity, (2) mode, (3) temporal conditions, and (4) contextual risk indicators (exposure, speed, transit activity, urban development, and opportunity considerations).

Examples of the multivariate approach used in this plan include:

- **Severity focus:** Across 2019–2023, **KSI crashes averaged 2.7%** of all crashes, supporting a primary emphasis on KSI reduction while still tracking the broader crash pyramid for leading indicators.
- **Mode sensitivity:** VRU crashes are explicitly analyzed and separately prioritized through the VRU HIN methodology (segments + intersections).
- **Time-of-day risk:** While many crashes occur during daytime hours, the **1–2 AM** period is characterized by **low frequency but high KSI share**, a classic pattern for severe-outcome risk that helps prioritize countermeasures and operations (night visibility, impairment mitigation, speed management).
- **Lighting context:** Pedestrian KSI outcomes are substantially worse in dark conditions. Pedestrian KSI share increased from **14.6% (daylight)** to **34.7% (dark)**. This indicates a strong relationship between severe pedestrian harm and nighttime conditions on the Scottsdale network.
- **Speed context:** Anonymous smart device data produces a proxy for driving speeds. 85th percentile and average speeds provide an empirical basis for speed-risk screening and for distinguishing corridors where operating speeds may not align with safe-system intent.

- **Urban contexts:** Where walking becomes a more useful condition, safety and design priorities can save lives. Pedestrian crashes are occurring midblock and at intersections. Crosswalk treatments ought to provide adequate protection and convenience to foster compliance and deliver on the goals of KSI reduction.

DRAFT

Table 10 - HIN Concepts Summary	All-Modes HIN Concept	VRU-Focused HIN Concept
Purpose	Identify roadway segments and intersections with elevated fatal and serious injury crash risk across all roadway users and crash types.	Identify roadway segments and intersections with elevated fatal and serious injury risk specifically affecting vulnerable road users (VRUs), including pedestrians and bicyclists.
Step 1. Inputs	• Crash Data (2019–2023) • Fatal & Serious Injury (KSI) Crash Concentrations • Traffic Volumes • Roadway Characteristics	• Crash Data (2019–2023) • VRU-only Fatal & Serious Injury (KSI) Crash Concentrations • Transit Ridership • Poverty • Roadway Characteristics
Step 2. Risk Evaluation	• Crash rates adjusted for exposure • Traffic volumes factored into analysis • Severity-weighted evaluation	• Population-based considerations • Disproportionate VRU risk factors • Severity-weighted evaluation
Step 3. Scoring Methodology	• Quantitative scoring method • Crash concentration factors • Relative risk factors	• Quantitative scoring method • Crash concentration factors • Relative risk factors
Step 4. Pattern Analysis	• Consistent geometric standards applied • Segments standardized • Intersections standardized	• Consistent geometric standards applied • Segments standardized • Intersections standardized
Step 5. Prioritization	• Scores aggregated by roadway segment • Scores aggregated by intersection • Rankings developed for implementation prioritization	• Scores aggregated by roadway segment • Scores aggregated by intersection • Rankings developed for implementation prioritization

Table 10 - HIN Concepts Summary	All-Modes HIN Concept	VRU-Focused HIN Concept
Primary Focus	Systemwide roadway safety and reduction of fatal and serious injury crashes for all travel modes.	Reduction of fatal and serious injury crashes disproportionately affecting pedestrians and bicyclists.
Key Considerations	Emphasizes crash exposure, roadway operations, traffic volumes, and systemic crash risk across the transportation network.	Emphasizes demographic vulnerability, multimodal access, opportunity considerations, and disproportionate injury risk for vulnerable road users.
Typical Countermeasures	Speed management, intersection redesign, access management, roadway departure mitigation, signal operations, and systemic corridor improvements.	Crossing safety improvements, protected intersections, separated bikeways, lighting, pedestrian visibility improvements, and multimodal access enhancements.
Intended Use	Prioritize broader transportation safety investments and corridor-level crash reduction strategies.	Prioritize VRU-focused infrastructure investments and implementation of Safe System countermeasures supporting walking, bicycling, and transit access.

Table 10 - HIN Concepts Summary	All-Modes HIN Concept	VRU-Focused HIN Concept
City-wide maps with higher resolution inset maps for South Scottsdale are included. Angle crash concentrations Areas of Persistent Poverty – a federally recognized designation	Intersections Segments Heat Map See ERROR! REFERENCE SOURCE NOT FOUND.	Intersections Segments Heat Map See ERROR! REFERENCE SOURCE NOT FOUND.

D. Economic Cost and Societal Harm Estimates



Figure 17 – Economic Analysis of Safety Investments

Safety investments are strengthened when they include an economic appraisal comparing the expected benefits of crash reduction to project costs. Standard practice is to estimate expected crash reductions (e.g., using Crash Modification Factors where applicable), translate reductions by severity into monetary benefits, and compare implementation and lifecycle costs to support benefit-cost comparisons and grant competitiveness. Importantly, methods used directly relate to economic losses. Table 11 assesses the costs associated with crash severities during the study period of 2019 – 2023.

Table 11 - Crash-Related Economic Loss Value, City of Scottsdale (2019-2023)

Crash Severity	Economic Loss per Crash (USD)	Crash Counts	Loss Totals (2019- 2023)
Fatality (K)	\$9,515,371	76	\$723,168,196
Suspected Serious Injury (A)	\$550,499	378	\$208,088,622
Suspected Minor Injury (B)	\$149,132	2643	\$394,155,876
Possible Injury (C)	\$103,145	2551	\$263,122,895
Property Damage Only (O)	\$10,680	11761	\$125,607,480
Totals		17409	\$1,714,143,069

Economic Loss Estimates from Table 1-5, 2023 ADOT Crash Facts

Because economic impacts are already embedded in the HIN's severity-weighted framework, projects advanced within the HIN are inherently positioned to demonstrate strong cost-effectiveness—aligning well with the benefit-cost expectations typical of USDOT's competitive grant programs.

Accordingly, this plan will apply economic appraisal during project selection and scoping to ensure scarce resources are prioritized toward strategies that deliver the greatest reductions in fatalities and serious injuries per dollar invested.

E. Mapped Data and Guided Implementation

The maps below are developed from the data described in the HIN Identification section above. Further details on the HIN analysis are found in the [HIN tables of the appendix](#).

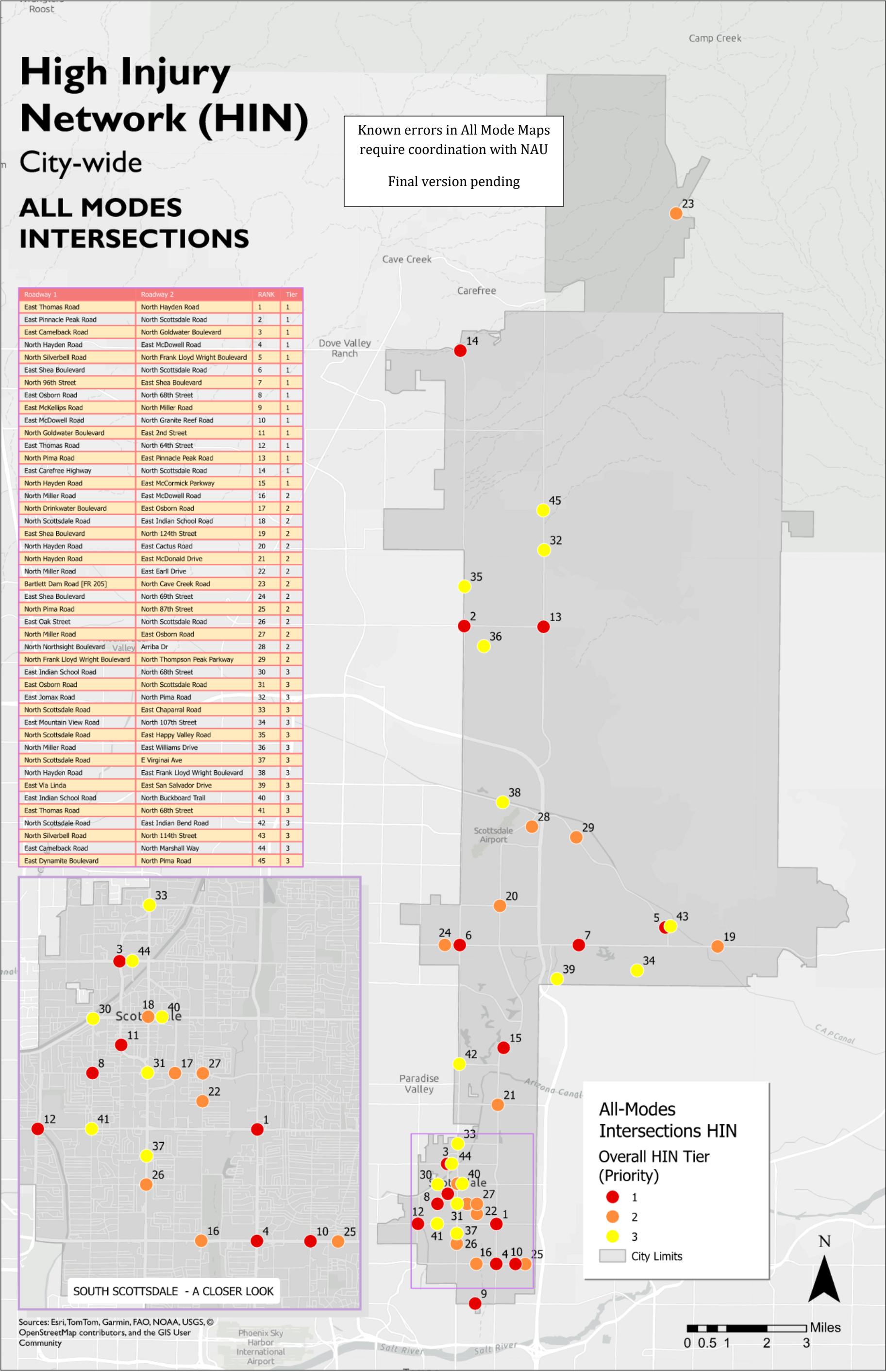


Figure 18 – HIN Map: All Modes, Intersections

High Injury Network (HIN)

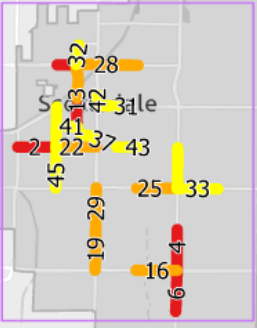
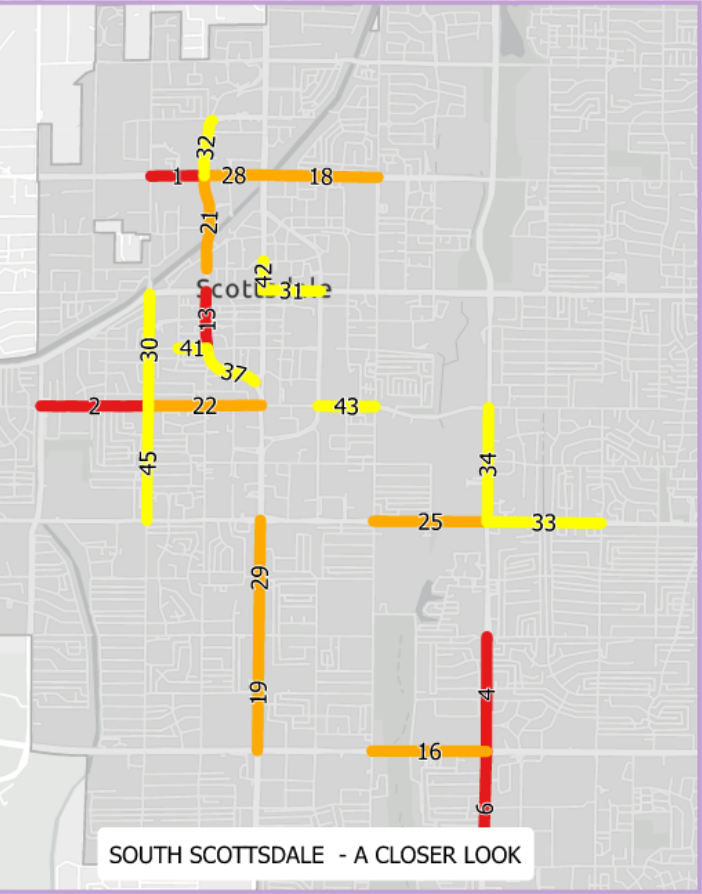
City-wide

ALL MODES SEGMENTS

Known errors in All Mode Maps
require coordination with NAU

Final version pending

ROADWAY	RANK	TIER
North Goldwater Boulevard	1	1
North Goldwater Boulevard	2	1
East McDowell Road	3	1
North Hayden Road	4	1
East Camelback Road	5	1
East Thomas Road	6	1
North Frank Lloyd Wright Boulevard	7	1
North 68th Street	8	1
East Pinnacle Peak Road	9	1
North Scottsdale Road	10	1
East Osborn Road	11	1
North Hayden Road	12	1
East Camelback Road	13	1
North 68th Street	14	1
East McDowell Road	15	1
North Scottsdale Road	16	2
East Thomas Road	17	2
East Osborn Road	18	2
North Scottsdale Road	19	2
East Indian School Road	20	2
North Scottsdale Road	21	2
North Frank Lloyd Wright Boulevard	22	2
North Hayden Road	23	2
North Hayden Road	24	2
East Shea Boulevard	25	2
North Goldwater Boulevard	26	2
North Goldwater Boulevard	27	2
East Shea Boulevard	28	2
East Camelback Road	29	2
East Shea Boulevard	30	3
North Scottsdale Road	31	3
East Shea Boulevard	32	3
East McDowell Road	33	3
North Frank Lloyd Wright Boulevard	34	3
East Chaparral Road	35	3
East Indian School Road	36	3
North Hayden Road	37	3
North Hayden Road	38	3
North Hayden Road	39	3
North Scottsdale Road	40	3
East 2nd Street	41	3
North Hayden Road	42	3
East Shea Boulevard	43	3
East McDonald Drive	44	3
North Hayden Road	45	3



All-Modes HIN

Overall HIN Segment Tier

- 1
- 2
- 3

City Limits

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

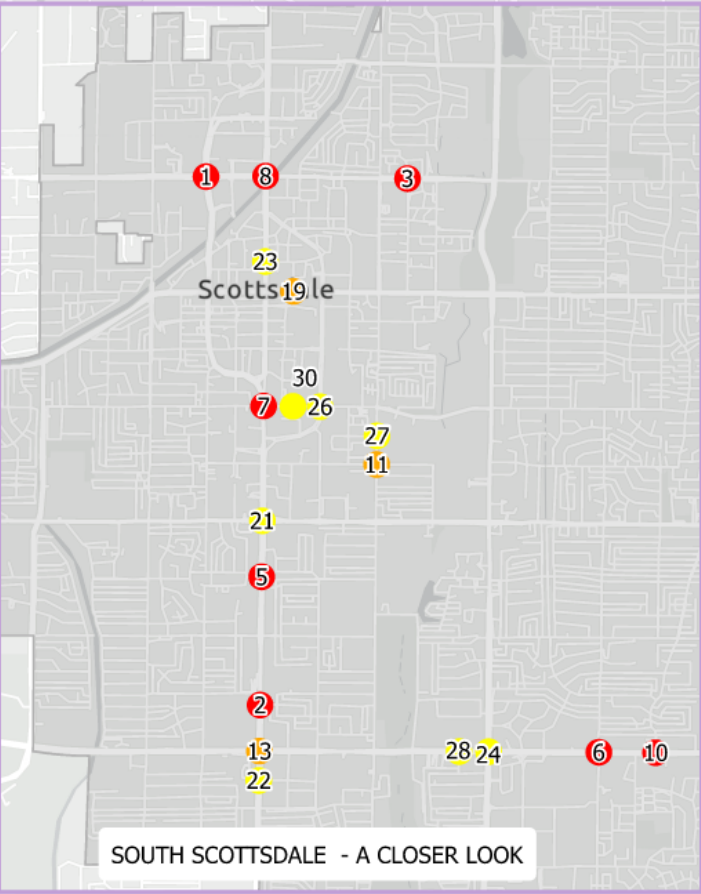
Figure 19 – HIN Map: All Modes, Segments

High Injury Network (HIN)

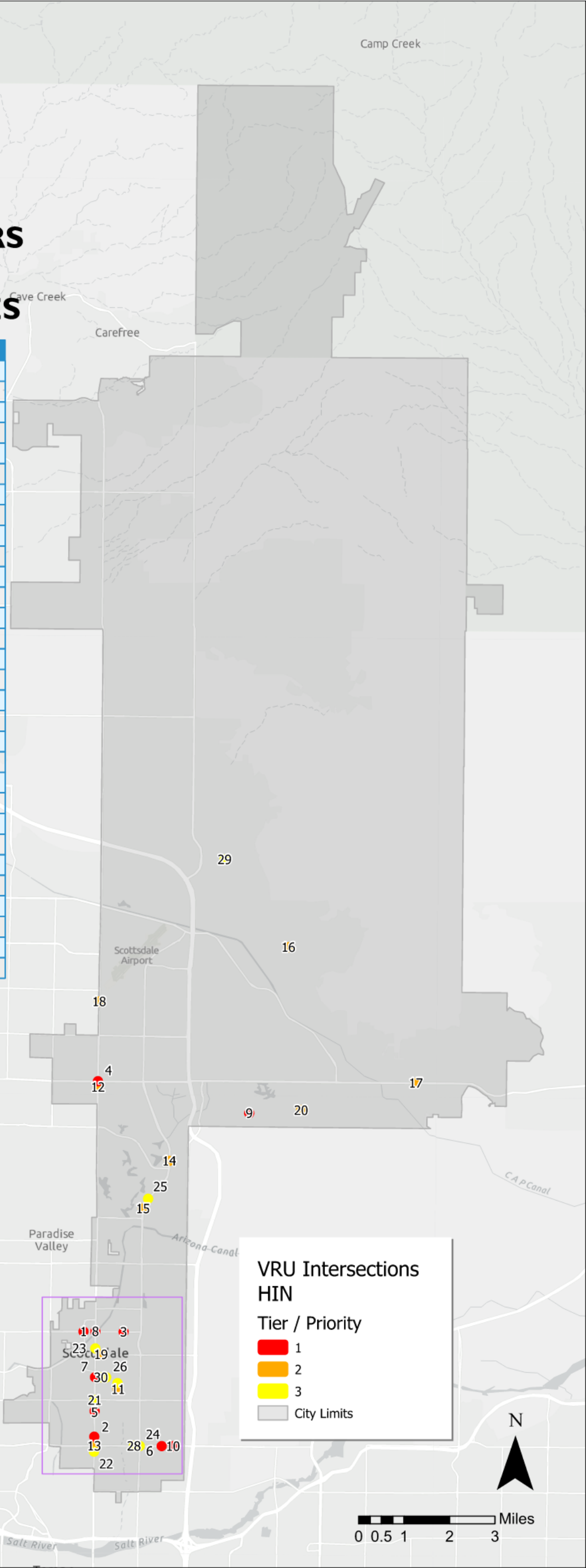
City-wide

VULNERABLE ROAD USERS INTERSECTIONS FATAL & SERIOUS INJURIES

Road_name1	Road_name2	Tier	Rank
East Camelback Road	North Goldwater Boulevard	1	1
East Granada Road	North Scottsdale Road	1	2
East Camelback Road	North Parkway Avenue	1	3
East Shea Boulevard	North Scottsdale Road	1	4
East Virginia Ave	North Scottsdale Road	1	5
East McDowell Road	North Granite Reef Road	1	6
East Osborn Road	North Scottsdale Road	1	7
East Camelback Road	North Scottsdale Road	1	8
East Via Linda	North 100th Street	1	9
North Pima Road	North 87th Street	1	10
East Earll Drive	North Miller Road	2	11
East Cochise Road	North Scottsdale Road	2	12
East McDowell Road	North Scottsdale Road	2	13
East Royal Palm Road	North Hayden Road	2	14
East Via Camello	North Hayden Road	2	15
East Queens Wreath Lane	North 105th Street	2	16
East Shea Boulevard	North 128th Street	2	17
East Joan De Arc Avenue	North Scottsdale Road	2	18
East Indian School Road	North Buckboard Trail	2	19
East Mountain View Road	North 107th Street	2	20
East Thomas Road	North Scottsdale Road	3	21
East SkySong Boulevard	North Scottsdale Road	3	22
East 3rd Avenue	North Scottsdale Road	3	23
East McDowell Road	North Hayden Road	3	24
East McCormick Parkway	North Hayden Road	3	25
East Osborn Road	North Drinkwater Boulevard	3	26
East Monterey Way	North Miller Road	3	27
East McDowell Road	North 79th Street	3	28
East Legacy Boulevard	North 94th Street	3	29
East Osborn Road	North Wells Fargo Avenue	3	30



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



VRU Intersections
HIN

Tier / Priority

1

2

3

City Limits

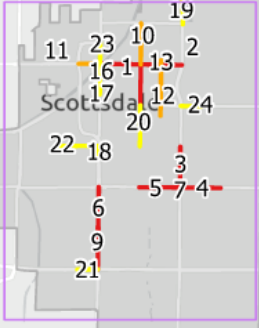
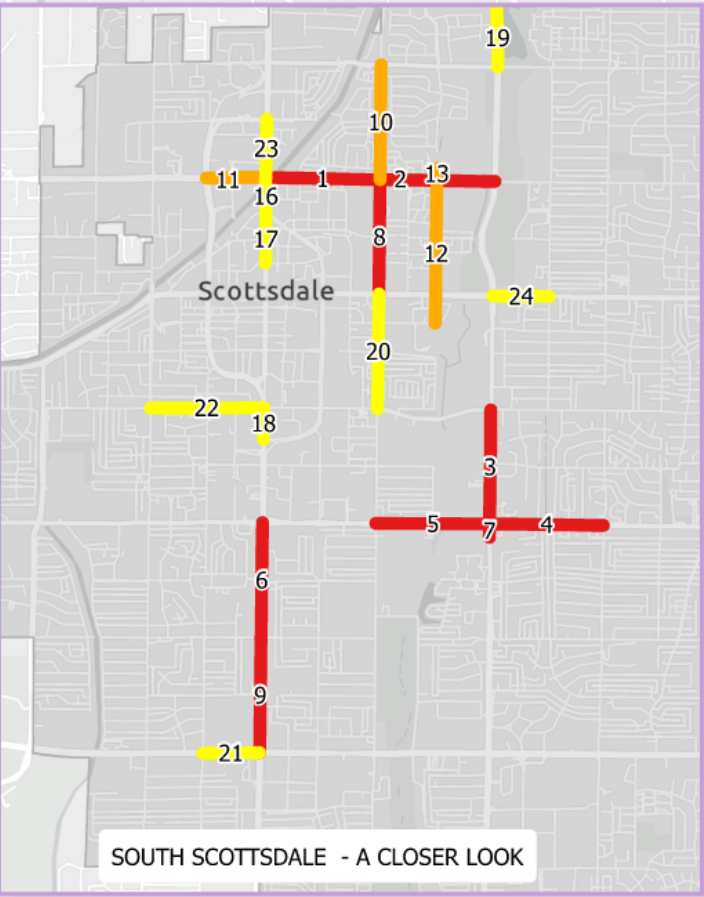
Figure 20 – HIN Map: Vulnerable Road Users, Intersections

High Injury Network (HIN)

City-wide

VULNERABLE ROAD USERS SEGMENTS FATAL & SERIOUS INJURIES

Roadway	Tier	Rank
East Camelback Road	1	1
East Camelback Road	1	2
North Hayden Road	1	3
East Thomas Road	1	4
East Thomas Road	1	5
North Scottsdale Road	1	6
North Hayden Road	1	7
North Miller Road	1	8
North Scottsdale Road	1	9
North Miller Road	2	10
East Camelback Road	2	11
North 78th Street	2	12
North 78th Street	2	13
North Hayden Road	2	14
North Scottsdale Road	2	15
North Scottsdale Road	3	16
North Scottsdale Road	3	17
North Scottsdale Road	3	18
North Hayden Road	3	19
North Miller Road	3	20
East McDowell Road	3	21
East Osborn Road	3	22
North Scottsdale Road	3	23
East Indian School Road	3	24



VRU Segments HIN

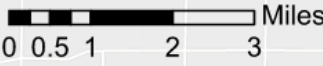
Tiers / Priority

1

2

3

City Limits



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

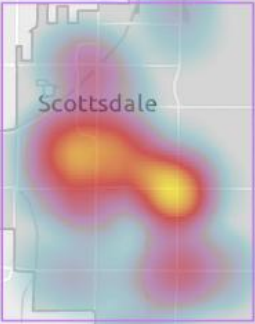
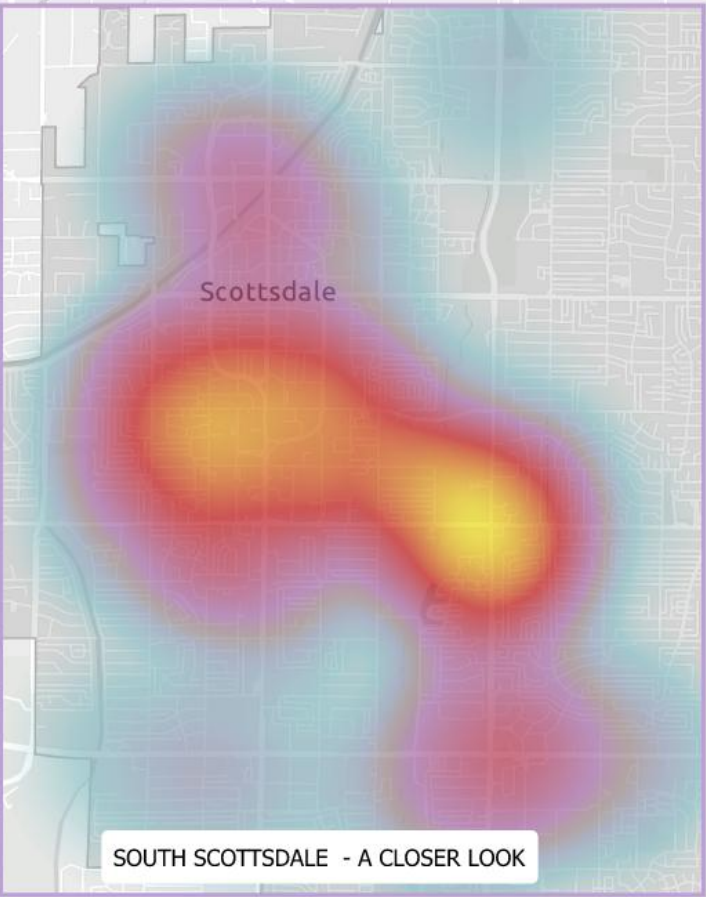
Figure 21 – HIN Map: Vulnerable Road Users, Segments

Concentration of Angle Crashes

City-wide

CRASHES RESULTING IN FATALITY (K) OR SERIOUS INJURY (A)

Road_name1	Road_name2	Tier	StopSign	Signalized	ANGLE CRASHES
North Hayden Road	East McDowell Road	3	0	1	37
North Drinkwater Boulevard	East Osborn Road	3	0	1	28
North Scottsdale Road	East Thomas Road	3	0	1	25
East Shea Boulevard	North Scottsdale Road	1	0	1	20
East Camelback Road	North Goldwater Boulevard	1	0	1	16
East McDowell Road	North 79th Street	3	1	0	11
North Scottsdale Road	East McDowell Road	2	0	1	11
East McDowell Road	North Granite Reef Road	1	0	1	10
North Pima Road	North 87th Street	1	1	0	8



Legend

KSI Crashes - Angle Codes

Sparse

Dense

City Limits

City Limits

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Phoenix Sky Harbor International Airport

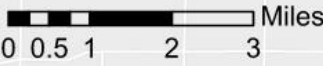


Figure 22 – Map: Angle Crash Concentrations (Heat Map)

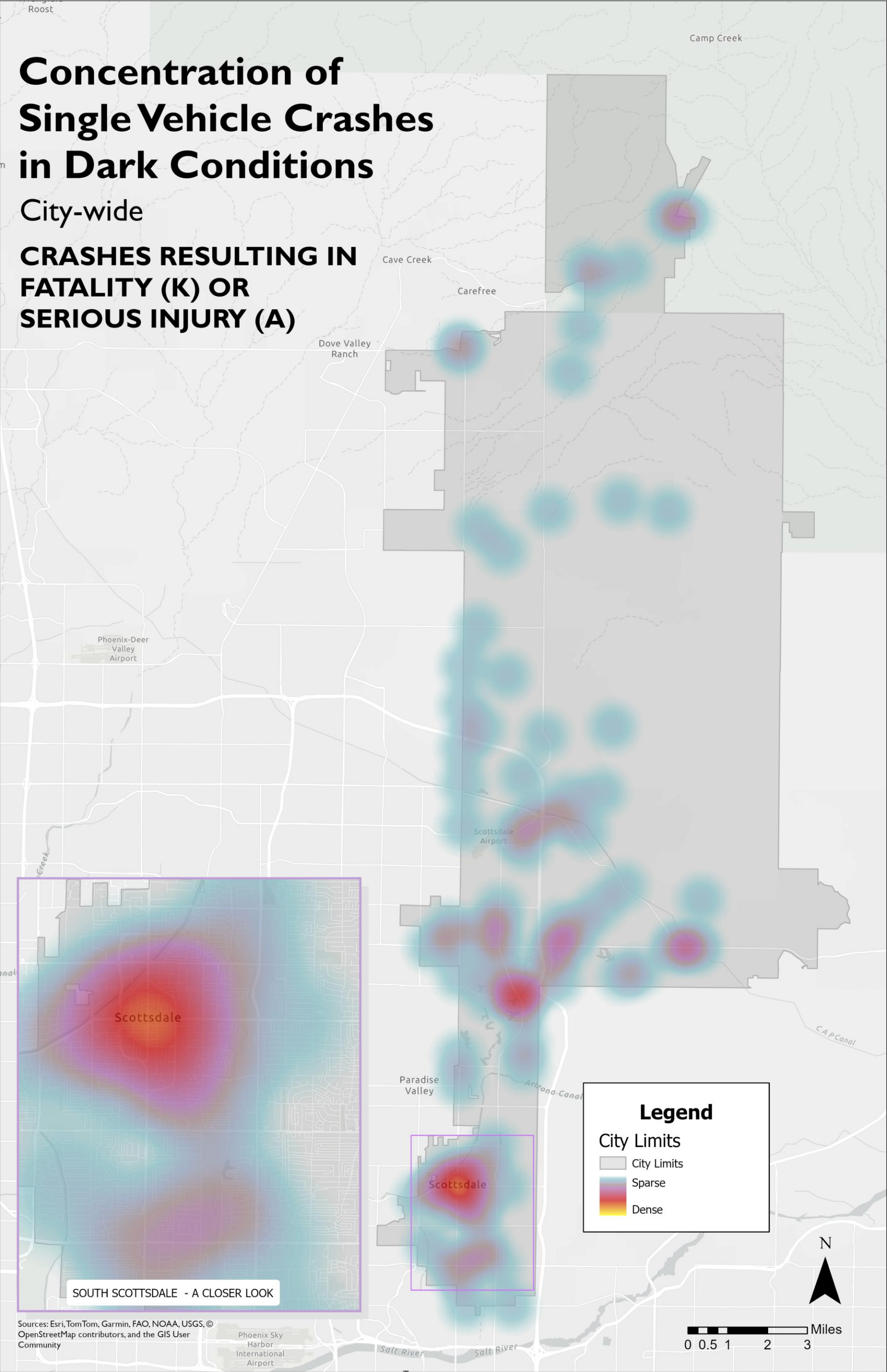


Figure 23 – Map: Single Vehicle Crashes in Dark Conditions

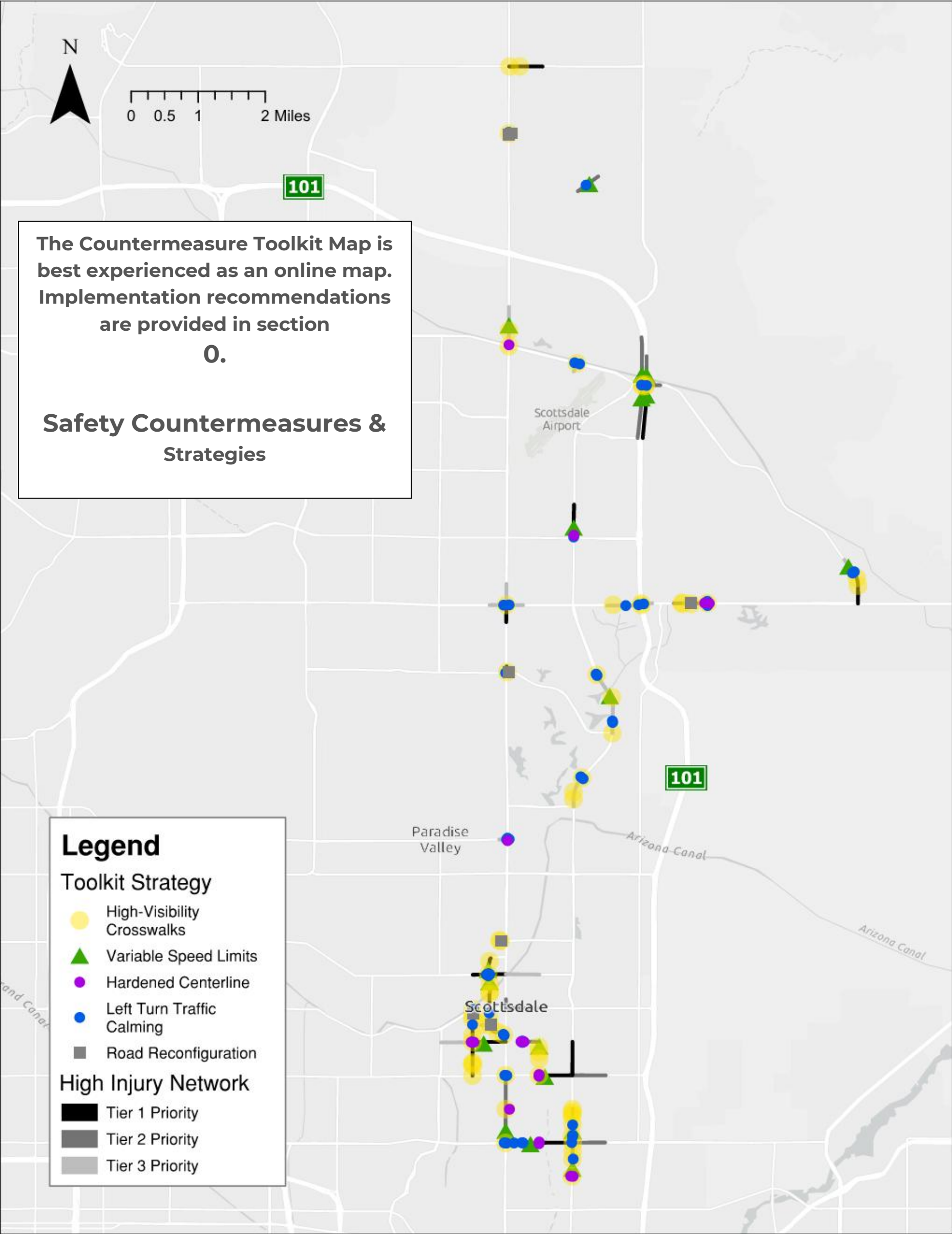


Figure 24- Map: Countermeasure Toolkit Map (Online version recommended)

F. Trends

The multivariate spatial analysis establishes a baseline pattern that exposes trends over time to verify progress and detect emerging problems.

› VRU overrepresentation

The most significant disparity appears in fatal and serious injury outcomes, where VRU crashes are disproportionately concentrated relative to all-mode crash trends.

The data indicate that vulnerable road users are far less likely to be involved in low-severity property damage only crashes and substantially more likely to experience physical injury during crash events. This reflects the inherent physical vulnerability of pedestrians and bicyclists, who lack the structural protection available to occupants of motor vehicles. As crash severity increases, the disparity between VRU crashes and systemwide crashes becomes progressively more pronounced. [RECALL TABLE 4 - KSI CRASHES, IMPAIRMENTS.](#)

These findings reinforce Safe System principles recognizing that human bodies are highly vulnerable to crash forces and that roadway design, operating speeds, and conflict conditions play a critical role in determining injury outcomes. The results also support separating VRU safety analysis from broader all-mode crash analysis because crash frequency alone does not adequately capture disproportionate VRU harm.

Direction for Safety Action Plan implementation should include the following:

- Prioritize reduction of fatal and serious injury crashes involving vulnerable road users as a core safety objective.
- Focus investments on reducing exposure to high-speed turning and crossing conflicts involving pedestrians and bicyclists.
- Advance systemic speed management strategies, particularly along corridors and intersections identified within the VRU High Injury Network (HIN).
- Prioritize multimodal infrastructure improvements including crossing enhancements, visibility improvements, protected intersections, refuge islands, and separated bicycle facilities where contextually appropriate.
- Use severity-weighted analysis methods that prioritize risk of death and serious injury rather than crash frequency alone.
- Recognize that even locations with relatively low pedestrian and bicycle volumes may warrant substantial safety investment because VRU crashes are disproportionately severe.
- Coordinate engineering, education, and enforcement efforts focused on yielding behavior, turning movement conflicts, nighttime visibility, and speed reduction.
- Continue incorporating opportunity-focused and context-sensitive analysis into vulnerable road user prioritization and implementation strategies.

› Intersections / Segments

Important cross-reference section for this data and analysis is found in [3.D Intersections](#), including Tables 5 and 6.

Comparison of Scottsdale's fatal and serious injury crash distribution with the regional benchmark can further identify whether severe crashes are disproportionately concentrated at intersections or along roadway segments. Locations identified through the intersection and segment High Injury Networks should therefore be evaluated separately so that countermeasures respond to the specific conflict patterns associated with each roadway environment.

MAG Data is available through their [Safety Program](#).

Table 12 - Regional Comparison KSI Crashes: Intersection / Segment

Comparison (Fatal and Serious Injury)	MAG Region (2007 – 2024)	Scottsdale (2020-2024)
All-mode KSI	Nearly 50% of fatal and serious-injury crashes occur at intersections	55.1% intersection / 31.3% segment (see Table 2 for additional context)
Pedestrian KSI	32% intersection / 68% mid-block	<i>VRU-Only Analysis</i> Combines Ped+ Bike 42.7% intersection / 38.5% segment (see Table 3 for additional context)
Bicyclist KSI	38% intersection / 62% mid-block	

› **Speed-risk**

The data indicate a strong relationship between increasing speeding severity and crash injury severity, particularly for fatal crashes. Lower-speed exceedances are associated primarily with property damage only (O) and minor injury (C and B) crashes, while the share

of fatal and serious injury crashes rises substantially as estimated speeds exceed the posted speed limit by greater margins.

At lower speeding ranges (less than 15 MPH over the speed limit), fatal crashes represent a very small share of crashes, generally less than one percent of the total. During these lower-speed exceedance conditions, crashes are dominated by non-injury and minor injury outcomes. However, beginning around 15 to 29 MPH over the speed limit, the proportion of fatal crashes begins to rise noticeably.

The trend becomes substantially more severe at speeds exceeding 30 MPH over the speed limit. Fatal crashes increase from approximately 6.6% of crashes at 30 to 44 MPH over the speed limit to 10.0% at 45 to 59 MPH over the speed limit, before increasing sharply to approximately 28.6% at 60 to 74 MPH over the speed limit. This indicates that crashes involving extreme speeding are disproportionately associated with fatal outcomes.

The data also suggests that while lower severity crashes remain more common overall, increasing travel speeds shift crash outcomes toward greater injury severity. This reflects the Safe System principle that human tolerance to crash forces is limited and that **kinetic energy increases exponentially with speed**.

Direction for the Safety Action Plan should include the following:

- Prioritize systemic speed management strategies on corridors with histories of severe injury and fatal crashes.
- Focus implementation efforts on roadway designs that reduce excessive operating speeds rather than relying solely on posted speed limits and enforcement.

- Advance context-sensitive traffic calming strategies, particularly on urban arterials and corridors with vulnerable road user activity.
- Coordinate engineering, education, and enforcement efforts to address high-end speeding behaviors associated with the greatest fatality risk.
- Expand automated and targeted speed enforcement strategies where legally permissible and operationally feasible.
- Design intersections and roadway segments to reduce opportunities for high-speed driving through geometric design, lane management, and signal timing practices.
- Prioritize speed reduction countermeasures within the High Injury Network (HIN), particularly at locations with patterns of severe and fatal crashes.
- Emphasize Safe System principles acknowledging that reducing speed is among the most effective methods for reducing fatal and serious injury crash outcomes.

› Crash Types

Crash types data, or as the crash records refers to them “collision manners,” were analyzed to identify systemic risk patterns and recurring driver errors. While the High Injury Network (HIN) analysis prioritized fatal and serious injury (KA) crashes, collision manner analysis requires a larger sample size. Accordingly, minor injury (B) crashes were included. These severity levels are collectively defined as KAB crashes.

Crash types reflect predictable human error and provide a basis for applying Safe System countermeasures. The Safe System approach recognizes that errors will occur and emphasizes designing roadways to reduce conflict likelihood and crash severity.

Table 13 - Fatal, Serious Injury, Minor Injury (KAB) Crash Counts by Collision Manner

Collision Manners (Unit 1)	KAB CRASH COUNTS				SHARE OF TOTAL	VRU OVER-REPRESENT'N MULTIPLIER
	Motorist	Bike	Ped	All Modes		
SINGLE VEHICLE	409	4	31	444	14.3%	0.70
ANGLE (NOT LEFT TURN)	717	85	52	854	27.6%	1.42
LEFT TURN	642	15	14	671	21.7%	0.38
REAR END	639	8	6	653	21.1%	0.19
HEAD ON	98	10	21	129	4.2%	2.12
SIDESWIPE SAME DIR.	83	12	5	100	3.2%	1.50
SIDESWIPE OPP DIR.	19		1	20	0.6%	0.44
REAR TO SIDE	3			3	0.1%	0.00
REAR TO REAR	2		1	3	0.1%	2.94
U-TURN	7			7	0.2%	0.00
OTHER	42	5	35	83	2.7%	4.25
UNKNOWN	85	17	29	131	4.2%	3.10
Totals	2746	156	195	3097		

G. Metrics tied to SS4A eligibility

This plan's prioritization framework aligns implementation with SS4A's core eligibility expectations by anchoring action to:

- **Baseline KSI crash history** (2019–2023) and KSI rate monitoring.
- **Network-scale identification of higher-risk locations** (All-Mode HIN and VRU HIN, for both segments and intersections).
- **Contributing-factor proxies** used for project and strategy matching (e.g., alcohol involvement, lighting context, time-of-day patterns, operating speeds).

H. Annual Public Reporting

Annual reporting is recommended to sustain transparency and to maintain accountability for KSI-reduction commitments. Reporting will summarize:

1. **Annual KSI and total crashes,**
2. **HIN updates** (as data refresh),
3. **Strategy implementation status,** and
4. **Before/after results** where projects have reached sufficient maturity for evaluation.

I. Performance measures

Performance measures will be reported in a way that is consistent with Safe System intent and with the plan's data structure, including:

- **Primary outcome:** annual fatalities + suspected serious injuries (K + A), citywide and on the HIN.
- **Supporting outcome measures:** severe VRU outcomes; severe outcomes by facility type (intersection/segment).

- **Process measures:** countermeasure delivery (e.g., projects delivered on Tier 1 HIN locations), and operational changes (e.g., speed management deployments).
- **Leading indicators:** nighttime severe-outcome patterns, operating speed distributions, and alcohol-involved KSI trends.

J. Collision Factors Summary

The crash factor screening in this plan prioritizes human factors strongly associated with severe outcomes and commonly used in SS4A implementation targeting. The factors include attention, impairment, and speeding.

› Key human-factor indicators:

- **Impairment risk proxy (alcohol involvement):** alcohol involvement averaged **6.4% of all crashes** and **12.9% of KSI crashes**, indicating disproportionate severe harm associated with alcohol-involved crashes.
- **High-severity temporal patterns:** the **1–2 AM** period has relatively fewer crashes but a higher share of KSI outcomes, consistent with elevated risk conditions (often associated with impairment, fatigue, and higher speeds).
- **Seat belt use:** KSI outcomes were notably worse where belts were not worn (by collision type), reinforcing a behavioral safety emphasis area for severe injury reduction.
- **Safe System framing:** human behavior factors (e.g., alcohol, speeding, risk taking) are commonly organized within injury-prevention frameworks such as the Haddon Matrix, supporting the plan's linkage from contributing factors to countermeasure strategy selection.

K. Roadway/operational factors

This plan also emphasizes roadway and operational conditions that increase crash likelihood and/or severity—especially where countermeasures can reduce risk without relying solely on perfect human behavior. Operational and context indicators in the baseline analysis include:

- **Lighting condition:** substantially higher pedestrian KSI share in dark conditions, supporting priorities such as improved illumination, crossing enhancements, and nighttime operations/enforcement coordination at high-risk locations. Also single-vehicle crashes in dark conditions in less urban conditions.
- **Speed environment and operating speeds:** networkwide speed data (average and 85th percentile) provide direct evidence for identifying corridors where speed management should be paired with engineering and operational changes.
- **Exposure-sensitive screening:** the Overall HIN's use of KA crash rates (per VMT for segments; per entering vehicles for intersections) ensures that priority locations are not identified solely by raw counts, but also by rate-based risk where exposure data allow.
- **Strategic VRU prioritization:** the VRU HIN incorporates transit activity, density, and AoPP status to better reflect where pedestrian/bike vulnerabilities may be concentrated. VRU safety priorities are not solely driven by crash counts or crash rates.

8. Safety Countermeasures & Strategies

L. Scottsdale's Safety Challenges and Opportunities

› Regional comparison

The City of Scottsdale has consistently performed better than the Maricopa Association of Governments (MAG) regional average for fatality rates per capita, demonstrating value in the City's coordinated safety approach. Comparing the five-year average of fatalities attributable to crashes on roadways, the MAG region saw an annual loss of life equivalent to 12.79 per 100,000 population versus Scottsdale's 6.03 per 100,000 population.

Examples of Established and Emerging Safety Practices:

- Collaboration between the Scottsdale Police Department and Transportation Department to identify and manage automated speed and red-light running photo enforcement at locations with elevated speeding and crash risk.
- Enhanced visibility for left-turn movements and optimized signal phasing to reduce conflicts.
- Access management through raised medians and right-in/right-out driveways on major arterials.
- Expansion of walking and biking routes with grade separation and physical buffers from traffic.
- Piloting of near-miss detection
- Traffic circle installations in appropriate contexts.
- Red-light running detection.
- Annual crash reports and ongoing reviews of context-based speed limits.
- Targeted neighborhood traffic calming.

- Systemic streetlight improvements for safer streets in dark conditions.
- Road safety assessments and traffic studies at high crash locations or other locations of concern that lead to low-cost solutions throughout the year.

Closely comparing the percentage of crashes that result in fatal injuries, the City of Scottsdale is performing better than the Maricopa Association of Government (MAG) region (of which Scottsdale is one of 27 Cities and Towns, and three (3) Native Nations across Maricopa and Pinal Counties).

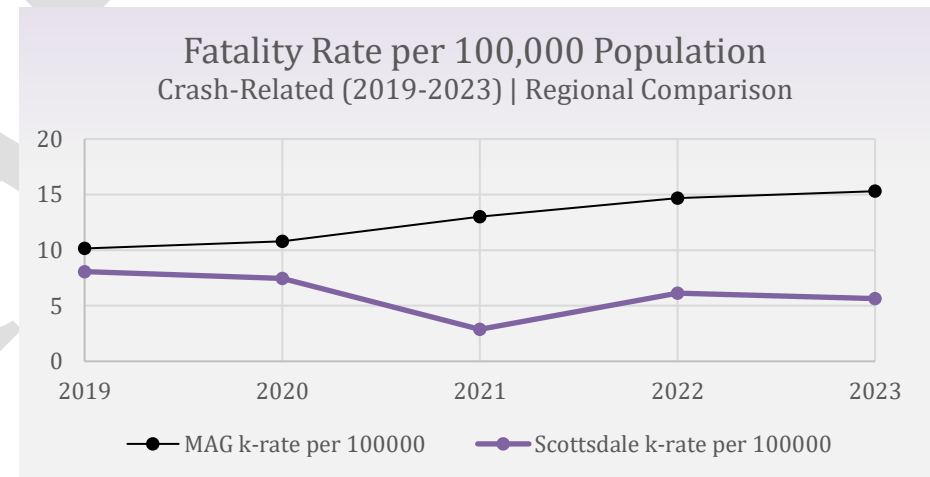


Figure 25– Regional Comparison: Fatality Rate per 100,000 Population for crash-related (2019-2023)

Although Scottsdale's safety outcomes compare well relative to a region showing a "fatal crash hotspot", there are many opportunities to protect the public on Scottsdale's roadways through ongoing focused policy refinement based on working across departments to leverage new technology and changing policy landscapes at the state

and federal levels and track activity prioritizing the High Injury Network maps. These crash records also omit State Route 101 to focus on the roadways under direct jurisdiction of the City.

A note about performance metrics and analysis

Performance metrics used throughout this plan include crash rates that account for traffic volumes at roadway segments and intersections.

CRASH RATES

While this is standard transportation engineering practice, crash rates alone do not fully capture the broader public health risks associated with increased driving exposure, higher operating speeds, and growth in total vehicle travel.

As Scottsdale continues implementing Safe System practices, future performance evaluations should consider both traditional traffic engineering measures and broader community safety outcomes, including the relationships among speed, exposure, crash severity, travel behavior, and population growth. **This balanced approach supports a more comprehensive understanding of transportation safety and community risk.**

This plan accommodates multiple perspectives where the data makes analyses possible and informs policymakers and administrators with flexibility in their first standalone safety action plan under the Safe Streets and Roads for All (SS4A) program.

Table 14 - Injury Severity Crash Codes (KABCO)

Injury Severity Crash Codes				
K	A	B	C	O
Fatal Injury	Serious Injury Suspected	Minor Injury Suspected	Possible Injury	Property Damage Only
Possible Abbreviations: KA or KSI These injuries are the primary focus of the Safe Streets Scottsdale plan.		These injuries offer additional insight into concerning trends.	These injuries are weighted less for safety analysis but can reveal nuanced issues.	

IMPORTANT REFERENCE

See Error! Reference source not found. for definitions of these codes. These injury severities found in crash records are heavily referenced in this plan.

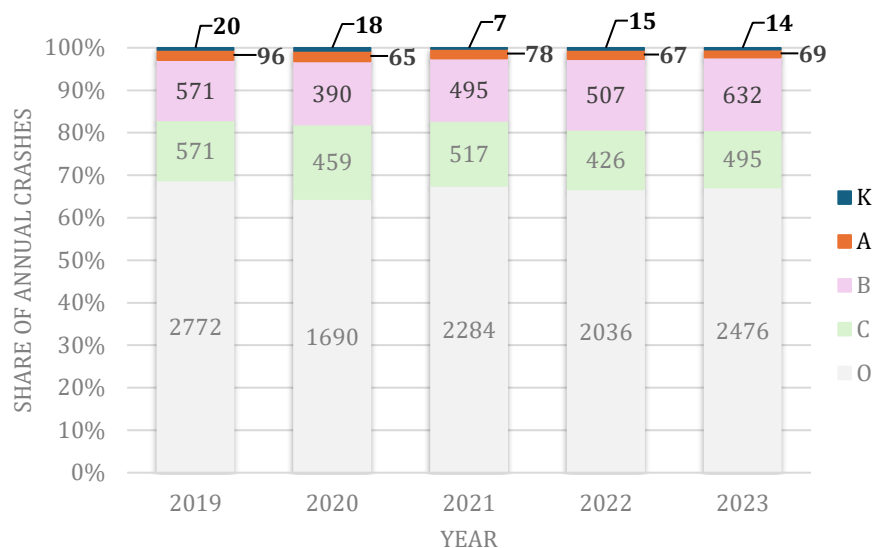


Figure 26 - Share of Annual Crashes by Year (2019-2023)

Crash Records and Data

Crash data for this plan relies on Arizona Department of Transportation (ADOT) and City-maintained records. The data herein will utilize the records collected and analyzed from 2019 through 2023. City traffic safety staff have supplemented ADOT's statewide database which can underrepresent crashes involving people walking and biking (ped and bike crashes). These records have improved accuracy of this plan's analysis.

Many statistics herein refer to crash counts. However, crash counts miss a full accounting for loss of life or life-altering injuries resulting from crashes. For example, crash records show 76 fatal crashes (K) with additional details. Reviewing those additional details exposes that those crashes resulted in 77 fatalities and 68 injuries from 2019 through 2023.

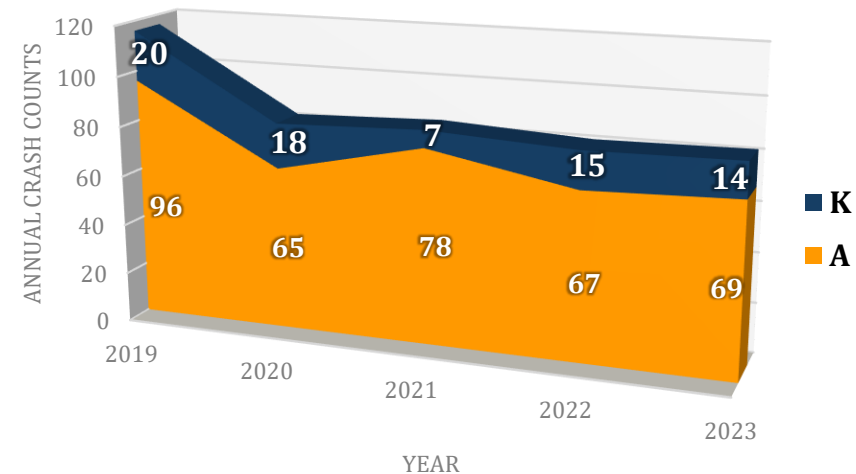


Figure 27 - Fatal (K) and Serious Injury (A) Crash Counts by Year (2019-2023)

Consistent with national and regional trends, **Scottsdale's pedestrians and bicyclists experience disproportionately high rates of fatal and serious injuries in roadway crash incidents compared with motorists.** This affirms the national emphasis encouraging investments that protect vulnerable road users (VRUs) through engineered design, enforcement, and education improving upon these measurable outcomes. The "risk multiplier" in **Error! Reference source not found.** provides a quantifiable risk increase for each injury type compared to all crashes.

This plan recommends the use of the comparison metrics of Table 2 as standard tracking for annual safety reports. Track a 40% reduction by 2035 as a commitment to improving conditions for Scottsdale vulnerable road users.

Citywide safety analyses indicate opportunities for improvement related to several categories which have been ranked in priority below:

1. Speed management
2. Safe turning movements and intersection design
3. Safer pedestrian crossings
4. Lighting and visibility during nighttime conditions
5. Raised medians and controlled access
6. DUI prevention and enforcement

Table 15 - Crash Count by Injury Severity & Mode Comparison (2019 – 2023)

	All Modes		VRU-Only		Comparison	
Injury Severity	Crash Counts	Percent Share	Crash Counts	Percent Share	VRU Risk Multiplier	
Fatal (K)	76	0.4%	20	3.4%	7.71	771% increased share
Serious Injury (A)	378	2.2%	76	12.8%	5.89	589% increased share
Minor Injury (B)	2643	15.2%	255	42.9%	2.83	283% increased share
Possible Injury (C)	2551	14.7%	144	24.2%	1.65	165% increased share
Property Damage Only (O)	11761	67.6%	99	16.7%	0.25	decreased share
Totals	17409	100.0%	594	100.0%		



Figure 28 - Multi-use Path intersecting 100th Street near Horizon Park

› Data-Driven Countermeasures:

Collision manner data were analyzed to identify systemic risk patterns and recurring driver errors. While the High Injury Network (HIN) analysis prioritized fatal and serious injury (KA) crashes, collision manner analysis requires a larger sample size. KAB crash data was used to find patterns in crash types (or collision manners). Countermeasures identified using the following selection process have been included in [Section 8H](#) of this document.

Crash types and context inform the countermeasure selection directly. This data is essential to informing data-driven methods which are a reliable form of applying objectivity into transportation safety work, especially where design and construction benefit-costs are heavily scrutinized.

The following describes the process for FHWA's acceptance of a proven countermeasure:

1. Identify the Safety Problem

- Analyze crash severity and patterns
- Assess exposure, traffic volumes, users, and roadway context
- Identify high-risk locations and crash types
- Define the specific safety need

2. Select and Design the Countermeasure + Study

- Select an appropriate countermeasure
- Define the expected safety effect
- Identify treatment and comparison locations
- Establish the study design, evaluation period, and data needs
- Define performance measures before implementation

3. Implement the Treatment

- Install the countermeasure consistently
- Document location, geometry, and design details
- Record operational conditions and traffic control
- Document installation dates and costs
- Track other changes that could affect study results

4. Collect Before/After Data

- Compile multi-year crash data
- Collect traffic-volume and user-exposure data
- Maintain comparable before-and-after conditions
- Track roadway, land-use, and traffic-control changes
- Organize data by crash type and injury severity

5. Analyze Safety Effectiveness

- Apply appropriate statistical evaluation methods
- Account for regression-to-the-mean and exposure changes
- Calculate Crash Modification Factors or percent crash reduction
- Quantify uncertainty and confidence intervals
- Evaluate results by crash type, severity, and roadway context

6. Document and Build the Evidence Base

- Prepare a technical memorandum or formal study report
- Document methods, assumptions, data, and results
- Demonstrate transparent and reproducible analysis
- Compare findings with FHWA and CMF Clearinghouse criteria
- Use validated findings to support broader safety planning and implementation

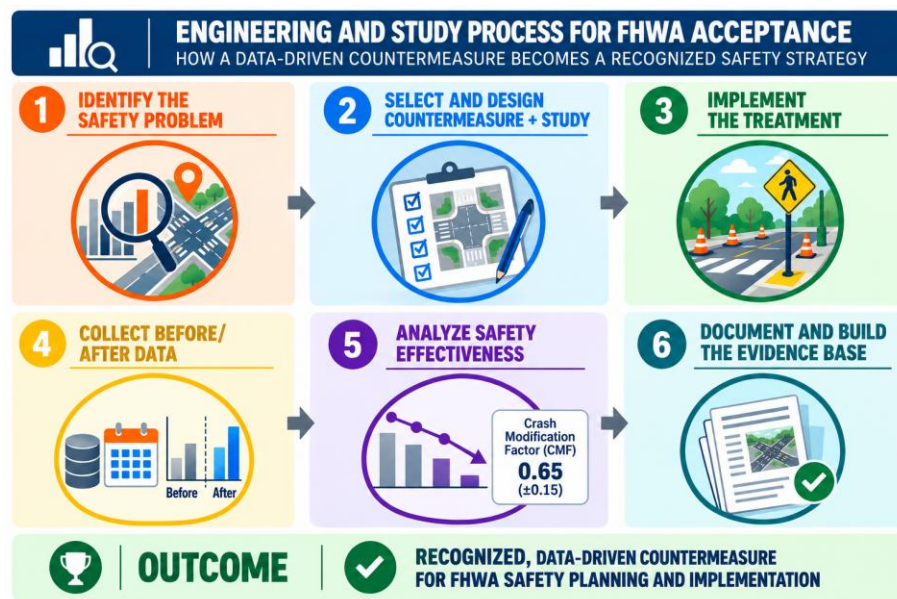


Figure 29 - Process for FHWA Acceptance

Crash types reflect predictable human error and provide a basis for applying Safe System countermeasures. The Safe System approach recognizes that errors will occur and emphasizes designing roadways to reduce conflict likelihood and crash severity.

Angle crashes, which involve two vehicles approaching from an angle where one vehicle's front impacts another's side, represent a high-risk crash type. These crashes are associated with severe injury outcomes due to exposure and impact conditions. See **Figure 22 – Map: Angle Crash Concentrations (Heat Map)** for the spatial distribution of KAB angle crash concentrations.

Speed is a primary determinant of crash severity due to the relationship between kinetic energy, mass of vehicles, and velocity ($KE = \frac{1}{2}mv^2$). This should be distinguished from speeding, defined as travel above the posted speed limit. Crash records indicate that 1.13% of angle crashes involved driving speeds exceeding the speed limit by 10+ MPH. This suggests that unsafe operating speeds, not solely speeding, contribute to risk.

Right-turn movements present a consistent conflict condition. Large curb radii facilitate higher turning speeds and increase exposure for crossing users. In many cases, curb radii are governed by the operational needs of large vehicles such as freight trucks and buses. While these vehicles must be accommodated, Safe System design strategies can manage turning speeds by tightening effective radii, improving visibility, and reducing conflict severity without restricting necessary vehicle access.

Many safety treatments are currently practiced within Scottsdale's Transportation Department. This analysis reemphasizes some treatments.

Disadvantaged Neighborhoods (Federal designation)

Federal policymakers recognize **Areas of Persistent Poverty (AoPP)** within the city. Projects serving these underserved communities are given priority by serving the needs of vulnerable populations. These census-designated areas are eligible for federal

Annual
Fatalities

0.4
0
0.4

Table 16 - AoPP Census Tracts (USDOT data)

TRACT FIPS	FIPS	POPULATION (2020)	Total Fatalities	Annual Fatalities
217600	04013217600	5036	2	0.4
217204	04013217204	2987	0	0
217502	04013217502	3629	2	0.4

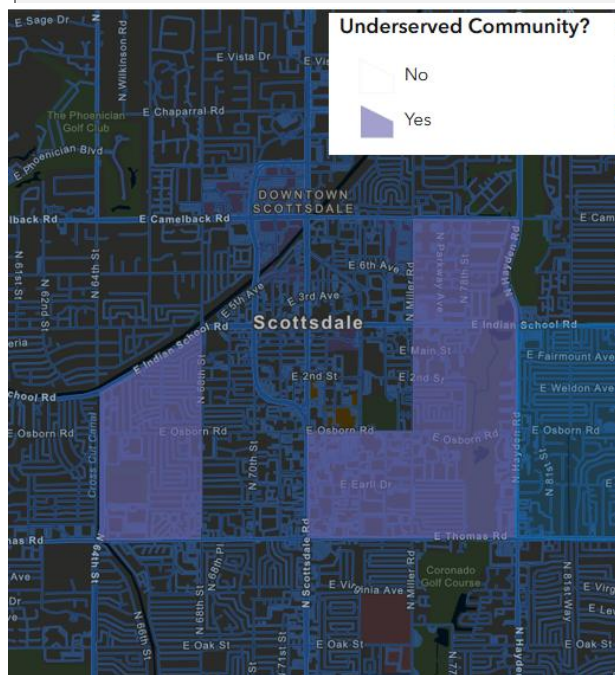


Figure 30 – Map: Area of Persistent Poverty (USDOT language)

Crash Distribution by Collision Manner

Comparing KSI to All Injury Severities

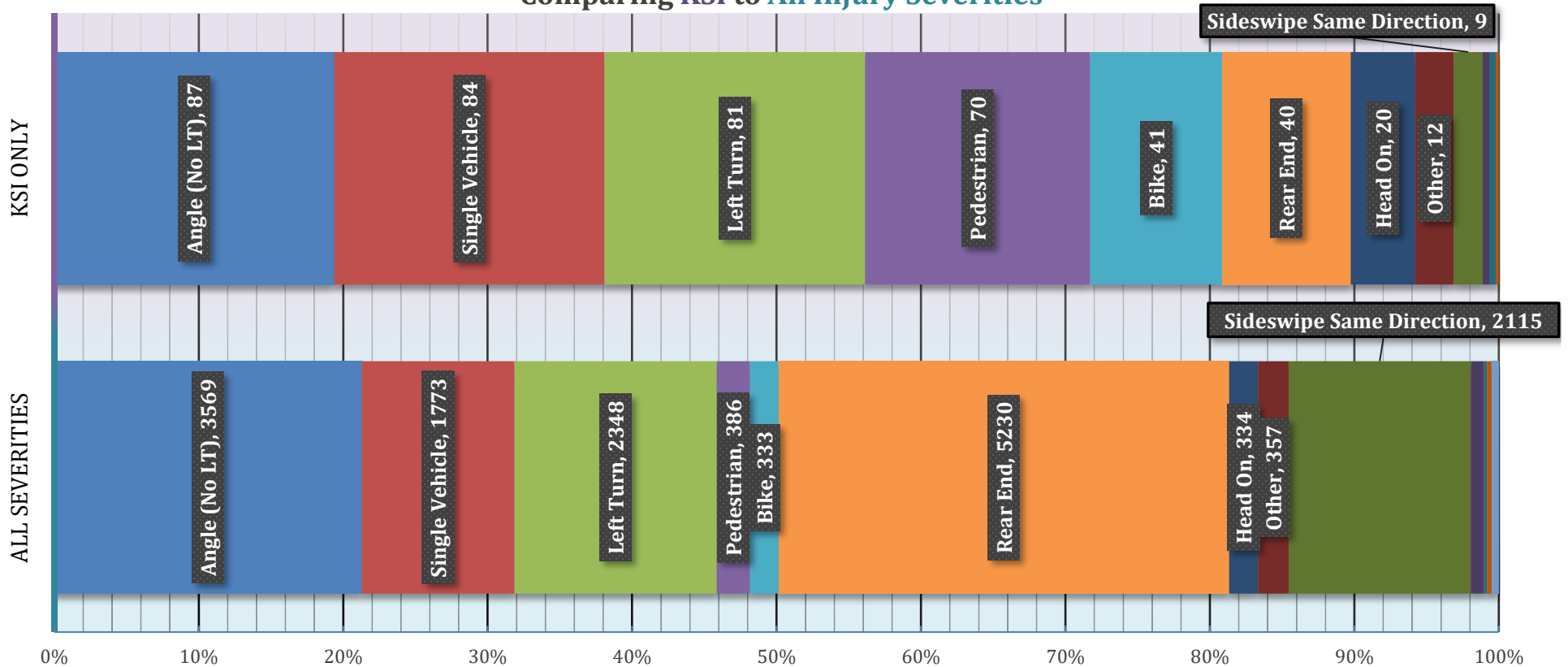


Figure 31- Crash Distribution by Collision Manner

Figure 12 offers a different visualization of the concerning distribution of risk by collision manner comparing fatal and serious injury suspected crash records. A similar analysis is quantified in that includes minor injury suspected (B).

M. Engineering

› Systemic Design, Intersections, Crossings, Speed Management, Access Management

Countermeasures are prioritized earlier in this plan. The essential task for implementation is to bring this information into existing decision-making processes that exist within the relevant departments as decisions are made today. The Technical Advisory

Working Group is the proper venue for agendaizing the discussions where multi-department challenges exist across the organization. Engineering requires coordination for other roadway users.

For a list of safety treatments, cross-references for engineering will best be found in the following sections of this plan:

- **High Injury Network (HIN) Identification**
- **Scottsdale's Safety Challenges and Opportunities**
- **Emphasis Areas**

- **Data-Driven Problem Identification**

N. Education

› **Branding, Corridors, Safe Routes to School, Outreach**

School partners is an opportunity for growth in Scottsdale's efforts to bring attention and additional resources to the families who rely on safe access to schools for regular drop-offs and pick-ups as well as special events. Educational resources and interventions are described earlier in this plan. Identifying staff capacity and responsibility of taking on this should rely on the Transportation Department in conjunction with City Management.

Partner with local media for road safety messages. Commonly, it is preferred to replace the term "accident" with "crash" in all public communications, as the term offers less accountability for a system that seeks to take ownership for safer outcomes. The term "accident" has been found to imply a lack of upstream responsibility to the provide more safety through systemic transportation reform.



Figure 32 – It's No Accident (FHWA)

O. Enforcement

› **Targeted, Fair, Effective, Based on data, Crash record optimization**

Intoxicated driving is a critical issue for the City of Scottsdale. According to meetings with the Technical Advisory Working Group, this is already well-established.

Automated camera enforcement is a controversial topic with state and local policy shifts being considered regularly. Staff should track these legal and policy shifts and discuss implications in the working group meetings.

Note that this automated enforcement is regularly supported by police departments across the country for the effectiveness of the tool and the reduction in police officer retaliation or threats to their body from vehicles passing by during a traffic stop.

P. Policy & Legislation

Local authority on speed limits, Legislative partnerships

As mentioned, legislation and policies on transportation safety are always evolving, having an impact on the available tools that the state legislature has deemed appropriate. Work with legal advisors in the City to track these matters. The working group is the forum for sharing and discussing implications for these matters.

Q. Post-Crash Care

› **EMS response and first responder safety**

More data will be important to bring to the crash analysis in future iterations of this plan.

Scottsdale Fire Department will play a critical role in the working group in coming years to build up the practice of merging their data with relevant fields to broaden the crash analytics to a further degree without the violation of privacy laws.

Safety equipment at the scene of a crash during the response is desired. **Planning estimates for the equipment should be assessed for future grant-making.**

R. Culture of Safety

A culture of safety establishes the expectation that serious crashes are preventable; the Safe System Approach provides the framework for acting on that expectation; and safety countermeasures and strategies are the tools used to reduce risk in the transportation system.

Clear priorities should be evaluated throughout the decision-making roles of City policy-makers. An [Organizational Safety Culture Self-Assessment for Transportation Agencies](#) is recommended to the Technical Advisory Working Group to carry out in the first year of advancing the transportation safety practices at the City.

S. Keeping Design Standards and Guidelines Current

Scottsdale has a robust set of standards and guides that promote best practices when planning, designing, and constructing safety improvements.

› Examples

The Crossing Guidelines Leading Pedestrian Interval (LPI) policies update offered as a sample in this plan's appendix is one example of where guide updates are critical.

Cross reference: **Crossing Guidelines & LPI policies.**

The Transportation and Infrastructure Department is recommended to review **Table 17 - Safety Treatments & Contexts** for missing design standards for future design standards and guidance updates.

T. Countermeasure Toolkit

For capital improvements within Figure 22 – Map: Angle Crash Concentrations (Heat Map), crash pattern analysis would recommend assessing the practicality of the following treatments, (definitions are included in Countermeasure Toolkit Contents):

High-priority

- Turn speed reduction
- Signal timing
- Access management
- Speed reduction and management
- Data collection tools

Secondary

- Visibility improvements
 - Daylighting
 - Lighting
 - Setback crossings
- Median refuge islands

Supporting

- Markings and signage
- Colored pavement

› Assessing Benefits Relative to Cost

Competitive grants, like SS4A, use **benefit cost analyses** to seek the best return on investment.

Relative cost	Typical planning meaning
Low	<\$25,000 per location, intersection leg, or small deployment
Moderate	\$25,000–\$150,000 per location/intersection, or limited corridor segment
High	>\$150,000 per location/intersection, or corridor-level capital project

Taking the prioritized countermeasures previously assessed, the relative costs of these improvements are listed below.

Priority	Treatment	Relative cost
High	Turn speed reduction	Moderate–High
High	Signal timing	Low–Moderate
High	Access management	Moderate–High

Priority	Treatment	Relative cost
High	Speed reduction and management	Moderate–High
High	Data Collection Tools	Low–Moderate
Secondary	Visibility improvements	Low–Moderate
Secondary	Median refuge islands	Moderate–High
Supporting	Markings and signage	Low
Supporting	Colored pavement	Low–Moderate

This approach supports both major capital projects and near-term improvements. Lower-cost treatments such as signal timing changes, daylighting, markings, signage, lighting, and quick-build curb extensions can be advanced rapidly at high-priority locations while larger projects

such as corridor speed management, raised medians, protected intersections, setback crossings, and access management are developed through the capital improvement process.

With excessive speeds, the probability of a fatal and serious injury (KSI) crash sees a sharp increase. Limited records exist for crashes where speeds exceed the speed limit by 15 MPH. These excessive speeding estimates are made by the reporting officer who collects information from witnesses and those involved in the crash.

Single vehicle crashes tend to be a sign of behavioral factors such as inattentive (or distracted) driving, reckless driving, or substance use and are represented in Scottsdale’s data. The significant occurrence should prompt investigating poor driving conditions or obstructions of visibility. Cross-tabulation of enough records and roadway conditions can provide more specifics for systemic prevention. The sample size and crash data quality does not allow for conclusive causation, but these are factors and methods to consider as the safety program evolves. This would best be supported by a post-crash analysis team who would develop more consistent and detailed site assessments at the scene of single vehicle crashes.

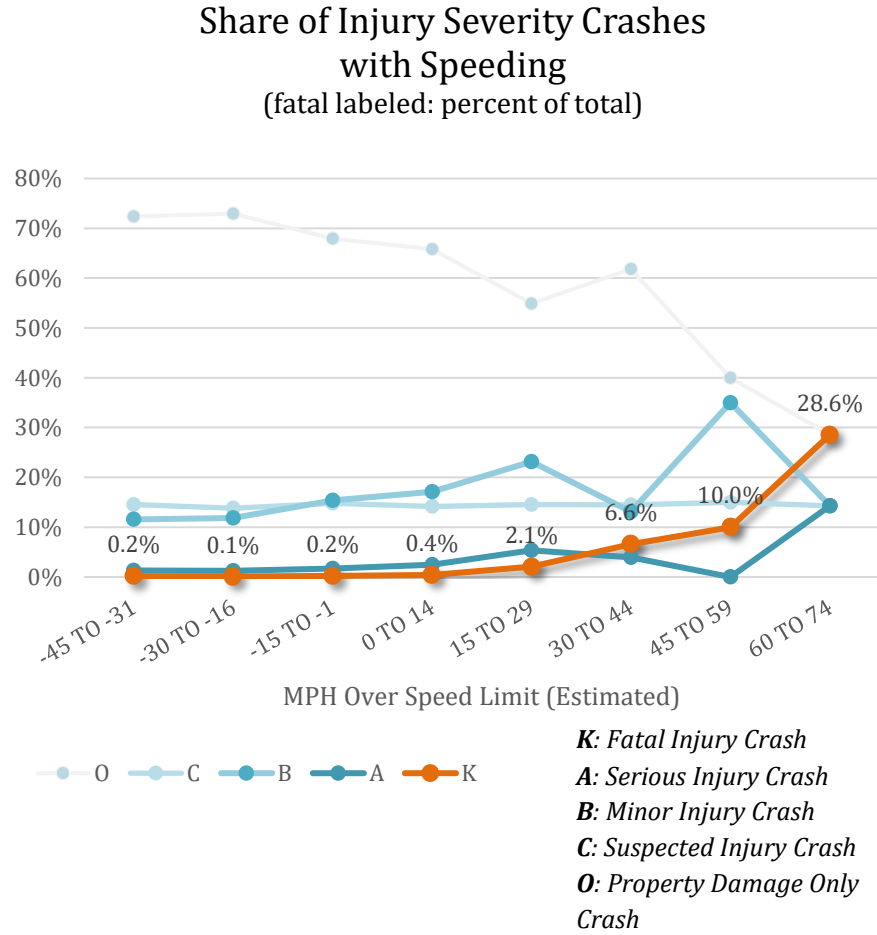


Figure 33 – Compare Injury Severity with Speeding (16,302 records used)

Review of the data and collaboration with Scottsdale staff identified the following framework for establishing countermeasures:

- 

1
Speed management on corridors where operating speeds increase crash severity.
- 

2
Intersection and turn conflict reduction, especially where angle, left-turn, pedestrian, or bicycle crashes are concentrated.
- 

3
Safer pedestrian crossings, including visibility, refuge, signal timing, and crossing-distance improvements.
- 

4
VRU protection, especially along corridors with pedestrian, bicycle, and transit activity.
- 

5
Lighting and visibility improvements, particularly in areas with nighttime crash patterns.
- 

6
Access management, where frequent driveways, alleys, and uncontrolled access points create recurring conflict conditions.

The Scottsdale toolkit map identifies five Tier 1 countermeasures—**High-Visibility Crosswalks, Variable Speed Limits, Hardened Centerline, Left-Turn Traffic Calming, and Road Reconfiguration.** These tier 1 countermeasures have been prioritized at these locations by using a combination of countermeasures that will mitigate risks to the

user profiles of the All-Modes and Vulnerable Road Users. There are examples of locations in relation to the City’s High Injury Network (HIN). The map offers a set of treatments intended for targeted application at locations where crash severity and network priority justify intervention. There are overlapping opportunities and tools, this list is based on what countermeasures best fit Scottsdale’s needs from a HIN analysis perspective. Please see: [Online Map | Click Here](#)

Tier 1 Countermeasure Toolkit Hierarchy		
1	Conflict visibility	High-Visibility Crosswalks
2	Speed Management	Variable Speed Limits
3	Turn-path and conflict management	Hardened Centerlines Left-Turn Traffic Calming
4	Fundamental conflict reduction	Road Reconfiguration

› Countermeasure Toolkit Contents

The *Countermeasure Toolkit Hierarchy* is a recommendation on considering safety priorities and swiftness of deployment within the City’s existing capacity. More complex and fiscally-challenging projects and programs will require longer timelines to develop and

implement. This toolkit is not intended to be exhaustive in nature. It provides countermeasures focused on crash trends within the City organized in priority levels based on conversations with city staff on readiness for application.

Tier 1 Countermeasures

High-Visibility Crosswalks

The principal function is **visibility and expectancy**. Higher visibility informs drivers where pedestrian crossing activity should be anticipated and provides a clearer path for all people, including those with low-vision, to walk across the roadway.

For Scottsdale, these treatments are most appropriate where the analysis identifies **crossing conflicts on arterial corridors, high pedestrian activity, older pedestrians, school or transit access, or nighttime pedestrian exposure**. On higher-speed arterials of five (5+) or more lanes, striping alone should not be treated as the complete countermeasure; it is often better considered the base treatment within a package that may include refuge islands, pedestrian signals, traffic controls, RRFBs, HAWK/PHBs, lighting, curb extensions, or speed management.

Primary crash targets: pedestrian crossing crashes, turning-vehicle/pedestrian conflicts, failure-to-yield crashes, and nighttime pedestrian crashes when visibility treatments are included.

Strongest modal benefit: pedestrians and mobility-device users.

Variable Speed Limits

Variable speed limits are primarily an **operational speed-management treatment**. Unlike a conventional posted speed limit, the displayed limit can respond to changing traffic or roadway conditions.

The strongest contexts are those where the **appropriate safe operating speed changes materially over time**—for example congestion transitions, special events, work zones, adverse weather, or other recurring operating conditions. In a Scottsdale context, this is likely to be a more specialized strategy than geometric speed management because many suburban arterial safety problems are persistent rather than temporary.

This includes a separate day and night speed limit which helps drivers in darker conditions proceed at a slower, often 10 MPH slower, rate of speed when visibility is compromised relative to daylight hours. The data and findings that support is the pattern of increase rates of KSI crashes relative to the rate of KSI crashes on average. The geographic patterns suggest paying attention to land use patterns and nighttime sight distances where low-lighting conditions are found:

- Pedestrians see an increased risk during dark conditions in entertainment districts.
- Single vehicle crashes see an increased risk in rural areas where roadway lighting and reflectivity of pavement markers are less prevalent may be compromising sight distance.
 - Aging population consideration: light vision declines rapidly at advanced ages.

Primary crash targets: speed-related crashes, rear-end crashes associated with large speed differentials, and severe crashes generally because lower impact speed reduces kinetic energy.

Strongest modal benefit: all users, with especially important severity benefits for pedestrians and bicyclists because they are less protected from kinetic energy.

Left Turn Calming / Hardened Centerline

A hardened centerline is fundamentally a **turn-path control treatment**. It physically or visually extends the centerline into the intersection so a left-turning driver cannot take a broad, high-speed diagonal path.

This is particularly well suited to Scottsdale's **large suburban intersections with wide receiving roadways and generous turning geometry**. The treatment can often be implemented using relatively low-cost materials and can be designed with mountable elements where buses, trucks, or emergency vehicles require additional swept-path accommodation.

The principal safety mechanism is not simply "slowing traffic" as much as it is making the **left-turn trajectory more predictable and orienting drivers to better see the pedestrian or bicycle crossing** while it improves yielding and reduces impact speed.

Primary crash targets: left-turn/pedestrian, left-turn/bicycle, sideswipe/encroachment, and some angle crashes.

Strongest modal benefit: pedestrians and bicyclists, with secondary benefit to opposing and adjacent motorists.

Left-turn traffic calming is broader than hardened centerlines. It includes any treatment intended to **reduce the speed and radius of the left-turn maneuver** and improve yielding behavior.

For Scottsdale, the strongest candidates are likely to be intersections with:

- Broad corner or median geometry
- Multiple receiving lanes
- High left-turn volumes

- Permissive left-turn operation
- Documented pedestrian/bicycle conflicts
- High approach speeds
- Large arterial-to-arterial intersections

Treatments can include hardened centerlines, extended median noses, slow-turn wedges, channelization, tighter effective geometry, or revised signal phasing.

Primary crash targets: left-turn angle crashes, left-turn/opposing-vehicle crashes, and left-turn conflicts with pedestrians and bicyclists.

Strongest modal benefit: broadly multimodal; particularly valuable where VRUs cross during or adjacent to left-turn movements.

Road Reconfiguration

Road reconfiguration is the broadest strategy in the toolkit. Its value comes from changing the **underlying conflict environment**, rather than simply warning users about it.

Depending on the corridor, a reconfiguration can:

- Add or formalize turn lanes
- Retrofit raised medians
- Provide pedestrian refuge
- Add buffered or protected bicycle space
- Shorten pedestrian crossings
- Reduce lane-changing
- Lower operating speeds
- Simplify intersection approaches

This is particularly applicable where Scottsdale has a **high-crash arterial with more vehicular capacity than is operationally necessary**, or where resurfacing/reconstruction creates an opportunity to redistribute existing pavement.

Primary crash targets: rear-end, sideswipe, turning, crossing, pedestrian, bicycle, and speed-related severe crashes.

Strongest modal benefit: all modes; the benefit can be especially large for pedestrians and bicyclists when roadway space is converted to refuge or separation.

High-Priority Countermeasures

Turn Speed Reduction

Treatments that slow turning vehicles and shorten crossings, including tighter curb radii, corner islands, hardened centerlines, and raised crossings.

Primary crash targets: Sideswipe, turning, and crossing crashes

Strongest modal benefit: all modes; the benefit can be especially large for pedestrians and bicyclists when roadway space is converted to refuge or reduced crossing lengths

Signal timing

Low-cost signal operational changes such as Leading Pedestrian Intervals, dynamic walk extension, dynamic green extension for bicyclists, protected turn phases, and phase separation to reduce conflicts.

Primary crash targets: left-turn/pedestrian, left-turn/bicycle

Strongest modal benefit: pedestrians and bicyclists

Access management

Driveway, alleyway, dedicated turn lanes, and access-point treatments that reduce conflict points between vehicles, pedestrians, and bicyclists.

Primary crash targets: sideswipe, turning, crossing, pedestrian, bicycle

Strongest modal benefit: all modes

Speed reduction and management

Corridor-level design and operations strategies that lower vehicle speeds through lane narrowing, complete streets, traffic calming, and speed-supportive signal timing.

Primary crash targets: All crash types with an emphasis on fatal and severe injury outcomes

Strongest modal benefit: All modes

Data collection tools

Scottsdale already has a TMC but the implementation of systems to detect near misses or red-light running events could inform future decisions and priorities.

Primary crash targets: All crash types

Strongest modal benefit: All modes

Secondary Countermeasures

Daylighting

Daylighting is a safety strategy to **protect broad visibility** across the full intersection. Daylighting is applied in the streets of Old Town with mixed results. For example, in Figure 10 the pedestrian ramp is

visible to the right of the lane, but not the left of the lane. Visibility of approaching pedestrians is an applicable strategy for the City of Scottsdale.



Figure 34– Regenerated Streetview, Daylighting Example (Old Town context)

Primary crash targets: angle crashes, pedestrians struck at intersections, and crashes in dark conditions

Strongest modal benefit: Pedestrian and bicycle

Lighting

Adequate lighting should be placed at pedestrian crossings according to the FHWA guidance to result in more visibility and recognition of users for drivers.

Primary crash targets: Dark condition crashes involving pedestrians and bicyclists both midblock and at intersections

Strongest modal benefit: Pedestrian and bicycle

Setback Crossings

Setback crossings which place VRUs in forward view of driver and are striped further away from the immediate corner. This orientation also allows for VRUs to better detect and react to a non-yielding driver.

Primary crash targets: Pedestrian and bicycle crashes at intersections

Strongest modal benefit: Pedestrian and bicycle

Median refuge islands

Raised median islands that allow pedestrians and bicyclists to cross one direction of traffic at a time.

Primary crash targets: Pedestrian and bicycle crashes at intersections, pedestrian and bicycle crashes midblock

Strongest modal benefit: Pedestrian and bicycle

Supporting

Marking and signage

Crosswalks, stop/yield bars, warning signs, turn restrictions, lane-use signs, signal head visibility improvements, and delineators that clarify movements and reinforce expected behavior.

Primary crash targets: All crashes; particular use where repeated noncompliance has lead to increased near miss reporting

Strongest modal benefit: All modes

Colored pavement

Colored conflict-zone markings that increase awareness of bicycle, pedestrian, transit, or other priority movement areas.

Primary crash targets: Pedestrian and bicycle crashes

Strongest modal benefit: Pedestrian and bicycle

U. Countermeasure Recommendations

Countermeasure Recommendations		
1	Conflict visibility	Adopt high visibility crosswalks in all urban contexts and at every crosswalk identified in the VRU HIN. Identifying high-conflict intersections.
2	Speed Management	Recommendation: Complement the City's current lighting improvement districts with nighttime speed management zones with a comprehensive approach to nighttime roadway operations. Establish a pre- and post-evaluation process to monitor the impact of these strategies to monitor/report on progress.
3	Turn-path and conflict management	Conduct a demonstration project to evaluate the applicability of left-turn calming using quick-build products for centerline hardening . Select a location identified in the toolkit map. Plan for a pre-/post-evaluation process. Document learning process with maintenance leadership and field personnel.
4	Fundamental conflict reduction	Assess what VRU segments meet the FHWA Bike Selection Guide for protected bike lanes and plan and start a design with MAG programs to install quick-build bollards to turn a high-stress condition into a low-stress bikeway suitable for all ages and abilities.

9. Funding & Implementation

A. SS4A grants and eligibility

FY2026 is scheduled to be the last round of the SS4A-specific funding, as it was titled under the Bipartisan Infrastructure Law (enacted in November 2021). Future funding and implementation may have to be secured through other means, pending future federal transportation legislation. This section was included for due diligence purposes.

B. MAG and ADOT

Safety funding is currently undergoing dynamic shifts. The most timely direction this plan can offer is to keep staff involved with state and regional partnering agencies on these matters.

Programs:

- AZ SMART Fund
 - Federal discretionary grant program administered by ADOT for surface transportation projects
- Expanded Transportation Safety goals with the passage of Prop 479
 - Maricopa County voter-approved half cent sales tax to fund regional transportation projects until 2045

C. Scottsdale's Budget Priorities

The City commonly uses the Transportation Privilege (Sales) Tax of 0.20% as a voter-approved (1989) revenue source that is dedicated to transportation improvements and operations and deposited in the City's Transportation Fund. Local funding source is best used as match funds to acquire state and federal funding.

Using the HIN areas strategically is important. Some segments stack together well to make for a single project. Use the tiers as a guide for prioritization, but if a tier 3 project is adjacent to a tier 1 project, consider bringing these projects together to save money on mobilizing and reviewing design plus mobilizing, staging, and procuring construction activities.

Starting with Tier 1 HINs, both All-Mode and VRU, Segment and Intersection data align well with the data here in treatment options. Several treatments including a variety of sources are included below and compared on their contexts and placemaking opportunities.

Table 17 - Safety Treatments & Contexts

Treatment	Corridor Context	Intersection Context	Pedestrian Context	Bike Context	Sense of Place
Advisory Lanes	✓			✓	
Bike Lanes	✓			✓	
Chicanes	✓				✓
Choker	✓				✓
Curb Extensions		✓	✓	✓	✓
Gateways	✓	✓	✓		✓
Lateral Shift	✓				
Leading Pedestrian Intervals		✓	✓	✓	✓
Multi-Way Stops		✓			
On-Street Parking	✓				✓
Pedestrian Refuges or	✓	✓	✓		✓

Treatment	Corridor Context	Intersection Context	Pedestrian Context	Bike Context	Sense of Place
Median Islands					
Pedestrian Scramble		✓	✓		
Plazas and Parklets	✓				✓
Raised Crosswalks	✓	✓	✓		✓
Raised Intersections		✓	✓		✓
Raised Medians	✓				
Rectangular Rapid Flashing Beacons	✓	✓	✓	✓	
Residential Shared Street	✓				
Road Closures	✓				✓
Road Diet	✓				
Roundabouts or Mini Roundabouts		✓			
Shared Lane Markings (Sharrows)	✓			✓	
Signal Progression	✓	✓			
Skinny Street or Queuing Street	✓				
Speed Cushions	✓				

Treatment	Corridor Context	Intersection Context	Pedestrian Context	Bike Context	Sense of Place
Speed Detector Signs	✓				
Speed Humps	✓				
Speed Tables	✓				
Staggered Crossings		✓	✓		
Textured Pavement or Crosswalks		✓	✓		✓
Traffic Signage and Markings	✓	✓			✓
Turn Hardening		✓			

10. Appendices

A. Data tables and maps (HIN, crash trends)

The following tables outline simple data that informs the ranking for the following High Injury Network analyses with input data. [The HIN tables are mapped and labeled by rank number.](#)

1. All-Mode Intersection HIN
2. All-Mode Segment HIN
3. VRU Intersection HIN
4. VRU Segment HIN

› All-Mode Intersection HIN

Intersection Rank	Roadway 1	Roadway 2	HIN Tier	Total Crashes	KSI Crashes	HSM Weighted	Total Segment HIN Score
1	E. Thomas Road	N. Hayden Road	1	134	5	194	496.87
2	E. Pinnacle Peak Road	N. Scottsdale Road	1	96	5	141	345.97
3	E. Camelback Road	N. Goldwater Boulevard	1	95	3	122	307.20
4	N. Hayden Road	E. McDowell Road	1	112	4	163	301.65
5	N. Silverbell Road	N. Frank Lloyd Wright Boulevard	1	51	4	87	266.20
6	E. Shea Boulevard	N. Scottsdale Road	1	106	5	151	243.05
7	N. 96th Street	E. Shea Boulevard	1	60	5	105	234.95
8	E. Osborn Road	N. 68th Street	1	29	4	65	220.05
9	E. McKellips Road	N. Miller Road	1	39	3	81	205.38
10	E. McDowell Road	N. Granite Reef Road	1	37	4	88	202.01
11	N. Goldwater Boulevard	E. 2nd Street	1	59	2	77	190.24
12	E. Thomas Road	N. 64th Street	1	69	2	102	174.16
13	N. Pima Road	E. Pinnacle Peak Road	1	58	3	85	166.90
14	E. Carefree Highway	N. Scottsdale Road	1	25	3	67	166.68
15	N. Hayden Road	E. McCormick Parkway	1	28	3	70	151.71
16	N. Miller Road	E. McDowell Road	2	55	3	82	149.62
17	N. Drinkwater Boulevard	E. Osborn Road	2	52	2	70	144.89
18	N. Scottsdale Road	E. Indian School Road	2	98	2	116	143.08
19	E. Shea Boulevard	N. 124th Street	2	48	2	81	136.15
20	N. Hayden Road	E. Cactus Road	2	65	2	83	133.34
21	N. Hayden Road	E. McDonald Drive	2	76	2	94	131.89
22	N. Miller Road	E. Earll Drive	2	13	3	40	130.80
23	Bartlett Dam Road [FR 205]	N. Cave Creek Road	2	5	1	29	127.91
24	E. Shea Boulevard	N. 69th Street	2	35	2	68	127.42
25	N. Pima Road	N. 87th Street	2	20	1	44	122.26
26	E. Oak Street	N. Scottsdale Road	2	44	2	77	121.24
27	N. Miller Road	E. Osborn Road	2	36	2	54	119.74

Intersection Rank	Roadway 1	Roadway 2	HIN Tier	Total Crashes	KSI Crashes	HSM Weighted	Total Segment HIN Score
28	N. Northsight Boulevard	Arriba Dr	2	9	1	33	118.81
29	N. Frank Lloyd Wright Boulevard	N. Thompson Peak Parkway	2	70	2	88	118.68
30	E. Indian School Road	N. 68th Street	3	44	2	77	118.45
31	E. Osborn Road	N. Scottsdale Road	3	61	2	79	117.72
32	E. Jomax Road	N. Pima Road	3	16	2	34	117.28
33	N. Scottsdale Road	E. Chaparral Road	3	73	1	97	116.98
34	E. Mountain View Road	N. 107th Street	3	5	2	23	116.21
35	N. Scottsdale Road	E. Happy Valley Road	3	12	3	54	116.00
36	N. Miller Road	E. Williams Drive	3	11	2	44	113.54
37	N. Scottsdale Road	E. Virginai Ave	3	14	3	56	113.07
38	N. Hayden Road	E. Frank Lloyd Wright Boulevard	3	85	1	94	109.01
39	E. Via Linda	E. San Salvador Drive	3	39	2	57	108.21
40	E. Indian School Road	N. Buckboard Trail	3	27	2	45	101.28
41	E. Thomas Road	N. 68th Street	3	57	1	81	97.52
42	N. Scottsdale Road	E. Indian Bend Road	3	54	2	72	96.00
43	N. Silverbell Road	N. 114th Street	3	18	1	27	94.21
44	E. Camelback Road	N. Marshall Way	3	38	1	47	93.92
45	E. Dynamite Boulevard	N. Pima Road	3	41	1	50	93.81

All-Mode Segment HIN

Segment Rank	Roadway Segment Name	All-Mode HIN Segment Tier	Total Crashes	KSI crashes	KA Crash Rate	HSM Weighted	Total Segment HIN Score
1	N. Goldwater Boulevard	1	139	3	4.56	166	354.3
2	N. Goldwater Boulevard	1	136	4	3.69	172	330.5
3	E. McDowell Road	1	261	11	0.33	375	214.4
4	N. Hayden Road	1	258	8	0.30	360	196.1
5	E. Camelback Road	1	226	6	0.47	280	191.0
6	E. Thomas Road	1	272	6	0.26	341	174.3
7	N. Frank Lloyd Wright Boulevard	1	154	5	0.69	199	165.5
8	N. 68th Street	1	116	7	0.61	209	163.2
9	E. Pinnacle Peak Road	1	145	7	0.60	208	160.5
10	N. Scottsdale Road	1	181	7	0.34	274	160.3
11	E. Osborn Road	1	109	7	0.84	172	158.0
12	N. Hayden Road	1	76	3	1.69	118	153.6
13	E. Camelback Road	1	184	4	0.43	220	144.5
14	N. 68th Street	1	102	7	0.63	180	142.4
15	E. McDowell Road	1	182	8	0.25	284	141.5
16	N. Scottsdale Road	2	137	4	0.62	173	136.6
17	E. Thomas Road	2	203	6	0.24	272	133.9
18	E. Osborn Road	2	100	4	0.95	136	132.9
19	N. Scottsdale Road	2	243	6	0.16	327	131.8
20	E. Indian School Road	2	181	6	0.31	235	130.3
21	N. Scottsdale Road	2	203	6	0.16	302	121.7
22	N. Frank Lloyd Wright Boulevard	2	199	3	0.28	226	119.5
23	N. Hayden Road	2	175	6	0.24	244	119.5
24	N. Hayden Road	2	164	6	0.24	233	114.0
25	E. Shea Boulevard	2	221	6	0.15	290	114.0
26	N. Goldwater Boulevard	2	101	4	0.59	137	105.2
27	N. Goldwater Boulevard	2	120	3	0.50	147	104.0
28	E. Shea Boulevard	2	201	5	0.18	246	103.5
29	E. Camelback Road	2	232	3	0.15	259	100.5
30	E. Shea Boulevard	3	373	3	0.06	415	98.9
31	N. Scottsdale Road	3	176	5	0.20	221	98.6
32	E. Shea Boulevard	3	185	5	0.18	230	97.0
33	E. McDowell Road	3	205	5	0.15	250	96.4
34	N. Frank Lloyd Wright Boulevard	3	85	5	0.55	130	96.0
35	E. Chaparral Road	3	80	1	0.84	104	95.3
36	E. Indian School Road	3	145	4	0.21	196	89.7
37	N. Hayden Road	3	75	9	0.23	186	88.9
38	N. Hayden Road	3	121	5	0.21	196	88.9
39	N. Hayden Road	3	106	1	0.59	115	88.6
40	N. Scottsdale Road	3	235	5	0.10	280	88.5

Segment Rank	Roadway Segment Name	All-Mode HIN Segment Tier	Total Crashes	KSI crashes	KA Crash Rate	HSM Weighted	Total Segment HIN Score
41	E. 2nd Street	3	38	6	0.50	122	86.2
42	N. Hayden Road	3	119	2	0.39	137	85.3
43	E. Shea Boulevard	3	217	2	0.13	235	84.9
44	E. McDonald Drive	3	85	3	0.44	127	83.8
45	N. Hayden Road	3	180	6	0.10	249	79.6

VRU Intersection HIN

Rank	Roadway 1	Roadway 2	VRU HIN Tier	Total VRU Crashes	VRU KSI Crashes	HSM Weighted	VRU Intersection HIN Weighting
1	E. Camelback Road	N. Goldwater Boulevard	1	8	3	35	59.61
2	N. Scottsdale Road	E. Granada Road	1	2	2	35	48.40
3	E. Camelback Road	N. Parkway Avenue	1	1	1	25	44.18
4	E. Shea Boulevard	N. Scottsdale Road	1	6	2	24	40.35
5	N. Scottsdale Road	E. Virginia Ave	1	4	1	28	36.33
6	E. McDowell Road	N. Granite Reef Road	1	3	1	27	34.72
7	E. Osborn Road	N. Scottsdale Road	1	9	1	18	33.60
8	N. Scottsdale Road	E. Camelback Road	1	4	1	13	32.69
9	E. Via Linda	N. 100th Street	1	1	1	25	32.07
10	N. Pima Road	N. 87th Street	1	1	1	25	31.75
11	N. Miller Road	E. Earll Drive	2	2	2	20	30.05
12	N. Scottsdale Road	E. Cochise Road	2	1	1	25	30.05
13	N. Scottsdale Road	E. McDowell Road	2	7	1	16	29.94
14	N. Hayden Road	E. Royal Palm Road	2	1	1	25	29.04
15	N. Hayden Road	E. Via Camello	2	1	1	25	28.62
16	N. 105th Street	E. Queens Wreath Lane	2	1	1	25	28.22
17	E. Shea Boulevard	N. 128th Street	2	1	1	25	27.29
18	N. Scottsdale Road	E. Joan De Arc Avenue	2	1	1	25	26.73
19	E. Indian School Road	N. Buckboard Trail	2	3	2	21	25.46
20	E. Mountain View Road	N. 107th Street	2	3	2	21	24.85
21	N. Scottsdale Road	E. Thomas Road	3	8	0	8	23.79
22	N. Scottsdale Road	E. SkySong Boulevard	3	1	1	10	21.75
23	N. Scottsdale Road	E. 3rd Avenue	3	4	1	13	21.57
24	N. Scottsdale Road	E. 3rd Avenue	3	4	1	13	21.57
25	N. Hayden Road	E. McDowell Road	3	3	1	12	20.81
26	N. Hayden Road	E. McCormick Parkway	3	7	1	16	19.71
27	N. Drinkwater Blvd.	E. Osborn Road	3	5	1	14	19.59
28	N. Miller Road	E. Monterey Way	3	2	1	11	16.53
29	E. McDowell Road	N. 79th Street	3	2	1	11	16.09
30	E. Legacy Boulevard	N. 94th Street	3	4	1	13	15.48

VRU Segment HIN

Rank	Roadway Segment Name	VRU HIN Segment Tier	Total VRU Crashes	VRU KSI Crashes	HSM Weighted	Transit Index	Pop. Density Index	Persist. Poverty (+10%)	HIN Sore
1	N. Scottsdale Road	1	22	5	127	1.93	1.43	1.1	384.38
2	E. Thomas Road	1	11	6	155	1.46	1.42	1.1	352.88
3	N. Scottsdale Road	1	13	6	157	1.42	1.34	1.1	329.61
4	N. Scottsdale Road	1	6	5	126	1.34	1.33	1.1	246.46
5	N. Miller Road	1	9	4	105	1.44	1.31	1.1	217.81
6	E. Camelback Road	1	28	2	76	1.86	1.35	1.1	210.07
7	E. Camelback Road	1	5	4	101	1.33	1.34	1.1	198.21
8	N. Scottsdale Road	1	19	3	91	1.31	1.47	1.1	192.89
9	E. Indian School Road	1	19	4	85	1.40	1.37	1	162.54
10	N. Hayden Road	1	6	3	78	1.18	1.38	1.1	138.65
11	N. Scottsdale Road	1	6	3	78	1.18	1.35	1.1	136.60
12	N. Scottsdale Road	2	14	3	41	2.00	1.41	1	115.94
13	N. Hayden Road	2	4	2	52	1.08	1.62	1.1	99.68
14	N. Hayden Road	2	3	2	51	1.05	1.59	1.1	94.25
15	N. Hayden Road	2	14	3	71	1.00	1.21	1	86.11
16	E. Thomas Road	2	7	3	64	1.21	1.10	1	85.43
17	N. Miller Road	3	12	1	36	1.76	1.30	1	82.79
18	N. Scottsdale Road	3	17	2	50	1.42	1.15	1	81.82
19	N. 78th Street	3	9	3	66	1.04	1.18	1	81.46
20	E. Camelback Road	3	12	2	45	1.19	1.37	1.1	80.58
21	N. Hayden Road	3	8	2	56	1.06	1.33	1	78.60
22	E. Osborn Road	3	10	2	43	1.13	1.44	1.1	77.49
23	N. Miller Road	3	10	2	43	1.26	1.43	1	77.23
24	N. 78th Street	3	2	2	35	1.37	1.38	1.1	72.97

B. Data and HIN Calculation – Detailed Report

Northern Arizona University (NAU), a partner in traffic safety analyses, has developed a detailed report on initial developments of the HIN. There have been added criteria to omit projects that were elevated as outliers in their KSI (KA) Crash Rates. The initial lists were narrowed down to more focused lists.

For reference: [NAU HIN Development \(documentation\)](#).

C. Crossing Guidelines & LPI policies

External Reference: [\(Draft\) Policy for Review](#)

1. Purpose & Scope

This concise guide aligns Scottsdale's pedestrian crossing practices with Northern Arizona University (NAU) and City of Phoenix research on LPIs and complements Scottsdale's crossing guidelines. It emphasizes data-driven screening and operations while keeping implementation practical. This may serve

the countermeasure implementation of the Vulnerable Road User (VRU) High-Injury Network (HIN) at signalized intersections.

Primary references (hyperlinked):

- [NAU/AZTrans: Treatments in Phoenix \(project summary\)](#)
- [City of Phoenix: Road Safety Action Plan – Pedestrian Treatment Study \(Final Report link\)](#)
- [FHWA Proven Safety Countermeasure: LPI \(tech sheet\)](#)
- [ADOT: LPI overview \(3–10 sec guidance; MUTCD Sec. 4E.06\)](#)
- [NACTO Urban Street Design Guide: Signal Phasing \(LPI\)](#)
- [FHWA STEP: Uncontrolled crossing resources \(RRFB, PHB, refuge, raised crossings\)](#)

2. Where LPIs Fit (and Where They Don't)

LPIs are for signalized intersections to reduce pedestrian-involved turning vehicle conflicts. For unsignalized locations, continue to use Scottsdale's three-step procedure and treatment toolbox (e.g., RRFB, HAWK/PHB, refuge islands, raised crossings).

Use LPIs when one or more apply:

- Pedestrian-involved turning conflicts or crash patterns at signalized intersections.
- High turning volumes (right or left), permissive movements, or complex geometry.
- Priority contexts (and changing contexts): schools, transit stops, older-adult destinations, tourist/entertainment districts, and VRU-specific High Injury Network segments.

3. Screening & Data

Crash analysis involved in the Safe Streets Scottsdale plan found this conflict to be overrepresented in the data and of particular interest in Walk Audit engagement.

Using conflict-based screening process that complements traditional warrants:

- Use crash history (≥5 most recent years) to flag sites with pedestrian injuries or turning-movement involvement.
- Optional (high cost): Traffic video review (representative hours, manual or automated) to log Post-Encroachment Time (PET) near-miss conflicts and turning volumes.
- Consider latent demand (e.g., land use generators, ACS changes, context transition) when observed pedestrian volumes are low but expected to grow.
- Land Use Generation changes: See anticipated population and/or job density changes in the General Plan or General Plan Land Use Amendments not yet realized.
- American Community Survey data offers insights very few years as to the change of housing and employment across geography to assess recent trends.
- Corridors connecting urbanized areas may serve more active transportation trips generated. Anticipating these influences may reach outside of their immediate contexts for at least a mile in all directions.

Expected performance: Peer-reviewed NAU analysis in Phoenix found LPI presence associated with ≈10–15% fewer all conflicts (PET ≤ 5s) and ≈50% fewer severe conflicts. [\[TRR 2025 abstract\]](#)

4. Implementing LPIs (Operations & Design)

Timing

- Set LPI to 3–7 seconds (typical per FHWA/NACTO) and up to 10 seconds where crossing distance/user needs justify (per ADOT/MUTCD guidance).

- *Apply only to affected crosswalk(s) or all approaches, depending on conflict patterns and coordination needs across consistent contextual conditions.*

Signal Phasing & Turning Movements

- *Right-Turn-on-Red (RTOR): Consider pairing LPIs with time-of-day or approach-specific No Turn On Red (NOTR) where conflicts persist or in sensitive pedestrian-priority contexts (schools, high pedestrian volumes). – **Highly relevant per Safe Streets Scottsdale (2026).***
- *Left turns/FYA: If permissive lefts create conflicts during the LPI or early WALK, consider protected phasing during pedestrian lead or adjust permissive windows.*
- *Corridor approach: Where one intersection meets LPI criteria, consider upgrading adjacent signals to establish consistency and predictability along the corridor.*

Accessibility & Detection

- *Provide Accessible Pedestrian Signals (APS) wherever LPIs are implemented to convey the lead interval audibly/tactually in compliance with PROWAG; when possible, limit delay of crosswalk activation on button actuation.*

Evaluation & Adjustment

- *After implementation, repeat video review to remeasure PET distributions and turning compliance; retime LPI as needed.*

Funding

- *Anticipate MAG Travel Option Grants (with Proposition 479 taxing authority) will offer new design details and programs to promote transportation safety upgrades. See [MAG Regional Travel Options and Optimization Study 2025](#).*
- *Prop 479 includes dedicated regional funding categories for:*
 - *Safety*
 - *Arterial intersections*
 - *ITS*
 - *Nonmotorized transportation*
 - *Active transportation*
 - *Emerging technology*
 - *Transit access improvements*
 - *The regional investment plan includes approximately:*
 - **\$200M for safety**
 - **\$400M for arterial intersection improvements**
 - **\$800M for nonmotorized transportation**
- *As of May 2026, USDOT and legislative leadership have published commitments to continue Safe Streets and Roads for All implementation will have long-term programmed funding.*

5. Unsignalized Crossings: Keep Scottsdale's Process, Elevate Priority

Continue to apply Scottsdale's 3-step procedure (site description, data collection, evaluation) and use the established scoring factors (origins/destinations, pedestrian/vehicular volumes, distance to nearest controlled crossing, speed, crossing distance/median, lighting, crash history).

Key tools include high-visibility markings, lighting, curb extensions, refuge islands, RRFBs, and PHBs; select based on speed/volume and context.

6. What Changes vs. Scottsdale's 2018 LPI Draft

2018 Draft LPI Policy (Summary)	Updated Practice
Duration ≥3s; engineer discretion.	Set 3–7s typical; consider up to 10s where crossing time (or users) justify. Base on conflict data and crossing characteristics (FHWA/ADOT/MUTCD).
Turning restrictions Incremental; add only if needed after LPI.	Proactively evaluate pairing with NTOR (time-of-day or approach-specific) where high conflicts or sensitive contexts exist; reassess post-deployment.
Site triggers High ped activity; ped>20/hr (or >10/hr in 4 non-consecutive hours); >60 conflicting turns/hr; crashes; schools; T-intersections; visibility issues.	Add conflict-based screening using PET and turning volumes; prioritize HIN corridors, schools/transit, and latent demand areas even where current volumes are low.
APS MUTCD recommends APS at LPI sites. Case-by-case timing/plan changes.	Treat APS as standard at LPI sites to ensure the audible lead and access for all. Formalize before/after monitoring (PET/conflicts, compliance); adjust LPI and turning phasing accordingly.
Location-by-location implementation.	Consider corridor-level consistency once one intersection qualifies, to reduce driver surprise and increase predictability.

7. Appendix: Quick Links

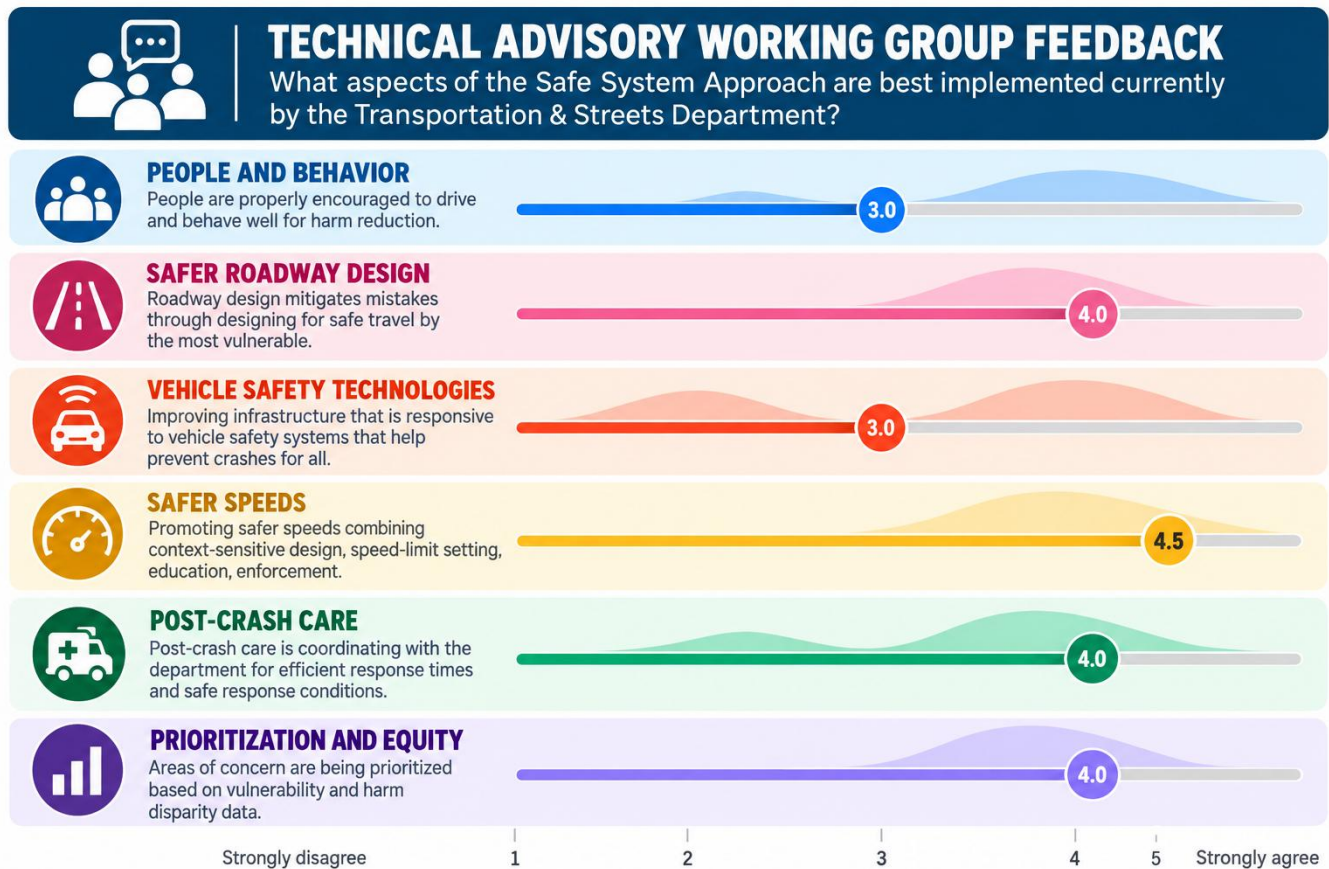
- [NAU \(TRR 2025\) – LPI conflict reductions \(abstract\)](#)
- [NAU/AZTrans project summary – Phoenix LPI & pedestrian treatment guidance](#)
- [Phoenix RSAP page – Pedestrian Treatment Study \(Final Report link\)](#)
- [FHWA: LPI Proven Safety Countermeasure](#)
- [ADOT: LPI overview & MUTCD reference](#)
- [NACTO: Signal phasing examples \(LPI\)](#)
- [FHWA STEP: Unsignalized crossing resources](#)

Note: This guide builds upon NAU and City of Phoenix research for LPI site selection and evaluation methods and complements Scottsdale's existing crossing guidelines. Replace or add local hyperlinks as Scottsdale publishes updated policy language.

D. Intersection Safety for VRUs

Safety Evaluations of Innovative Intersection Designs for Pedestrians and Bicyclists (Report No. FHWA-HRT-23-052, May 2023) can be reached at [Part-IV-Citation-15-16 -FHWA.pdf](#).

E. Technical Advisory Feedback



The Technical Advisory Working Group has all the representation needed to move forward as an implementation team moving this plan forward.

Recommendation: *Incorporate all first-responder data into a single database to enhance future crash and injury analyses.*

F. Transportation Commissioner Feedback Summary

Transportation Commission Meeting Dates – Consultants Summarizing Feedback from the following dates:

- January 16, 2025
- February 20, 2025
- April 18, 2025
- August 21, 2025

Taken together, the Transportation Commission’s comments indicate that the Safety Action Plan should be **more than a retrospective crash report**. Commissioners repeatedly encouraged a **proactive Safe System framework** that strengthens minimum design standards, uses physical design to influence travel behavior, identifies systemic risk before severe crashes accumulate, and strategically applies enforcement where engineering treatments alone cannot adequately manage risk. **(August 21, 2025)**

Commissioners also consistently asked the project team to **explain the data rather than simply present it**. Requested areas of additional analysis included time of day, traffic volume, alcohol involvement, seasonal patterns, traffic-control type, operating speed, direction of travel, land use, lighting, and roadway geometry. Commissioners also expressed interest in evaluating whether previous transportation investments produced measurable safety benefits and recognized that relatively small numbers of fatal and serious-injury crashes can make individual-location trends unstable from year to year. **(April 18, 2025)**

The Commission also raised the importance of examining **Property Damage Only (PDO) crashes as supplemental safety information**. While fatal and serious-injury crashes remain the principal Safe System outcome, Commissioners noted that concentrations of lower-severity crashes may identify locations experiencing unusual conflict or risk before a severe crash history develops. This feedback supports incorporating PDO patterns as a supplemental diagnostic measure alongside the High Injury Network and systemic risk analysis. **(February 20, 2025)**

A third consistent message was that **implementation and accountability should be visible**. Commissioners requested clear and specific goals, defined time horizons, shorter-term milestones, an established plan-update cycle, evidence supporting countermeasure and enforcement decisions, and continued opportunities for public participation. This feedback supports organizing implementation around a clear progression of **risk identified → countermeasure selected → project or program implemented → outcome measured → plan updated**, rather than presenting recommended strategies as a static list. **(January 16 and August 21, 2025)**

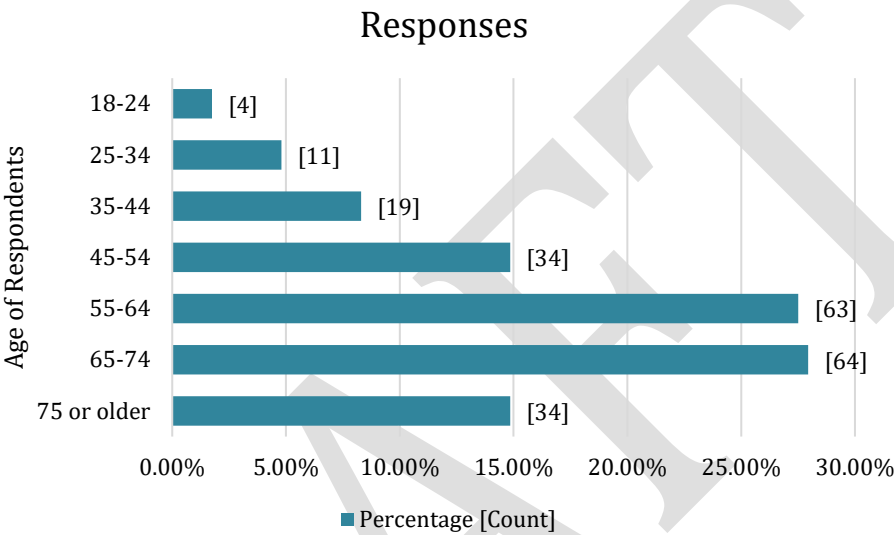
Finally, Commissioners repeatedly emphasized the importance of addressing **Scottsdale-specific transportation and land-use conditions**. Topics raised during the meetings included high-speed arterial roadways, tourism and unfamiliar drivers, nighttime pedestrian activity, special events, extreme heat, development and access patterns, e-bikes and scooters, school-aged and novice road users, pedestrian access to businesses, bicycle detection at traffic signals, and roadway designs that may create indirect or difficult pedestrian routes. **(January 16, February 20, and April 18, 2025)**

Collectively, the Commission's feedback supports a Safety Action Plan that applies established Safe System principles while adapting implementation strategies to **Scottsdale's roadway network, travel patterns, land uses, visitor activity, and community priorities**.

G. Community Questionnaire and Engagement Results

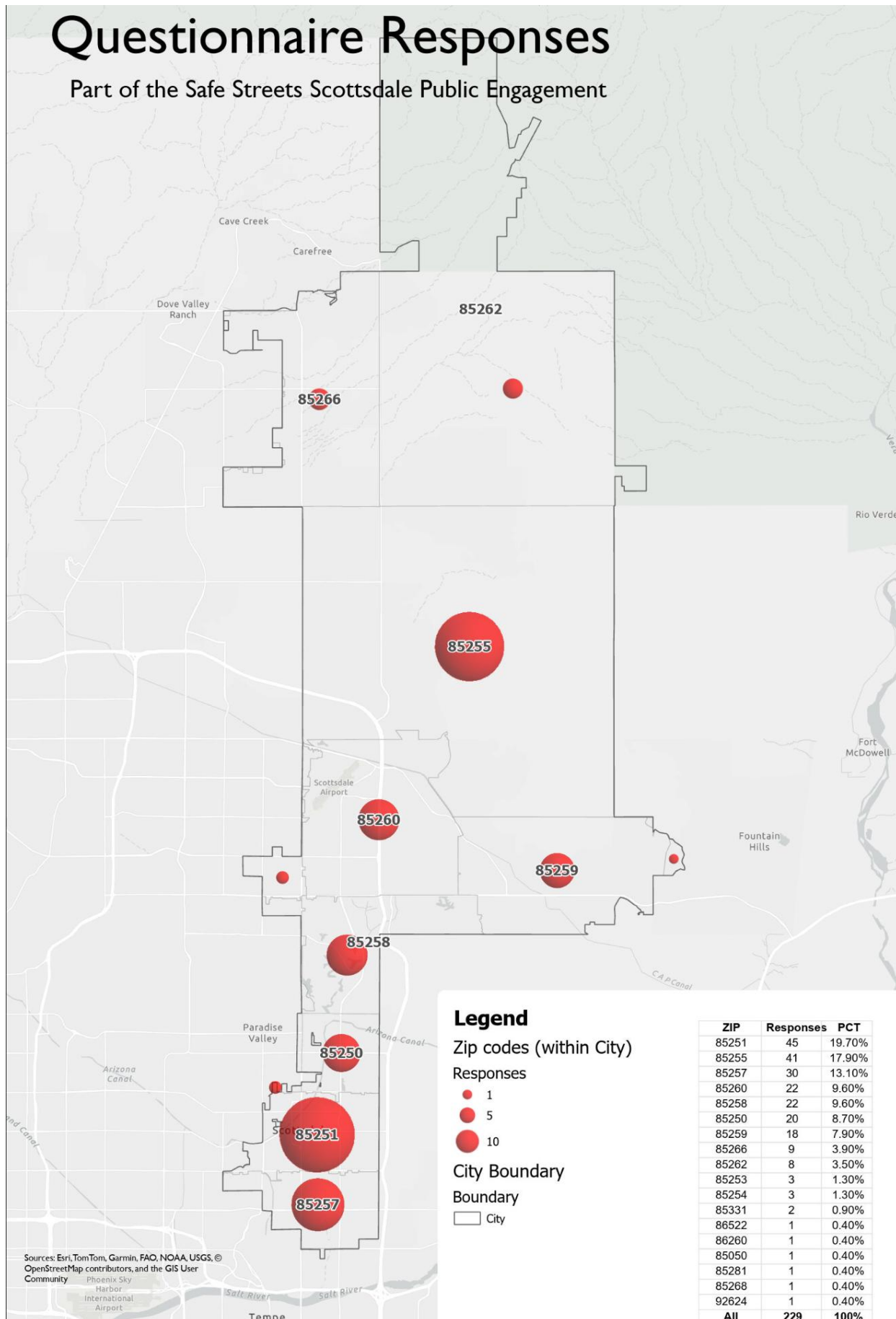
› Online Questionnaire

The Safe Streets Scottsdale online questionnaire was promoted through City communications and remained open from September 18 through November 25, 2025, receiving 229 responses. Because participation was voluntary, the results should be interpreted as engagement input rather than a statistically representative survey; however, the responses provide useful direction on public perceptions, safety priorities, and locations where respondents experience discomfort or risk.



Respondents were predominantly older adults: 55–64 and 65–74 were the largest age groups, with 63 and 64 responses respectively, and respondents age 55 or older represented approximately 70 percent of all participants. Adults age 45 or older represented roughly 85 percent of responses. No respondents were under 18, and only four were age 18–24. Gender responses were 56 percent female, 41 percent male, and 3 percent prefer not to say. Responses were concentrated in Scottsdale ZIP codes, led by 85251, 85255, 85257, 85260, 85258, and 85250, which together accounted for most participation.

Travel responses show that the respondent group is highly car-oriented but still regularly experiences Scottsdale through multiple modes. In a typical week, 92 percent reported driving a motor vehicle, 35 percent reported walking or using a wheelchair/mobility scooter, 24 percent reported bicycling or using a scooter, 21 percent reported riding as a passenger, 11 percent used taxi or ride-hail, and 5 percent used public transit. Respondents most commonly reported traveling through quiet residential streets and major arterial roads, each selected by 84 percent of respondents, followed by highways or freeways at 66 percent and busy commercial or Old Town streets at 61 percent. Most respondents did not identify personal access barriers, but smaller shares reported limited income, not owning a bicycle, disability, physical conditions affecting bicycling, lack of a driver’s license, or lack of access to a personal vehicle.



Safety Solution Priorities: Resulting preferences (response counts)					
Priority	Design	Education	Enforcement	Lighting	Speed
First	23	6	19	14	16
Second	18	15	16	17	12
Third	14	17	14	15	18
Fourth	14	18	14	15	17
Last	9	22	15	17	15
<i>When the counts are weighed: First choice = 5 through Last choice = 1</i>					
Multipliers	Design	Education	Enforcement	Lighting	Speed
First (x5)	115	30	95	70	80
Second (x4)	72	60	64	68	48
Third (x3)	42	51	42	45	54
Fourth (x2)	28	36	28	30	34
Last (x1)	9	22	15	17	15
Total Weight Score	266	199	244	230	231
Weighted Priority	1	5	2	4	3

When asked to rank safety approaches, respondents placed the strongest priority on safer roadway design, followed by traffic enforcement, speed management, lighting/signage, and education/awareness. Using the weighted ranking method shown in the appendix materials, roadway design received the highest score, indicating preference for physical and operational changes such as crosswalks, separated bike lanes, traffic circles/roundabouts, markings, and signals. Enforcement and speed management also ranked highly, suggesting that respondents see unsafe behavior and vehicle speeds as major contributors to perceived risk, but the top-ranked preference was for changes to the street environment itself.

Open-ended and mapped “trouble spot” comments were coded into recurring themes. Driver behavior was the largest concern, representing 29 coded comments, or 27 percent of mapped comments. These comments most often referenced speeding, red-light running, rolling through stop signs, failure to yield, distracted driving, and aggressive maneuvers. Traffic control and roadway configuration was the second-largest theme, with 20 comments, or 19 percent, including concerns about roundabouts, unclear lane configurations, short signal timing, turn-arrow conflicts, and confusing or ineffective crossing control. Crossing safety was third, with 18 comments, or 17 percent, and focused on long crossing distances, missing crossings, drivers failing to stop at marked or HAWK crossings, and turn conflicts at intersections.

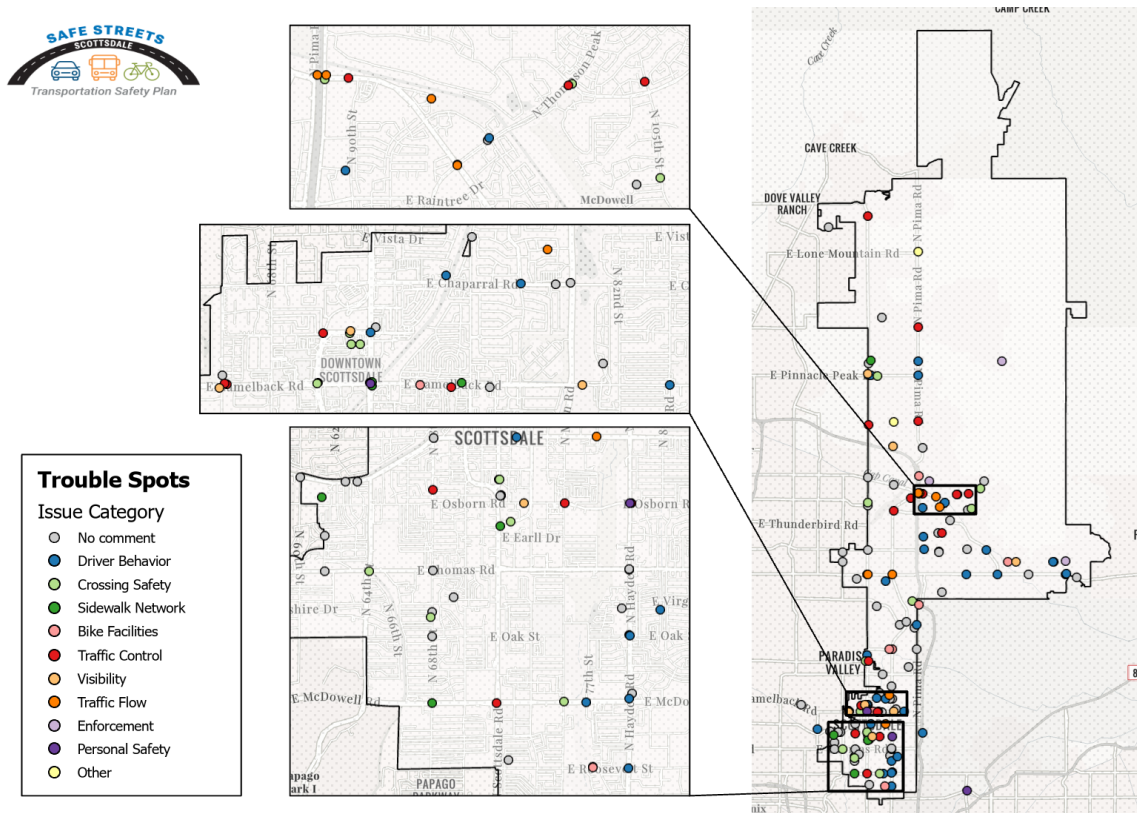


Figure 35 – Map: Trouble Spots (Q10 of Questionnaire)

Mapped comments show that perceived trouble spots were not evenly distributed citywide. Reports were densest in South Scottsdale and the Old Town area, with additional concentrations along major arterial corridors and at complex intersections. The geographic pattern reinforces the questionnaire themes: respondents were most likely to identify locations where high traffic volumes, wide crossings, turning conflicts, speeding, limited visibility, or discontinuous pedestrian and bicycle facilities combine to create stressful conditions.

Overall, the questionnaire indicates that respondents want the Strategic Transportation Safety Plan to prioritize physical roadway design changes, targeted enforcement, and speed management, with special attention to crossings, intersections, arterial corridors, and locations where walking or bicycling facilities are missing, uncomfortable, or poorly separated from vehicle traffic. The results also show a need to supplement questionnaire findings with other engagement methods that reach younger people, transit users, lower-income households, people with disabilities, and residents or visitors who may be underrepresented in this opt-in response set.

Concern theme	Share of coded comments	Summary for plan narrative
Driver behavior	29 comments (27%)	The most common concern was unsafe driver behavior, especially speeding, red-light running, rolling through stop signs, failure to yield, distracted driving, and aggressive maneuvers. Several comments described high-speed corridors, drivers rushing through signals, and vehicles not yielding to pedestrians or bicyclists in crosswalks.
Traffic control and roadway configuration	20 comments (19%)	Respondents frequently pointed to confusing or uncomfortable traffic control conditions, including roundabouts, unclear lane configurations, short signal timing, turn-arrow concerns, missing or insufficient traffic control, and malfunctioning or ineffective crossing equipment. Roundabouts and complex intersections were repeatedly described as stressful or hard to navigate.
Crossing safety	18 comments (17%)	Many comments focused on the difficulty of crossing wide or busy streets. Respondents noted missing crosswalks, long crossing distances, drivers failing to stop at marked or beacon-controlled crossings, and unsafe right- or left-turn conflicts. Several comments emphasized the need for new crossings where people already walk or where sidewalks and destinations create clear desire lines.
Bicycle facility concerns	8 comments (8%)	Bicycle-related comments highlighted missing bike lanes, disappearing bike lanes, inadequate separation from traffic, debris or construction impacts in bike lanes, and unsafe crossings where multi-use paths intersect with turning vehicles.
Traffic flow, congestion, and freeway-related conflicts	8 comments (8%)	Respondents identified high traffic volumes, congestion, cut-through traffic, and freeway ramp areas as contributors to unsafe conditions. Some comments described drivers rushing to access SR 101 or other high-speed facilities, creating stressful merge, turn, and crossing conditions.
Sidewalk network and pedestrian infrastructure	7 comments (7%)	Comments identified missing sidewalks, narrow or constrained sidewalks, non-ADA sidewalk ramps, sidewalk gaps, and uncomfortable walking conditions along major streets. Several respondents described having to walk on gravel or in areas with limited pedestrian accommodation.
Visibility	7 comments (7%)	Visibility concerns included poor nighttime lighting, limited sight distance from foliage or curves, and difficulty seeing pedestrians at dawn, dusk, or nighttime crossings. Respondents linked visibility issues to both crossing safety and driver reaction time.
Enforcement	3 comments (3%)	Some respondents explicitly called for stronger enforcement of speeding, red-light running, school-zone behavior, parking restrictions, and unsafe U-turns, particularly near schools and high-activity areas.
Personal safety / comfort	3 comments (3%)	A smaller number of comments raised concerns about perceived personal safety, including homelessness, vagrancy, and high-activity commercial or tourist areas that make walking feel less comfortable.
Other / future conditions	3 comments (3%)	Other comments included anticipated needs related to future development, new destinations, or general roadway concerns that did not fit neatly into one category.

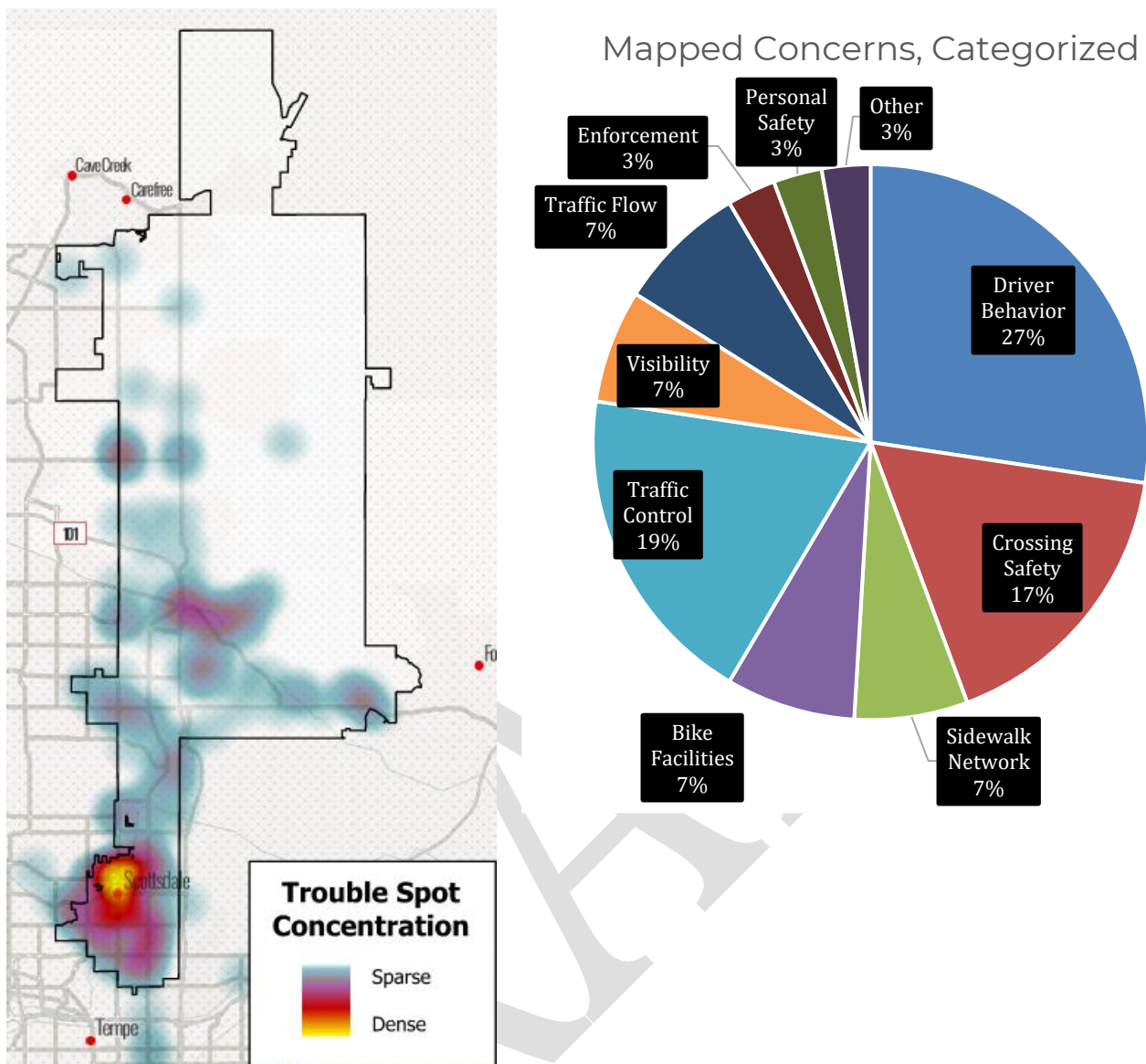
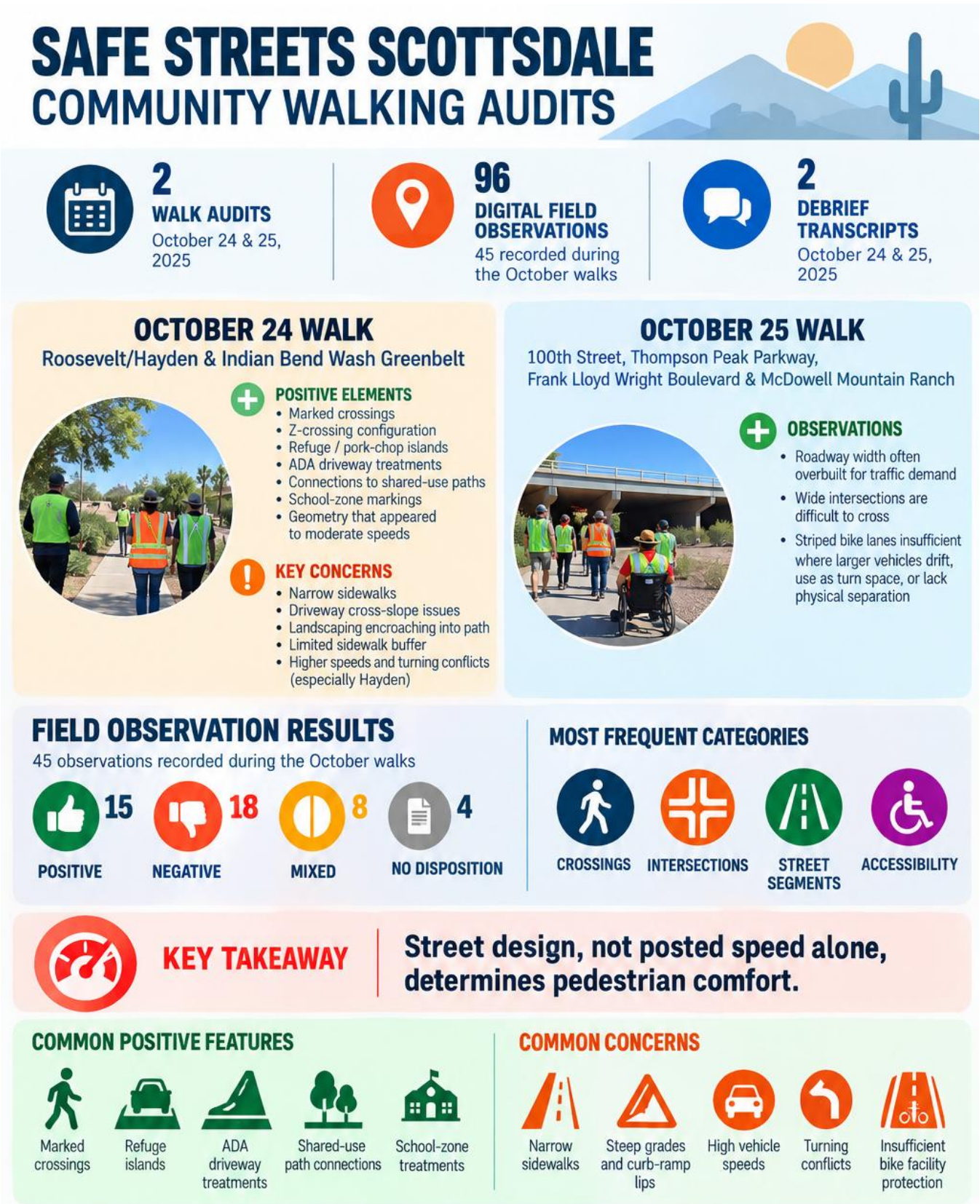


Figure 36 – Map: Questionnaire Trouble Reported Hot Spot

› Community Walking Audits

The Safe Streets Scottsdale walking assessments used guided field walks, digital field observations, and facilitated debrief discussions to document how Scottsdale's pedestrian environment functions from the perspective of people walking, using mobility devices, bicycling, and accessing nearby trails, schools, parks, and neighborhood destinations. The team captured two debrief transcripts from October 24 and October 25, 2025, and 96 digital field observations; 45 of the digital observations were recorded during the October walking assessment dates. Overall, the walk audits identified a consistent pattern: Scottsdale has many strong pedestrian and trail assets, but comfort and safety decline where wide streets, high vehicle speeds, narrow sidewalks, discontinuous bike facilities, limited crossing control, steep or constrained ADA access, and maintenance issues converge.



treatments that create flatter pedestrian passage, cul-de-sac access to shared-use paths, school-zone markings, and locations where street curvature or constrained geometry appeared to moderate speeds. At the same time, participants repeatedly described Roosevelt and Hayden as examples of the difference between neighborhood-scale walking comfort and arterial-scale exposure. Roosevelt was viewed as more walkable where speeds were lower and the street felt more self-regulating, but participants still observed narrow sidewalks, driveway cross-slope issues, prickly pear or other landscaping encroaching into the pedestrian path, limited sidewalk buffer, and discomfort where vehicles continued to travel faster than felt appropriate for a neighborhood Indian Bend Wash Greenbelt-access route. Hayden was described as substantially more stressful because of higher operating speeds, wider crossing distances, turning conflicts, and the perceived vulnerability of standing in or near refuge areas while vehicles moved quickly through the intersection.

On October 24, a major theme from the debrief was that design consistency matters as much as the presence of individual treatments. Participants recognized good ideas in existing infrastructure, including ADA-graded driveway transitions, refuge islands, bicycle connections, pedestrian signals, and Indian Bend Wash Indian Bend Wash Greenbelt access points, but said these features were unevenly applied. Several participants contrasted locations where pedestrian recall or push-button response worked well with locations where the pedestrian signal experience felt slow, unclear, or insufficient. The group also raised the need to standardize effective practices across similar contexts, especially where neighborhood streets feed pedestrians and bicyclists toward Hayden, the Indian Bend Wash Indian Bend Wash Greenbelt, schools, and commercial areas.

The October 25 walk focused on 100th Street, Thompson Peak Parkway, Frank Lloyd Wright Boulevard, Horizon Park, and McDowell Mountain Ranch area. Participants described 100th Street as overbuilt for observed traffic demand in some segments, with roadway width and lane configuration contributing to a motor-vehicle-dominant environment. Wide intersections were repeatedly described as difficult for pedestrians because they require people to begin crossing immediately, maintain a fast walking pace, and manage turning traffic at the same time. Participants also identified striped bike lanes as insufficient where larger vehicles drift into them, where stripes are used as de facto turn space, or where people biking must rely only on paint separation from fast-moving traffic.

The most frequent digital field-note categories from the October walks were crossings, intersections, street segments, and accessibility. Of the 45 October field observations, 18 were coded as negative, 15 as positive, 8 as mixed, and 4 did not include a disposition. Crossings and intersections generated both positive and negative comments: participants appreciated visible crossings, shorter exposure distances, refuges, and school-zone treatments, but identified short crossing times, insufficient markings, lack of driver yielding, unclear priority, and exposure to high-speed turning traffic as recurring concerns. Accessibility comments were mostly negative, with repeated references to narrow sidewalks, steep grades, curb-ramp lips, inadequate turning space, constrained driveway crossings, and pedestrian routes that would be difficult or unsafe for wheelchair users, older adults, people using walkers, or people pushing strollers.

Across both walks, participants emphasized that **street design, not posted speed alone, determines pedestrian comfort**. Several comments noted that wide lanes, open sight lines, and lack of friction invite higher speeds even where the posted limit or land-use context suggests slower movement. Participants contrasted this with self-regulating streets and roundabouts, where geometry, curvature, landscaping, and narrower operating space can encourage lower speeds without depending entirely on enforcement. The walk audits therefore support a Safe System conclusion: Scottsdale should use roadway design, crossing design, traffic calming, and context-sensitive street standards to manage speed proactively, especially on neighborhood access streets, school routes, park approaches, and routes connecting to the Indian Bend Wash Indian Bend Wash Greenbelt and trail system.

Accessibility was one of the clearest cross-cutting issues. Participants documented locations where sidewalks were approximately four feet wide, where walls or landscaping created a constrained pedestrian envelope, where prickly vegetation encroached into the route, where curb ramps were too steep or had lips, and where driveway grades created uncomfortable cross-slopes. These issues were described not simply as ADA compliance concerns, but as everyday barriers affecting older adults, wheelchair users, people with walkers, children, bicyclists using sidewalks because they do not feel comfortable in the street, and people pushing strollers. Participants also noted that narrow sidewalks can force conflicts between people walking and bicycling, particularly where bicyclists choose the sidewalk because adjacent bike lanes or streets feel unsafe.

Trail and Indian Bend Wash Greenbelt connectivity emerged as a major Scottsdale strength and a major opportunity for refinement. Participants praised Scottsdale's separated trail crossings and underpasses, noting that the city has an unusually robust network of tunnels, shared-use paths, and grade-separated connections. However, the audits found that **these assets are not always legible, direct, or comfortable for pedestrians.** Participants identified missing or insufficient wayfinding, unmarked trail access, narrow connecting paths, steep or eroded path edges, drainage and sediment buildup, underpass maintenance needs, lighting concerns, and indirect access between neighborhoods and major trail facilities. The October 25 debrief specifically emphasized that underpasses are valuable but must be located close enough to desired pedestrian paths to be used; if the underpass requires a long detour, many pedestrians will still prefer crossing at the intersection.

Lighting and visibility were raised as safety and comfort issues, particularly at wide crossings, tunnels, underpasses, dawn/dusk conditions, and locations with limited sight distance. Participants noted that lighting should support pedestrian visibility across the full width of wide streets and should also improve perceived personal safety in underpasses. Debrief comments also suggested design refinements such as better edge definition, safety striping along path edges, improved underpass lighting, and maintenance practices that remove debris, dirt, or washout material from walking and bicycling routes.

Participants identified several low-cost or moderate-cost opportunities: repainting or upgrading crosswalk markings, improving stop-bar placement, adding or adjusting pedestrian signs, widening or clearing constrained sidewalks where feasible, trimming or redesigning landscaping that intrudes into pedestrian space, correcting curb-ramp lips and steep ramp transitions, adding pedestrian-scale lighting at wide crossings or underpasses, improving wayfinding to parks/trails/underpasses, and adding safety edges or shoulder space along shared-use paths with steep drop-offs. **Other recommendations would require policy or capital-program changes,** including reconsidering residential street width standards, expanding **traffic calming** or modal-filter concepts that allow walking and biking through while discouraging cut-through driving, using **safer intersection geometry**, providing more **protective bicycle separation** than paint alone, and **improving school-area crossings near parks, libraries, gas stations, apartments, and other youth destinations.**

The walk audits also generated public-engagement findings. **Participants valued the act of walking together because it made abstract design issues visible:** crossing time felt different on foot than behind a windshield; narrow sidewalks became more apparent when the group encountered walls, driveways, landscaping, or bicyclists; and trail access gaps became more meaningful when participants tried to connect neighborhoods to parks, schools, and underpasses. The debriefs also emphasized the importance of "local champions" who can support safety changes when projects face status quo bias or opposition. Participants suggested that walking clubs, bicycling events, city-sponsored "walk to connect" programs, open-street events, and social walking campaigns could build a stronger walking culture while also increasing community awareness of sidewalk, crossing, and trail conditions.

In summary, the walking assessment materials indicate that Scottsdale's pedestrian environment benefits from a strong legacy of trails, Indian Bend Wash Greenbelt connections, underpasses, roundabouts, school-

zone treatments, and selected high-quality crossings. The primary gaps are not a lack of safety tools, but inconsistent application, constrained pedestrian space, insufficient speed management at transition points between neighborhood streets and arterials, indirect or poorly marked trail access, and accessibility details that can make otherwise useful routes difficult for many users. These findings support STSP actions focused on consistent pedestrian crossing standards, ADA retrofit prioritization, trail-access wayfinding, underpass and path maintenance, speed-management design, protected bicycle facilities, and context-sensitive street standards that make walking and bicycling comfortable by design rather than dependent on individual driver behavior.

› Walk Audits with staff and multi-departmental stakeholders

Staff and multi-departmental walk audits were conducted as part of the Safe Streets Scottsdale engagement program to test roadway, sidewalk, crossing, trail, transit, and accessibility conditions in the field. Materials reviewed include 96 digital walk-audit observations and compiled audio transcriptions from March and October 2025 walk audit events. The audit participants represented a range of professional perspectives and lived experiences, including transportation, accessibility, pedestrian, bicycle, transit, enforcement/operations, and community-safety viewpoints. The resulting comments are especially useful because they combine technical observations with real-time user experience: participants documented not only whether infrastructure was present, but whether it was legible, reachable, comfortable, maintained, and usable by people walking, bicycling, using wheelchairs or scooters, accessing transit, or navigating visually.

Across the 96 digital observations, the most common topics were crossings, intersections, accessibility/ADA conditions, street segments, and other site-specific conditions such as barriers, drainage, sidewalk condition, underpasses, noise, illegal stopping, and hidden utility boxes. Dispositions skewed toward issues needing attention: 46 observations were negative, 26 positive, 19 mixed, and 5 did not include a disposition. Crossing-related observations were the largest category, followed by intersections and accessibility. This distribution indicates that the audits most often identified safety and comfort issues at conflict points where people walking or biking must interact with motor vehicles, transit stops, turning traffic, curb ramps, and signal equipment.

Crossings, signal timing, and pedestrian controls were the most frequent and actionable concern.

Participants documented locations where high-visibility crosswalks, RRFBs, and roundabout crossings were viewed positively, especially where crossings improved pedestrian visibility, shortened exposure, or provided a refuge island. However, many crossing comments identified operational shortcomings: crosswalks that would benefit from ladder-style striping, stop bars that should be pulled back to improve visibility, crosswalk buttons located too far from the crossing, buttons hidden behind stationary buses, crosswalk timing that felt too short for slower pedestrians, and missing or inadequate signage. The audio notes repeatedly mention signals, pushbuttons, and warning signs, including audible buttons that speak but do not function consistently, “watch for turning vehicles” signs placed too low or too close to the crossing, RRFBs where drivers continue through the crossing, and walk indications that drivers ignore.

Driver yielding and turning behavior emerged as a central safety theme. Several observations described drivers failing to stop for people in crosswalks even when flashing beacons were active or a pedestrian had the walk indication. One participant using a wheelchair reported that a driver nearly struck them despite the cross signal, noting that low wheelchair height and driver inattention compounded the risk. Another October observation described crossing Frank Lloyd Wright Boulevard at Thompson Peak Parkway as “a nightmare” because right-turning drivers from Thompson Peak to Frank Lloyd Wright did not pay attention to walk signs and turned through pedestrian movements. These comments indicate that marked crossings and signals are not sufficient by themselves where turning speeds, sight lines, permissive movements, driver expectation, or enforcement conditions do not support yielding.

Accessibility barriers were repeatedly observed and often tied directly to independence and dignity. The field notes and transcripts identify steep or long ramps, curb-ramp lips, insufficient turning space, poorly located ramps, only one usable ADA ramp at a crossing, narrow sidewalk segments, and routes blocked or narrowed by shrubs, clutter, walls, landscaping, or tunnel conditions. Participants noted that some conditions required assistance for a wheelchair user, were not accessible for blind pedestrians, or would be difficult for motorized scooters. The digital observations categorized 17 entries as accessibility-related; 13 of those were negative. This makes ADA access one of the strongest deficiency themes in the walk-audit data and suggests that future improvements should prioritize continuous accessible routes, not only isolated curb-ramp upgrades.

Sidewalk and pathway width, buffers, and physical separation strongly shaped comfort. Participants reacted negatively to narrow sidewalks next to fast traffic, especially where no buffer existed near schools or along major streets. Several comments noted that pedestrians, wheelchair users, and bicyclists are forced uncomfortably close to moving traffic when sidewalk space is constrained. By contrast, participants responded positively to wide scenic pathways and multi-use paths that could comfortably accommodate multiple bicycle riders. The audits also identified places where street furniture, utility elements, landscaping, walls, or prickly vegetation reduced the effective width of the pedestrian route. These findings support prioritizing usable clear width, buffer space, shade placement, and separation from moving traffic as comfort and safety factors, not just amenity considerations.

Transit interface conditions created both positive and negative observations. Participants appreciated bus stops that were insulated from the street and provided a safer pedestrian waiting environment. However, the audits also documented conflicts where buses or the audit trolley blocked lanes, where a stationary bus obscured access to a crosswalk pushbutton, and where a bus stopping on a three-lane roadway effectively removed a travel lane. These observations point to the need for better integration of transit stops, pedestrian crossings, and curbside operations so that buses do not block crosswalk access, obscure pedestrians, or create unexpected conflicts with vehicles and people walking.

Trail and underpass connectivity were seen as major Scottsdale strengths, but wayfinding and maintenance gaps reduce their value. Participants praised underpasses, scenic paths, and neighborhood connections to shared-use paths, including comments that the city's underpass system is a significant asset. At the same time, participants documented underpasses or trail connections that were not obvious, lacked signage, needed sweeping or lighting, had landscape or sediment issues, or were difficult for motorized scooters. One audio note specifically identified the Thompson Peak and Pima underpass as poorly maintained and difficult for scooter users. The audits suggest that Scottsdale's separated path network can be strengthened through wayfinding, lighting, drainage maintenance, safety-edge improvements, and more direct access between neighborhoods, parks, schools, transit stops, and trail facilities.

Maintenance issues were less frequent than crossing or ADA comments, but often had high accessibility consequences. Observed issues included slick sidewalk concrete from sprinkler overspray, overgrown shrubbery, clutter between trolley stops and the roadway, debris or sediment in tunnels, drainage problems, erosion or washout under pavement edges, and inconsistent functioning of signal features. These are relatively practical issues compared with major capital reconstruction, but they materially affect whether a person using a wheelchair, scooter, walker, stroller, or bicycle can use the route safely.

Pedestrian behavior observations suggested that crossing placement and convenience matter. At one location near Mustang, participants observed multiple people crossing outside the marked crosswalk even though a flashing-light crosswalk was approximately 15 feet away. This was not framed simply as noncompliance; it suggests that even small detours, delays, unclear desire lines, or perceived inconvenience can cause people to "vote with their feet." For the STSP, this reinforces the importance of

locating crossings where people actually want to cross, minimizing unnecessary deviation, and using design to support natural pedestrian paths rather than relying only on rules or signage.

The audits also documented positive practices worth replicating. Positive observations included neighborhood-to-path connectivity, internally illuminated signs, roundabouts that support steady traffic flow, marked crossings at school zones, pedestrian refuge applications, separated crossings, wide shared-use paths, good signage for the Indian Bend Wash multi-use path, and bike-lane treatments that made some participants feel safer. These comments are important because they show that Scottsdale already has a strong toolbox; the engagement findings point toward applying successful tools more consistently and adapting them to specific contexts.

Overall, the staff and multi-departmental walk audits indicate that Scottsdale's pedestrian and bicycle network has valuable assets. Assets are valued, especially in trails, underpasses, roundabouts, school-zone treatments, marked crossings, and neighborhood connectivity. Yet, that comfort and safety are undermined where design details fail at the user level. The most important appendix-level findings are: improve crossing visibility and signal usability; lengthen or review pedestrian clearance times on wide streets; address right-turn yielding conflicts; standardize accessible pushbutton and curb-ramp placement; prioritize continuous ADA routes; maintain underpasses, sidewalks, and path edges; trim or redesign landscape conflicts; improve trail and underpass wayfinding; and treat transit stops as part of the pedestrian network. The walk audits support a Safe System approach that focuses on predictable human behavior, lower-speed conflict points, redundancy in crossing protection, and infrastructure that works for people with the least physical protection and the greatest accessibility needs.

› **Virtual Reality Bike engagement summary**

The **Virtual Reality (VIRTUAL REALITY (VR)) Bike engagement was designed as a high-quality experiential engagement method rather than a high-volume survey instrument.** Its primary value was not the number of total interactions, but the depth and realism of each interaction: participants were able to experience Scottsdale bikeway conditions from a first-person bicyclist perspective, in a risk-free setting, using immersive 360-degree video and a stationary bicycle. This format offered an unusually direct way to help residents, youth, parents, staff, and other stakeholders understand how street design feels to a person biking, including conditions that may be difficult to communicate through maps, crash data, photographs, or written questionnaires alone. The method supported three engagement purposes at once: public input, safety education, and empathy-building for vulnerable roadway users.

The VIRTUAL REALITY (VR) engagement was included in the STSP public outreach plan as a “pop-up” experience intended to show video clips from a bicycle rider's perspective, complementing the questionnaire, walking audits, trolley audits, public meetings, and website-based engagement. The VIRTUAL REALITY (VR) ride used real-world first-person video from Scottsdale biking environments so participants could experience different facility types and roadway conditions before answering follow-up questions. This format was especially useful because participants did not need to be confident bicyclists to respond meaningfully; non-riders, infrequent riders, youth, parents, and people who primarily drive could still evaluate how a bikeway environment felt from the perspective of someone exposed to traffic.



Figure 37 - Scenes from VIRTUAL REALITY (VR) Bike Engagement

Questionnaire Results

Audience and segmentation

The three engagement events attended yielded **41 VIRTUAL REALITY (VR) experiences** with responses to the before and after questionnaire respondents could digitally respond to on their phone using a QR code or by tablet with the questions loaded.

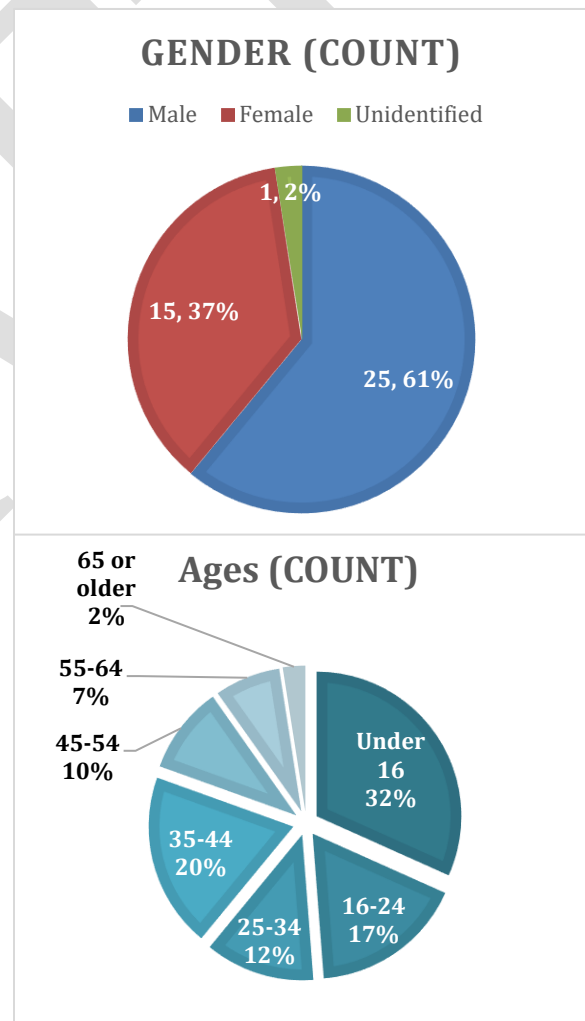
Participation by Gender

- Male: 25 (~61%)
- Female: 15 (~37%)
- Unidentified: 1 (~2%)

Participation by Age

AGE RANGE	COUNT
Under 16	13
16-24	7
25-34	5
35-44	8
45-54	4
55-64	3
65 or older	1

The engagement reached 41 VIRTUAL REALITY (VR) participants across three events. The group was smaller than the citywide online questionnaire but meaningfully different in composition. In particular, it attracted younger participants: 13 participants were under 16, 7 were ages 16–24, 5 were ages 25–34, 8 were ages 35–44, 4 were ages 45–54, 3 were ages 55–64, and 1 was age 65 or older. This youth representation is important because the broader community questionnaire skewed older, while the VIRTUAL REALITY (VR) format created an accessible, engaging way for younger people and families to participate in the safety



planning process. Gender participation was 25 male participants, 15 female participants, and 1 unidentified participant.

The questionnaire used a pre/post structure. Before the VIRTUAL REALITY (VR) ride, participants reported their baseline impressions of biking in Scottsdale, including whether it seemed fun, affordable, safe or pleasant, scary or intimidating, and relaxing. Before the experience, views were mixed: “fun” rated relatively positively, but “safe or pleasant” and “relaxing” had more divided responses. For “safe or pleasant,” only 14 of 35 respondents gave the two highest ratings, while 10 gave the two lowest ratings. For “scary or intimidating,” 8 of 34 respondents gave the two highest ratings, while 18 gave the two lowest ratings, showing that some participants already perceived biking as stressful while others did not. The report also notes that men and frequent riders were more likely to rate biking as fun and safe/pleasant, while women and infrequent riders were more likely to perceive biking as scary or intimidating.

After the VIRTUAL REALITY (VR) ride, participants reported how the experience changed their perceptions. The most notable shift was that biking in Scottsdale seemed **more fun** to 25 participants, or 61 percent, while 14 said it felt the same and only 2 said less fun. For safety and comfort, 18 of 40 participants, or 45 percent, said biking seemed more safe or pleasant after the experience; 16 said the same, and 6 said less safe or pleasant. For “scary or intimidating,” 19 of 41 participants, or 46 percent, said biking seemed less scary or intimidating after the VIRTUAL REALITY (VR) ride, while 12 said the same and 10 said more scary or intimidating. This mixed result is useful: the VIRTUAL REALITY (VR) ride reduced fear for many participants, but it also made some participants newly aware of exposure, traffic stress, or facility limitations that they may not have previously understood.

Survey Question:

If VIRTUAL REALITY (VR) Biking experienced changed your impression of biking in Scottsdale, how so?

Response	Fun (n=41)	Safe or Pleasant (n=40*)	Scary or Intimidating (n=41)
More	25 (61.0%)	18 (45.0%)	10 (24.4%)
Same	14 (34.1%)	16 (40.0%)	12 (29.3%)
Less	2 (4.9%)	6 (15.0%)	19 (46.3%)

*Safe/Pleasant had 1 missing response (percentages based on 40 valid responses).

The diagnostic questions suggest that the VIRTUAL REALITY (VR) method was generally effective as an engagement and education tool. Twenty-nine participants, about 71 percent, reported that the experience was helpful. Participants most often said the VIRTUAL REALITY (VR) ride exposed them to new experiences or allowed them to relive previous biking conditions from a structured safety perspective. Among the small number who did not find the method helpful, the most common barriers were discomfort with the stationary bike or VIRTUAL REALITY (VR) technology, limited interest in bike safety, or the experience not feeling real enough. These responses indicate that while VIRTUAL REALITY (VR) should not replace other engagement formats, it is a strong supplemental tool for creating informed feedback and reaching participants who may respond better to immersive, activity-based engagement than to traditional meetings or surveys.

The strongest design takeaway is that participants preferred lower-stress bicycling environments. When asked where they would enjoy riding in real life, 34 participants, or 85 percent, selected Scene 1, identified

as the low-stress condition. Moderate or modest-stress scenes received lower but still meaningful support, with Scene 2 and Scene 4 each selected by 18 participants, and Scene 3 selected by 17. The high-stress scene was selected by 14 participants, or 35 percent. **This pattern indicates that some confident or experienced riders may tolerate higher-stress conditions, but the broadest public appeal is associated with low-stress bikeway experiences.**

For Safe Streets Scottsdale purposes, this supports prioritizing comfortable, well-separated, legible bicycle facilities and connections that can serve a wider range of ages and abilities.

Overall, the VIRTUAL REALITY (VR) bike engagement provided a distinctive form of public input that was less about volume and more about perspective. It helped participants experience, rather than merely imagine, the difference between low-stress and high-stress bikeway conditions. It also broadened the engagement portfolio by reaching younger participants and creating a shared experiential basis for discussing bikeway comfort, separation, speed management, and vulnerable roadway user safety. For the STSP, the VIRTUAL REALITY (VR) results support actions that expand low-stress bicycle networks, separate bicyclists and pedestrians from motor vehicle traffic where feasible, manage vehicle speeds by design, improve safety education for youth and inexperienced riders, and use experiential engagement tools to build public understanding of why bikeway design details matter.

H. Grant Preparation Checklists

› Eligible Safety Action Plan

USDOT requires Implementation Grant applicants to have an adopted Action Plan meeting SS4A minimum eligibility requirements. The plan must generally include:

- Leadership commitment
- Safety analysis
- Engagement and collaboration
- Policy/process changes
- Project and strategy identification
- Progress and transparency measures
- Safety performance metrics
- Goal setting tied to fatal and serious injury reduction
- The Action Plan must:
 - Be completed or updated between 2020 and the NOFO deadline
 - Include roadway safety analysis and mapping
 - Identify projects and strategies for implementation

› Project Readiness

Implementation Grants are not intended for vague concepts. USDOT expects applicants to demonstrate that projects are reasonably advanced and implementable.

Typical readiness items include:

- Defined project locations
- Preliminary concepts or layouts
- Existing conditions analysis
- Cost estimates
- Implementation schedule
- Identification of responsible agencies
- Match funding strategy
- Maintenance/operations considerations
- Consistency with local plans and policies
- Higher-scoring applications generally show:
 - Near-term deliverability
 - Existing community support
 - Prior corridor study or conceptual design
 - Coordination with MPOs, DOTs, transit agencies, or utilities

› Strong Safety Need Documentation

USDOT places heavy emphasis on demonstrating severe safety need using objective data.

Typical data preparation needs include:

Data Type	Typical Preparation Need
Crash data	5-year KSI analysis
High Injury Network	GIS maps for segments/intersections
VRU crash analysis	Pedestrian/bicycle severity trends
Speed data	85th percentile and operating speeds
Exposure/context	Land use, schools, transit, tourism
Opportunity indicators	Underserved community analysis
Lighting conditions	Nighttime crash patterns
Behavioral factors	Alcohol, distraction, seat belt trends
Existing facilities	Sidewalks, crossings, bikeways, APS
Before/after evaluation plans	CMFs and performance measures

USDOT strongly favors:

- Spatial analysis
- Systemic risk analysis
- Multivariate prioritization methods
- Severity-weighted approaches
- Safe System framing

› Mapping and GIS Preparation

Recent NOFO guidance increasingly emphasizes map-based documentation.

Typical required or expected mapping includes:

- High Injury Networks
- Project locations
- Crash density maps
- Opportunity/underserved community overlays
- Existing pedestrian/bicycle networks
- Transit connectivity
- Speed-risk corridors
- Jurisdictional boundaries

[Spatial file preparation guide.](#)

› **Benefit-Cost and Safety Performance Documentation**

Although SS4A Implementation Grants are not as rigidly benefit-cost-driven as some FHWA discretionary programs, competitive applications still typically include:

- Crash Modification Factors (CMFs)
- Expected KSI reduction
- Economic appraisal logic
- Safety performance estimates
- Before/after evaluation methodology

Applicants are expected to explain:

- Why selected countermeasures are appropriate?
- How projects reduce fatal and serious injury risk?
- Why the proposed investments are cost-effective?

FHWA safety guidance consistently emphasizes data-driven prioritization and economic effectiveness in project selection.

› **Engagement and Collaboration Documentation**

Implementation applications are expected to document meaningful engagement, not merely public notification.

Typical preparation items include:

- Meeting summaries
- Walk audit results
- Survey findings
- Stakeholder letters
- Interagency coordination
- Opportunity- and Vulnerability-focused outreach
- Tribal/community engagement where applicable

USDOT's FY25 guidance streamlined evaluation into three major categories:

- Safety Need
- Safety Impact
- Engagement and Collaboration

› **Performance Monitoring and Transparency**

Applicants should demonstrate how progress will be tracked after award.

Typical preparation includes:

- Annual reporting structure
- KSI tracking metrics
- HIN update process
- Before/after evaluations

- Dashboard plans
- Delivery tracking
- Countermeasure implementation monitoring

Common performance measures:

- Fatalities and serious injuries
- VRU KSI outcomes
- Speed reductions
- Crossing upgrades completed
- LPIs implemented
- Sidewalk gaps closed
- Lighting improvements
- Tier 1 HIN projects completed

› **Typical Implementation Grant Deliverables**

A competitive SS4A Implementation Grant package often includes:

Deliverable	Typical Status
Safety Action Plan	Final/adopted
HIN maps	Complete
Project list	Prioritized
Cost estimates	Planning-level complete
Benefit narrative	Developed
GIS exhibits	Finalized
Letters of support	Collected
Public engagement documentation	Compiled
Performance framework	Defined
Funding match strategy	Identified
Schedule	Developed
Maintenance responsibility	Assigned

TENTATIVE FUTURE AGENDA ITEMS

Rev.10-09-26

All Items Subject to Change

TRANSPORTATION COMMISSION

***Include upcoming project public meetings in the Projects and Programs Update and send the TC members an email when there are upcoming open houses.

November 19

- Trolley – new colors and layout – Nathan..... Information and Discussion
- FY 27/28 CIP Recommended Project List.....Information and Possible Action
- Projects and Programs Update..... Information and Discussion
- Transportation Commission Identification of Future Agenda Items

December **Post Cancellation Notice by 11/23**

January 21

- Strategic Transportation Safety Plan: Final Draft..... Information and Possible Action
- Approval of the Annual Transportation Commission Report
- 2027 Transportation Commission Meeting Schedule
- Election of Officers
- Transit – (including Old Town and Spring Training Trolley Update, Hours and days of Trolley operation, process to change routes, how often it changes, looking at low income users, shade at transit stops, etc) comparison with other cities and agencies transit ridership in the region, Old Town Trolley, Trolley service days and hours
- Paratransit and Commute Solutions
- Coordination with Regional Partners – Valley Metro and City of Phoenix, Tempe

February 18

- ADOT Traffic Safety in School Zones Manual Update – reach out to contacts early
- Cool Pavement results for study (city of Phoenix) – reach out to contacts early

FUTURE ITEMS:

INFORMATION ITEMS

- NTMP – program, criteria, process, historical reference including exceptions..... Action Item
- Possible ADOT Crash Form Updates (January? Time it when it's closer to going live)
- Statewide e-bike emergency room visits study
- Traffic Signal Detection
- Annual Speed Limit Evaluation in other cities
- Waymo/ AV – including incidents with the vehicle or the vehicle entering an incident scene
- Doordash Dot food delivery AV small carts
- ADOT New School Zone striping/ signage manual
- TMC tour – fall 2027
- Private Development Review - How Transportation interacts with Development Review on Private Development.... Information and Discussion – *Satanay, Greg*
- Post Storm Care ongoing in summer
- Traffic calming device prioritization process – need to refine – possible action

*Speed humps on Oak Street [check to see if this is related to the bike lane] – Maybe during the NTMP item in September – see Helayne

Cell Phone antennas placed in ROW including crash data

*Coordination with Parks & Recreation on ROW coordination

*Coordination with PD

- **Transit Update - comparison with other cities and agencies transit ridership in the region, Old Town Trolley, Trolley service days and hours – April 2026**
- **Neighborhood Traffic Management Program -----Information, Discussion and Possible Action**
Program overview, criteria, process and historical reference including exceptions – Helayne Dominguez, Senior Traffic Engineer
- **Hidden Hills Update**
- **Review of Travel Demand Patterns.....Information**
Information on how travel demand patterns effects roadway improvements – Nathan Domme, Transportation Planning Manager
- **PCI and the Five-Year Paving Plan.....Information**
Information on the Transportation & Streets Department's Paving Section –
- **Projects and Programs Update.....Information**
Information on continuing projects and programs throughout the city –
- **Digital Messaging Sign Project..... Information**
Information on the digital messaging sign project – Cristina Lenko, Public Information Officer
- **Transportation Link to the Tree and Shade Program..... Information**
Information on Transportation component of the Tree and Shade Program – Tim Conner, Environmental Initiatives Manager
- **IBW Path Renovation..... Information**
Update on the IBW Path renovation – Susan Conklu, Senior Transportation Planner
- **Roundabout Program..... Information**
Information on the Roundabout Program – Nathan Domme, Transportation Planning Manager
- **New Frank Lloyd Wright Interchange..... Information**
Information on the new FLW Interchange –

TRANSPORTATION & STREETS DEPARTMENT ACTIVITIES

- **Expanding Maintenance Needs.....Presentation and Discussion**
Maintenance of current infrastructure –
- **Leading Pedestrian Interval Policy.....Presentation and Discussion**
Discuss Leading Pedestrian Interval Policy and application – John Hoang, Traffic Engineering and Operations Manager
- **Traffic Signal Detection – John Savage**
- **Construction Mitigation Plan.....Presentation and Discussion**
Follow up on the initial presentation from staff –