Appendix A. Relevant Plans and Policies

APPENDIX A

Literature Review

Originally Submitted on December 15, 2024

The Santa Cruz County Rural Highways Safety Plan (RHSP) will be informed by other previously completed planning documents, as summarized in this literature review, with a focus on content related to the RHSP scope and corridors. The RHSP seeks to enhance safety for all users of the County's six conventional highways: specifically, Highway 1 north of the City of Santa Cruz city limits, Highway 9, Highway 236, Highway 35, and Highways 129 and 152 outside the City of Watsonville city limits, which collectively function as main streets, intercommunity connectors, and rural highways. The objective is to create a roadmap to Vision Zero by identifying high-risk locations and generating a prioritized suite of implementable countermeasures. The intent is to achieve zero traffic deaths and serious injuries by 2050 with projects and strategies implemented through close partnerships with Caltrans.

The literature review documents reviewed by the consultant team included: 1) foundational state and regional policy documents that establish principles to guide transportation initiatives on state highways, 2) regional and local planning documents that offer information related to existing conditions, corridor visions, crash analyses, and recommendations to address safety concerns, 3) design guidance documents issued by Caltrans that may inform specific recommendations to be developed through the RHSP, and 4) other relevant recent or ongoing plans or projects.

FOUNDATIONAL POLICY DOCUMENTS

This section describes foundational policy documents at the state or regional level that are relevant to the RHSP.

California Transportation Plan 2050 (2021)

The California Department of Transportation's (Caltrans) *California Transportation Plan 2050* is a statewide plan that provides a long-range vision for the state's transportation system. The plan aims to develop a safe, resilient, and universally accessible transportation system through policies, investments, and strategies. The plan identifies fourteen recommendations, including 19 specific action items related to expanding access to safe and convenient active transportation options and enhancing transportation safety and security.

Climate Action Plan for Transportation Infrastructure (2021)

The *Climate Action Plan for Transportation Infrastructure* (CAPTI) provides a framework to help align investments in transportation infrastructure with state goals around climate, health, and social equity. CAPTI includes multiple guiding principles, including making safety improvements to reduce fatalities and severe injuries of all users on public roads. The plan includes 34 key action items for state implementation, including action SR.4 to "Re-focus Caltrans Corridor Planning Efforts to Prioritize Sustainable Multimodal Investments in Key Corridors of Statewide and Regional Significance" which will facilitate "the development of innovative safety solutions based on the safe systems approach that advance sustainable transportation modes, particularly for rural communities."

California Safe Roads 2020-2024 Strategic Highway Safety Plan (2023) and Implementation Plan (2024)

Caltrans' *California Safe Roads 2020-2024 Strategic Highway Safety Plan* (SRSHS) is a statewide plan that establishes a framework to reduce fatalities and serious injuries on public roads, which utilizes the Safe System Approach as one of its guiding principles. Priority areas for the SRSHS include active transportation, impaired driving, intersections, lane departures, and speed management. Focus areas include various populations and issue areas such as aging drivers, emerging technologies, and work zones. The accompanying Implementation Plan includes actions that safety advocates developed to support the priority and focus areas. Some relevant examples of actions highlighted in the Implementation Plan include "B.1: Establish a preferred methodology for developing a High Injury Network (HIN) for bicyclists" and "AD.3 Identify the driving habits, needs and concerns of California's aging roadway users in order to expand and/or improve services that will promote safety."

California Highway Safety Improvement Program Implementation Plan (2023)

Caltrans' *California Highway Safety Improvement Program (HSIP) Implementation Plan* identifies actions for the state to take in 2023 to invest over $200 million in HSIP funding while meeting certain requirements and safety performance targets that are aimed at reducing fatalities and serious injuries. The HSIP Implementation Plan includes four principles to help guide HSIP investments: 1) Integrate Equity, 2) Implement Safe System Approach, 3) Double Down on What Works, and 4) Accelerate Advanced Technology.

State Highway System Management Plan (2023)

The *State Highway System Management (SHSM) Plan* supports Caltrans in meeting federal asset management requirements and informs maintenance, rehabilitation, and operational investments by applying a performance management framework to the state highway system. The SHSM Plan fulfills the state's requirements for a 10-Year State Highway Operation and Protection Program (SHOPP) Plan, as well as a 5-Year Maintenance Plan. Elements of the plan include a needs assessment, revenue and financial projections, and programs and performance objectives.

California Freight Mobility Plan (2023)

The *2023 California Freight Mobility Plan* produced by Caltrans governs near and long-range freight planning and capital investments and supports investments in the state's freight system to make it more efficient, reliable, modern, integrated, resilient, safe, and sustainable.

Goal five of seven in the plan centers “Safety and Resiliency” and seeks to “eliminate freight-related deaths and serious injuries and improve system resilience by addressing infrastructure vulnerabilities associated with security threats, effects of climate change impacts, and natural disasters.” The plan also includes an implementation chapter that outlines specific strategies and objectives to help accomplish the plan’s vision.

Director's Policy 35: Transportation Asset Management

Issued in 2018, *Director’s Policy (DP) 35* establishes that Caltrans will utilize a systematic asset management framework approach to ensure that investments in transportation maximize effectiveness and achieve desired performance levels. DP 35 also supports accountability by identifying how the state can best apply available resources across the transportation system regarding planning, design, construction, maintenance, and operations of assets.

Director's Policy 37: Complete Streets

Issued in 2021, *DP 37* establishes the creation of complete streets that improve active transportation and access to transit as a priority to support state goals related to climate, health, and social equity. Specifically, it directs that “all transportation projects funded or overseen by Caltrans will provide comfortable, convenient, and connected complete streets facilities for people walking, biking, and taking transit or passenger rail unless an exception is documented and approved.”

Caltrans District 5 Active Transportation Plan (2021)

The Caltrans *District 5 Active Transportation Plan*, completed in 2021, supports incorporating active transportation and transit improvements into projects in District 5 by providing a prioritized list of bicycle and pedestrian needs on the state highway system. The plan advances the vision statement and goals of *Toward an Active California*, the statewide bicycle and pedestrian plan, which seeks to ensure that people in California of all ages, abilities, and incomes can safely, conveniently, and comfortably walk and bicycle for their transportation needs by 2040. The prioritized list and accompanying story map describe high-level needs on all state highways, including RHSP corridors in District 5, which encompasses the counties of Monterey, San Benito, San Luis Obispo, Santa Barbara, and Santa Cruz.

Caltrans District 5 Climate Change Vulnerability Assessments (2019)

The Caltrans *District 5 Climate Change Vulnerability Assessments* report provides an initial look at state highway system assets exposed to climate stressors. The assessment considers various climate factors, including potential changes in temperature, precipitation, and sea level rise, to identify Caltrans assets that may be vulnerable to climate change impacts.

Caltrans District 5 Adaptation Priorities Report (2021)

Building on the District 5 *Climate Change Vulnerability Assessments*, the *Adaptation Priorities Report* informs the order in which climate assessments should be conducted for the

almost 2,000 District assets, including road segments, bridges, and culverts. In addition to considering potential climate change impacts on each asset, the report also considers other factors, such as the asset's condition and how many users would be affected, to inform prioritization. The prioritization methodology includes exposure factors, such as how much of a segment is exposed to sea level rise, and consequence factors, such as condition ratings for culverts. The report assigns priority levels from one to five to reviewed assets, with the highest scores receiving the first priority.

REGIONAL AND LOCAL PLANNING DOCUMENTS

This section presents regional and local planning documents that provide relevant information and recommendations for the RHSP.

County of Santa Cruz Active Transportation Plan (2022)

The *County of Santa Cruz Active Transportation Plan* (County ATP) identifies community needs and provides recommendations for infrastructure projects and programs to support walking and biking in unincorporated areas of the county. The County ATP serves as an update to the 2011 Santa Cruz County Bicycle Plan and aims to create a network of biking and walking routes that connect key destinations within the county that are safe, comfortable, and accessible for community members of all ages, backgrounds, and abilities. The recommendations in this plan are intended to support a healthy community, improve affordable transportation options for low-income and vulnerable residents, and help the county achieve statewide goals to address climate change by reducing vehicle miles traveled.

The County ATP analyzed bicycle and pedestrian-related crash data from the University of California Berkeley's *Transportation Injury Mapping System* (TIMS) over a ten-year period from 2009 to 2018. Over this period, there were a total of 7,730 injury crashes, including 649 bicycle-related (six fatal) and 301 pedestrian crashes (23 fatal). *Figure 1* shows annual bicycle crashes in Santa Cruz County from 2009 to 2018. While only a small portion of trips are made by foot or bike, bicycle-related and pedestrian crashes account for about 12% of all crashes. The most common bicycle crash factors were improper turning (25%), automobile right-of-way violations (22%), and unsafe speed (19%). The most common pedestrian crash factors were pedestrian violations (27%), pedestrian right-of-way violations (24%), unsafe speed (14%), and improper turning (12%). State Routes (SRs) 9 and 1 were the second- and third-most common pedestrian crash locations. SRs 1, 9, and 129 were some of the top locations for fatal pedestrian crashes.

Figure 1: Annual Bicycle Crashes in Santa Cruz County per TIMS 2009 – 2018 data

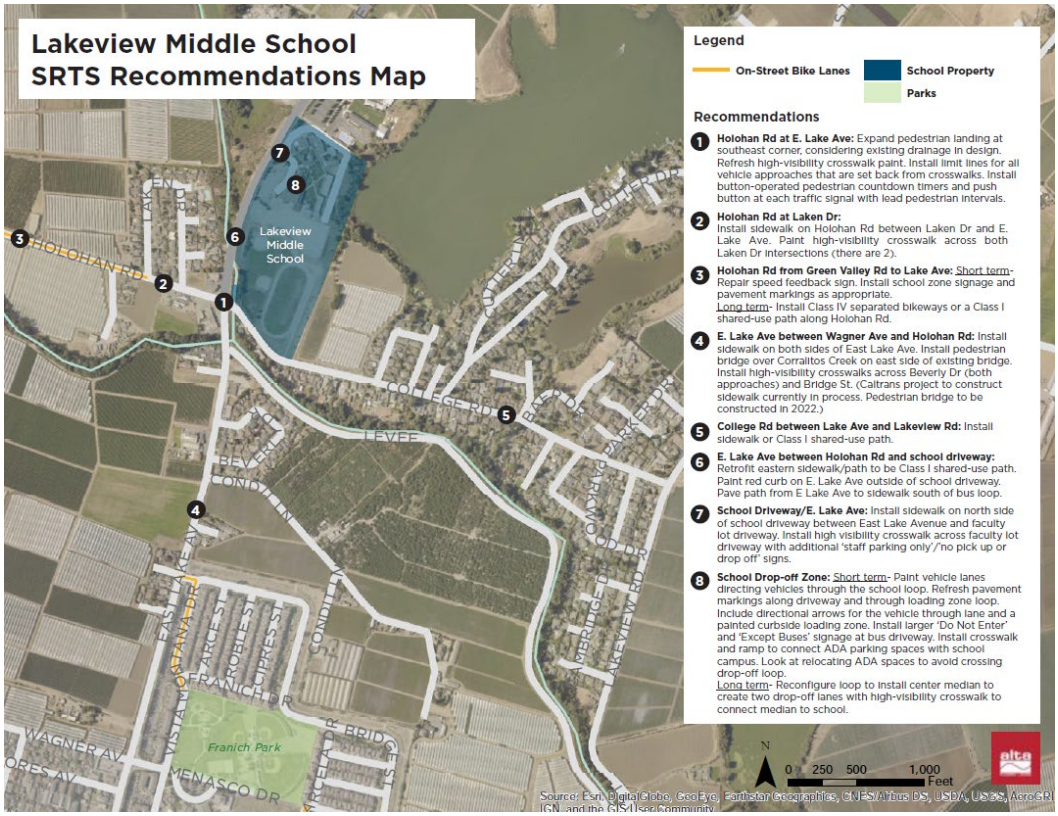
Source: County of Santa Cruz Active Transportation Plan (2022)

Based on the crash data analysis and other information, the County ATP developed recommendations on Caltrans highways such as SR 1 and 152 that may be explored further through the RHSP as well as policy recommendations, including adoption of a Vision Zero Policy and establishment of a Vision Zero task force to help the county reduce severe injuries and fatalities. Examples of infrastructure recommendations contained in the County ATP include signage installation, pedestrian/bicycle overcrossing improvements, Class II and Class IV bikeways, bike boxes, and high visibility crosswalks.

County of Santa Cruz/City of Scotts Valley Complete Streets to Schools Plan (2020)

The *County of Santa Cruz/City of Scotts Valley Complete Streets to Schools Plan* provides recommendations to enhance transportation safety at nineteen public schools in unincorporated Santa Cruz and Scotts Valley, including both infrastructure and programmatic improvements. The County of Santa Cruz and the City of Scotts Valley established their own respective goals for this document, with the County seeking to 1) double the active transportation rates at each school and 2) eliminate severe injuries and fatal crashes among youths under the age of 18 who are walking or bicycling. The Plan, led by the County, focuses on recommendations that support the “Six E’s” of Safe Routes to Schools - engineering, education, encouragement, enforcement, evaluation, and equity. The Plan analyzed crash data obtained from the Statewide Integrated Traffic Records System (SWITRS) for the 10-year period between 2006 and 2015. Based on the analysis, the Plan suggests four relevant recommendations at Lakeview Middle School for SR 152/E. Lake Avenue, including installing crosswalk improvements, sidewalk/Class I path, and signage (see *Figure 2*). Two of these recommendations - LM1 and LM7 - were ranked in the Plan’s top ten list of prioritized projects.

Figure 2: Infrastructure Recommendations for Lakeview Middle School



Source: County of Santa Cruz/City of Scotts Valley Complete Streets to Schools Plan (2019)

Caltrans Transportation Concept Reports

Caltrans has completed Transportation Concept Reports (TCRs) for each SR included in the RHSP within the last ten years, as shown in *Table 1*. TCRs are generally developed to increase safety, improve mobility, provide excellent stewardship, and meet community and environmental needs along each corridor through integrated transportation network management, including highway, transit, pedestrian, bicycle, freight, operational improvements, and travel demand management components. The TCRs are primarily intended to provide recommendations for each corridor's ultimate facility concept with a focus on operational needs and congestion. Some TCRs have more explicit vision statements that provide further guidance for developing recommendations. Some TCRs include supporting recommendations related to safety, Complete Streets, multimodal infrastructure, and operations but do not include location-specific recommendations (e.g., specific intersections, postmiles). TCRs also provide information on existing conditions related to corridor performance and vehicle, pedestrian, and bicycle infrastructure and can identify state projects that support each study's recommendations.

Table 1: Summary of recommendations contained in Caltrans TCRs

SR	Year	Recommended Facility Concept

1	2019	Maintain configuration as two- to four-lane highway between Santa Cruz northern city limit and county line
9	2016	Maintain configuration as two-lane conventional highway
35	2015	Maintain configuration as a two-lane conventional highway and continue the Safety Program partnership with the California Highway Patrol
129	2015	Maintain configuration as a two-lane conventional highway between Blackburn Street and US 101
152	2017	Maintain configuration as two-lane conventional highway between the Watsonville city limit and the county line
236	2015	Maintain configuration as two-lane conventional highway

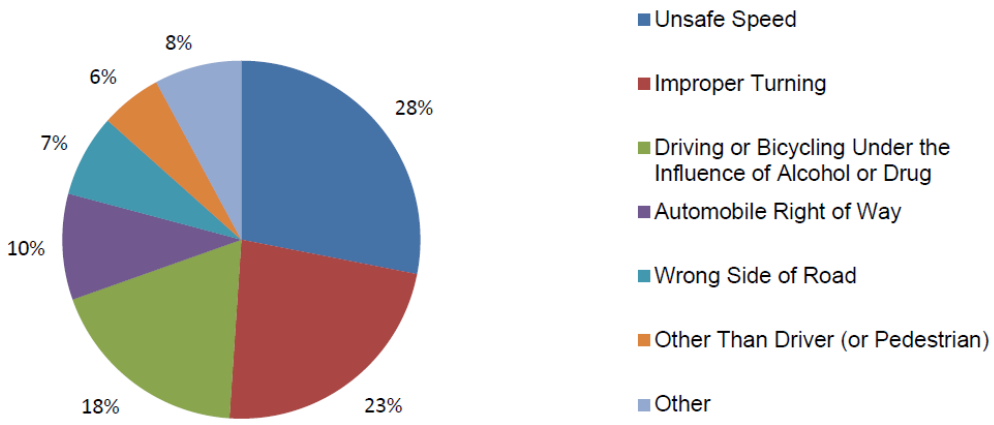
Highway 9 San Lorenzo Valley Complete Streets Corridor Plan (2019)

The *Highway 9 San Lorenzo Valley Complete Streets Corridor Plan* (SLV Plan) is a planning study led by SCCRTC that sets a vision to improve mobility in San Lorenzo Valley with a focus on SR 9 in the communities of Felton, Ben Lomond, Brookdale, and Boulder Creek from Henry Cowell State Park to SR 236. The SLV Plan is intended to enhance safety, access, and traffic operations. This plan highly supports the development of the RHSP and includes information on existing conditions, a crash data analysis, recommendations for improvements, and a Complete Streets Improvements Toolkit with relevant transportation countermeasures and improvements.

The crash data analysis utilized 2013 - 2017 TIMS data and found that:

- Forty percent of all crashes were “hit object” crashes due to curving right-of-way and close proximity to objects such as buildings or trees,
- Impaired driving caused by alcohol or drugs was a significant issue, and
- More than half of all crashes were caused by two crash factors: unsafe speed (28%) and improper turning (23%) (see *Figure 3*).

Figure 3: Primary Cause Factor of Crashes in San Lorenzo Valley per TIMS 2013 – 2017 data



Source: Highway 9 San Lorenzo Valley Complete Streets Corridor Plan (2019)

Based on the crash data analysis and other information collected, the SLV Plan identified 34 priority projects and developed seven overarching priorities for the entire study area. Three of the seven priorities address recommendations directly related to safety issues, including:

- Corridor Priority A: safety measures throughout the study area to reduce speeding and crashes, such as calming traffic treatments, radar feedback signs, reducing/enforcing speed limits, installing roadside barriers to reduce crash severity, widening shoulders, and others
- Corridor Priority C: installation of bike lanes or separated paths on Highway 9 to address bike crashes and safety
- Corridor Priority E: pedestrian safety measures such as lighting at crosswalks and intersections, rectangular rapid flashing beacons, and crosswalk enhancements

Beyond the corridor-wide priorities, the SLV Plan also identified 28 priority project concepts for further study along SR 9 and connecting roadways. These concepts include recommendations such as new crosswalks, improved bike facilities, and lighting. Projects 9 through 11 focused on San Lorenzo Valley schools and were studied further through the *San Lorenzo Valley Schools Complex Access Study* (summarized below). All 28 projects have recommendations that should be considered further in the development of the RHSP.

Project Study Report - Project Development Support for SR 9 (2022)

In June 2022, Caltrans completed a *Project Study Report - Project Development Support (PSR-PDS) for SR 9* between Henry Cowell State Park and Pool Drive. The purpose of the PSR-PDS includes providing safe mobility for all road users, reducing vehicle speeds, and enhancing pedestrian safety and mobility. The PSR-PDS builds on prior completed initiatives, including the SLV Plan, by considering its recommendations as part of the build alternative. The PSR-PDS includes numerous sections that support the development of the RHSP, including a traffic engineering performance assessment and a safety/crash analysis that identified multiple deficiencies along the corridor, such as deficient pedestrian and bicycle facilities and narrow shoulders. The PSR-PDS used *Caltrans Traffic Accident Surveillance and Analysis System* (TASAS) data from 2017 to 2020 to conduct a safety

analysis, which found that crashes in the corridor are likely caused by turning movements, entering and exiting driveways, and congestion related to commuting and curving roadways. Speeding was also identified as an issue. The PSR-PDS presents a build alternative with detailed recommendations for each segment of the corridor, including areas for sidewalk improvements, shoulder widening, bikeway installation, and crosswalk improvements. Conceptual plans and sections are also included in the PSR-PDS, which may be used to help inform RHSP recommendations.

San Lorenzo Valley Schools Complex Access Study (2023)

The *San Lorenzo Valley Schools Complex Access Study* (School Access Study), prepared by SCCRTC and the San Lorenzo Valley Unified School District, provides recommendations for both infrastructure and non-infrastructure improvements to enhance mobility and safety on SR 9 in the vicinity of three San Lorenzo Valley schools located between Glen Arbor Road and Graham Hill Road. The School Access Study includes various chapters that support the RHSP, including findings related to existing conditions, traffic data analyses, and proposed projects and programs to address identified mobility and safety issues. The School Access Study found 49 total injury-involved reported crashes on SR 9 in the study area between January 2015 and December 2019, utilizing SWITRS data. The most common crash types were rear-end, hit object, and sideswipe crashes. The School Access Study evaluated and built on four priority projects identified in the 2019 SLV Plan: Projects 9, 10, 11, and 12. Recommendations are located around the San Lorenzo Valley Elementary, Middle, and High schools and consist of various treatments such as sidewalk improvements, shoulder improvements, bike lanes, evaluation of roundabouts and traffic signals, multi-use paths, and crossing improvements, including rectangular rapid flashing beacons. The School Access Study developed conceptual plans that provide more design detail than the PSR-PDS for SR 9, which also includes the three schools' frontages within its limits.

Figure 4: Map of San Lorenzo Valley Schools

Source: San Lorenzo Valley Schools Complex Access Study (2023)

DESIGN GUIDANCE DOCUMENTS

The following Caltrans design guidance documents were reviewed, all of which may inform recommendations developed through the RHSP:

- Traffic Calming Guide: Offers guidance for implementing traffic calming measures on the state highway system across six different categories, including signage and markings, intersection modifications, roadway narrowing, vertical roadway elements,

roadway modifications, and other measures. Measures described in this guide may be considered in cases where reduced vehicle speeds or traffic volumes are desired.

- Design Information Bulletin (DIB) 82-06 - Pedestrian Accessibility Guidelines for Highway Projects (2017): Provides design guidelines for pedestrian accessibility considerations in highway projects, inclusive of provisions from the 2010 American with Disabilities Act Standards, the Public Rights-of-Way Accessibility Guidelines, and the California Building Code.
- DIB 89-02 - Class IV Bikeway Guidance (2022): Provides design guidance for Class IV bikeways, also known as separated bikeways, including vertical elements, separation widths, approaches, and curb selection.
- DIB 94 - Complete Streets Contextual Design Guidance (2024): Establishes best practices and offers design guidance for implementing complete streets on Caltrans facilities.

OTHER RECENT OR ONGOING PLANS

Finally, this section presents other recent or ongoing plans in or around the project study area that may be relevant to the development of the RSHP.

Downtown Watsonville Specific Plan (2023): establishes a community-driven vision and planning framework to guide the area's evolution into a vibrant, mixed-use, and walkable district that builds on its historic character. It aims to support higher-intensity development, foster multimodal access, and reduce automobile dependency while encouraging reinvestment, innovation, and partnerships to activate downtown throughout the week. This plan provides the foundation for coordinated public and private actions to realize the community's vision for a connected and sustainable future. Since SR 152 operates along portions of Main Street and as a one-way couplet along E Lake Avenue and E Beach Street, and Riverside Drive on the south end of the Plan area is a part of SR 129, this Specific Plan is relevant to the RHSP.

County of Santa Cruz General Plan and Local Coastal Program (2024): establishes a vision and framework to guide sustainable development, transportation improvements, and land use in unincorporated areas. It prioritizes vibrant, walkable neighborhoods, preservation of rural character, and multimodal transportation options while fostering economic growth and environmental stewardship. The plan incorporates a layered network approach with different street types to guide transportation improvements and addresses existing roadways, including SRs covered by the RHSP, as well as bicycle and pedestrian infrastructure.

2045 Santa Cruz County Regional Transportation Plan (2022): The Regional Transportation Plan (RTP) is a state-required, long-term strategy document that shapes transportation investment decisions in Santa Cruz County. It identifies key transportation issues, sets funding priorities, and outlines the needs for transit, highways, local roads, biking, and walking infrastructure. Updated every four years, the RTP estimates potential funding from local, state, and federal sources over a 20- to 25-year period to address these priorities. The Association of Monterey Bay Area Governments (AMBAG) approved the latest Regional Transportation Plan in June 2022. AMBAG is now working on the

2050 Monterey Bay Area Metropolitan Transportation Plan and Sustainable Communities Strategy.

North Coast Facilities Management Plan (2024): The North Coast Facilities Management Plan (NCFMP) addresses the growing challenges posed by increased visitation to Santa Cruz County's North Coast, emphasizing the need for sustainable recreation management and improved visitor facilities. Developed through collaboration with government agencies, nonprofits, and local stakeholders, the plan outlines goals, actions, and strategies to enhance public safety, protect natural resources, and improve visitor experiences while coordinating long-term infrastructure development. By consolidating existing efforts and fostering cooperation, the NCFMP provides a cohesive framework to address environmental, safety, and management concerns in the region.

Bridge Replacement Project over Pajaro River & Salsipuedes Creek (EA05-1Q980):

As part of the Pajaro River Flood Risk Management Project, the City is working with United States Army Corps of Engineers (Corps), the Santa Cruz County Flood Control and Water Conservation District – Zone 7, and the Monterey County Water Resources Agency (MCWRA) to improve levees along the Pajaro River which will cause the replacement of the following bridges in the near-term:

- E. Lake Ave near Holohan Road/College Road (where Corralitos Creek crosses underneath)
- Riverside Drive (where Salsipuedes Creek flows underneath)
- Walker Street railroad bridge

Strengthening Watsonville Neighborhoods:

The City of Watsonville and Ecology Action recently won a $2 million Reconnecting Communities grant to conduct a feasibility study on the burden that truck routes, including SR 152 and SR 129, pose to residential neighborhoods and the downtown core of the City of Watsonville. The study will evaluate alternative truck routes and a range of alternative design options along each street corridor to address the long-term burden that these routes have imposed on the growth and development of the city. The study will include a focus on improving safety for active transportation modes, expanding multi-modal use throughout Watsonville, and reducing emissions close to schools and residential neighborhoods.

Appendix B. RHSP Vision and Goals

FEHR PEERS

Appendix B

Vision, Goals, and Objectives Framework for Rural Highways Safety Plan

Originally Submitted September 2024

SJ24-2298

This memorandum describes the vision and objectives of the Rural Highways Safety Plan (RHSP). The vision and objectives establish a defined Vision Zero goal and will be used as a framework to guide the development of the RHSP, including project prioritization and alternatives analysis. The proposed vision, goals, and objectives build on the State and Federal policy context and best practices detailed in **Appendix A**.

This memorandum is organized into two sections:

- **Proposed Plan Vision** describes the overarching vision of the RHSP.
- **Plan Goals and Objectives** provide the framework for an actionable RHSP.

Proposed Plan Vision

The proposed Plan vision indicates the overarching intent for the RHSP and establishes a Vision Zero goal for the project's study area. The proposed vision is as follows:

RTC and Caltrans are committed to eliminating traffic fatalities and serious injuries on undivided State Highways in unincorporated Santa Cruz County by 2050 through the implementation of holistic Safe System Approach strategies.

Goals and Objectives

The RHSP vision provides the framework for an achievable performance-based plan. The RHSP goals support the RHSP vision by prioritizing reducing crashes that result in traffic fatalities and serious injuries as well as focusing on a collaborative approach to issue identification and strategy deployment. The objectives associated with each goal detail actionable and measurable strategies

to achieve the associated goals. The RHSP goals and objectives are listed below. This framework will be referenced in future stages of the Plan development to guide the preferred alternative selection process.

Goal 1: Commit to Vision Zero

The RHSP will lay out a clear and actionable roadmap aligned with the Vision Zero goal. This includes five objectives that are key to reducing killed and severely injured (KSI) crashes along the study corridors.

- **Make safety the default design choice (specifically risk factor reduction through speed management and separating users in space and time) rather than the exception**. In addition to speed management strategies, risk reduction should focus on reducing exposure through land use and travel demand management strategies. Risk factors can be assessed using the Federal Highway Administration's (FHWA) Safe System Project-Based Alignment Framework tool that uses surrogate data to measure kinetic energy. This can also be evaluated against Caltrans' Design Information Bulletin (DIB) 94 treatment selection guidance to ensure alignment with best practices and the most recent Caltrans guidance. National Cooperative Highway Research Program (NCHRP) 1036 also provides a framework for tradeoff decision-making in support of multi-modal safety.
- **Clarify the context of the road segment (movement or place-focused)** by establishing a street typology to match safety improvements (especially target speed) with the appropriate context and road use. The place types defined in DIB 94 can be used as a basis for this typology and should have an appropriate modal hierarchy and target speed. This objective's success can be measured based on alignment with the established place type standards as adapted from DIB 94. Additionally, observed speeds should align with target speed speeds for each place type.
- **Maximize accessibility and connectivity** by ensuring streets are comfortable for all users and abilities and provide sufficient connections to the wider multi-modal transportation network throughout the region. This can be measured quantitively through level of traffic stress[1] and qualitatively with measures such as proximity to other facilities or major destinations/land uses and the number of crossing connections to other facilities.
- **Advance regional sustainability goals** by effectively decreasing the share of vehicles and shifting travelers to other modes. This can improve safety by reducing the exposure rate. Level of traffic stress, as well as transit frequency and reliability, can be used as a proxy for mode shift potential, as the quality of multimodal infrastructure is directly related to induced user demand and potential mode shift. Other sustainability goals can

[1] Level of traffic stress refers to the level of comfort a bicyclists may experience on a given roadway based on factors like connectivity, the existence/quality of bicycle networks, and roadway context. This methodology was first developed by the Mineta Transportation Institute (https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity)

be achieved as co-benefits to safety projects, such as building green infrastructure. This objective can be measured qualitatively through the quantity and quality of green infrastructure.

Goal 2: Advance Partnerships and Collaboration

Addressing safety on the study corridors is a shared responsibility that requires strong partnerships to effectively implement the RHSP. The following three objectives detail how to continue to build these relationships.

- **Collaborate with stakeholders** to solicit input throughout the process of developing the RHSP. Stakeholders can share additional perspectives and insights into the process and can help to establish a culture of safety throughout RTC departments and among County stakeholders. Surrogate safety data should include near misses and other qualitative community input not included in crash data.
- **Proactively engage with Caltrans** to develop a plan that is feasible and lays a clear roadmap to navigate Caltrans' processes. The RHSP will need to be developed closely with Caltrans as they own the right of way on these corridors. Improvements should meet DIB 94 requirements to ensure alignment with Caltrans' latest best practices.
- **Focus on upstream, population-scale considerations for safety,** including who is traveling; what mode they are using; where are they traveling; why are they traveling; and which policies, design decisions, and other upstream considerations influenced their socio-economic and built environment experience. Strategies should prioritize population-scale approaches, de-emphasizing the role and need for education and enforcement interventions.

Goal 3: Prioritize Equity and Community Engagement

Elevating equity and meaningful community engagement is a priority in all stages of Vision Zero and Safe System work. Nationwide studies have concluded that low-income communities and communities of color often carry a disproportionate burden of traffic-related injuries and fatalities, lack the infrastructure to facilitate safe access and mobility, and are more likely to be stopped by law enforcement.[2] RTC is currently preparing a *Transportation Equity Action Plan* that will identify Equity Priority Communities across Santa Cruz County.[3] The following objectives outline how to prioritize equity and meaningful community engagement for the RHSP, which will not only inform the alternatives selection but also be infused throughout all stages of the Plan development.

[2] See https://smartgrowthamerica.org/dangerous-by-design/ and https://visionzeronetwork.org/wp-content/uploads/2023/09/Prioritizing_Health_Equit_in_Vision_Zero_Planning.pdf for further information.
[3] See https://www.sccrtc.org/funding-planning/equity/ for further information.

- **Cross-analyze traffic-related injuries and fatalities with demographic factors,** including Equity Priority Communities, and acknowledge the disproportionate burden of crashes in underserved communities.
- **Coordinate with RTC's *Transportation Equity Action Plan*** to define equity in a consistent way and develop methods for incorporating equity in decision-making processes that work across projects.
- **Accept that humans make mistakes and focus on the environment and context that travel occurs within.** This should include de-emphasizing law enforcement in favor of focusing on the "New Es" of Energy, Exposure, and Equity. Shift enforcement away from traffic stops and bike citations to more equitable options like speed safety cameras and post-crash care. While strategic enforcement can be an important tool, the Safe System approach recognizes that built environment interventions and sociodemographic factors are most impactful.
- **Supplement data with community input** so that the Plan can better reflect and meet community needs. Ground truth recorded crash data with community-sourced crash, near miss, and general safety observations during Phase 1 of outreach. During Phase 2 of outreach, update draft recommendations, emphasis areas, and project priorities based on community feedback.
- **Offer different options for inclusive engagement** so that stakeholder and resident feedback and insights are incorporated into the development of the RHSP. Offer both virtual and in-person options at different times of day and locations to maximize opportunities for engagement. This should include online surveys or questionnaires that can be completed asynchronously to allow flexibility. Where possible, outreach should strive to "meet people where they are" through pop-up events, temporary demonstration projects, or information booths at local events and community hubs.
- **Invite participation from and collaborate with community-based organizations** to help distribute information and solicit feedback from community leaders.
- **Reduce barriers to participation** by compensating people for more involved participation or offering childcare or meals at traditional public meetings.

Goal 4: Ensure Future Funding Success

A key goal of the RHSP is for the plan to meet State and Federal requirements of a Local Roadway Safety Plan (LRSP) and Safe Streets for All Action Plan (SS4A Action Plan). The following objectives seek to prepare RTC and partner agencies to apply for funding (e.g., SS4A, HSIP) and successfully implement priority safety projects identified as part of the RHSP.

- **Develop RSHP to meet SS4A funding requirements** to allow identified projects to compete for the federal funding programs. To be competitive for SS4A Implementation grant eligibility, the RHSP should meet all nine action plan components included in **Appendix A**.

- **Ensure consistency with other related regional and local plans** (e.g., Santa Cruz County LRSP, Caltrans Highway Safety Improvement Plan, County of Santa Cruz Active Transportation Plan). Demonstrate how the RHSP goals align with other regional and local plans. Align with guidance and recommendations in State and County plans as well as Federal guidance to maximize access to State and Federal roadway safety funds.
- **Prioritize investments where kinetic energy risk is highest and in historically underserved communities.** Kinetic energy transfer is directly related to the severity of a crash. Kinetic energy transfer can be addressed by reducing exposure (travel volume), likelihood (conflict points), and severity (speed and mass) of crashes. This aligns with other state mode shift and greenhouse gas (GHG) emissions goals established in RTC's *2045 Regional Transportation Plan* ("2045 RTP") and Caltrans' *California Transportation Plan 2050* ("CTP 2050"). Furthermore, prioritizing historically underserved communities addresses transportation inequities. These areas can be defined through coordination with RTC's *Transportation Equity Action Plan* or by using U.S. Census household income and race data.
- **Infuse safety into all projects on the corridors, including maintenance efforts**. Look for opportunities to address safety through existing maintenance efforts, such as repaving efforts or as part of site plan reviews. Identify areas to institutionalize safety throughout department practices, including eliminating policies such as traffic Level of Service (LOS) that worsen crash risk. Where possible, provide Safe System Approach training for staff and elected officials as well as the media.

Attachment B-1: Goals, Objectives, and Measures of Effectiveness

The proposed goals and objectives will be used to guide the development of the RHSP. Goals 1 and 2 are intended to be used as a framework to evaluate alternatives by using associated measures of effectiveness, as shown in **Table B-1**. On the other hand, goals 3 and 4 are intended to be infused through all stages of the Plan and have less quantifiable measures of effectiveness.

Table B-1: Alternatives Evaluation Approach

Objective	Candidate Measures of Effectiveness/Outcomes	Key Data Source/Evaluation Framework
Goal 1: Commit to Vision Zero		
Make safety the default design choice (specifically risk factor reduction through speed management and separating users in space and time)	• Difference between operating speed and target speed • Number of conflict points • Travel volumes • Number of conflict points • Operating speeds • Percentage of heavy vehicles, large passenger vehicles, and electric vehicles	DIB 94, Safe System Project-Based Alignment Framework, and NCHRP 1036
Clarify the context of the road segment (movement or place-focused)	• Defined place types and associated target speed	DIB 94

Objective	Candidate Measures of Effectiveness/Outcomes	Key Data Source/Evaluation Framework
Maximize accessibility and connectivity	• Level of traffic stress • Walking, bicycling, and transit travel time to key destinations • Frequency of crossing opportunities • Connections to other low stress facilities	-
Advance regional sustainability goals	• Quantity and quality of green infrastructure • Level of traffic stress • Frequency and reliability of transit	Regional sustainability goals in CTP 2050 and 2045 RTP
Goal 2: Advance Partnerships and Collaboration		
Collaborate with stakeholders	• Near miss data • Quantity of stories, input from community and key stakeholders	-
Proactively engage with Caltrans	• Alignment with Caltrans policies and procedures • Proactive outreach connections with Caltrans	DIB 94
Focus on upstream, population-scale considerations for safety	• Potential mode shift • Alignment with place type context	Safe System Pyramid
Goal 3: Prioritize Equity and Community Engagement		
Cross-analyze traffic-related injuries and fatalities with demographic factors	• Crash analysis presented alongside Equity Priority Communities or socio-demographic data	-

Objective	Candidate Measures of Effectiveness/Outcomes	Key Data Source/Evaluation Framework
Coordinate with RTC's *Transportation Equity Action Plan* project team	• Meeting(s) with Transportation Equity Workgroup • Consistent definition of equity and processes to incorporate equity in decision-making	-
Accept that humans make mistakes and focus on the environment and context that travel occurs within	• Participation of law enforcement in stakeholder meetings or interviews	Safe Systems Pyramid
Supplement data with community input	• Community safety observations from webmap, meetings, and workshops	-
Offer different options for inclusive engagement	• Flexible options for community engagement during Phases 1 and 2 of outreach	-
Invite participation from and collaborate with community-based organizations	• Partner with community groups that represent diverse interests to participate in stakeholder and public meetings, and distribute project information	-
Reduce barriers to participation	• Incentives for more involved participation	-
Goal 4: Ensure Future Funding Success		
Develop RSHP to meet Safe Streets for All Action Plan (SS4A Action Plan) requirements	• Plan meets all nine SS4A elements	SS4A grant requirements
Ensure consistency between other related regional and local plans	• Complete literature review of other related plans to understand identified areas of concern and past recommendations	Regional and local plans

Objective	Candidate Measures of Effectiveness/Outcomes	Key Data Source/Evaluation Framework
Prioritize investments where kinetic energy risk is highest and in historically underserved communities	• RHSP includes a prioritization framework that emphasizes areas with high kinetic energy risk and in locations with historically underserved communities	Safe System Roadway Design Hierarchy
Infuse safety into all projects on the corridors, including maintenance efforts	• Institutionalize safety throughout department practices, such as repaving efforts, site plan reviews, and eliminating LOS policies • Provide Safe System Approach training for staff and elected officials as well as the media	

Source: Fehr & Peers, 2024.

Appendix C. Existing Conditions Memo

Appendix C

Existing Conditions Report

Originally Submitted September 2024

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Executive Summary

This report presents a comprehensive overview of Santa Cruz County's existing transportation facilities in the six-corridor study area, laying the groundwork for the development of the Rural Highway Safety Plan (RHSP). The RHSP is located in Santa Cruz County and specifically focuses on six conventional state-owned highways: Highway 1 north of the City of Santa Cruz city limits, Highway 9, Highway 236, Highway 35, and Highways 129 and 152 outside the City of Watsonville city limits. These six conventional highways collectively function as main streets, intercommunity connectors, and rural highways as they traverse a range of communities and contexts in the County.

Place Types

Caltrans identifies place types in *Design Information Bulletin 94 ("DIB 94") - Complete Streets: Contextual Design Guidance* as a tool to describe key components of the project context and provide valuable insight into land use, development density, population, and available transportation and mobility options. DIB 94 provides design guidance and outlines modal priorities by place type.

While DIB 94 defines three rural areas place types, the RHSP developed an additional rural place type to better suit the County and its specific needs. The RHSP place types include Rural Main Streets, Transitional Areas, Undeveloped Non-Mountainous Areas, and Undeveloped Mountainous Areas as described below:

- *Rural Main Streets* are often characterized by state highways that serve as a primary main street running through the town center. Due to the varying levels of development in these areas, projects on Rural Main Street highway segments can be more complex and costly compared to similar projects in less-developed rural regions. Low speeds and vulnerable road user priority are expected in these areas.
- *Transitional Areas* are located along state highways that serve as a link between Rural Main Streets and Undeveloped Areas. These highways accommodate both inter-regional traffic and residents seeking access to services. Speed management in these zones is critical to set expectations in advance of the activity clusters and increased conflict points present in Rural Main Street zones.
- *Undeveloped Areas* are typically served by state highways that have traditionally prioritized the efficient movement of vehicles and freight over long distances. However, these highways also often serve as the only connection between destinations for users of all modes while lacking robust active transportation or transit infrastructure. In Santa Cruz County, Undeveloped Areas can be further subdivided into two categories:
    - *Non-Mountainous* are state highways in Undeveloped Areas that are generally flat and have minimal changes in grade.
    - *Mountainous* are state highways in Undeveloped Areas that travel through mountainous areas and may have steeper grades or more curves in the roadway.

Because this place type definition will be linked to target speed setting in the RHSP recommendations, it is important to recognize these two categories as distinct place types. They will ultimately have different contextual target speeds and associated treatments to address the conflict and severity risk elements present in each.

There are situations where the existing place type is different from the community-desired place type (this typically occurs in locations where, with additional pedestrian and bicycle facilities, traffic calming, and/or on-street parking, a park-once Main Street environment could be achieved).

Potential Risk Factors Key Findings

A Safe System proactively identifies the sources of kinetic energy risk, understanding that humans are vulnerable to injury when high levels of kinetic energy are present and conflicts occur. Kinetic energy risk assessment looks at three core components: crash exposure, crash likelihood, and crash severity. As shown in **Table ES-1**, key risk factors on the study highways may include:

Table ES-1: Potential Risk Factors on Study Highways

Crash Exposure	Crash Likelihood (Conflict Points)	Crash Severity (Mass and Speed)
• Limited alternative transportation options • Presence of high pedestrian and bicyclist generators such as Rural Main Streets, schools, and parks • High vehicle, pedestrian, and bicycle volumes • Limited affordable housing near employment locations	• Mountainous roads with low visibility • Lack of pedestrian and bicycle facilities • Within 150 feet of intersections • 2+ vehicle lanes • Lanes with narrow shoulders • Lack of physical separation between travel directions • Two-way turn lane	• High truck volumes or agricultural vehicles • High vehicle speeds • Horizontal and vertical curves • Vulnerable road users

Source: Fehr & Peers, 2024.

Locations within the study highways where many of these factors are present include:

- Highway 1 from Davenport (Marine View Avenue) to Santa Cruz City boundary
- Highway 9 from Felton (Glengarry Road) to Boulder Creek (Bear Creek Road)
- Highway 129 adjacent to the Watsonville City boundary near Highway 1/Lee Road east to the County line near Old Chittenden Road
- Highway 152 near Interlaken between Carlton/Casserly Road and Watsonville City boundary near Bridge Street

Crash History Key Findings

In addition to the proactive risk factors assessment, a comprehensive crash history of the study highways was conducted to identify notable trends and patterns in crashes with killed or severe injury (KSI) outcomes within the six study highways, based on crash data for the past ten years (2014 to 2023) from

Traffic Incident Mapping System (TIMS). The following key findings are based on analysis of the crash history:

- **Crash Type**: The most common crash types included hitting fixed objects and broadsides. This may be attributed to the horizontal and vertical curves on the study highways.
- **Primary Collision Factor:** The most frequently reported primary collision factors were unsafe speed, improper turning, and driving or bicycling under the influence of alcohol or drugs.
- **Crashes by Highway**: The highest total crashes (579) across the ten years, representing 41% of all crashes on the study highways, occurred on Highway 9.
- **KSIs by Highway**: Generally, KSIs made up about 20% of all crashes on each highway. Highway 35 had a higher ratio of 30% KSIs to total crashes and Highway 129 had the lowest ratio of 16% KSIs to total crashes.
- **Bicycle and Pedestrian Crashes by Highway**: Bicycle and pedestrian crashes made up a small number of total crashes on each study highway (about 12% on average) but the share of bicycle and pedestrian related KSIs on each study highway was almost double (about 28% on average).
    - Most notably, on Highway 9, bicyclists and pedestrians were involved in 15% of all crashes but 50% of all KSI.
- **Race of Victims:** The race of crash victims on the study highways is comparable to the race of the general population in the County. Similar to the County demographics, most crash victims were identified as White or Hispanic.
- **Age of Victims:** For individuals aged 65 and older, the share of total crashes (9%) is smaller compared to the population share (18%). However, the share of KSI crashes (11%) is slightly higher than the share of total crashes.

Public Input

Santa Cruz County Regional Transportation Commission (RTC) and the project team conducted a series of community engagement activities in Fall 2024 as part of the project's Milestone 1 update. These efforts were designed to gather input from a broad range of stakeholders and community members for the purposes of safety planning. Participants were asked to provide feedback pertaining to existing conditions, including their own experiences relevant to safety, transportation facilities, and collisions or near-miss incidents on the study corridors. Engagement activities included online tools, committee and stakeholder meetings, and a virtual workshop, which were supported by targeted promotion efforts. Below is a high-level summary of community input themes received by corridor:

- **Highway 1:** As a key corridor for recreational activities and tourism, Highway 1 experiences high vehicle, pedestrian, and bicycle volumes. The mix of these travel modes, combined with a lack of adequate active transportation facilities and limited, informal parking, can lead to unpredictable interactions and may make people feel uncomfortable.

- **Highway 9:** Particularly through San Lorenzo Valley, people want Highway 9 to function more as a "Rural Main Street" with improved intersection treatments to slow vehicle speeds and facilitate pedestrian crossings.
- **Highway 35:** People have observed speeding by recreational drivers. Additionally, people can feel uncomfortable parking and accessing their cars parked along the highway.
- **Highway 129:** Particularly at crossings, Highway 129 feels undesirable to people walking and biking due to high speeds, truck traffic, and limited visibility. Bicyclists also reported debris on shoulders.
- **Highway 152:** People often mentioned concerns about congestion near the fairgrounds, which can cause people to make unpredictable maneuvers (e.g., U-turns, driving on shoulder or wrong side of road). Bicyclists noted they dislike riding on Highway 152 due to the lack of shoulders and blind corners.
- **Highway 236:** While Highway 236 was mentioned less frequently in discussion, respondents mentioned that campground locations can experience increased pedestrian activity, creating potential conflicts with passing vehicles.

Next Steps

This existing conditions analysis serves as the basis for future analysis and recommendations. By understanding the reactive and proactive safety challenges on the study highways, the project team will build profiles highlighting the top safety emphasis areas and systemically identify the appropriate countermeasures.

1. Introduction

This report presents a comprehensive overview of Santa Cruz County's existing transportation facilities in the six-corridor study area, laying the groundwork for the development of the recommendations in the Rural Highway Safety Plan (RHSP). The following sections outline the existing policy background, transportation conditions, and safety landscape, and provides a summary of the first round of outreach for this study.

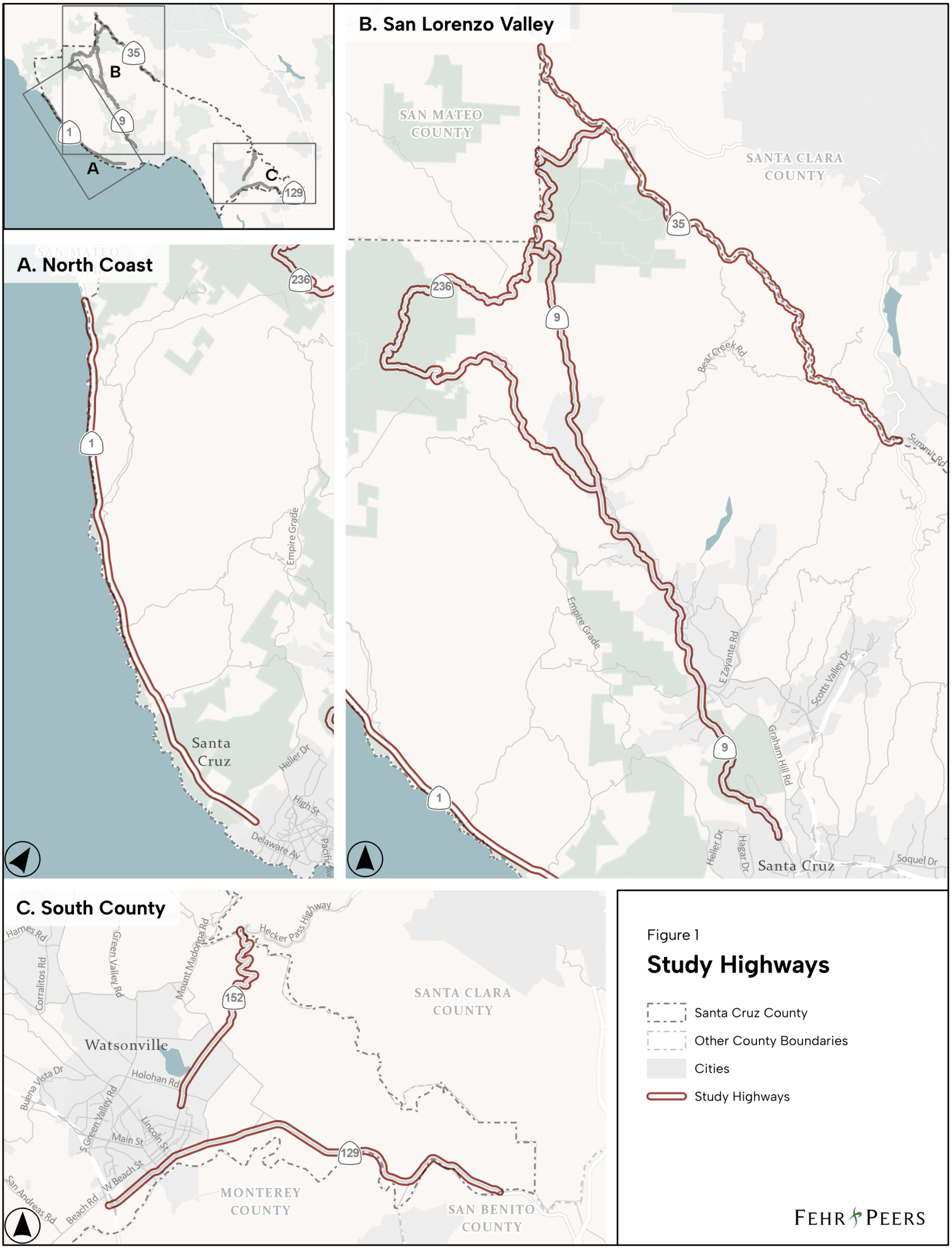
1.1 Project Overview

The RHSP seeks to substantially enhance multimodal safety on six rural highways by identifying high-risk areas, analyzing crash patterns, and recommending targeted countermeasures. This initiative aligns with Vision Zero—a global movement and Caltrans commitment, with the goal of achieving zero traffic-related deaths and serious injuries by 2050. The RHSP will serve as a structured roadmap for Santa Cruz County, Caltrans, and other local stakeholders to enhance overall road safety for all users, including drivers, pedestrians, cyclists, and transit riders. The RHSP employs a comprehensive, data-driven approach by conducting an extensive literature review, assembling a transportation network inventory, and analyzing crash data and risk factors to understand safety factors affecting different roadway user groups. This analysis aims to pinpoint systemic and location-specific hazards to guide RTC and Caltrans' investments in safety improvements.

The RHSP is developed in collaboration with Caltrans District 5, the Santa Cruz County Community Traffic Safety Coalition, local school districts, UC Santa Cruz, emergency responders, neighborhood groups, and community representatives. These partnerships ensure that the RHSP reflects local priorities and integrates a wide range of perspectives.

1.2 Project Location

This project is located in Santa Cruz County and specifically focuses on six conventional state-owned highways: Highway 1 north of the City of Santa Cruz city limits, Highway 9, Highway 236, Highway 35, and Highways 129 and 152 outside the City of Watsonville city limits, as shown in **Figure 1**. These six conventional highways collectively function as main streets, intercommunity connectors, and rural highways as they traverse a range of communities and contexts in the County.


A
B
C
35
9
1
129
B. San Lorenzo Valley
SAN MATEO COUNTY
SANTA CLARA COUNTY
236
Bear Creek Rd
Summit Rd
Empire Grade
E Zayante Rd
Scotts Valley Dr
Graham Hill Rd
Heller Dr
Hagar Dr
Soquel Dr
Santa Cruz
A. North Coast
Santa Cruz
Heller Dr
High St
Delaware Av
Pacific Av
C. South County
Hames Rd
Corralitos Rd
Green Valley Rd
Mount Madonna Rd
Hecker Pass Highway
152
Watsonville
Holohan Rd
Buena Vista Dr
S Green Valley Rd
Main St
Lincoln St
W Beach St
San Andreas Rd
Beach Rd
MONTEREY COUNTY
SAN BENITO COUNTY
Figure 1
Study Highways
Santa Cruz County
Other County Boundaries
Cities
Study Highways
FEHR PEERS

2. Existing Planning & Policy Background

Our team conducted a literature review to ensure that the RHSP is informed by previously completed planning initiatives. The 27 documents reviewed can be divided into three main categories: 1) foundational state and regional policy, 2) regional and local planning, and 3) Caltrans design guidance.

The foundational state and regional policy documents collectively establish safe, multimodal infrastructure as a priority for both the state of California and Caltrans District 5 and also endorse the Safe System Approach to achieving Vision Zero.

Various regional and local planning documents provide detailed background information on existing conditions and collision data for each RHSP corridor as well as recommendations and countermeasures to address identified safety issues. The County of Santa Cruz *Active Transportation Plan* (2022) identified RHSP corridors for safety enhancements. Highways 1, 9, and 129 were identified in the *Active Transportation Plan* as the top locations for fatal pedestrian collisions (based on 2009-2018 data obtained from UC Berkeley's Transportation Injury Mapping System). A substantial amount of work related to transportation safety has already been completed for SR 9 and schools across Santa Cruz County through the *Highway 9 San Lorenzo Valley Complete Streets Corridor Plan* (2019), *County of Santa Cruz/City of Scotts Valley Complete Streets to Schools Plan* (2020), *Caltrans Project Study Report - Project Development Support for SR 9* (2022), and the *San Lorenzo Valley Schools Complex Access Study* (2023). These documents include recommendations and conceptual designs for a variety of transportation safety treatments. The RHSP will consider the recommendations in these previous plans as a starting point for this effort.

Caltrans documents, including the *Traffic Calming Guide* and several *Design Information Bulletins (DIBs)*, provide detailed design guidance to support the development of recommendations on the state highway system in response to identified safety issues. The *Highway 9 San Lorenzo Complete Streets Corridor Plan* Appendix also contains a Complete Streets Improvement Toolkit that provides guidance on utilizing various types of transportation enhancements such as narrowed lanes, rumble strips, safety lighting, and new crosswalks.

A brief summary of the policy and planning documents reviewed is included below.

2.1 Foundational Policy Documents

- *California Transportation Plan 2050 (2021)* – Provides a long-range vision for the state's transportation system with the aim of making it safe, resilient, and accessible. The Plan includes 19 specific action items related to expanding access to safe and convenient active transportation options and enhancing transportation safety and security.

- *Climate Action Plan for Transportation Infrastructure (2021)* – Provides a framework to help align transportation investments throughout the state with goals around climate, health, and social equity. The Plan includes 34 key action items for implementation, including action SR 4 to "Re-focus Caltrans Corridor Planning Efforts to Prioritize Sustainable Multimodal Investments in Key Corridors of Statewide and Regional Significance" which will facilitate "the development of innovative safety solutions based on the safe systems approach that advance sustainable transportation modes, particularly for rural communities."
- *California Safe Roads 2020-2024 Strategic Highway Safety Plan (2023)* – Provides a statewide framework to reduce fatalities and serious injuries on public roads, using the Safe System Approach as one of its guiding principles. Examples of priority and focus areas in the plan include active transportation, impaired driving, and speed management.
- *California Safe Roads 2020-2024 Strategic Highway Safety Plan Implementation Plan (2024)* – Provides actions for implementation across 16 challenge areas to support the Safety Plan. Examples of actions in the Implementation Plan include "B.1: Establish a preferred methodology for developing a High Injury Network (HIN) for bicyclists" and "AD.3 Identify the driving habits, needs and concerns of California's aging roadway users in order to expand and/or improve services that will promote safety."
- *California Highway Safety Improvement Program Implementation Plan (2023)* – Identifies actions for the state to take in 2023 to invest over $200 million in Highway Safety Improvement Program (HSIP) funding while meeting certain requirements and safety performance targets aimed at reducing fatalities and serious injuries.
- *State Highway System Management Plan (2023)* – Applies a performance management framework to the state highway system in support of meeting federal asset management requirements for Caltrans.
- *California Freight Mobility Plan (2023)* – Governs near and long-range freight planning and capital investments across the state to make the freight system more efficient, reliable, modern, integrated, resilient, safe, and sustainable.
- *Caltrans Director's Policy 35: Transportation Asset Management* – Establishes that Caltrans will utilize a systematic asset management framework approach to ensure that investments in transportation maximize effectiveness and achieve desired performance levels.
- *Caltrans Director's Policy 37: Complete Streets* – Establishes the creation of complete streets that improve active transportation and access to transit as a priority to support state goals related to climate, health, and social equity. The Policy directs that "all transportation projects funded or overseen by Caltrans will provide comfortable, convenient, and connected complete streets facilities for people walking, biking, and taking transit or passenger rail unless an exception is documented and approved."
- *Caltrans District 5 Active Transportation Plan (2021)* – Provides a prioritized list of bicycle and pedestrian needs on the state highway system to support incorporation of active transportation and transit improvements into projects for the counties of Monterey, San Benito, San Luis Obispo, Santa Barbara, and Santa Cruz. The Plan supports meeting the state's goal of ensuring that people

in California of all ages, abilities, and incomes can safely, conveniently, and comfortably walk and bicycle for their transportation needs by 2040.

- *Caltrans District 5 Climate Change Vulnerability Assessments (2019)* – Provides an initial review of state highway system assets that are exposed to climate stressors to identify which assets may be vulnerable to climate change impacts.
- *Caltrans District 5 Adaptation Priorities Report (2021)* – Informs the order in which climate assessments should be conducted for the almost 2,000 assets in District 5 including road segments, bridges, and culverts and assigns a priority score between one and five to each asset.
- *Caltrans Reconnecting Communities Handbook (2023)* – Provides a framework for agencies on how to partner with Caltrans to reconnect communities through planning and capital projects. This can apply to communities including unincorporated towns in Santa Cruz where Caltrans facilities run through the center and serve as the main streets.

2.2 Regional and Local Planning Documents

- *County of Santa Cruz Active Transportation Plan (2022)* – Identifies community needs and provides recommendations for infrastructure projects and programs to support walking and biking in unincorporated areas of the County. The Plan aims to create a network of biking and walking routes that connect key destinations within the County and are safe, comfortable, and accessible for community members of all ages, backgrounds, and abilities.
- *County of Santa Cruz/City of Scotts Valley Complete Streets to Schools Plan (2020)* – Provides recommendations to enhance transportation safety at nineteen public schools in unincorporated Santa Cruz and Scotts Valley, inclusive of both infrastructure and programmatic improvements in support of 1) doubling the active transportation rates at each school and 2) eliminating severe injuries and fatal collisions among youths under the age of 18 who are walking or bicycling in unincorporated areas.
- *Caltrans Transportation Concept Reports (TCRs)* – Provides recommendations for each RHSP corridor's ultimate facility concept with a focus on operational needs and congestion. Developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated transportation network management.
- *Highway 9 San Lorenzo Valley Complete Streets Corridor Plan (2019)* – Provides recommendations for improvements to enhance safety, access, and traffic operations on SR 9 in the communities of Felton, Ben Lomond, Brookdale, and Boulder Creek. Identifies 28 priority project concepts that include improvements such as new crosswalks, improved bicycle facilities, and lighting.
- *Project Study Report - Project Development Support for SR 9 (2022)* – Provides a project alternative that builds on the *Highway 9 San Lorenzo Valley Complete Streets Corridor Plan* to provide safe mobility for all road users, reduce vehicle speeds, and enhance pedestrian safety and mobility for SR 9 between Henry Cowell State Park and Pool Drive. Proposed improvements include shoulder widening, bikeway installation, and crosswalk improvements, among others.

- *San Lorenzo Valley Schools Complex Access Study (2023)* – Provides recommendations for both infrastructure and non-infrastructure improvements to enhance mobility and safety on SR 9 in the vicinity of three San Lorenzo Valley schools located between Glen Arbor Road and Graham Hill Road. Recommendations include improvements such as bike lanes, multi-use paths, and rectangular rapid flashing beacons.
- *Climate Adaptation Vulnerability Assessment and Transportation Priorities Report (2025)* – Details the climate related risks and hazards that affect different areas in the County, particularly the effects on transportation facilities in the County. The report includes recommendations for mitigating the effects on transportation infrastructure.

2.3 Treatment Selection and Design Guidance Documents

- *Caltrans Traffic Calming Guide* – Offers guidance for implementing traffic calming measures on the state highway system across six different categories including signage and markings, intersection modifications, roadway narrowing, vertical roadway elements, roadway modifications, and others. Measures described in this guide may be considered in cases where reduced vehicle speeds or traffic volumes are desired.
- *Caltrans Design Information Bulletin 82-06 - Pedestrian Accessibility Guidelines for Highway Projects (2017)* – Provides design guidelines for pedestrian accessibility considerations in highway projects, inclusive of provisions from the 2010 *American with Disabilities Act Standards*, the P*ublic Rights-of-Way Accessibility Guidelines*, and the *California Building Code*.
- *Caltrans Design Information Bulletin 89-02 - Class IV Bikeway Guidance (2022)* – Provides design guidance for Class IV bikeways, also known as separated bikeways, including for vertical elements, separation widths, approaches, and curb selection.
- *Caltrans Design Information Bulletin 94 - Complete Streets Contextual Design Guidance (2024)* – Establishes best practices and offers design guidance for implementing complete streets on Caltrans facilities.

3. Transportation Conditions

This chapter describes the transportation conditions on each of the study highways, including roadway characteristics, pedestrian facilities, bike facilities, and transit options. It also introduces the concept of "place types."

3.1 Place Types

Caltrans identifies place types in *Design Information Bulletin 94 ("DIB 94") - Complete Streets: Contextual Design Guidance* as a tool to describe key components of the project context and provide valuable insight into land use, development density, population, and available transportation and mobility options. Place types assist agencies in recognizing shared transportation needs, priorities, and challenges for different street types based on location context. Consistent with international best practice for Safe System implementation, designating a place type is an essential first step for assessing contextually appropriate target speeds, selecting speed management geometric and operational interventions to design to that speed, and then selecting multimodal treatments to separate users in space and time based on that context and speed.

DIB 94 provides design guidance and outlines modal priorities by place type. The place types are visualized in **Figure 2**. The study highways primarily fall under the "rural areas" place types. Detailed descriptions of rural place types are provided in the following subsection. The locations of each place type by post miles are included **Attachment C-1.**

A critical element of assigning place types is determining if the place type will be the current condition or the potential condition with supportive changes in the build environment. For the purpose of the RHSP, place types have been defined based on the community desired condition, which in some cases may differ from the status quo.

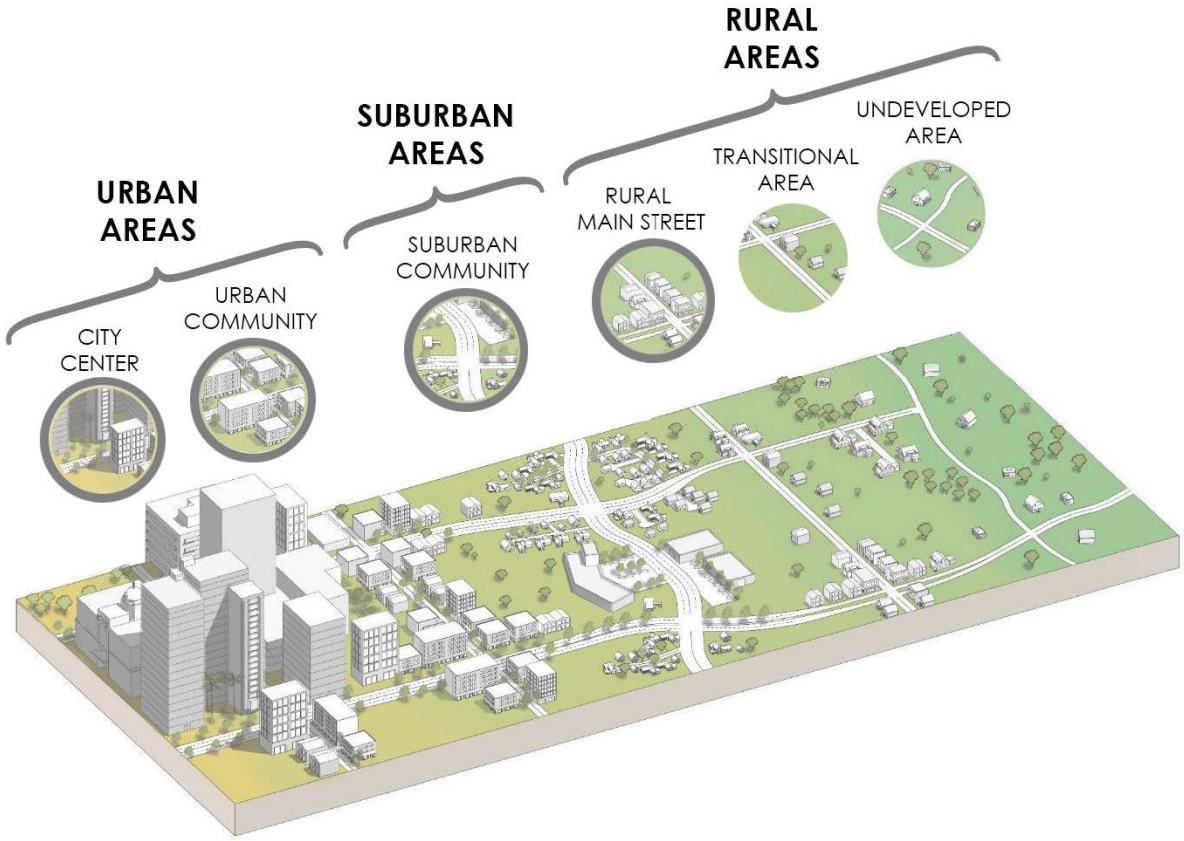


Figure 2: Caltrans Place Types for Contextual Design Guidance (Caltrans, DIB 94)

3.1.1 Rural Areas

The rural areas place types apply to the low-density areas outside the built-up urban and suburban communities. All the place types in the RHSP are within the rural areas category. Single-occupancy vehicle use tends to be higher in rural areas, but zero- or low-vehicle ownership households may exist here as well. Village center and retail/services nodes may be typically accessed by car but can serve as "park once" environments with clusters of pedestrian activity. Bicycle travel occurs throughout the place types, as well as transit service with periodic bus stops.

While DIB 94 defines three rural areas place types as shown in **Figure 2**, the RHSP developed an additional place type to better suit the County and its specific needs. The RHSP place types include Rural Main Streets, Transitional Areas, Undeveloped Non-Mountainous Areas, and Undeveloped Mountainous Areas. Place type varies with different segments of the study highways, as shown in **Figure 3**.

Rural Main Streets are often characterized by state highways that serve as a primary main street running through the town center. Due to the varying levels of development in these areas, projects on Rural Main Street highway segments can be more complex and costly compared to similar projects in less-developed rural regions. Low speeds and vulnerable road user priority are expected in these areas.

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Undeveloped Areas are typically served by state highways that have traditionally prioritized the efficient movement of vehicles and freight over long distances. However, these highways also often serve as the only connection between destinations for users of all modes while lacking robust active transportation or transit infrastructure. In Santa Cruz County, Undeveloped Areas can be further subdivided into two categories:

- *Non-Mountainous* are state highways in Undeveloped Areas that are generally flat and have minimal changes in grade.
- *Mountainous* are state highways in Undeveloped Areas that travel through mountainous areas and may have steeper grades or more curves in the roadway and diminished sightlines due to dense forests, embankments, and other natural terrain features.

Because this place type definition will be linked to target speed setting in the RHSP recommendations, it is important to recognize these two categories as distinct place types. They will ultimately have different contextual target speeds and associated treatments to address the conflict and severity risk elements present in each.

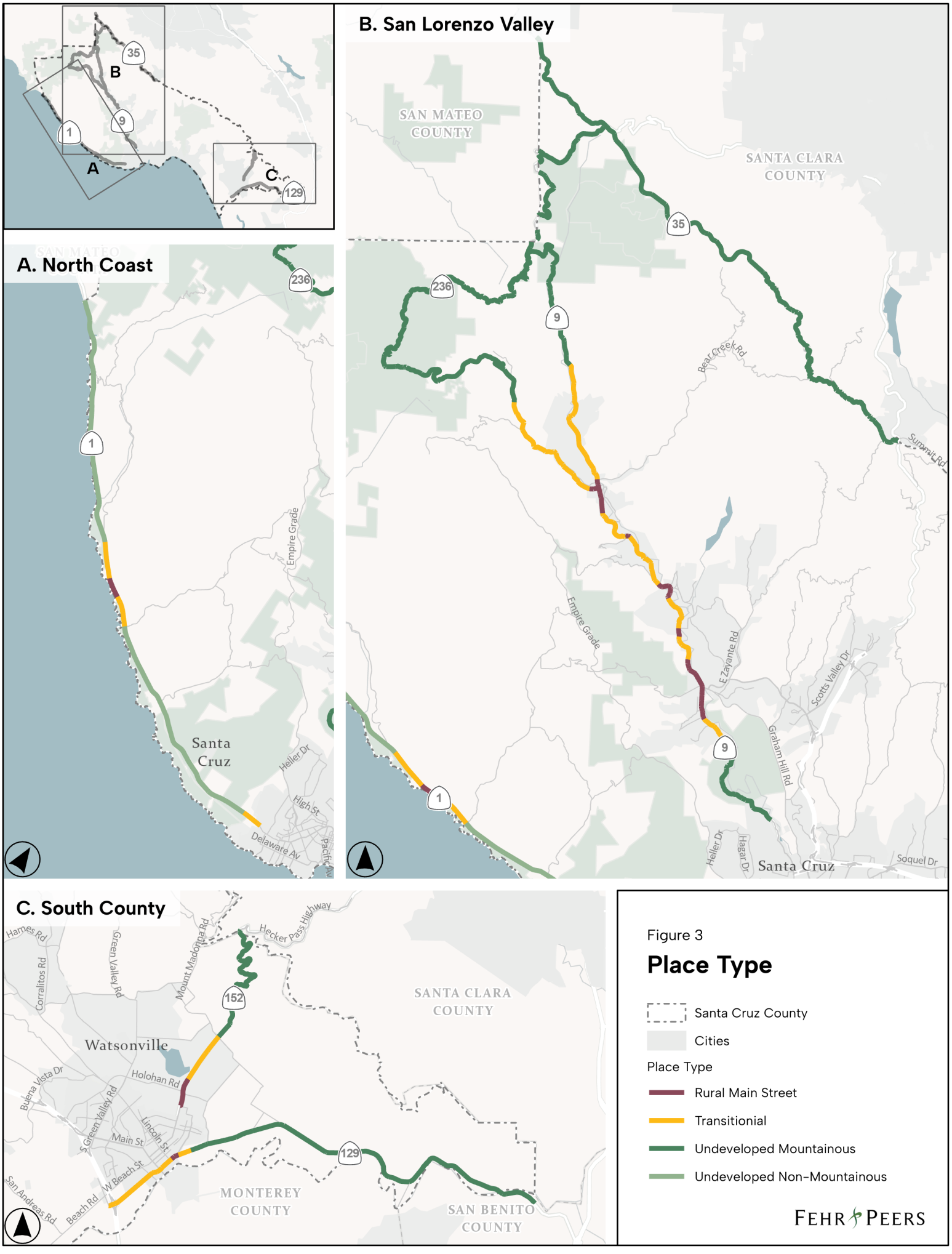

Figure 3

Place Type

- Santa Cruz County
- Cities

Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS

3.2 Study Highways

The following highways were selected by RTC for this project because they represent essential rural transportation corridors which have not been included in previous dedicated comprehensive safety planning efforts compliant with HSIP and/or Safe System for All (SS4A) implementation grant requirements. Each of the six study highways is critical to serving the complex transportation needs of Santa Cruz County.

Highway 1 is a north-south highway spanning from near Waddel Beach to the Pajaro River in Santa Cruz County. Primarily a two-lane highway, it expands to four lanes in some more developed areas, with speed limits generally around 55 mph. The majority of Highway 1 within the study area can be described by the Undeveloped Non-Mountainous and Transitional place types but becomes a Rural Main Street through Davenport, about eight miles north of the City of Santa Cruz. It has no on-street pedestrian or bicycle facilities but there are some existing and planned multi-use trails that run parallel to Highway 1. Transit service on Highway 1 includes Santa Cruz Metro Route 40 from Santa Cruz Metro Center to Davenport which runs limited commuter service in the morning, midday and evening on weekdays and weekends. Bus stops are located every 2–5 miles between Davenport and the City of Santa Cruz. They are situated on the shoulder and typically lack marked pedestrian access routes, shelters, benches, or other bus stop amenities. Highway 1 within the study area is designated as a Surface Transportation Assistance Act (STAA) Terminal access freight route.

Highway 9 is a north-south highway that runs through the San Lorenzo Valley. It is a two-lane, rural highway through the Santa Cruz Mountains, with speed limits ranging from 25 to 55 mph. This route passes through towns including Felton, Ben Lomond, Brookdale, and Boulder Creek as a Rural Main Street place type and serves as a major corridor for residents, workers, and tourists. North of Boulder Creek, Highway 9 can be characterized largely as Transitional and then as Undeveloped Mountainous through the Santa Cruz Mountains on the northern border of Santa Cruz County. Portions of Highway 9 in Ben Lomond and Felton have sidewalks and signalized crosswalks, though there are major sidewalk gaps and many sidewalks are not ADA compliant. There are no bicycle facilities throughout Highway 9. Transit service on Highway 9 includes Santa Cruz Metro Route 35 from River Front Transit Center to Boulder Creek, which runs every 30 minutes on weekdays and weekends. Where Highway 9 serves as a Rural Main Street, stops are typically spaced 1,300 feet and located on the far side of the intersection. Bus stops typically lack amenities, including benches and shelters, and are not ADA accessible. Most intersections with bus stops are uncontrolled but have marked pedestrian crosswalks. In Transitional and Undeveloped Mountainous areas, bus stops are spaced about a mile apart and are typically located on the shoulder with no marked pedestrian crossing. Highway 9 within the study area is designated as a 65’ California Legal (CA Legal) Route, meaning it is restricted to California-legal trucks only. Kingpin-to-rear-axle (KPRA) advisories are in effect with a maximum recommended length of 30’ due to the curvy, mountainous roadway alignment.

Highway 35 is a north-south highway that extends from Saratoga Gap north of Highway 9 to Highway 17 near Redwood Estates along the crest of the Santa Cruz Mountains. It is mostly a two-lane road with a

speed limit of 50 mph. In some areas, it is one lane and vehicles in opposing directions are required to yield. It offers scenic views, making it popular among recreational drivers. Highway 35 is largely characterized as an Undeveloped Mountainous place type with no pedestrian or bicycle facilities and no public transit service. Highway 35 within the study area is designated as a 65' CA Legal freight route with a KPRA advisory of 30' due to the curvy, mountainous roadway alignment.

Highway 129 is an east-west highway that runs through Santa Cruz County from Watsonville to San Benito County near River Oaks. The road is four lanes west of Watsonville and two lanes east of the city limits. Highway 129 is a rural highway with a speed limit of 45 - 55 mph. It serves as a critical route for local agricultural traffic and connects to Highway 1 in Watsonville. Highway 129 is defined as a Rural Main Street near Watsonville, then becomes Transitional, and is mostly Undeveloped Mountainous near the County boundary. There are no pedestrian or bicycle facilities on this highway within the study area except at the intersection with Lakeview Road, where a roundabout constructed in 2021 includes uncontrolled marked pedestrian crossings, truncated dome mats, pedestrian refuge islands, and pedestrian yield signs with directional arrows. Highway 129 within the study area is designated as an STAA Terminal access route. Transit service on Highway 129 includes Monterey-Salinas Transit Route 27 from Watsonville to Marina which runs limited commuter service in the morning, midday, and evening on weekdays and weekends from Highway 1 to Rodriguez Street on Highway 129

Highway 152 is an east-west highway that runs from Watsonville to the County line within Santa Cruz County. It connects coastal areas to communities in the Santa Clara Valley on the other side of Hecker Pass in Santa Clara County. Highway 152 is a two-lane rural highway with a typical speed limit of 55 mph. It serves as a Rural Main Street near the border of Watsonville, featuring limited and non-continuous pedestrian facilities and no bicycle facilities. It becomes Transitional through Interlaken then Undeveloped Mountainous further east. Transit service on Highway 152 includes Santa Cruz Metro Route 79 runs for a quarter mile from East Lake to Crestview, which runs every 30 minutes on weekdays and every hour on weekends. There are no bus stops on this highway within the study area. Only the portion of Highway 152 that serves as a Rural Main Street is a designated freight route. It is categorized as a 65' CA Legal freight route with a KPRA Advisory of 30' but features a special restriction disallowing trucks over 45' in length from traveling the route between Carlton Road near Watsonville and Watsonville Road near Gilroy.

Highway 236 is generally a north-south highway that serves as a loop route connecting to Highway 9 near Waterman Gap in the north and Boulder Creek in the south. This two-lane rural highway has varying speed limits due to sharp curves and challenging terrain. Though the highway remains bidirectional, in some places it is less than two lanes wide requiring vehicles to yield. It primarily serves local traffic and provides connections to rural areas, forested lands, and recreational sites within the County. Highway 236 is defined as Undeveloped Mountainous place type in the northernmost portion and then becomes Transitional before intersecting with Highway 9 at Boulder Creek. Highway 236 currently features no pedestrian or bicycle facilities and no public transit service. However, the future Boulder Creek Complete Streets project proposes roadway improvements to increase access to school, commercial, and medical facilities along the southern portion of Highway 236. Highway 236 within the study area is designated as a 65' CA Legal freight route with a KPRA advisory of 30' due to the curvy, mountainous roadway alignment.

4. Safety Landscape

RTC and Caltrans are dedicated to eliminating traffic fatalities and serious injuries on conventional state highways in Santa Cruz County by 2050. This commitment will be achieved through the implementation of holistic Safe System Approach strategies, which prioritize safety by addressing multiple aspects of the transportation system. The RHSP advances this vision by proactively identifying and addressing the risk factors that may lead to serious and fatal injuries when crashes occur.

4.1 Potential Risk Factors

A core principle of the Safe System Approach is that humans are vulnerable. When subject to kinetic energy forces, human bodies become injured, at times with fatal consequences. A Safe System proactively identifies the sources of kinetic energy risk and then applies redundant and systemic interventions to mitigate it.

Kinetic energy risk assessment looks at three core components: crash exposure, crash likelihood, and crash severity. Crash exposure addresses where people are traveling or intend to travel. This includes contextual information like presence of pedestrian or bicycle generating uses and roads with high vehicle, pedestrian, and bicycle volumes. Crash likelihood focuses on the potential for "conflicts" between travelers and system elements, such as road design or intersection configuration including lack of pedestrian and bicycle facilities, increased vehicle lanes, lack of intersection controls, fixed objects, or undivided two-lane roadways. Crash severity considers the injury potential if a conflict becomes a crash, factoring in elements like mass, speed, and angle.

As shown in **Table 1** and **Figure 4,** key potential risk factors on the study highways may include:

Table 1: Potential Risk Factors on Study Highways

Crash Exposure	Crash Likelihood	Crash Severity
• Limited alternative transportation options • Presence of high pedestrian and bicyclist generators such as Rural Main Streets, schools, and parks • High vehicle, pedestrian, and bicycle volumes • Limited affordable housing near employment locations	• Mountainous roads with low visibility • Lack of pedestrian and bicycle facilities • Within 150 feet of intersections • 2+ vehicle lanes • Lanes with narrow shoulders • Lack of physical separation between travel directions • Two-way turn lane	• High truck volumes or agricultural vehicles • High vehicle speeds • Horizontal and vertical curves • Vulnerable road users

Source: Fehr & Peers, 2024.

By focusing on locations where these potential risk factors are prevalent, the RHSP moves beyond a reactive reliance on crash data to a proactive risk assessment approach aligned with Safe System principles.

The relevant locations where each potential risk factor present are mapped in **Figure 4.** The potential risk factors are given equal weighting and represented with transparent yellow lines. The result is a map that shows the density of potential risk factors across the study highways. Areas with a higher density of potential risk factors are shown in darker yellow lines. The presence of more potential risk factors represents an area that may have greater overall risk for undesired outcomes in collisions, particularly for exposed users of the transportation system. The RHSP, therefore, is specifically focused on locations where the greatest number of potential risk factors are present. This includes the following areas:

- Highway 1 from Davenport (Marine View Avenue) to Santa Cruz City boundary
- Highway 9 from Felton (Glengarry Road) to Boulder Creek (Bear Creek Road)
- Highway 129 adjacent to the Watsonville City boundary near Highway 1/Lee Road east to the County line near Old Chittenden Road
- Highway 152 near Interlaken between Carlton/Casserly Road to Watsonville City boundary near Bridge Street

These areas tend to have potential risk factors within all three categories of risk. Some areas with many potential risk factors are characterized by inadequate geometry for the Rural Main Street designation, as on Highway 1 and Highway 9. These areas are typified by high volumes across all modes, frequent intersections with minimal intersection controls, and high vehicle speeds.

Additionally, there are also Mountainous Rural Areas with many potential risk factors. These areas tend to have pedestrian, bicycle, and vehicle traffic for recreational trips and can lack adequate sight distance, lighting, and/or shoulders. These locations are also identified as having significant gaps between operational speeds and target speeds.

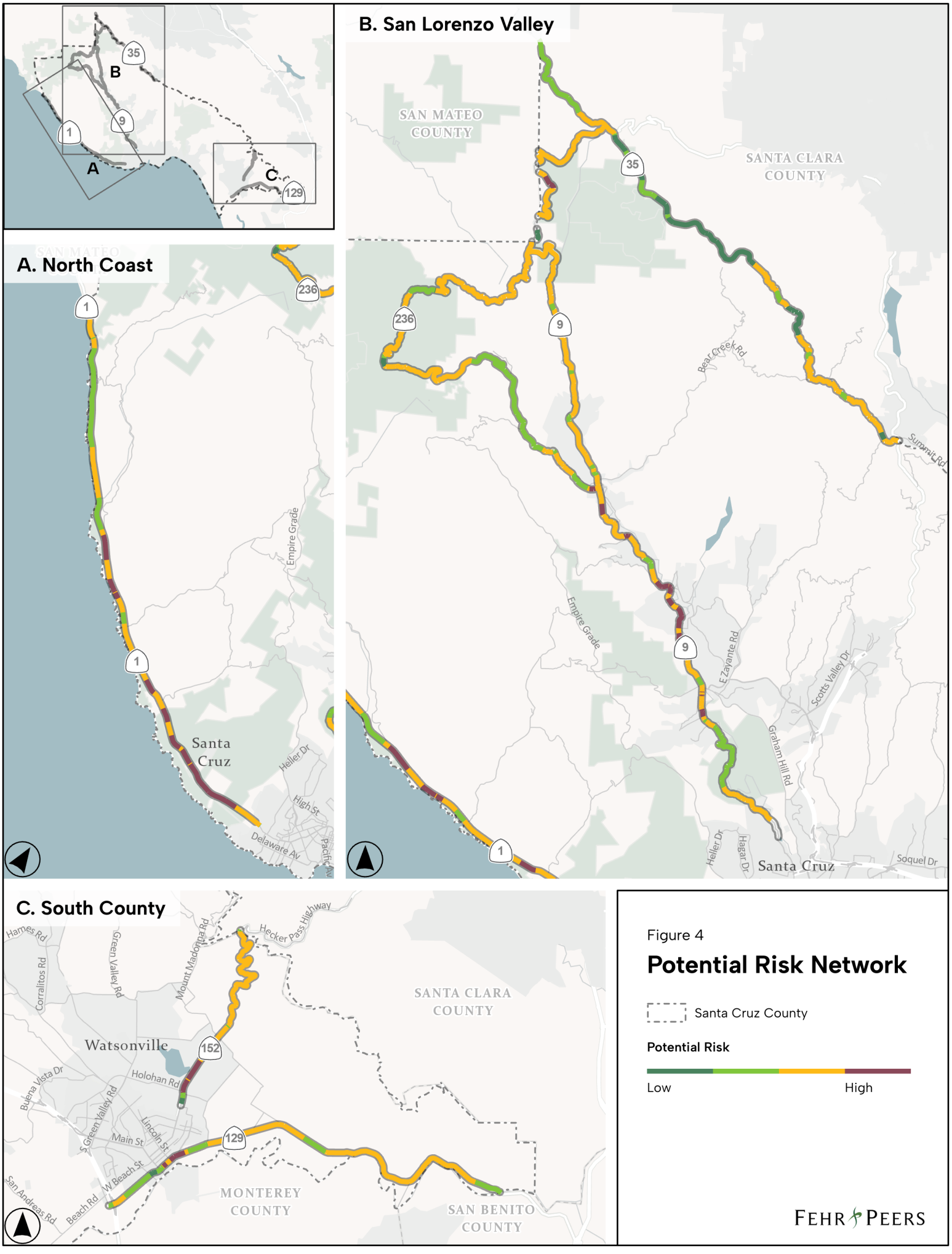

Figure 4

Potential Risk Network

Santa Cruz County

Potential Risk

Low — High

FEHR PEERS

4.2 Crash History

In addition to the proactive risk factors assessment, the project team reviewed a comprehensive crash history of the six study highways to identify notable trends and patterns in KSI crashes. The analysis was based on crash data for the past ten years (2014 to 2023) from Traffic Incident Mapping System (TIMS). TIMS provides geocoded access to crash data in California, drawing from the Statewide Integrated Traffic Records System (SWITRS), which includes records of injury and fatal crashes. SWITRS data is compiled and managed by the California Highway Patrol (CHP) and contains information about crashes reported to the CHP by both local and state authorities. The California Local Roadway Safety Manual advises using TIMS data for traffic crash analysis, and the Safe System Approach emphasizes a focus on preventing and analyzing crashes resulting in fatalities or serious injuries (often referred to as KSI crashes). It is important to recognize that crash databases may contain reporting biases or incomplete data, such as:

- Crashes involving pedestrians, cyclists, or motorcyclists may be underreported compared to those involving vehicle occupants.
- Crashes on rural highways or in mountainous areas may be underreported.
- Property damage-only incidents are less likely to be reported than more severe crashes.
- Younger individuals may be less inclined to report crashes.
- Crashes involving alcohol may also be underreported.
- Factors such as race, income, immigration status, and English proficiency could influence reporting, though research on these biases remains limited.
- Roadway context or upstream Safe System risk factors are not addressed, with PCFs limited to a behavioral "cause" as a result.

4.2.1 Total Crashes

From 2014 to 2023, there were 1,301 reported crashes on the six study highways; 276 of those were KSIs, as illustrated in **Figure 5**. Over the past decade, the number of crashes remained relatively steady, with the exception of 2020, when only 105 crashes were recorded—the lowest in the observed period. This 15% decrease from 2019 levels may be attributable to reduced road usage, especially by tourists, during the COVID-19 pandemic.

Over the ten-year period, approximately one in five crashes on the study highways resulted in a KSI. The highest ratio of KSI crashes was in 2022, totaling 25% of crashes (one in four) as KSIs.

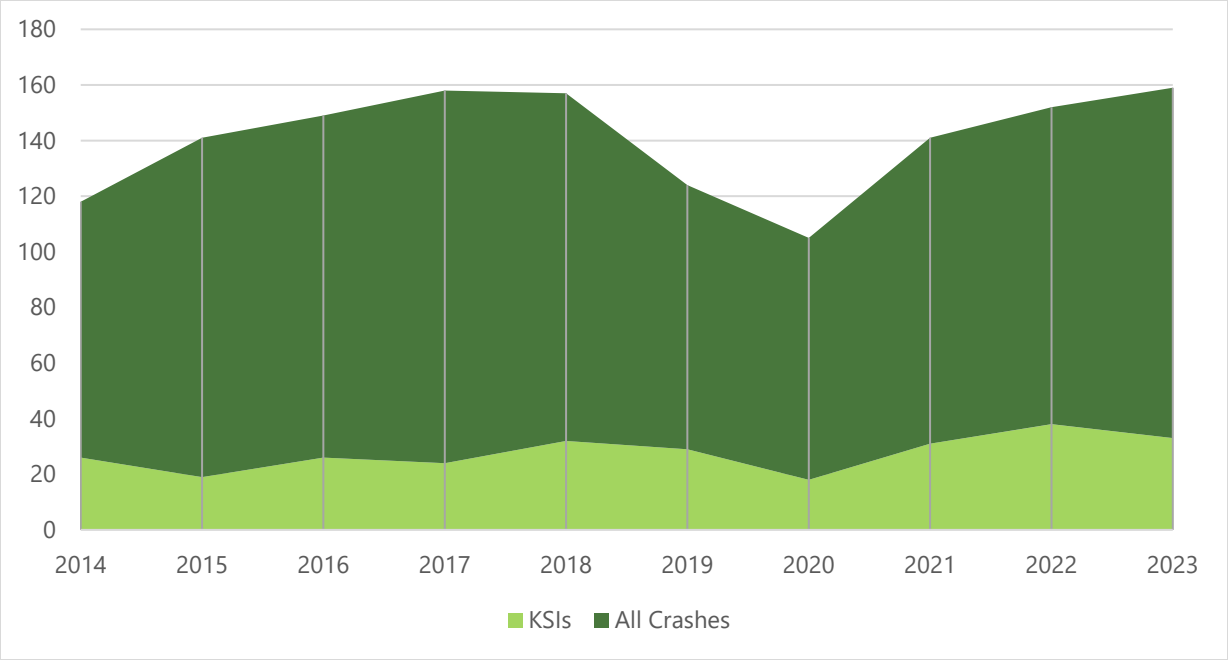

Figure 5: Study Highway Crashes from 2014 – 2023

4.2.2 Crashes by Mode

Of the 1,404 reported crashes that occurred on the study highways between 2014 and 2023, 10% (77) crashes involved a pedestrian or cyclist, as shown in **Figure 6**. While pedestrians and cyclists made up 10% of all crashes, they were overrepresented in KSI crashes, comprising over double the share of KSI crashes (22% or 143 crashes). This highlights the vulnerability of pedestrians and bicyclists among road users and is disproportionate to their very low mode share in the study corridors.

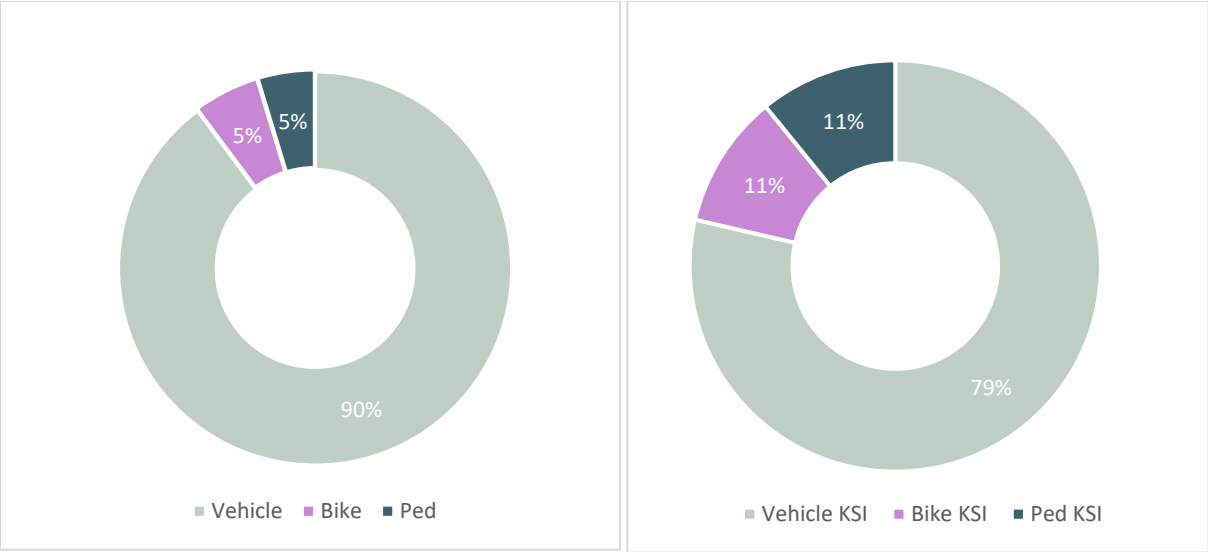

Figure 6: Modal Breakdown of Crashes

4.2.3 Crash Type

Crash types describe how a crash is reported by law enforcement based upon the parties who were involved and generally describe the way contact was made between the involved parties, as shown in **Figure 7**. The most common crash types across all crashes and among KSI crashes included hitting fixed objects and broadsides. This may be attributed to the horizontal and vertical curves on the study highways. While rear end crashes made up a high proportion of crashes, they tend to not result in KSI outcomes on the study highways. **Figure 7** shows that crash types that result in higher kinetic energy transfer, such as hit object, broadside, and head-on are associated with a greater proportion of KSI crashes.

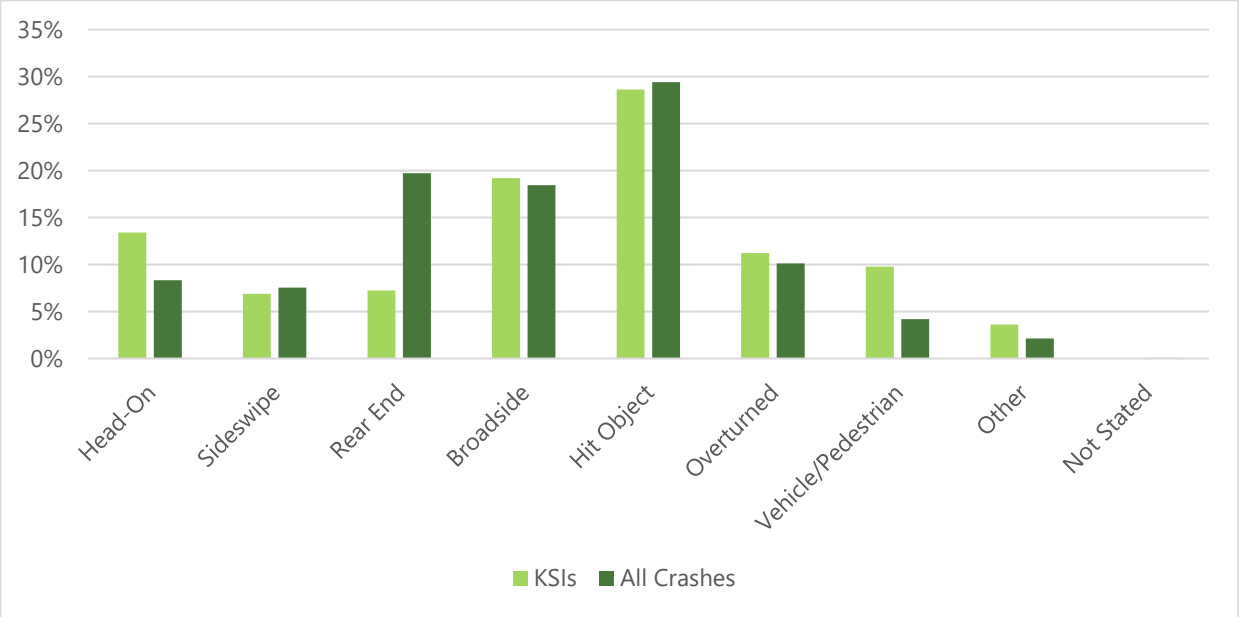

Figure 7: Crashes by Crash Type

4.2.4 Primary Collision Factors

Primary Collision Factors (PCFs) are identified by the responding officer based on their assessment of what contributed to the crash at the time of the crash. PCFs typically exclude contextual details about the location's design, which may have played a primary or secondary role in the incident. On the study highways, the most frequently reported PCFs for all crashes and KSI crashes, as illustrated in **Figure 8**, were unsafe speed, improper turning[1], and driving or bicycling under the influence of alcohol or drugs.

[1] **Improper turning** identifies a crash where a contributing cause is vehicle turns at intersections, turns onto/off of a road, and/or improper signaling during lane changes. It also covers drivers making an illegal U-turn, turning from a lane that does not allow turns, or making a turn that is signed as prohibited.

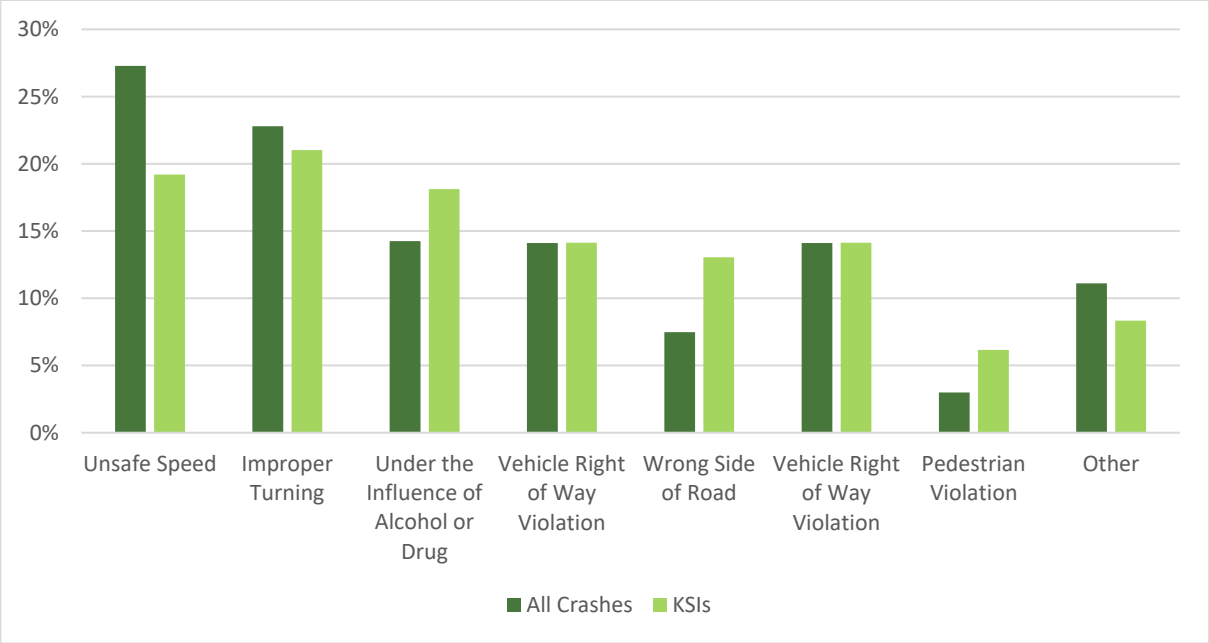

Figure 8: Crashes by Primary Crash Factor (PCF)

4.2.5 Demographic Information

The project team compared the share of crashes by reported race on the study highways to County-wide census data to identify if the share of crashes by race on the study highways is reflective of the population. As illustrated in **Figure 9**, the race of crash victims on the study highways was comparable to the race of the general population in the County.

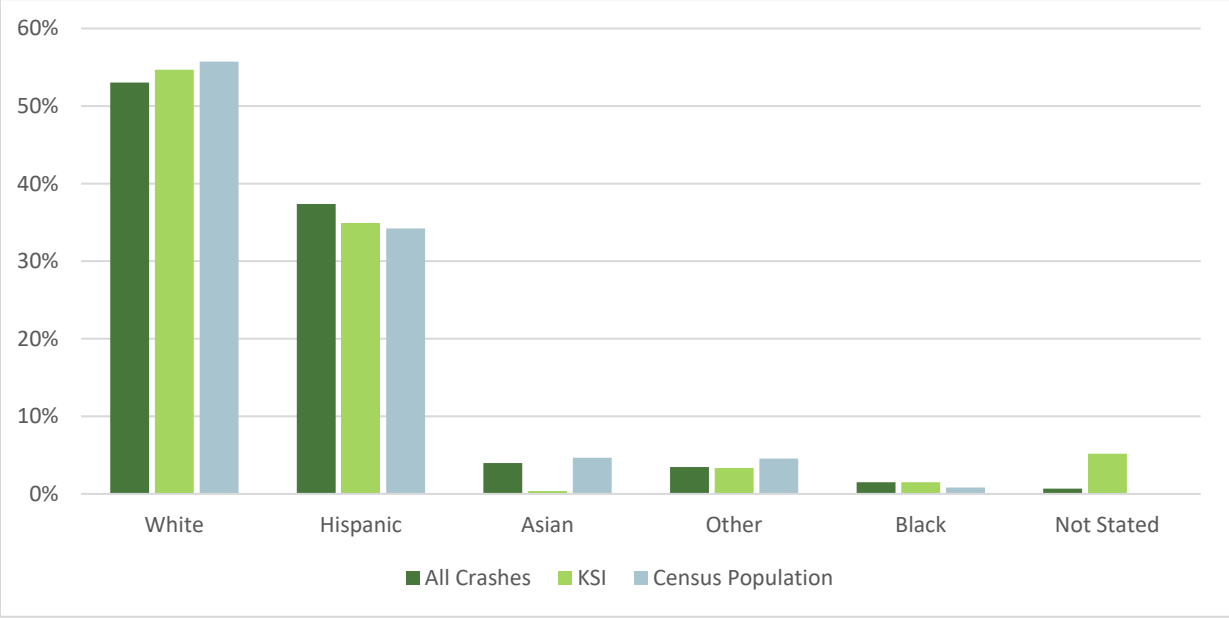

Figure 9: Crash Victims by Race

Figure 10 illustrates the distribution of crashes and KSI incidents by reported age group relative to the County census population. This analysis focuses on vulnerable populations including youth (under 15 years old) and seniors (ages 65 and older). There were fewer crashes involving people under 15 years old compared to the total population. In general, crash victims who are not included as youth or seniors were slightly overrepresented in both total crashes and KSIs relative to the census population as this group tends to represent a larger share of drivers. For individuals aged 65 and older, the share of KSI crashes is slightly higher than the share of total crashes, suggesting that seniors may be more vulnerable to undesired outcomes when involved in crashes.

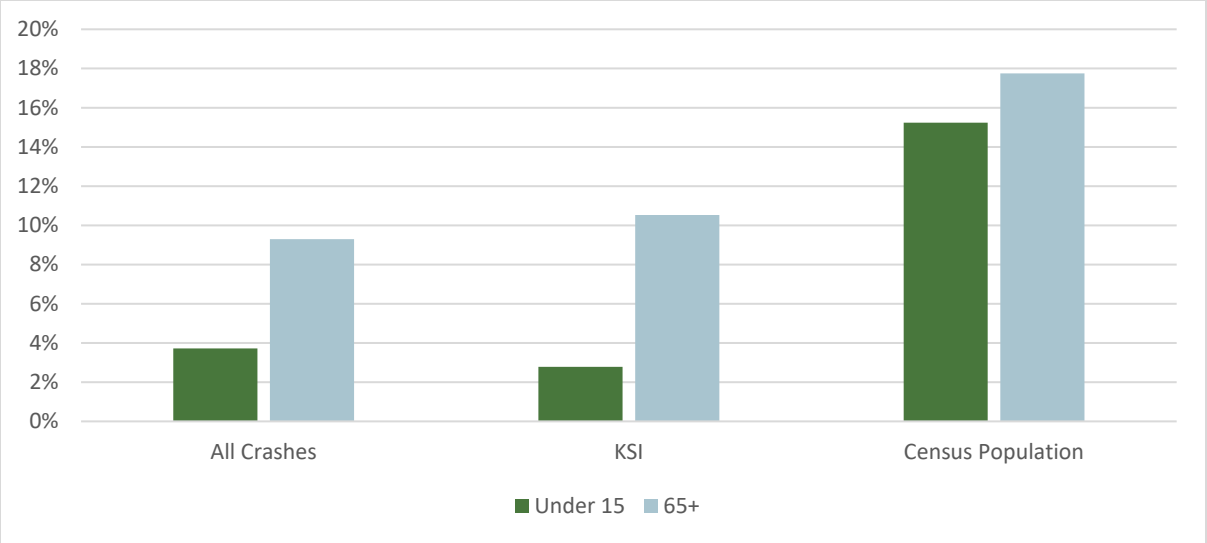

Figure 10: Crash Victims by Age

4.2.6 Study Highways

As shown in **Figure 11** and mapped in **Figure 12**, the total number of crashes by study highway varies. Highway 9 had the highest total crashes (579) across the ten years, representing 41% of all crashes on the study highways. About a quarter (24%, 331 crashes) occurred on Highway 129. Highway 1 and Highway 152 represent 15% (209 crashes) and 14% (39 crashes) of all study highways crashes, respectively. There were fewer than 100 crashes total on Highway 35 and Highway 236 (1% or 20 crashes and 5% or 75 crashes, respectively). Generally, KSIs made up about 20% of all crashes on each highway. Highway 35 had a higher ratio of 30% KSIs to total crashes and Highway 129 had the lowest ratio of 16% KSIs to total crashes.

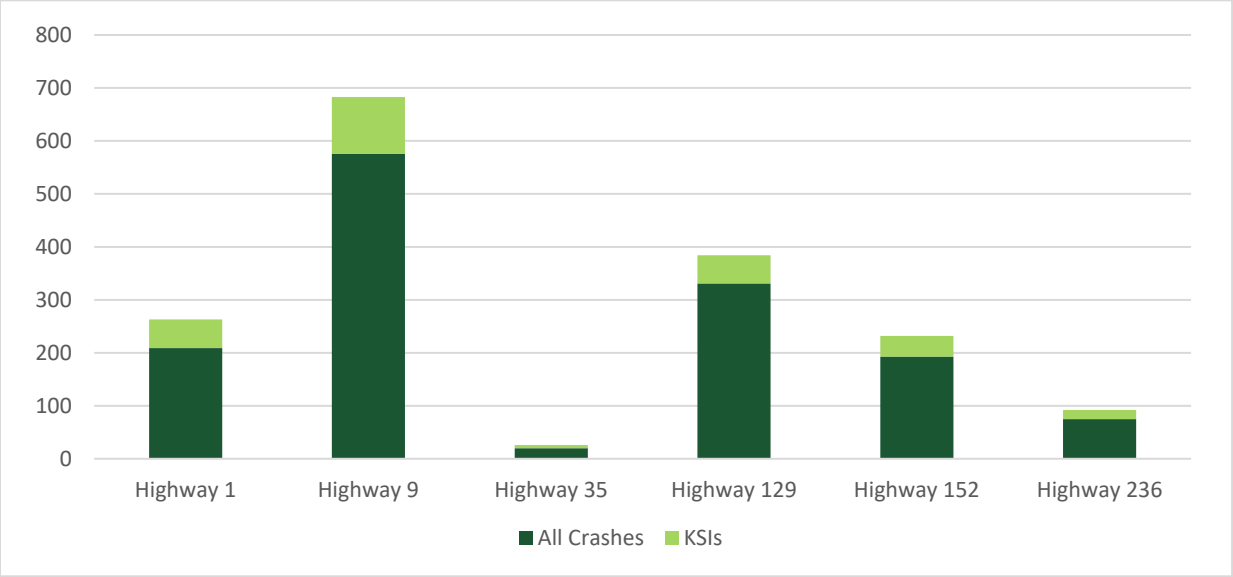

Figure 11: Crashes by Study Highway

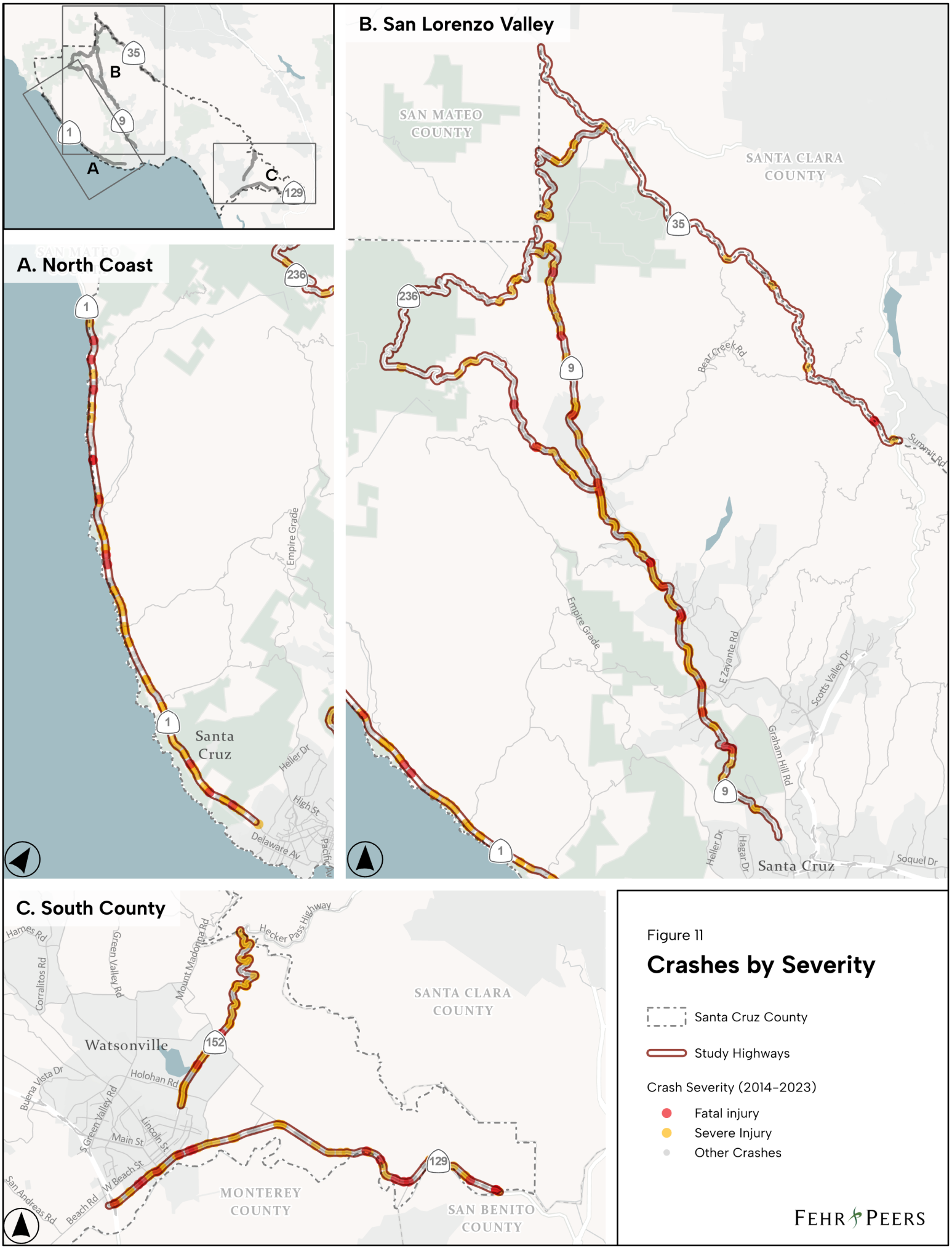

Figure 11

Crashes by Severity

Santa Cruz County

Study Highways

Crash Severity (2014-2023)

- Fatal injury
- Severe Injury
- Other Crashes

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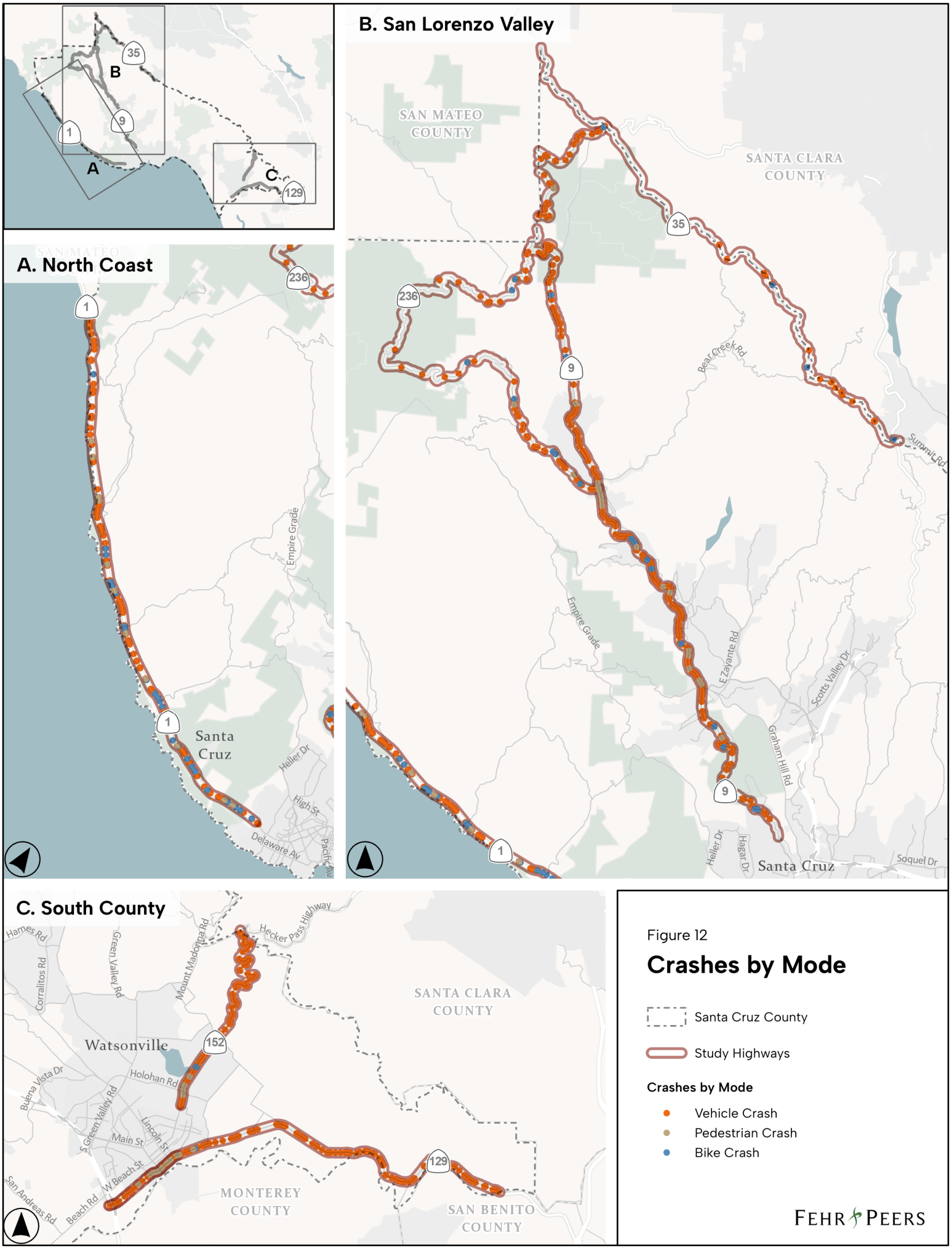

Figure 12

Crashes by Mode

Santa Cruz County

Study Highways

Crashes by Mode

- Vehicle Crash
- Pedestrian Crash
- Bike Crash

FEHR PEERS

As illustrated in **Figure 14** and **Figure 15** and mapped in **Figure 13**, bicycle and pedestrian crashes make-up a small number of total crashes on each study highway (about 12% on average) but the share of bicycle and pedestrian related KSIs on each study highway is almost double (about 28% on average). While making up 21% of all crashes, bicyclists and pedestrians were involved in one third (33%) of all KSIs on Highway 1. Most notably, on Highway 9, bicyclists and pedestrians were involved in 15% of all crashes but 50% of all KSI outcomes.

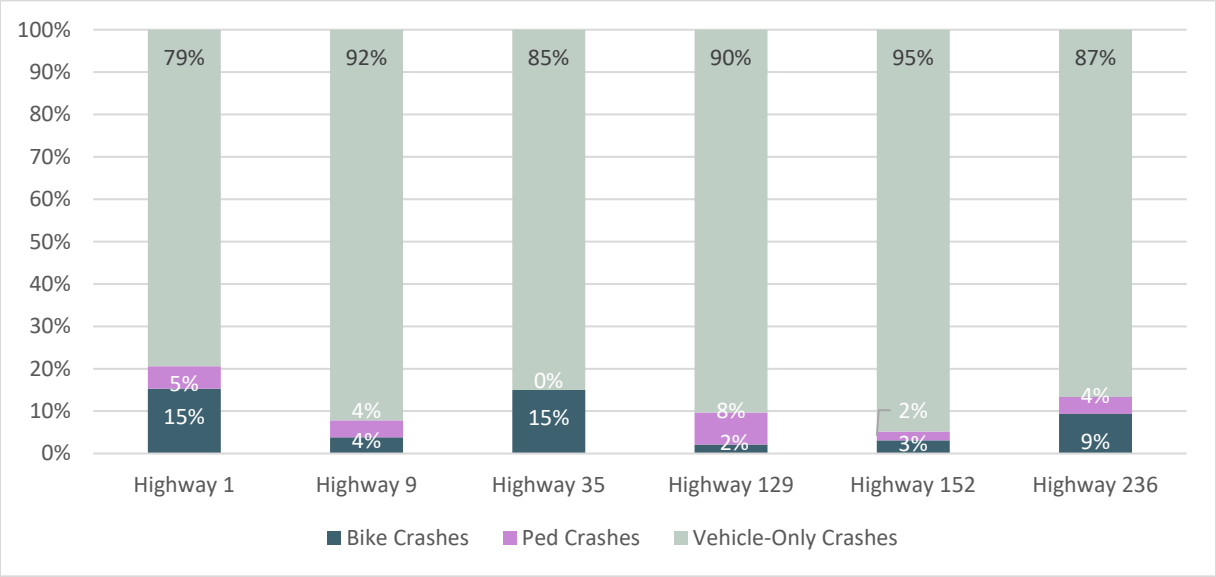

Figure 14: Modal Breakdown of Crashes by Highway

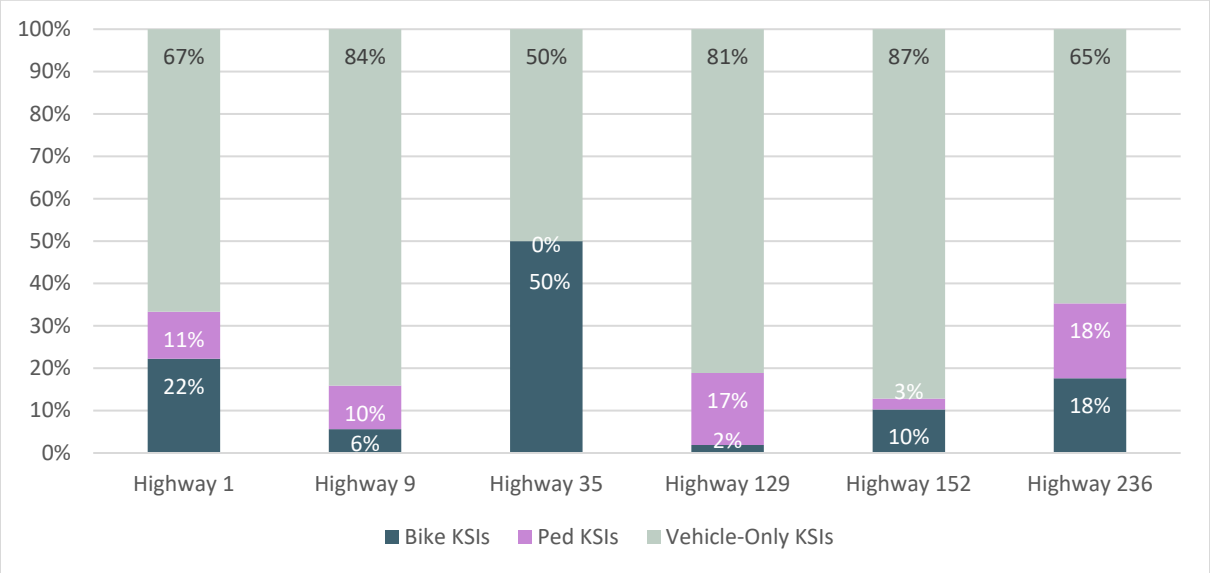

Figure 15: Modal Breakdown of KSI Crashes by Highway

5. Public Input

RTC and the project team conducted a series of community engagement activities in Fall 2024 as part of the project's existing conditions phase. These efforts were designed to gather input from a broad range of stakeholders and community members for the purposes of safety planning. Participants were asked to provide feedback pertaining to existing conditions, including their own experiences relevant to safety, transportation facilities, and collisions or near-miss incidents on the study corridors. Engagement activities included online tools, committee and stakeholder meetings, and a virtual workshop, which were supported by targeted promotion efforts.

5.1 Engagement Activities

This section summarizes the key Milestone 1 engagement activities conducted in Fall 2024.

Project Website: RTC launched a dedicated project webpage to serve as the central hub for project information, updates, and opportunities to provide input.

Online Survey: An online survey and interactive web map tool allowed community members to share feedback on safety concerns and near-miss incidents to help the project team better understand existing conditions and concerns.

Committee Meetings: RTC presented project updates and gathered input at these advisory committee meetings:

- October 8: Elderly & Disabled Transportation Advisory Committee (1:30–3:30 PM)
- October 14: Bicycle Transportation Advisory Committee (6:00–8:00 PM)
- October 17: Interagency Technical Advisory Committee (1:30–3:30 PM)
- December 3: Santa Cruz County Community Traffic Safety Coalition

Stakeholder Meetings: The project team held two stakeholder meetings conducted in a hybrid format, offering both in-person and virtual participation to ensure accessibility and expand participation. RTC leveraged existing contacts, from previous projects, to develop the stakeholder list, with a focus on engaging agency stakeholders, community organizations, and groups serving older adults and people with disabilities.

- October 21: South County Stakeholder Meeting (10:30 AM–12:00 PM) – Watsonville Civic Center. Sixteen stakeholders participated in this meeting.
- October 22: North County Stakeholder Meeting (10:00–11:30 AM) – RTC Office. Fifteen stakeholders participated in this meeting.

Community Workshop: The project team held a virtual community workshop on Wednesday, October 23, from 6:00–7:30 PM to engage the broader public. The workshop provided an overview of the project, opportunities for input, and small-group discussions with participants. Small group discussions were organized around key areas: North Coast (Highway 1), San Lorenzo Valley (Highways 9, 35, and 236), and South County (Highways 129 and 152).

Advertising and Promotion Strategies: RTC employed a variety of strategies to promote the virtual Community Workshop, online survey, and other engagement opportunities. This approach helped the project team reach a larger audience and collect input from diverse stakeholders and community members early in the planning process.

- Press Release: A press release was issued to local media outlets.
- Email Blasts: Project updates and workshop invitations were sent to RTC maintained email lists.
- Social Media: Information was shared via RTC's social media platforms (e.g., Facebook, X) to reach a wider audience.
- Partner Organizations: RTC collaborated with partner agencies and organizations, encouraging them to share workshop information with their respective communities.
- Flyers: RTC distributed and posted physical flyers throughout the adjacent communities
- All engagement activities were provided with bi-lingual options in Spanish.

5.2 Engagement Insights

This section summarizes the community and stakeholder feedback gathered from Milestone 1 engagement activities, organized by study highway. **Figure 16** shows the results of the community web survey including locations of comments and key themes. Statements reflect the opinions and preferences of the participants and have been edited only for flow and readability in this document.

5.2.1 Highway 1

Visitors and Recreation: Maintaining access to recreation is an important goal for the community and Highway 1 is an important recreational asset for cyclists, motorcyclists, and drivers. Understanding visitor patterns will be important to address safety needs, as many users come from outside the community.

Key Destinations and Crossings: High pedestrian activity occurs at Año Nuevo State Park, Moore Creek, Waddell Beach, 3-Mile and 4-Mile Beach, and Big Basin State Park. This activity level may pose safety risks, which are made worse by people parking along both sides of the road. High speeds combined with abrupt slowdowns near parks and beach destinations can lead to a greater risk of unpredictable driver behavior and near-misses. Another key destination mentioned was the City of Santa Cruz Resource Recovery Facility ("the dump") located on Dimeo Lane.

Parking Challenges: Existing parking lots cannot handle days with high visitor demand, which leads to spillover roadside parking and people crossing the street in unmarked areas, especially where shoulders are narrow (e.g., near 3-Mile Beach). Drivers trying to park frequently stop in travel lanes and may re-enter

traffic slowly due to unpaved or unmaintained parking areas, creating a greater chance of conflicts, particularly near beaches and trailheads. The absence of left-turn lanes into parking lots and attractions causes traffic backups and the potential for collisions involving slowing or turning vehicles.

Emergency Response: Clearer roadway naming and improved signage (e.g., for post miles) were suggested for enhanced crash response and water rescue along the North Coast. Additionally, poor cell phone coverage between Red, White, and Blue Beach and 4-Mile Beach can make emergency communication and response more difficult. Davenport residents frequently mentioned hearing sirens responding to crashes.

Davenport: The main pedestrian crossing in Davenport was noted a potential candidate for pedestrian safety improvements, such as a pedestrian hybrid beacon (PHB) or a properly marked crosswalk. Respondents mentioned the area near Cement Plant Road experiences high speeds, poor sight lines, shadows, and difficult left turns, particularly near the four-way intersection at Davenport Landing, where there is also high parking demand.

Cyclist Safety: People have witnessed or heard about crashes involving cyclists, especially near Pigeon Point Lighthouse and rolling stops at Bonny Doon Road. Better separation and parking design was discussed by participants as a potential option to reduce conflicts between bicycles and vehicles.

Potential Improvements: Enhanced infrastructure, such as improved shoulders and enhanced crossings (e.g., rectangular rapid flashing beacons (RRFBs) or PHBs), may help alert drivers to areas with high pedestrian activity. Areas around Año Nuevo, Moore Creek, and Dimeo Lane were cited as areas which could potentially benefit from traffic calming to reduce speeds and improve safety for all road users.

5.2.2 Highway 9

Rural Main Street Concept: People confirmed that Highway 9 should function as a "Rural Main Street" through all San Lorenzo Valley towns to better prioritize access and safety for people walking and biking. The "highway feel" around schools, combined with speeding and a lack of sidewalks or other pedestrian facilities, makes children and other pedestrians feel more exposed to traffic.

Informal Parking: People highlighted safety concerns related to informal parking along Highway 9, similar to Highway 1, with pedestrians crossing back and forth between parked cars. Haphazard parking near Boulder Creek and destinations like the Garden of Eden, can create conflicts between people walking, biking, and driving – including drivers backing up from parking areas into traffic. The idea of a reservation system for parking in high-demand areas, potentially in partnership with state parks, was discussed to enhance safety and manage congestion.

Bus Stops and ADA Access: Many bus stops lack paved pullouts and full ADA access accommodations, creating uncomfortable conditions for riders. Transit stops also generally lack sufficient lighting; respondents suggested improvements could include LED bus stop and crosswalk lighting.

Cyclist Safety: Participants mentioned concerns near mountain bike trails (both legal and illegal), with narrow, winding roads and vehicles often driving on the wrong side of the road to avoid cyclists. Future projects at former "washout" areas were suggested to incorporate bicycle and pedestrian infrastructure to enhance multimodal safety and access.

Crosswalk Improvements: Some respondents called for crosswalk enhancements in Felton, with a specific request for more RRFBs, particularly near Rite Aid at Hihn Street. People suggested installing a stop sign instead of an RRFB at Forest Street in Boulder Creek as well.

Lighting: Poor lighting was also cited as an issue, especially in Boulder Creek, during early mornings and late night.

5.2.3 Highway 35

Recreational Driving and Speeding: People have observed speeding and reckless driving behavior by car clubs, motorcyclists, and recreational drivers, particularly north and west of Gist Road on Highway 35.

Parking Concerns: People walking from parked cars to state parks along the highway with no sidewalks can result in undesired exposure. The new parking lot at Castle Rock has helped alleviate some parking and pedestrian safety issues.

5.2.4 Highway 129

General Safety Concerns: People shared concerns across all modes on this high-speed roadway. Certain locations along Highway 129, particularly at crossings, were described as undesirable for those walking and biking due to high speeds and limited visibility. People are also concerned about drivers making unauthorized turning maneuvers at large intersections with limited road markings.

Cyclist Concerns: Cycling conditions are challenged by high speeds, truck traffic, and debris on shoulders, limiting usage to experienced cyclists. Farmworkers often commute by bicycle and people expressed a desire for further safety improvements to support this vulnerable user group. One community member spoke about former club bike rides on Highway 129 to Rogge Road that have been discontinued due to past crashes and general safety concerns among club members. The community also expressed a desire for enhanced bike facilities along sections of Highway 129, particularly around the Murphy Crossing Road and San Miguel Canyon Road intersections. Traffic calming measures could also help to moderate speeds and enhance conditions for farmworkers commuting by bike, particularly during dawn and dusk.

Roundabouts: The roundabout on Highway 129 at Lakeview Road has improved the perception of safety and reduced speeds, though some drivers are still adjusting to it. People were interested in whether additional roundabouts may be appropriate on the corridor.

Commercial Truck Collisions: There are concerns about the frequency of commercial truck-involved collisions along Highway 129 and neighboring corridors.

Maintenance and Debris: Road debris, partly due to nearby agricultural uses, were noted as a concern for both cyclists and vehicles.

Specific Locations: People highlighted concerns at the Rogge Lane intersection due to perceived speeding and impatient drivers trying to turn off of Rogge Lane. Murphy Crossing Road, Rogge Lane, and Riverside locations could benefit from additional traffic calming or roundabouts to reduce travel speeds. Concerns related to poor visibility and tree obstructions were mentioned for the Lee Road and Rogge Lane intersections. People mentioned that conditions and sightlines at Carlton Road improved after intersection modifications, but further improvements could still be feasible.

5.2.5 Highway 152

Cyclist Safety: Highway 152 is generally challenging for bicycling due to the lack of shoulders and blind corners. Some cyclists mentioned avoiding this corridor entirely. Sections with wider shoulders, like on the north side of SR 152, are often used for parking, forcing cyclists into the roadway. Vehicles also park partially on the sidewalk between Bridge Street and Beverly Drive.

Concerns Related to the Fairgrounds: People often mentioned concerns about congestion near the fairgrounds, especially during school hours, flea markets, and events. This can cause drivers to make unpredictable maneuvers (e.g., U-turns, driving on shoulder or wrong side of road), creating potentially hazardous travel conditions. A lack of sufficient parking can cause attendees to park in surrounding areas and walk along or within the roadway, further exacerbating safety concerns for pedestrians and drivers. Travel demand management measures, additional crosswalks, and event traffic management strategies were requested, especially if adjusting the highway cross-section is not feasible. A proposed separated path to the fairgrounds from St. Francis High School and Lakeview Middle School, as well as adjacent park improvements were mentioned as a desired enhancement[2].

Congestion Impacts on Transit: Participants noted that SC Metro and other bus operations are often delayed in this area due to traffic congestion.

Flooding and Evacuation Challenges: loading along Highway 152 was noted as a concern given the need for it to be an effective evacuation route. Participants also mentioned concerns for emergency access and response.

Signage for Trucks: People mentioned that additional or enhanced signage would be beneficial to reinforce the prohibition of trucks over 45 feet on Hecker Pass. Current signs were noted to be lacking in visibility to moving traffic.

Specific locations: Recent improvements at the Holohan Road/College Road intersection with Highway 152 were noted, and people also acknowledged that more work is needed to better connect schools, the

[2] This concern may be addressed as a part of the Caltrans Highway 152/Holohan Road Intersection Improvements project which proposes to construct safety improvements for pedestrian and bike access to and from both schools.

fairgrounds, and surrounding areas. People mentioned traffic backups at the Casserly Road/Carlton Road intersection, particularly during peak hours and weekends, causing congestion and delays.

5.2.6 Highway 236

Park Access: While Highway 236 came up less frequently in discussion, at least one person mentioned that campground locations experience increased pedestrian activity, creating potential conflicts with passing vehicles.

5.2.7 General Comments

Other Ongoing Planning Efforts: Both the City of Santa Cruz and the County of Santa Cruz are working on related efforts: a Vision Zero plan in the City and a Local Roadway Safety Plan (LRSP) for unincorporated roads in the County. These plans, and the RHSP, should inform one another to maximize safety improvements and internal consistency. Some had questions about the status of and where to provide input on the Santa Cruz County LRSP.

Distracted Driving: One person mentioned how increased recreational use of Highways 1 and 9 has led to distracted driving and reckless maneuvers. Rumble strips may be considered in these areas.

Narrow Roadways: Participants noted that many areas have no shoulders, forcing cars to cross the double yellow line and drive on the wrong side of the road to pass cyclists.

ADA Access: Wheelchair users reported difficulties accessing crosswalk buttons, often needing to stand up to activate them. ADA accessibility needs to be improved across the corridor, especially where local roadways intersect with state highways.

Cell Service and Call Boxes: Participants requested enhanced communications infrastructure, including better cell service, to support emergency response to incidents on Highways 1, 9, and 129. Call boxes remain necessary due to poor cell coverage on these routes.

Potential Improvements: Some suggested that dedicated bike lanes should be implemented along all highways to improve safety and access. Others were interested in prioritizing concrete and hardscape solutions over signage and striping enhancements for long-term safety improvements. Some pointed to updates to driver education programs that may be needed to improve understanding of proper passing laws, sight lines, and the three-foot rule for cyclists.

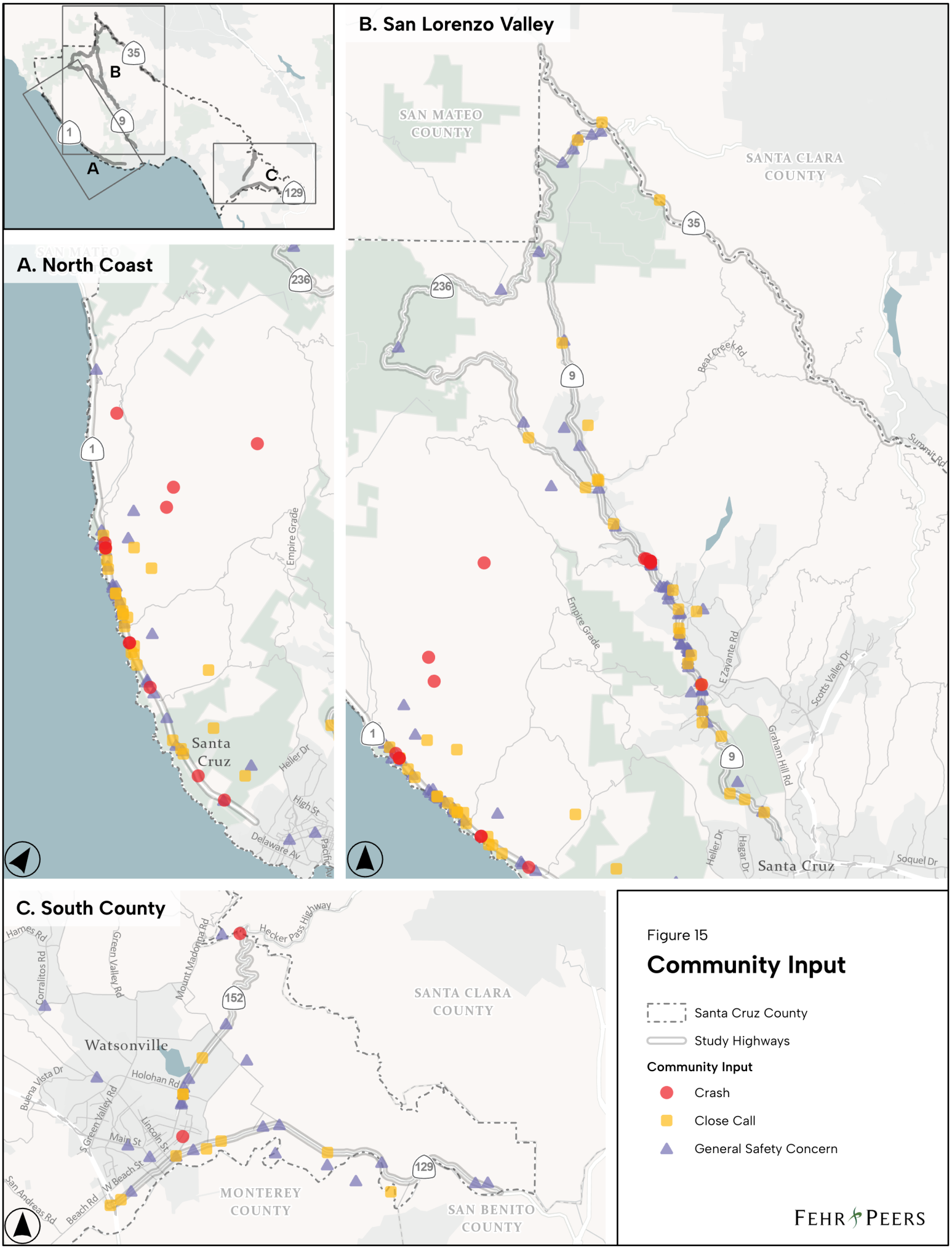

Figure 15

Community Input

- Santa Cruz County
- Study Highways

Community Input

- Crash
- Close Call
- General Safety Concern

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6. Next Steps

This existing conditions report is a critical first step in developing the RHSP and serves as the basis for future analysis and recommendations. By understanding both reactive safety challenges—such as crash history—and proactive safety concerns, like potential risk factors and place types, the project team can develop a nuanced understanding of the roadway's safety landscape.

The project team will build on the existing conditions analysis by defining collision profiles that focus on the primary factors associated with vehicle, bicycle, and pedestrian collisions and that best reflect the fundamental safety challenges along the study highways. These profiles will be used to determine what types of projects and countermeasures would likely be most effective at a given location and identify locations that may not have historically experienced a high rate of fatal and severe injury collisions but may do so in the future due to their contextual characteristics. The goal is to ensure that interventions are both effective and feasible and seek to address the root causes of safety challenges to ultimately support RTC's vision zero goal.

Attachment C-1:
Place Type Locations by Post Mile

FID	Highway	PM From	PM To	Lat1	Long1	Lat2	Long2	Type
1	1	20.4	20.99	36.962131	-122.073339	36.962131	-122.073339	Transitional Area (Santa Cruz)
2	1	20.99	28.47	36.962131	-122.073339	37.0095	-122.19146	Undeveloped non-mountainous
3	1	28.47	28.52	37.0095	-122.19146	37.009861	-122.192246	Transitional Area (Davenport)
4	1	28.52	29.142	37.009861	-122.192246	37.01483	-122.201322	Main Street (Davenport)
5	1	29.142	30.11	37.01483	-122.201322	37.025029	-122.212169	Transitional Area (Davenport)
6	1	30.11	37.45	37.025029	-122.212169	37.107674	-122.292649	Undeveloped non-mountainous
7	9	1.192	5.609	36.998158	-122.037104	37.041015	-122.072142	Undeveloped Mountainous
8	9	5.609	7.28	37.041015	-122.072142	37.06291	-122.080049	Main Street (Felton/Schools)
9	9	7.28	7.97	37.06291	-122.080049	37.071195	-122.084162	Transitional
10	9	7.97	8.11	37.071195	-122.084162	37.074269	-122.084529	Main Street
11	9	8.11	9.16	37.074269	-122.084529	37.085178	-122.089426	Transitional
12	9	9.16	9.77	37.085178	-122.089426	37.090406	-122.094151	Main Street (Ben Lomond)
13	9	9.77	11.297	37.090406	-122.094151	37.107583	-122.107696	Transitional
14	9	11.297	11.417	37.107583	-122.107696	37.107809	-122.109751	Main Street (Brookdale)
15	9	11.417	12.444	37.107809	-122.109751	37.116084	-122.120357	Transitional
16	9	12.444	13.238	37.116084	-122.120357	37.128471	-122.123005	Main Street (Boulder Creek)
17	9	13.238	16.356	37.128471	-122.123005	37.169876	-122.135936	Transitional
18	9	16.356	27.093	37.169876	-122.135936	37.25838	-122.122271	Undeveloped Mountainous
19	236	0	0.231	37.125388	-122.122311	37.12493	-122.12659	Main Street (Boulder Creek)
20	236	0.231	3.498	37.12493	-122.12659	37.156353	-122.161873	Transitional
21	236	3.498	17.662	37.156353	-122.161873	37.211434	-122.156777	Undeveloped Mountainous
22	35							Undeveloped Mountainous
23	152	1.328	2.375	36.92666	-121.745586	36.940859	-121.740767	Main Street (Watsonville)
24	152	2.339	3.688	36.940859	-121.740767	36.956114	-121.727453	Transitional
25	152	3.688	8.282	36.956114	-121.727453	36.995657	-121.717789	Undeveloped Mountainous
26	129	Lee Rd	0.954	36.893593	-121.776582	36.914521	-121.738974	Transitional
27	129	0.41	0.592	36.911124	-121.748076	36.912648	-121.744886	Main Street (Watsonville)
28	129	0.592	4.744	36.912648	-121.744886	36.914302	-121.676998	Undeveloped non-mountainous
29	129	4.744	9.997	36.914302	-121.676998	36.900491	-121.597467	Undeveloped Mountainous

Appendix D. Crash Profiles

Crash Profiles

- Conditions where KSI crashes are occurring
- Developed using crash data, contextual data, and community input
- Identifies systemic patterns linked to 5–15% of total KSIs

Countermeasures (Risk Management)

- **Demand Management**
- **Speed Management**
- **Conflict Management**

Demand Management

- **What is Demand Management?**
  - Strategies, policies, and design features that can reduce exposure (i.e, number or length of driving trips)
  - Goal is to reduce the number of roadway users potentially experiencing crashes
  - Requires holistic approaches beyond the roadway network that may include land use mix, transportation alternatives, etc.
- **Examples**
  - Transportation alternatives to reduce SOV use in high demand areas
  - Enhanced infrastructure that allows walking/biking rather than driving for walkable/bikeable trips
  - Targeted education on transportation alternatives

Speed Management

- **What is Speed Management?**
  - Strategies and roadway design features aimed at reducing vehicle speeds to match the local context
  - Goal is to reduce severity in a crash should it occur
  - Generally applied systemically across the roadway network
- **Examples**
  - Traffic calming features like traffic circles/roundabouts, gateway treatments, and vertical/horizontal deflection
  - Roadway width reductions
  - Speed feedback signs
  - Modified speed limit setting and application of warning/advisory speeds
  - Enhanced enforcement

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Conflict Management

- **What is Conflict Management?**
  - Strategies and roadway design features that seek to remove conflicts or reduce their severity (i.e., reduce likelihood of crash)
  - Goal is to reduce number of collisions that result in fatalities or serious injuries (KSIs)
  - Applied systemically across the roadway network or in response to collision profiles and risk factors at specific locations
- **Examples**
  - Installation of signs and pavement markings
  - Enhanced bicycle or pedestrian facilities, particularly at crossings
  - Modifications to roadway width, alignment, or travel lanes
  - Rumble strips, guardrails, and other shoulder treatments

Excessive Speed

Observed speed is over 10 mph above the target speed

Mode:
All modes

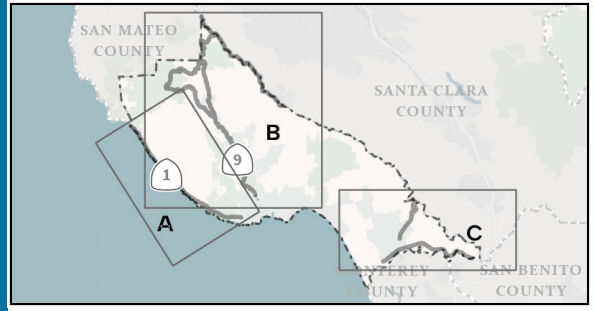
Represents **40% of all KSIs**, including:

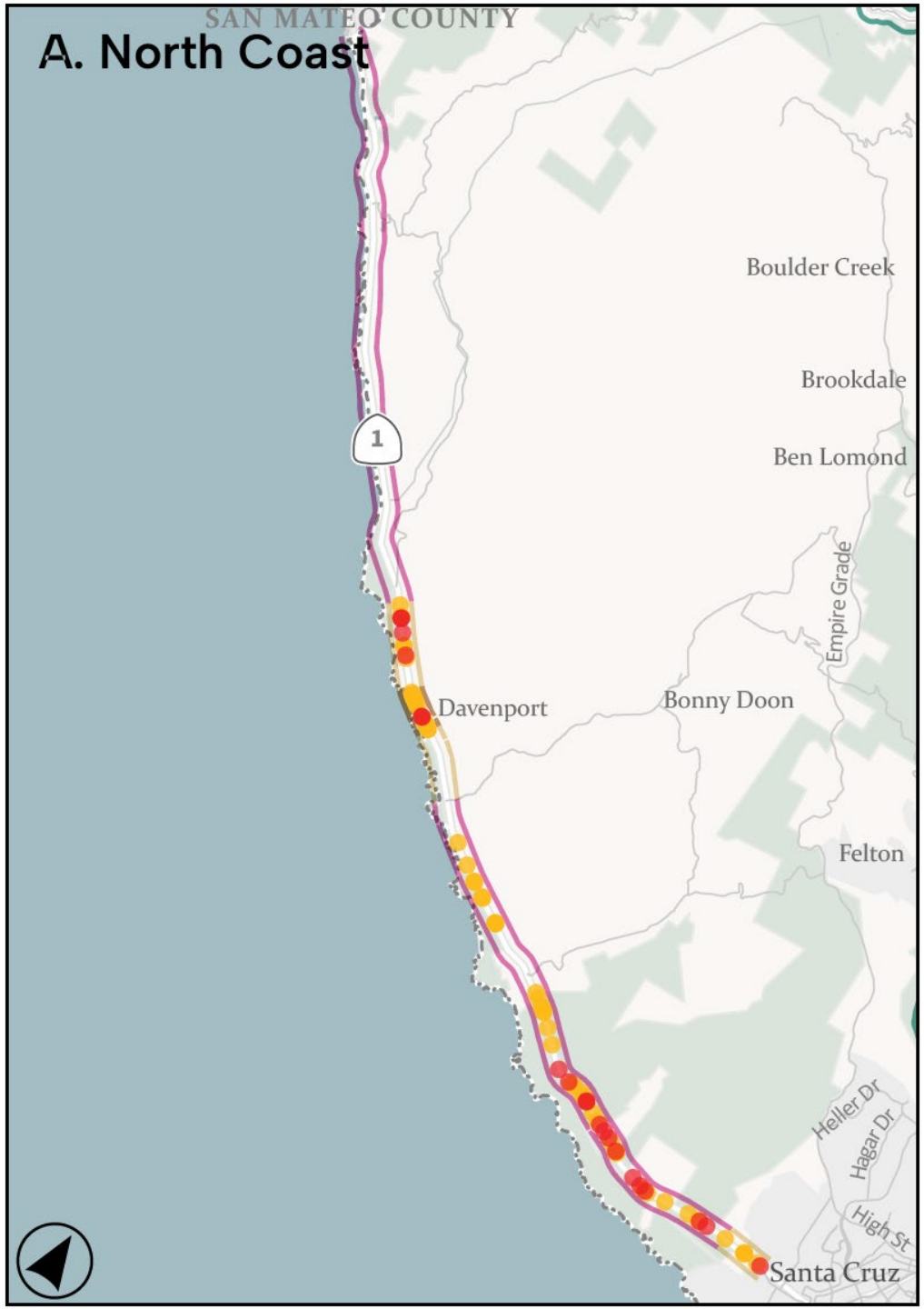
- **72%** of KSIs on Main Streets
- **42%** of KSIs on Transitional Streets
- **28%** of KSIs on Undeveloped Non-Mountainous Streets
- **32%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- High speeds (increased likelihood of KSI)
- Presence of vulnerable users

Excessive Speed





Excessive Speed

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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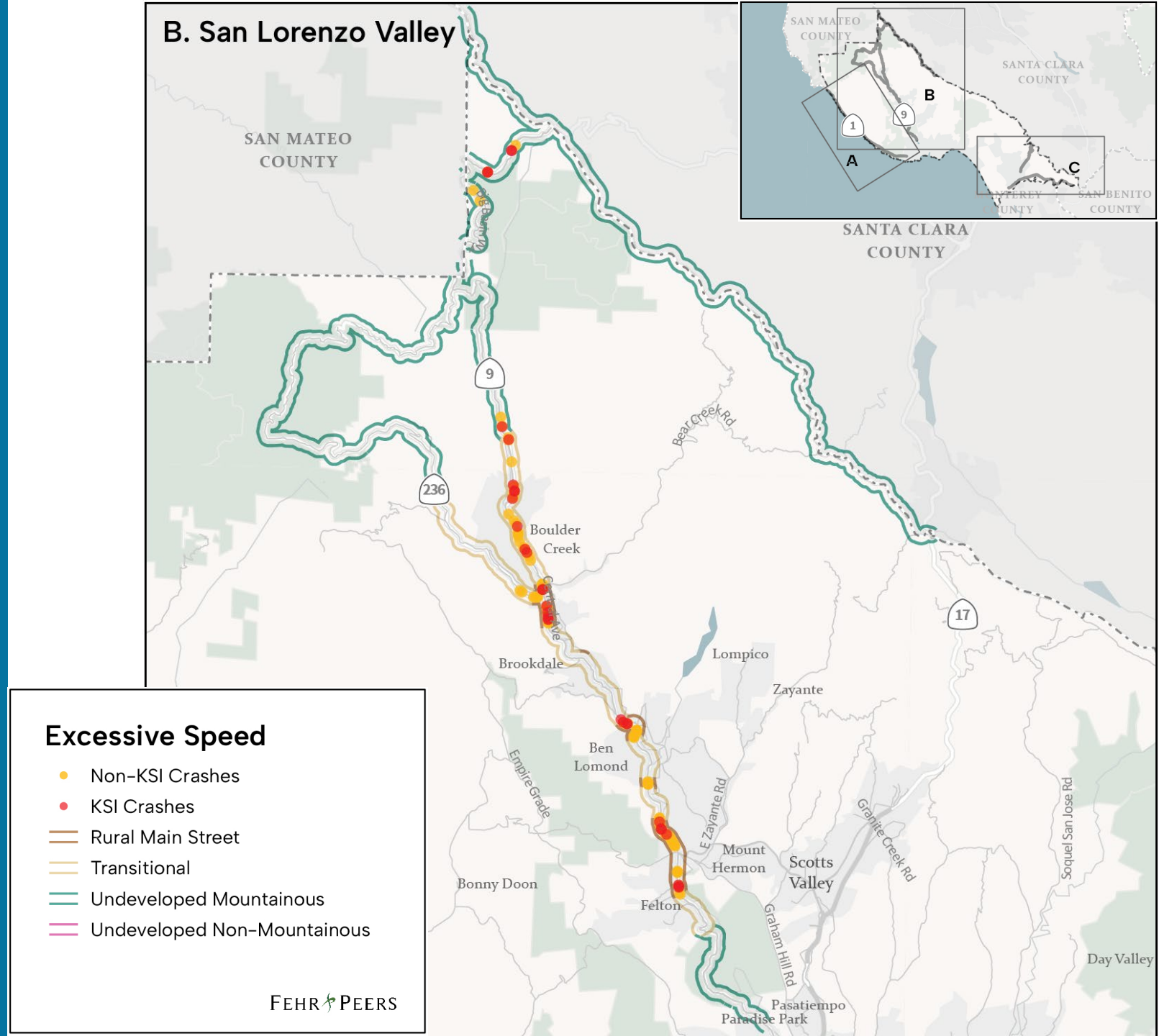
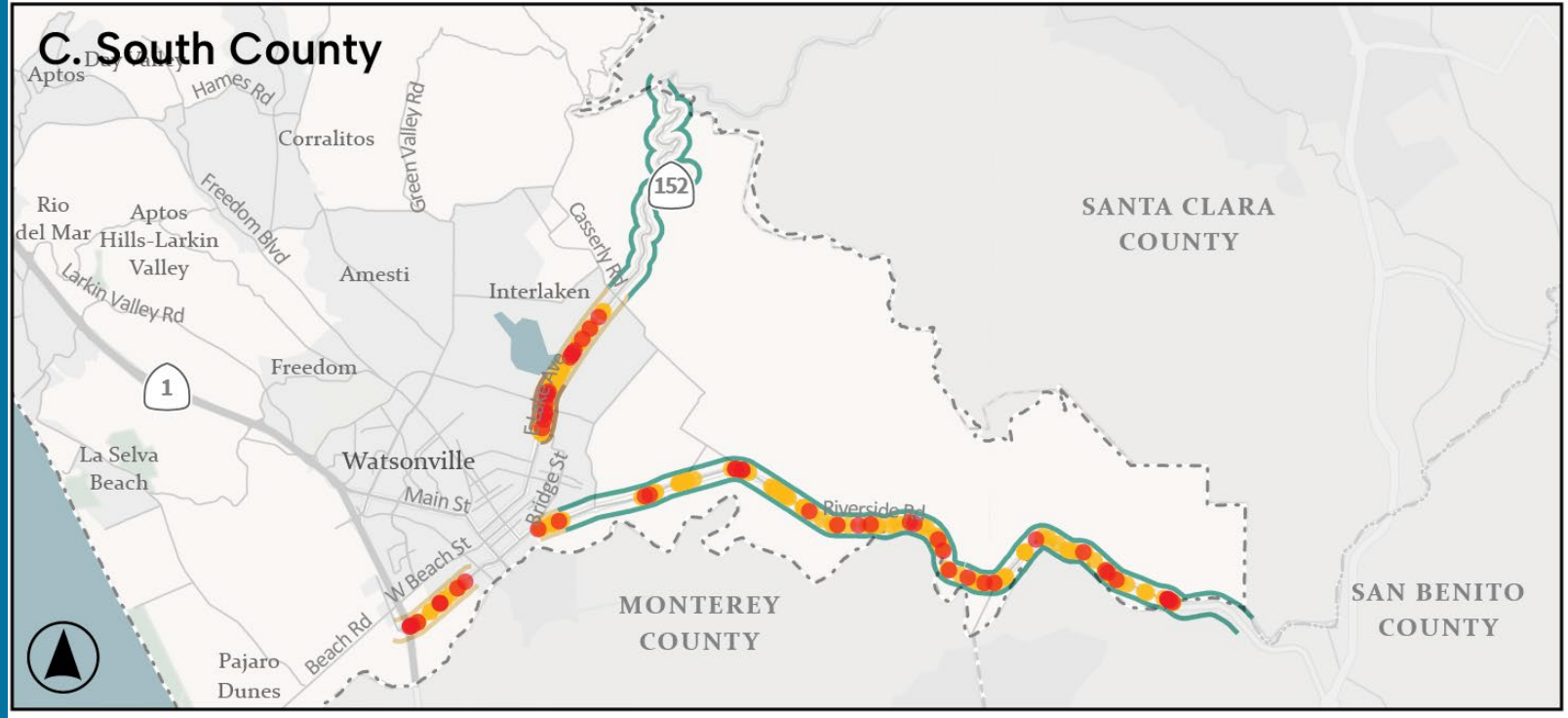
Excessive Speed



Excessive Speed



Excessive Speed

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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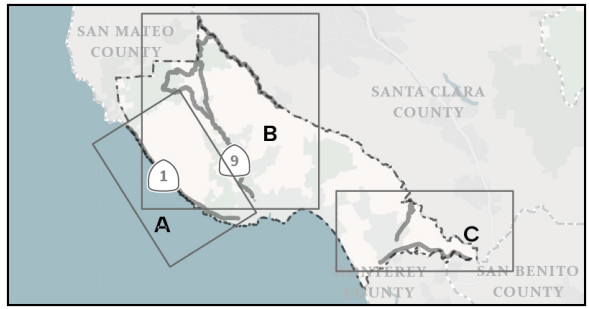


Countermeasures

- **Main Streets & Transitional Streets**
  - Sidewalk installation, reduced lane width, horizontal deflection, gateway treatments, traffic circles/roundabouts, speed feedback signs
- **Undeveloped Mountainous & Non-Mountainous Areas:**
  - Shoulder treatments, rumble strips, speed feedback and other vehicle activated signs

Pedestrian Crashes

Pedestrian crashes throughout the corridors

Mode:
Pedestrian

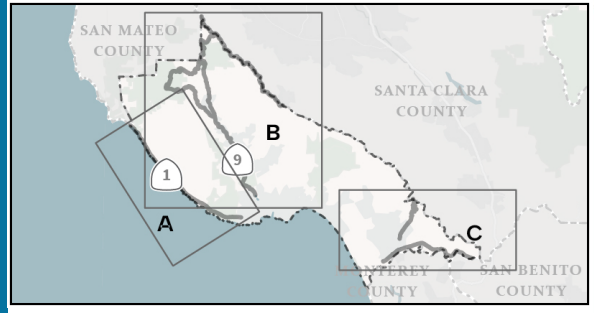
Represents **9%** of all KSIs, including:

- **31%** of KSIs on Main Streets
- **9%** of KSIs on Transitional Streets
- **9%** of KSIs on Undeveloped Non-Mountainous Streets
- **1%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- Sight distance
- High speeds
- Presence of vulnerable users
- Pedestrian facilities

Pedestrian Crashes



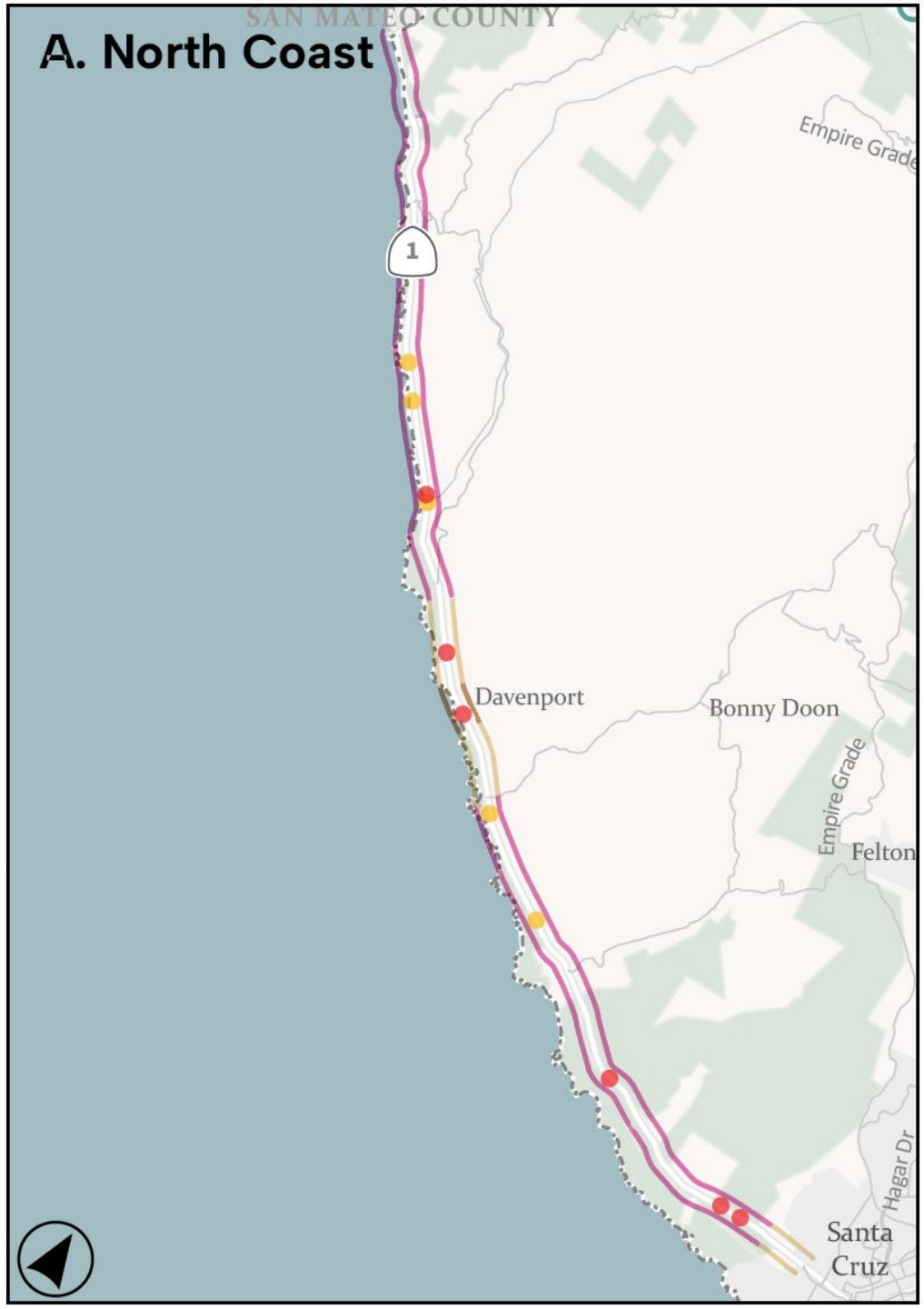
Pedestrian Crashes

- Non-KSI Crashes
- KSI Crashes

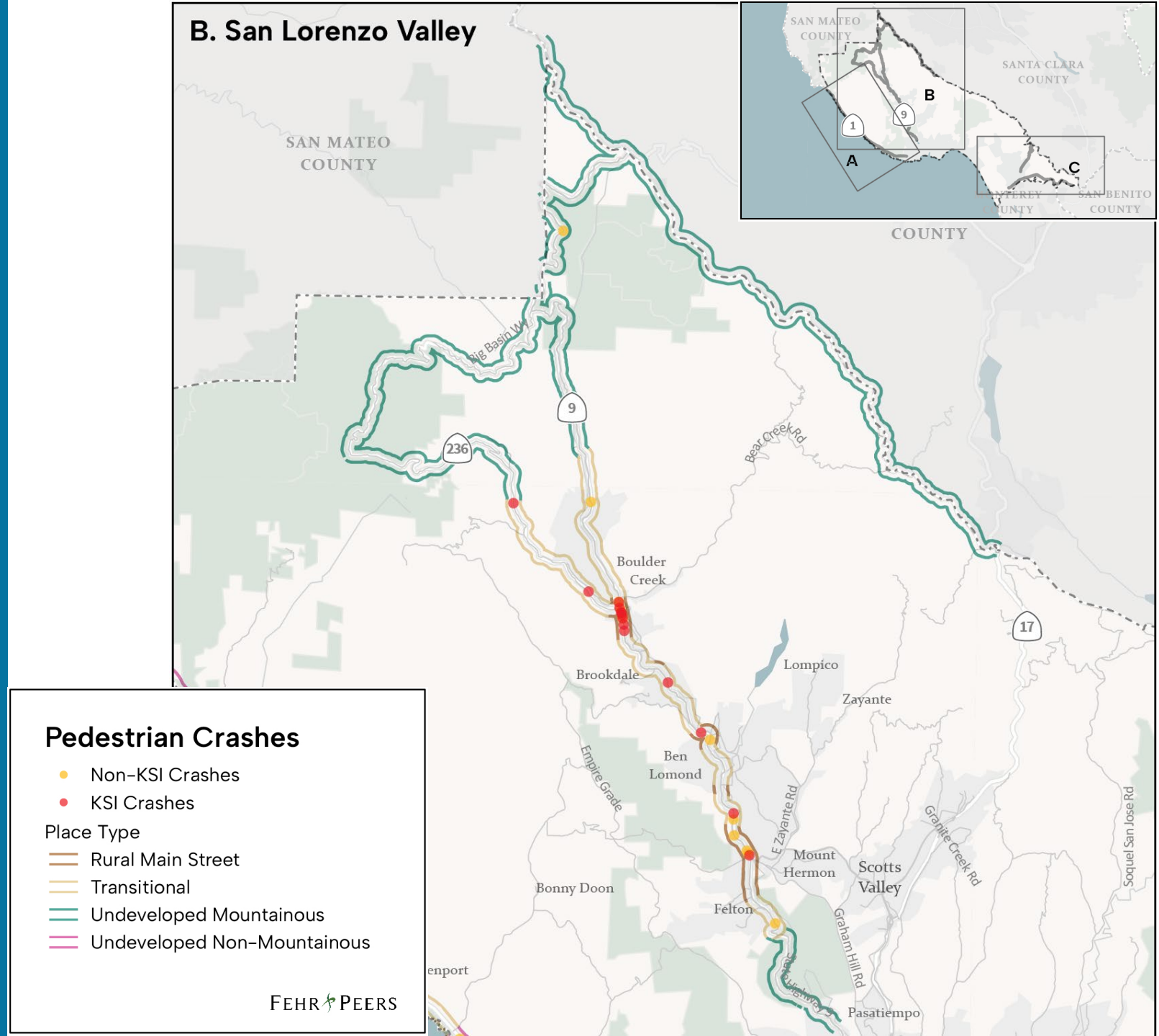
Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

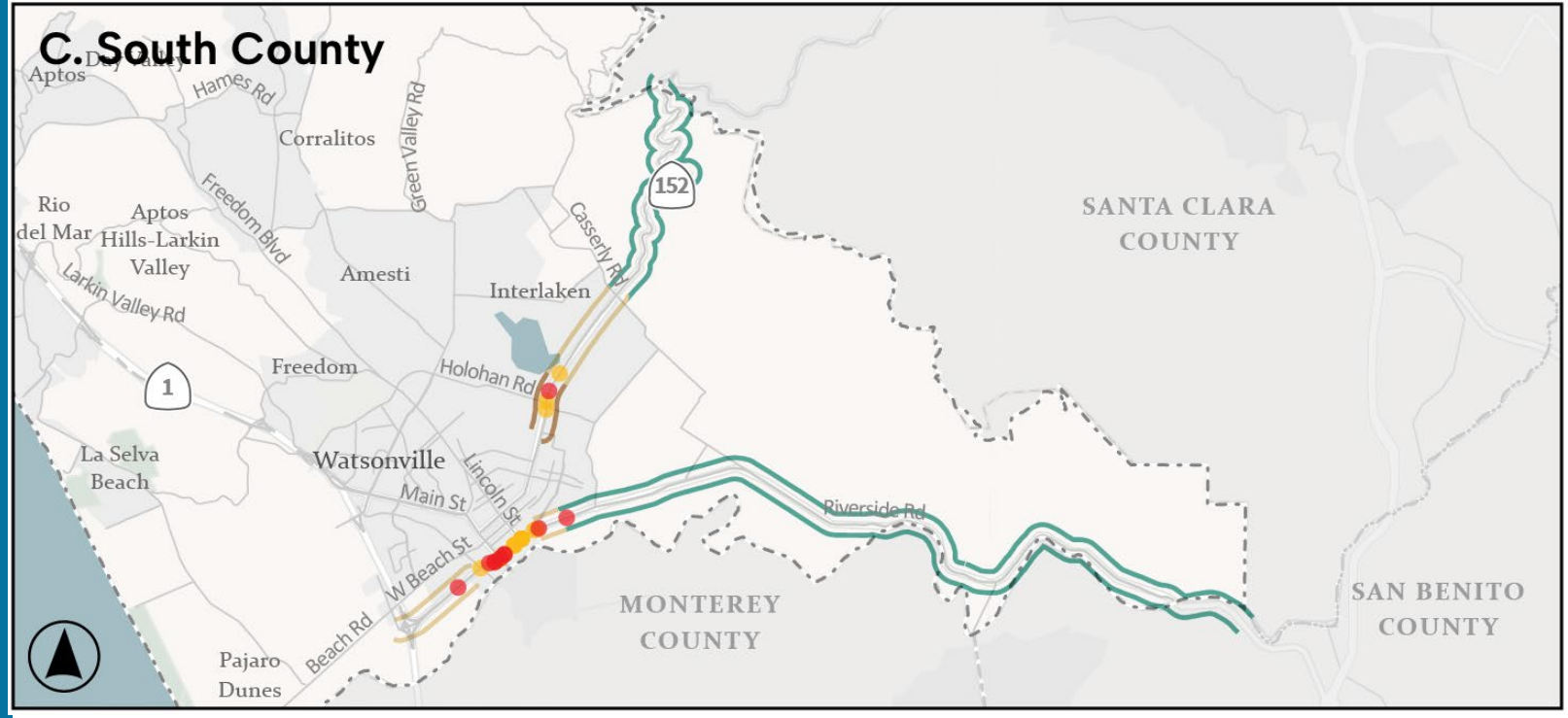
FEHR PEERS



Pedestrian Crashes



Pedestrian Crashes



Pedestrian Crashes

- Non-KSI Crashes
- KSI Crashes

Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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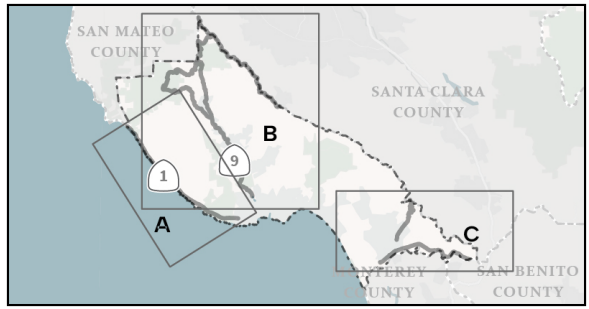


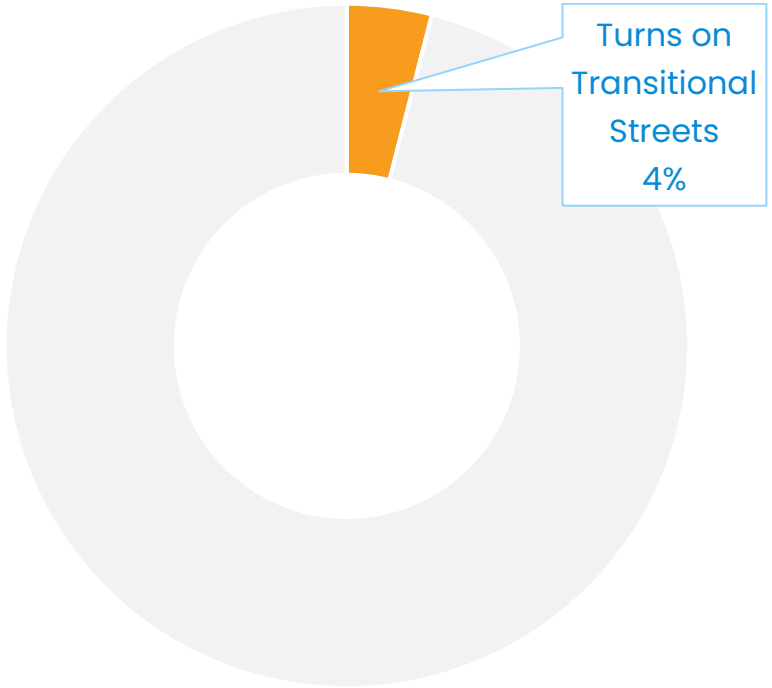
Countermeasures

- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)

Turns on Transitional Streets

Midblock vehicle-only crashes involving turns on transitional streets

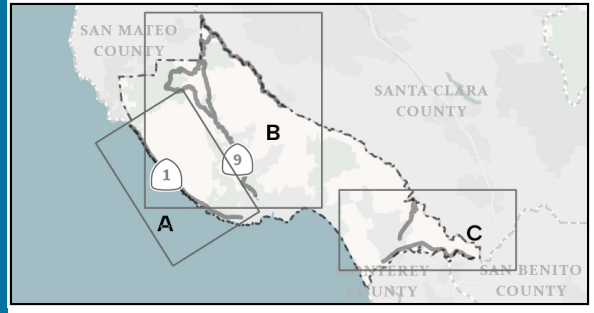
Mode: Vehicle on Vehicle

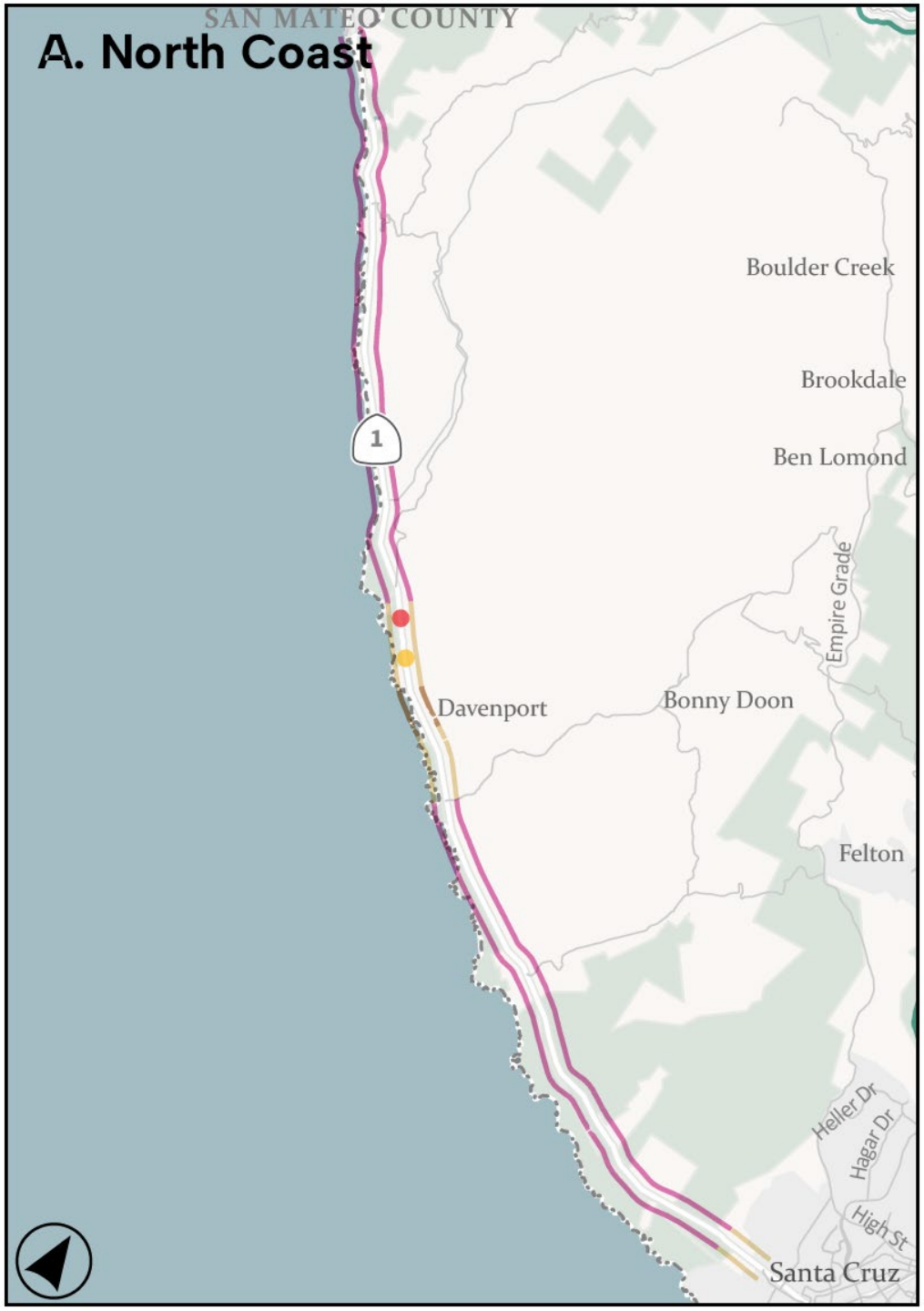


Key considerations:

- Driveway spacing/locations
- Sight distance
- Traversing high-traffic areas
- Observed speed exceeds target speed

Turns on Transitional Streets





Turns from Driveways In Transitional Streets

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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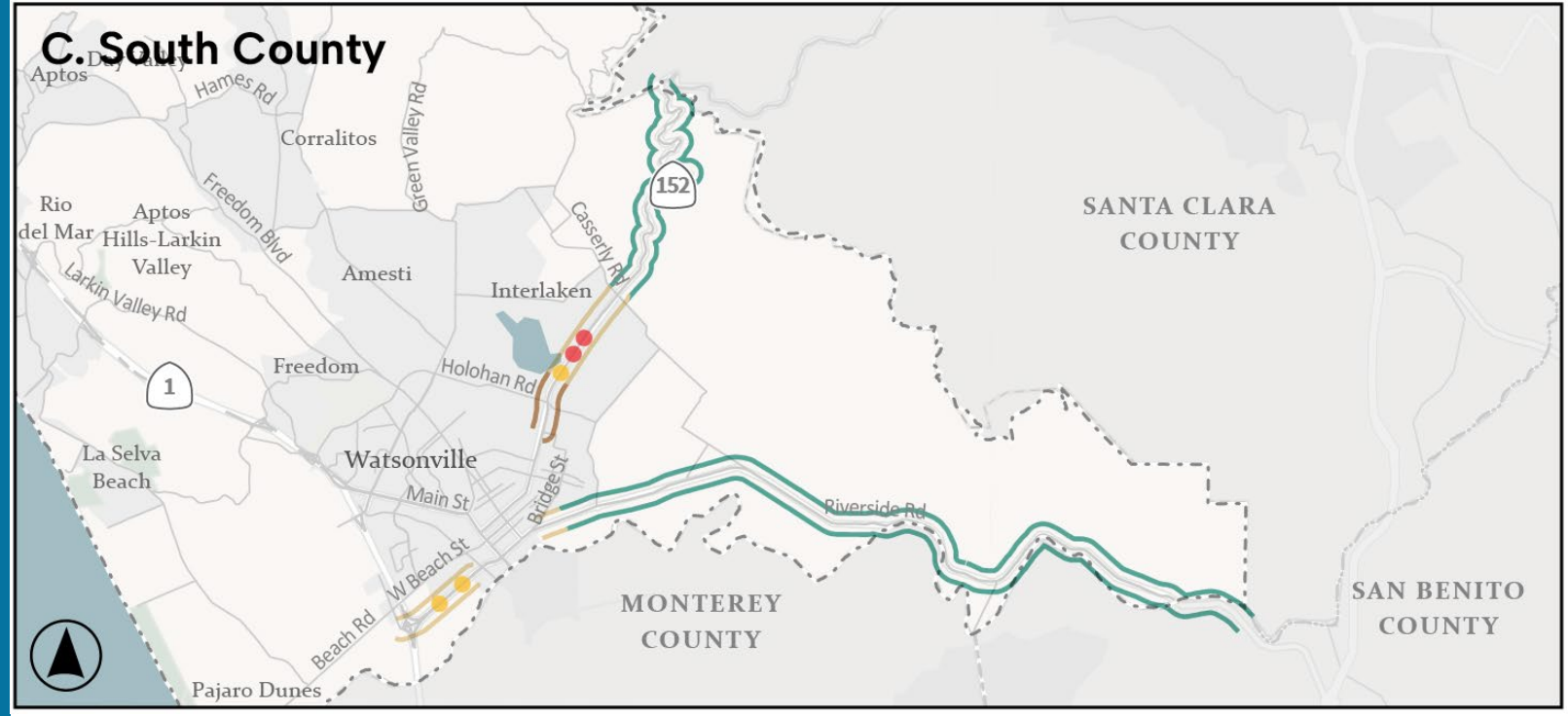
Turns on Transitional Streets

Turns on Transitional Streets



Turns from Driveways In Transitional Streets

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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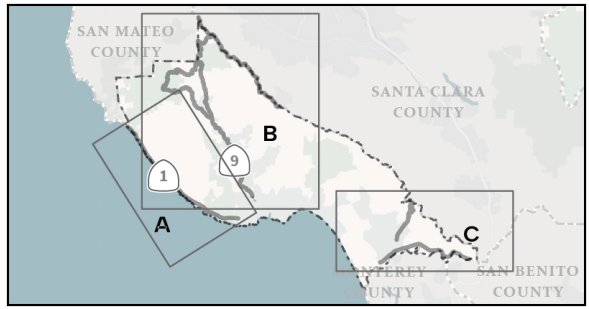


Countermeasures

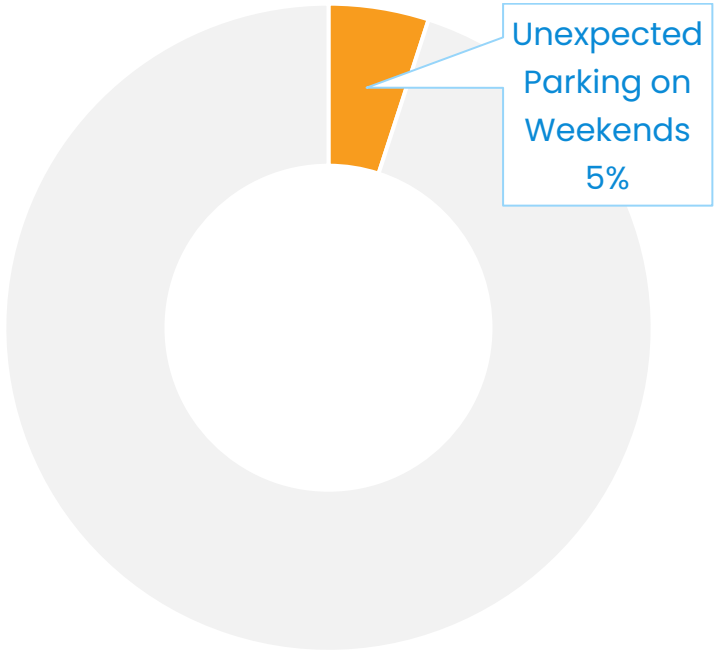
- Sight distance improvements at driveways through vegetation management, mirrors, and enhancements to codes and plan review for placement of driveways, fences, and other improvements
- Signage or active warning devices at key locations
- Geometric enhancements such as turn lanes (including two-way center turn lanes) and horizontal realignments
- Driveway consolidation where feasible

FHWA, Picasa

Weekend Driving on Undeveloped Non-Mountainous Roads

Vehicle crashes on weekends on Undeveloped Non-Mountainous roads

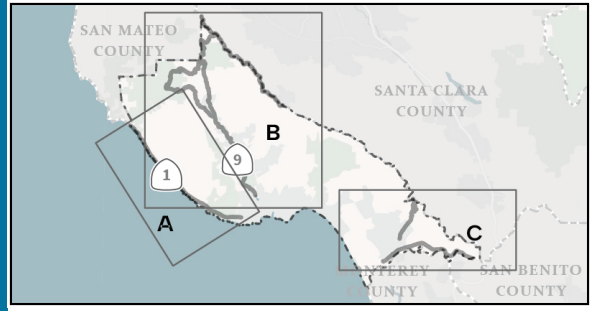
Mode:
Veh-Veh

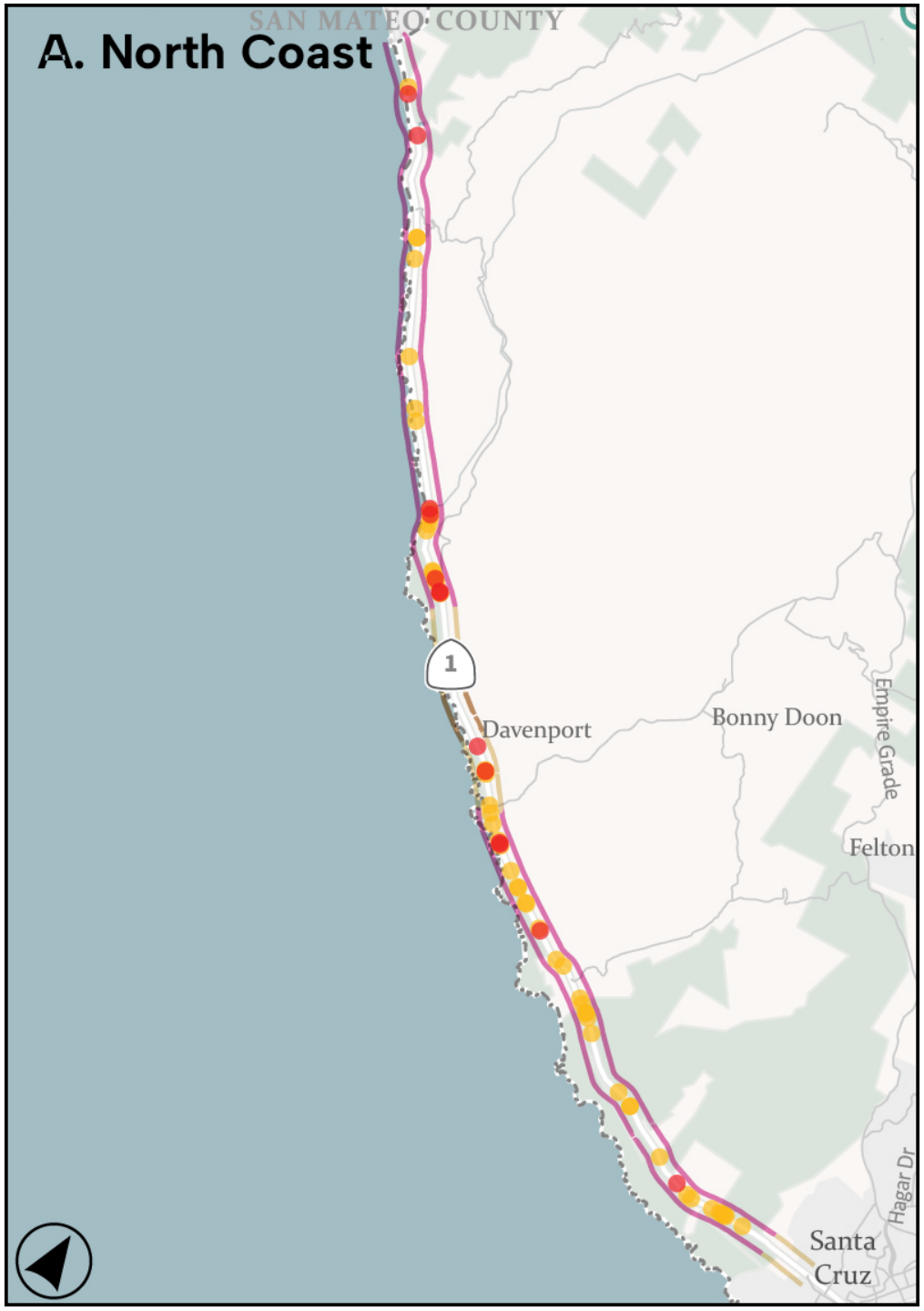


Key considerations:

- Sight distance
- Parking challenges at key destinations
- Presence of vulnerable users
- Drivers less familiar with roadways
- Observed speed exceeds target speed
- TDM strategies

Weekend Driving on Undeveloped Non-Mountainous Roads





Weekend Driving on Undeveloped Non-Mountainous Roads

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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Countermeasures

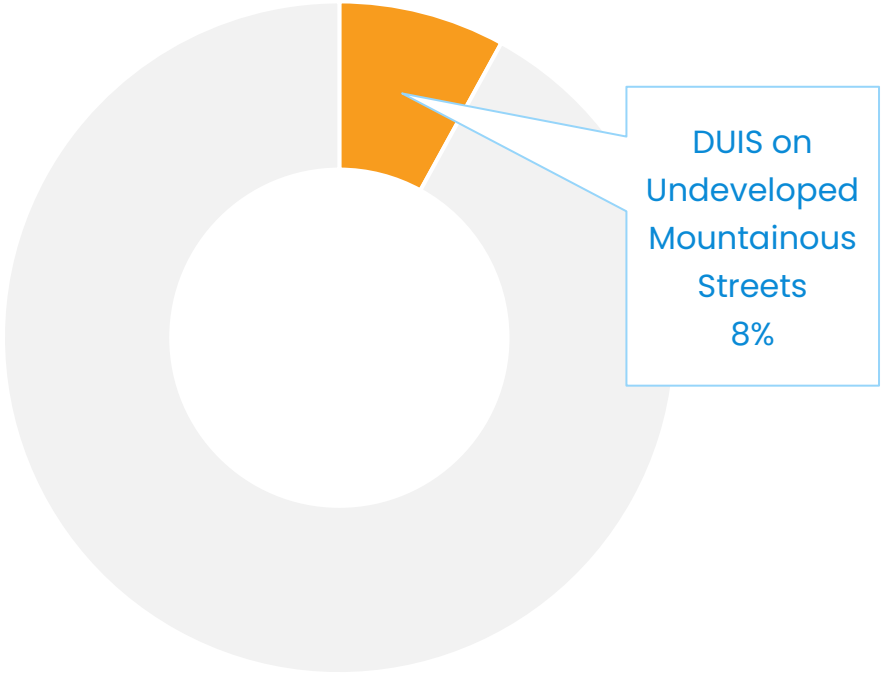
- Establish alternatives to driving to key destinations (demand management)
- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, signage
- Improved placement of and access to parking areas at key recreational sites to address informal parking along roadways
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)
- Shoulder treatments, rumble strips, speed feedback and other vehicle activated signs

Floyd County Georgia, 2024

DUIs on Undeveloped Mountainous Roads

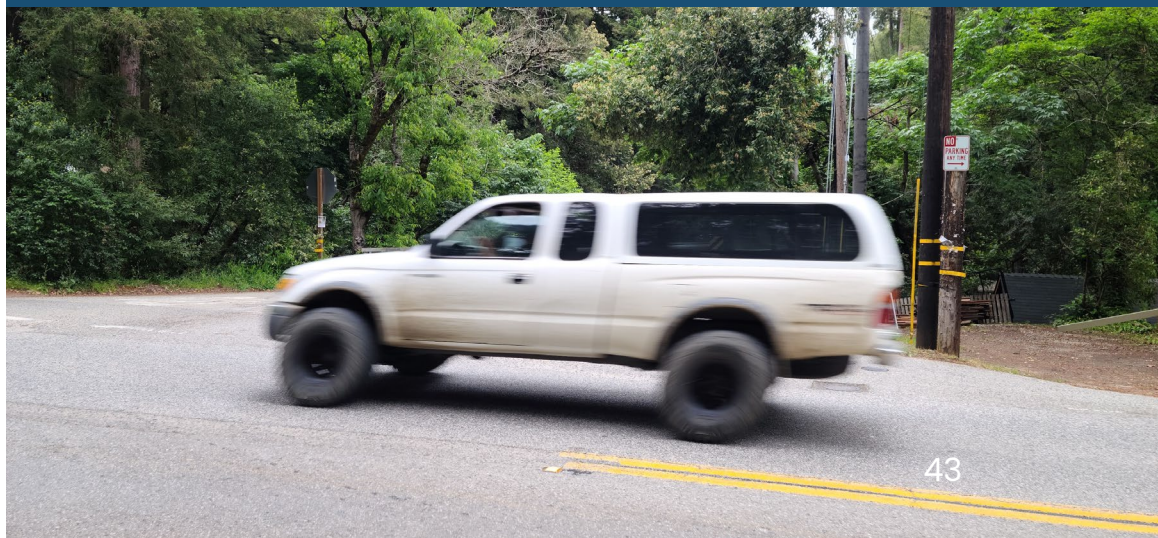
DUI related crashes on Undeveloped Mountainous Roads

Mode: Vehicle on Vehicle

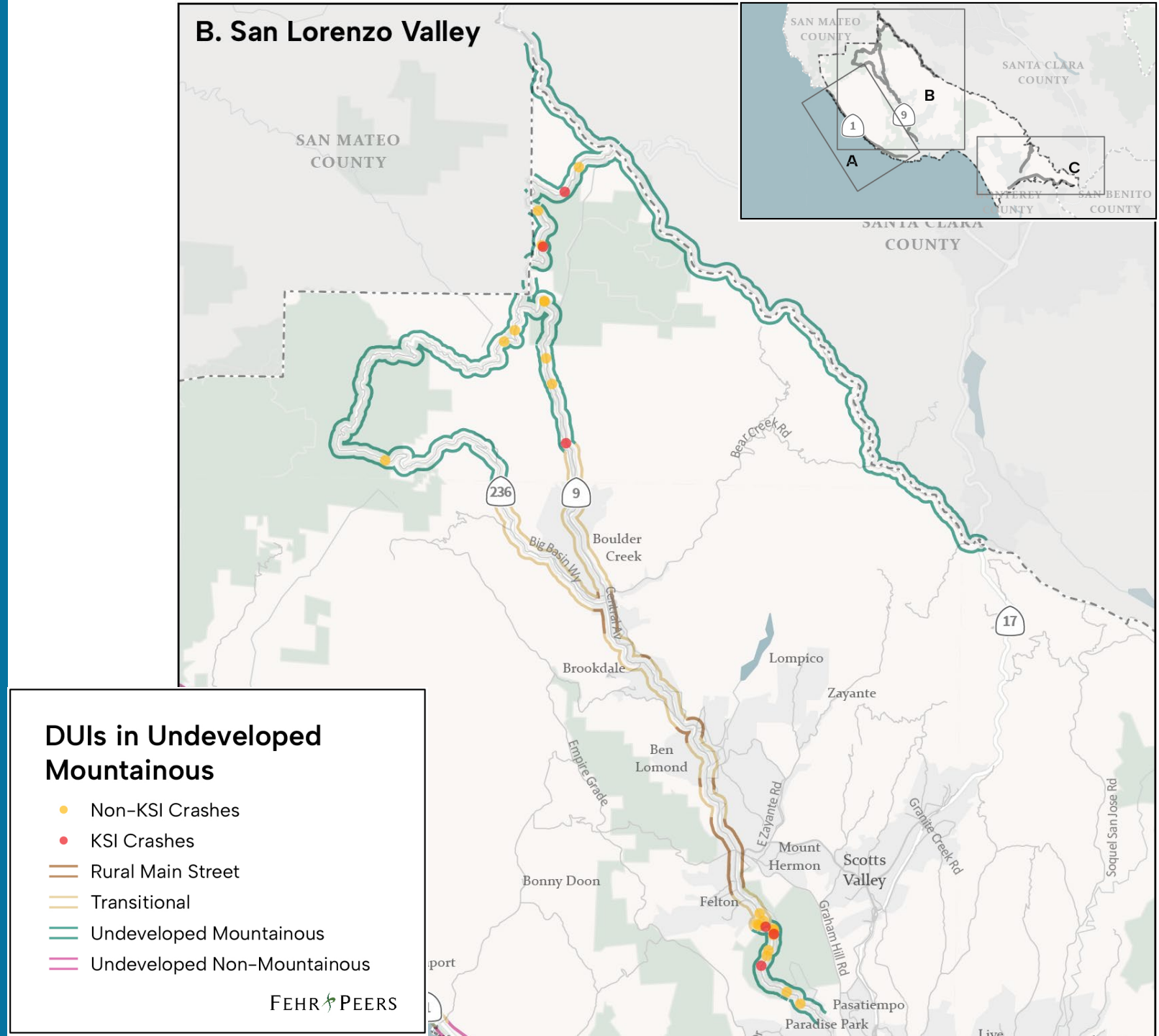


Key considerations:

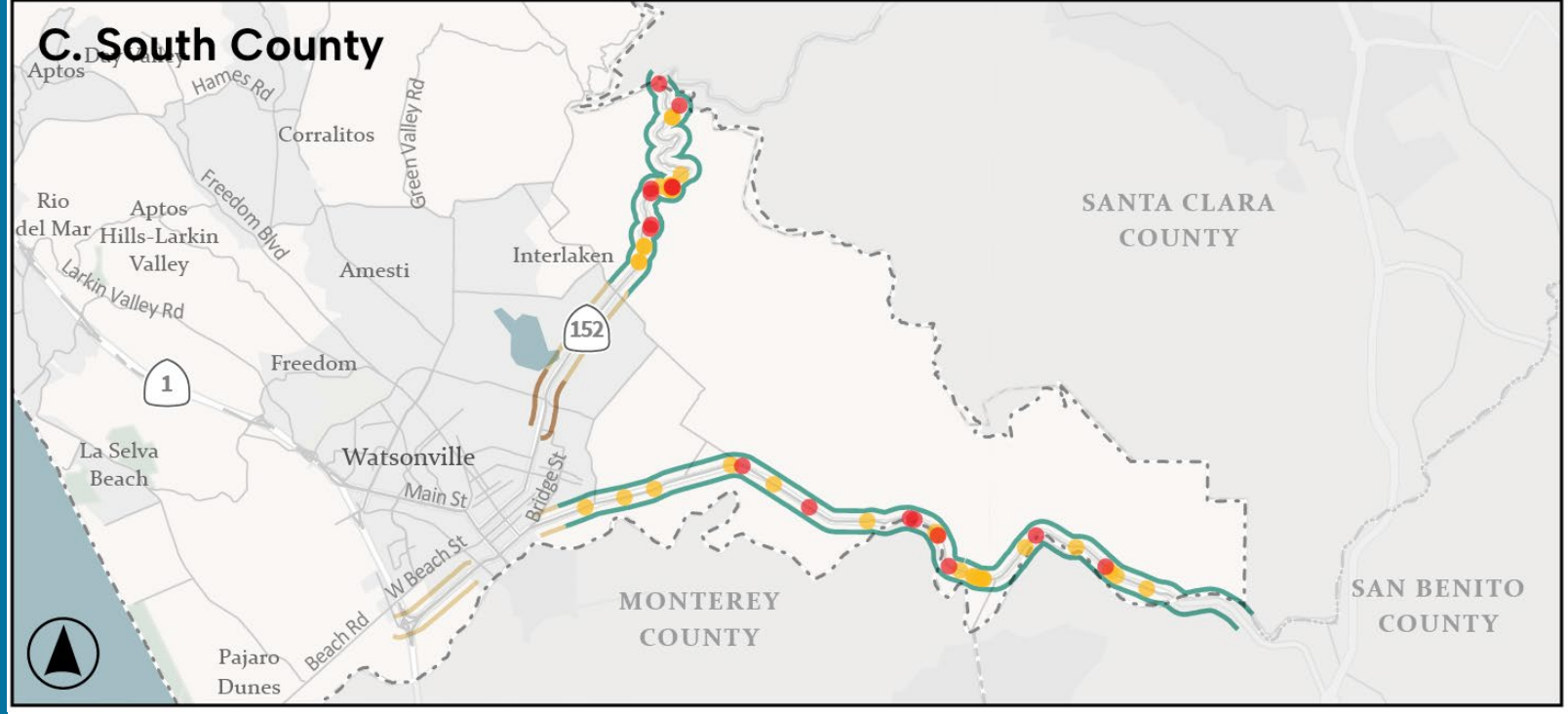
- Alternative travel options to driving drunk
- Observed speed exceeds target speed
- Reduce severe impacts of crashes by focusing on reducing speeds and addressing conflict points



DUIs on Undeveloped Mountainous Roads



DUIs on Undeveloped Mountainous Roads



DUIs in Undeveloped Mountainous

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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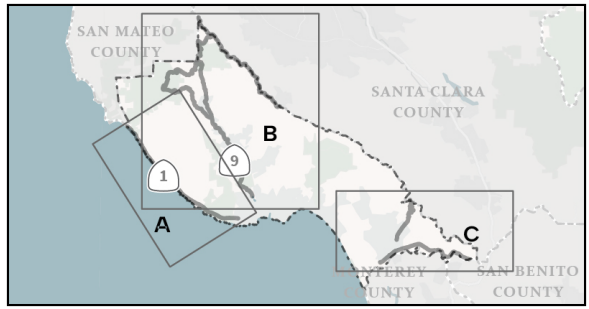
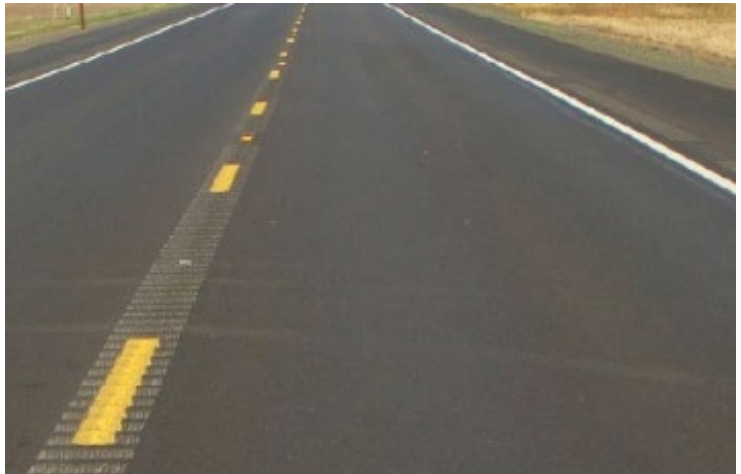


Countermeasures

- Transportation alternatives/business partnerships with rideshare or taxi services (demand management)
- Rumble strips, shoulder treatments, and centerline enhancements
- Enhanced warning for geometric inconsistencies, potentially including vehicle activated signs
- Guardrail

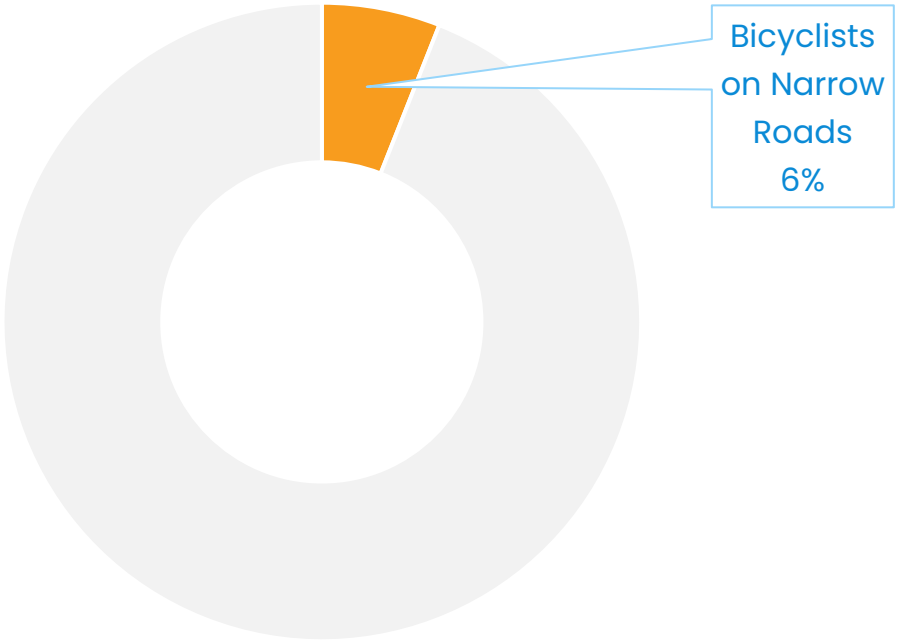
FHWA, Augusta, ME



Bicyclists on Narrow Roads

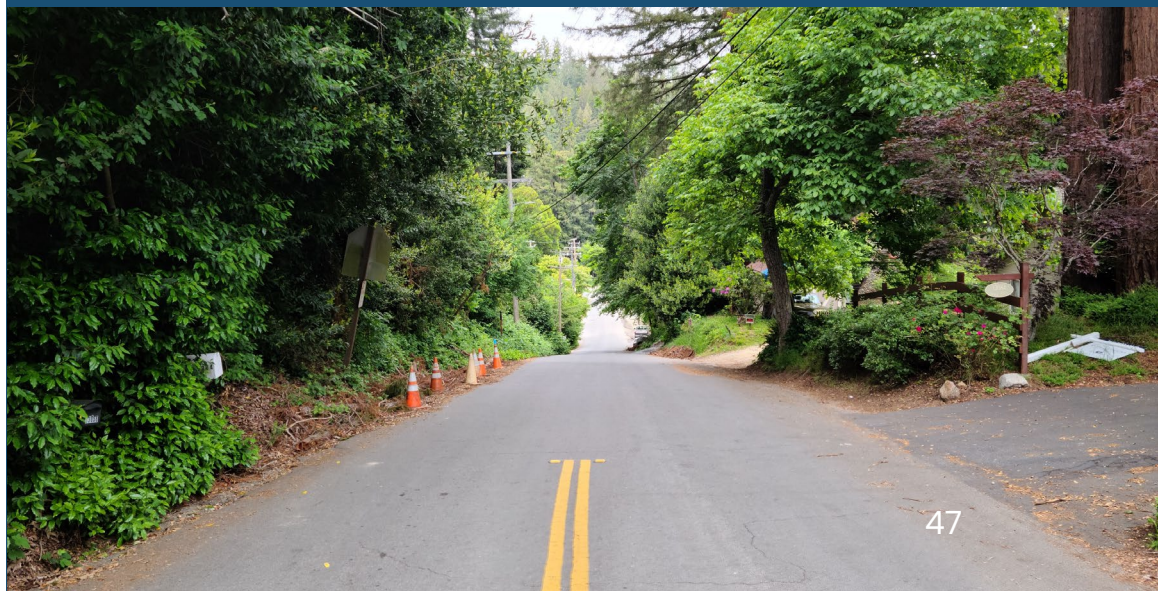
Bike crashes on narrow roadway segments (<36 feet roadway)

Mode:
Bicyclists

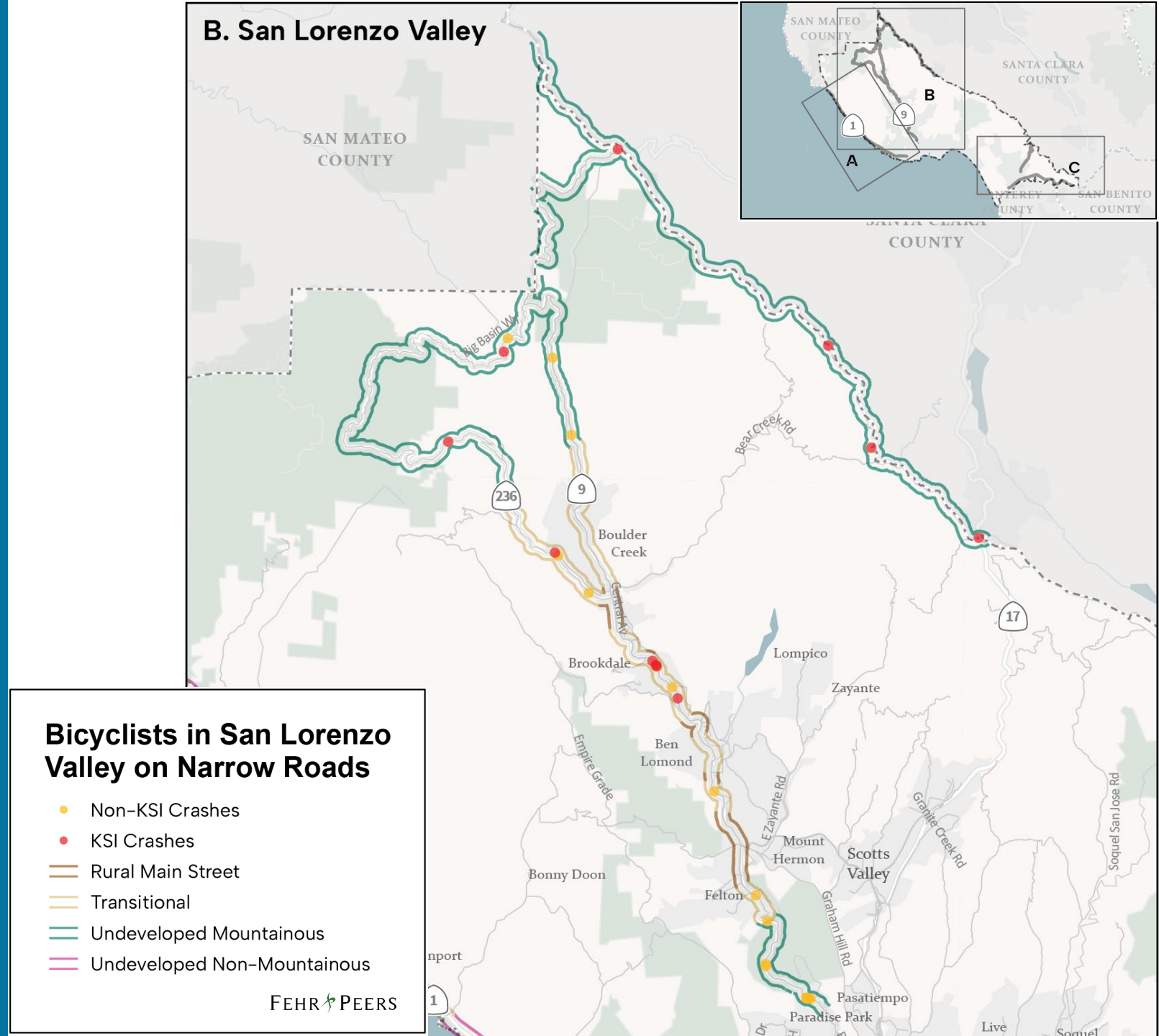


Key considerations:

- High levels of bicycle activity
- Lacking space for bicycle facilities
- Sight distance often reduced by horizontal or vertical constraints
- Observed speed exceeds target speed



Bicyclists on Narrow Roads



Countermeasures

- Bike lanes or separated paths along key corridors, particularly Highway 9
- Enhanced signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)
- Speed feedback and other vehicle activated signs, potentially including active signs to warn motorists of present bicyclists in constrained roadway sections

Lane Departures

Head-On or Hit Object vehicle crashes

Mode:
Veh-Veh

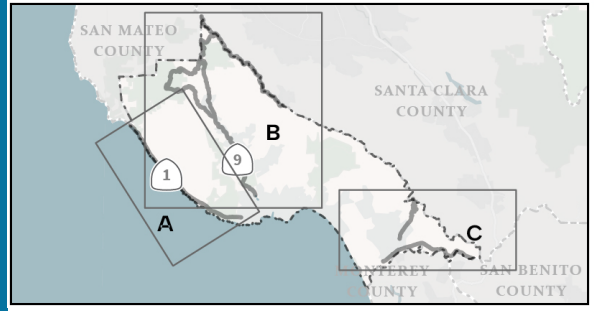
Represents **42%** of all KSIs

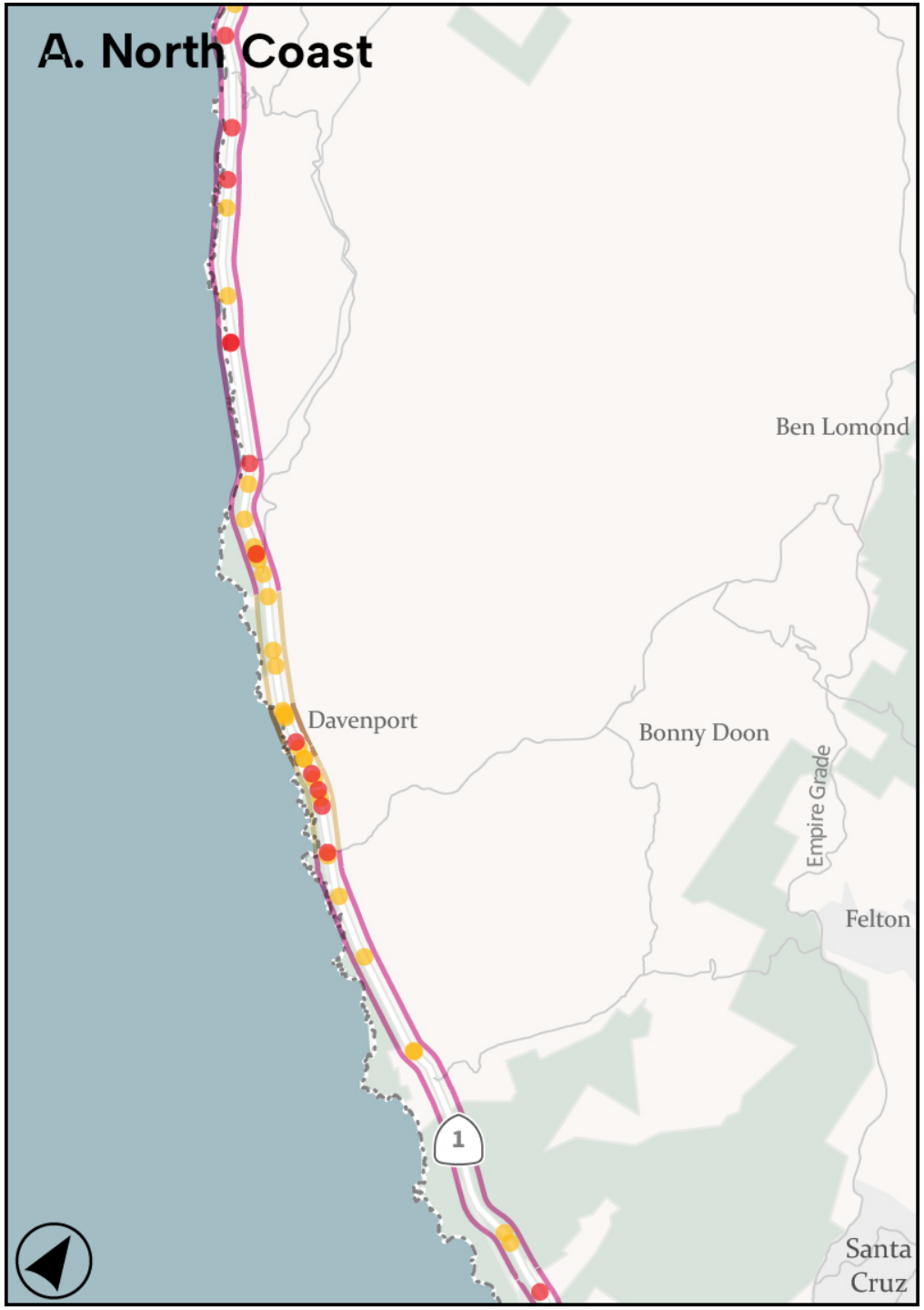
- **18%** of KSIs on Main Streets
- **45%** of KSIs on Transitional Streets
- **28%** of KSIs on Undeveloped Non-Mountainous Streets
- **55%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- Lane width
- Shoulder width
- Median type
- Horizontal and vertical curvature
- Presence of guardrail or other protective devices
- Sight distance
- Observed speed exceeds target speed

Lane Departures



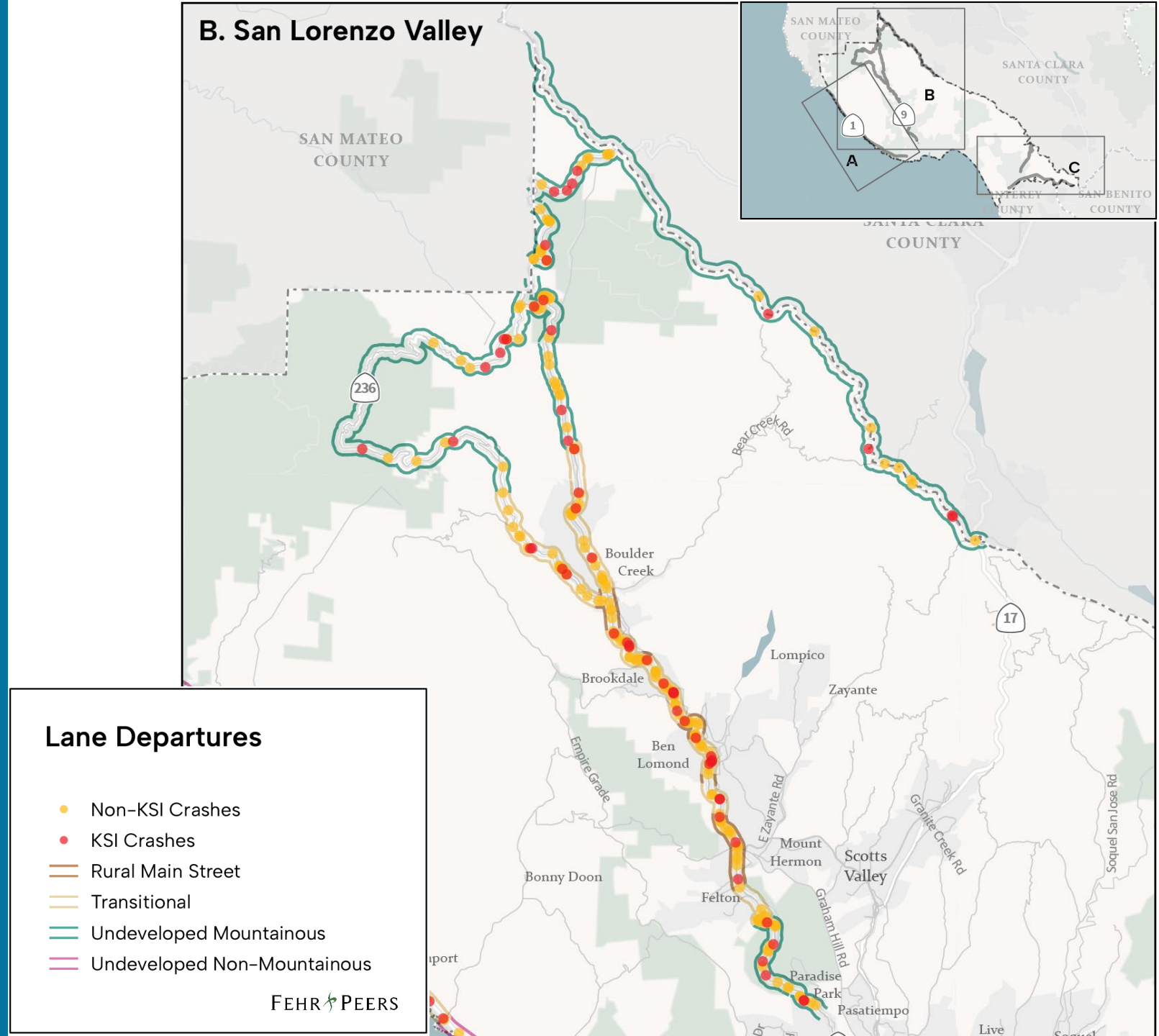


Lane Departures

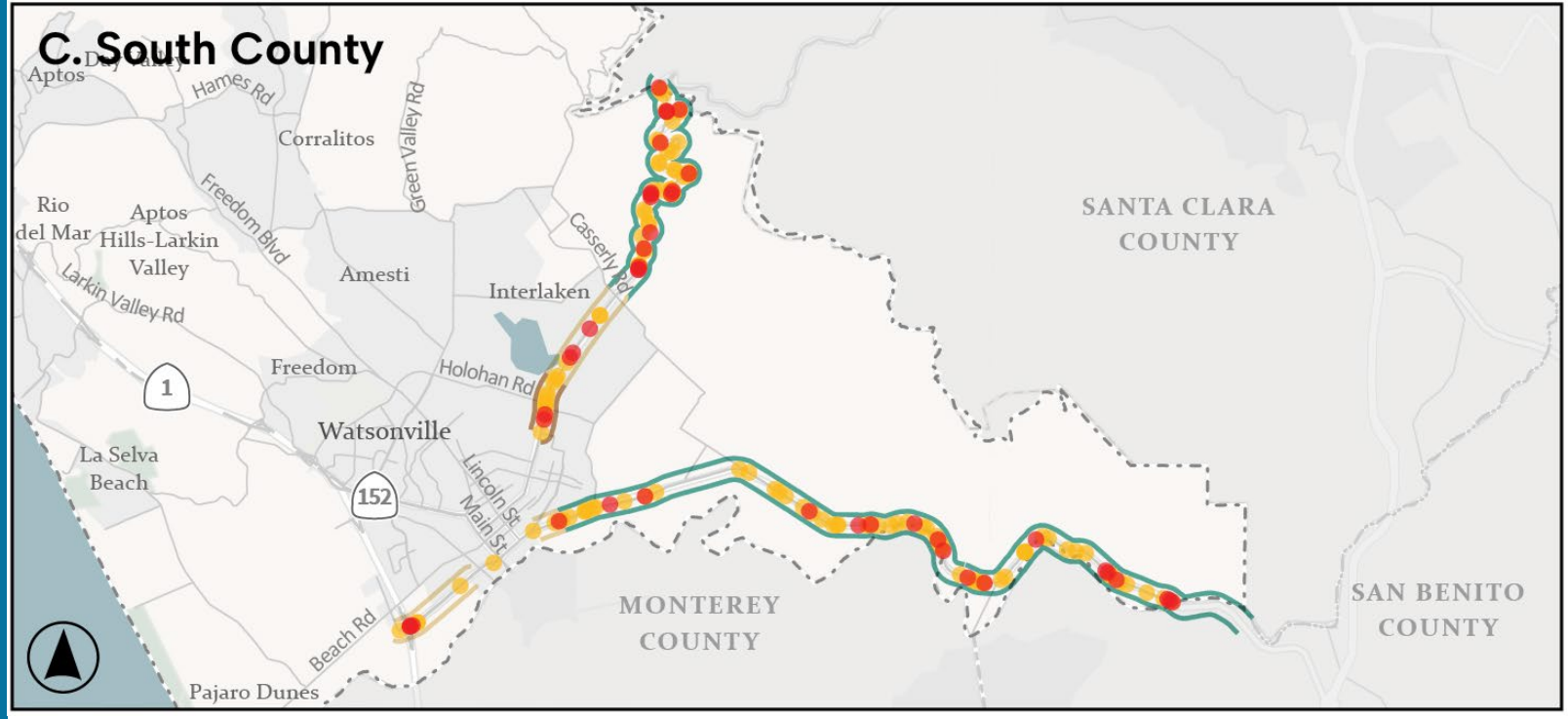
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR & PEERS

Lane Departures



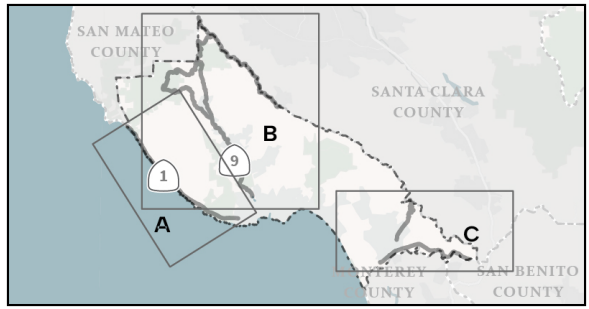
Lane Departures



Lane Departures

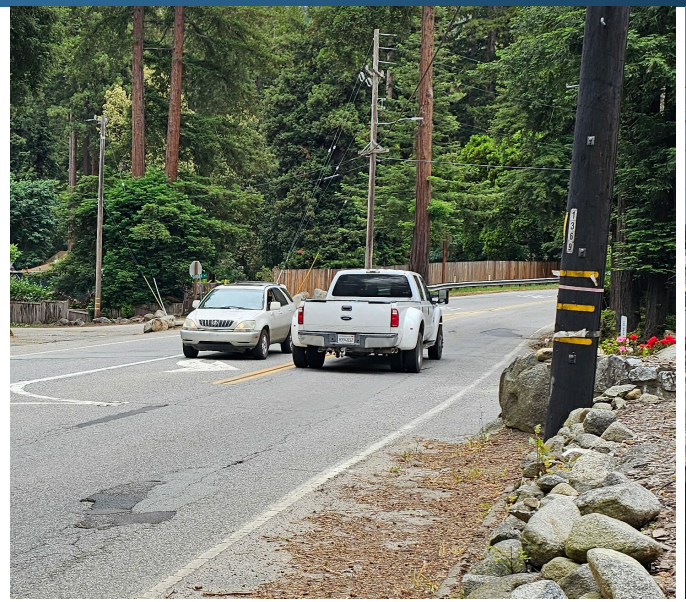
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS



Countermeasures

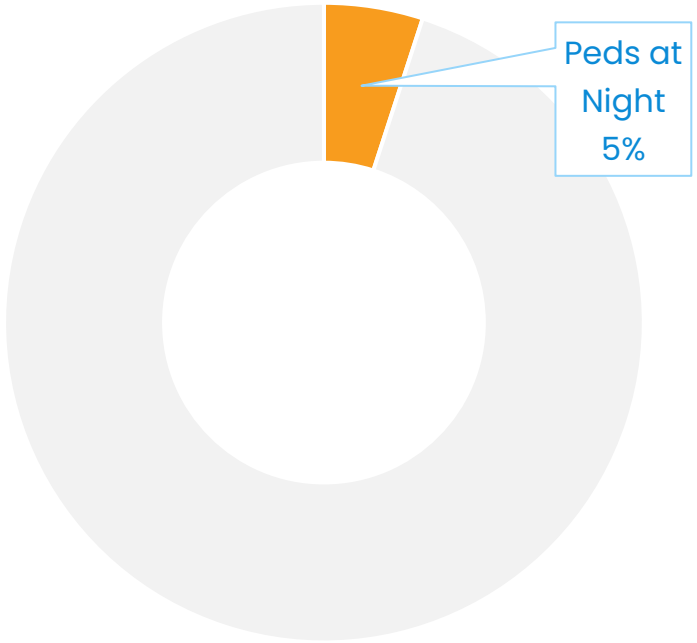
- **Main Streets & Transitional Streets**
  - Enhancing clear zone and using breakaway couplings
  - Raised medians/edges or two-way center turn lanes where appropriate
  - Provision of suitable parking areas to better define space
  - General traffic calming enhancements, particularly speed feedback signs
- **Undeveloped Mountainous & Non-Mountainous Areas**
  - Enhancing clear zone and using breakaway couplings
  - Guardrail
  - Rumble strips (edge and centerline)
  - Shoulder width enhancements
  - Speed feedback and other vehicle activated signs



Pedestrians at Night

Pedestrian crashes when lighting conditions were noted as Not Daylight

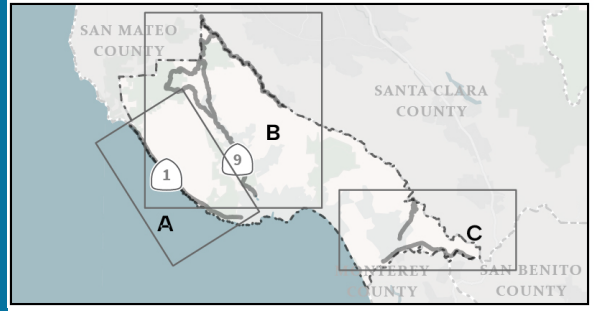
Mode:
Pedestrian

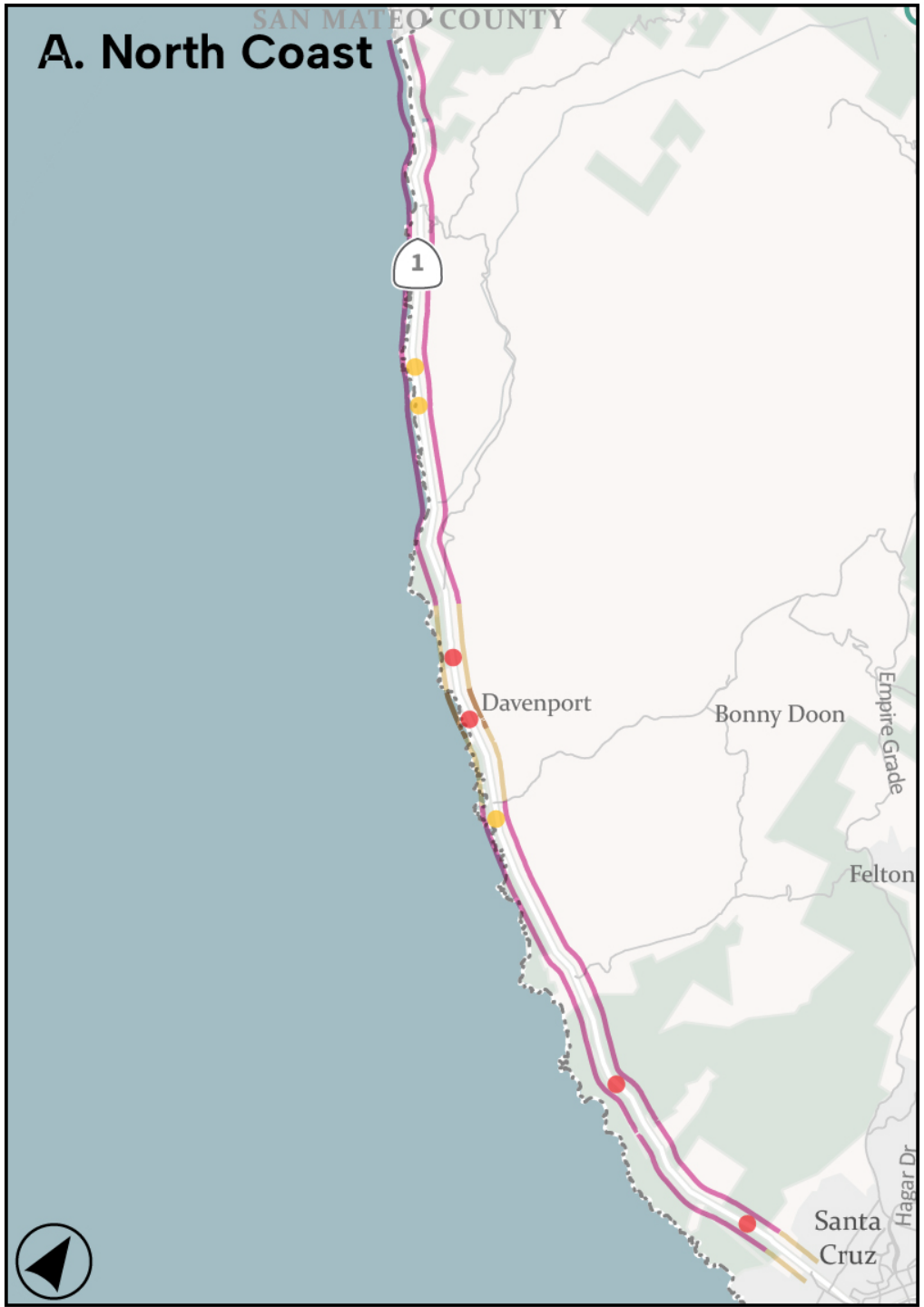


Key considerations:

- Lighting
- Presence of pedestrian facilities
- High pedestrian traffic

Pedestrians at Night



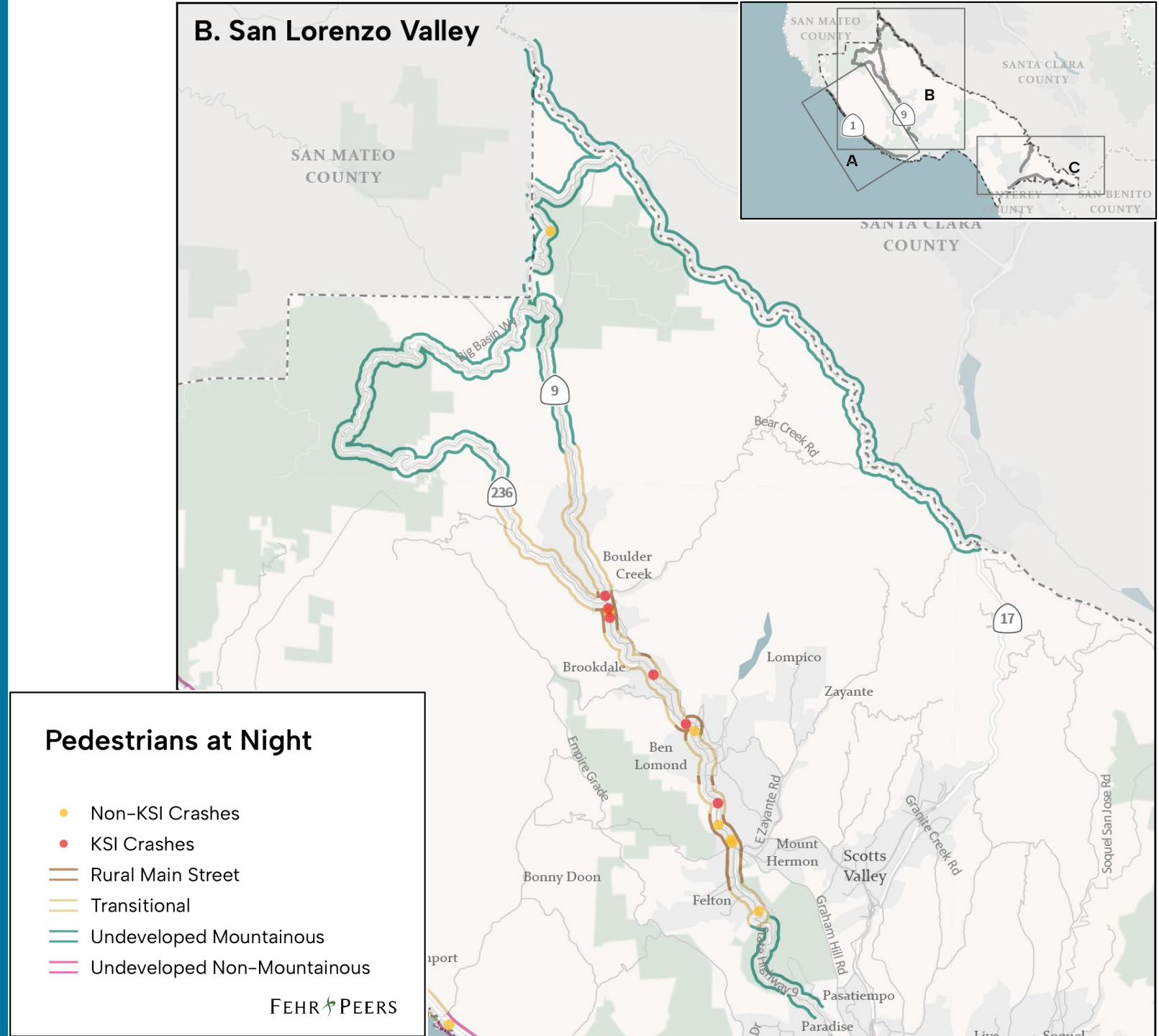


Pedestrians at Night

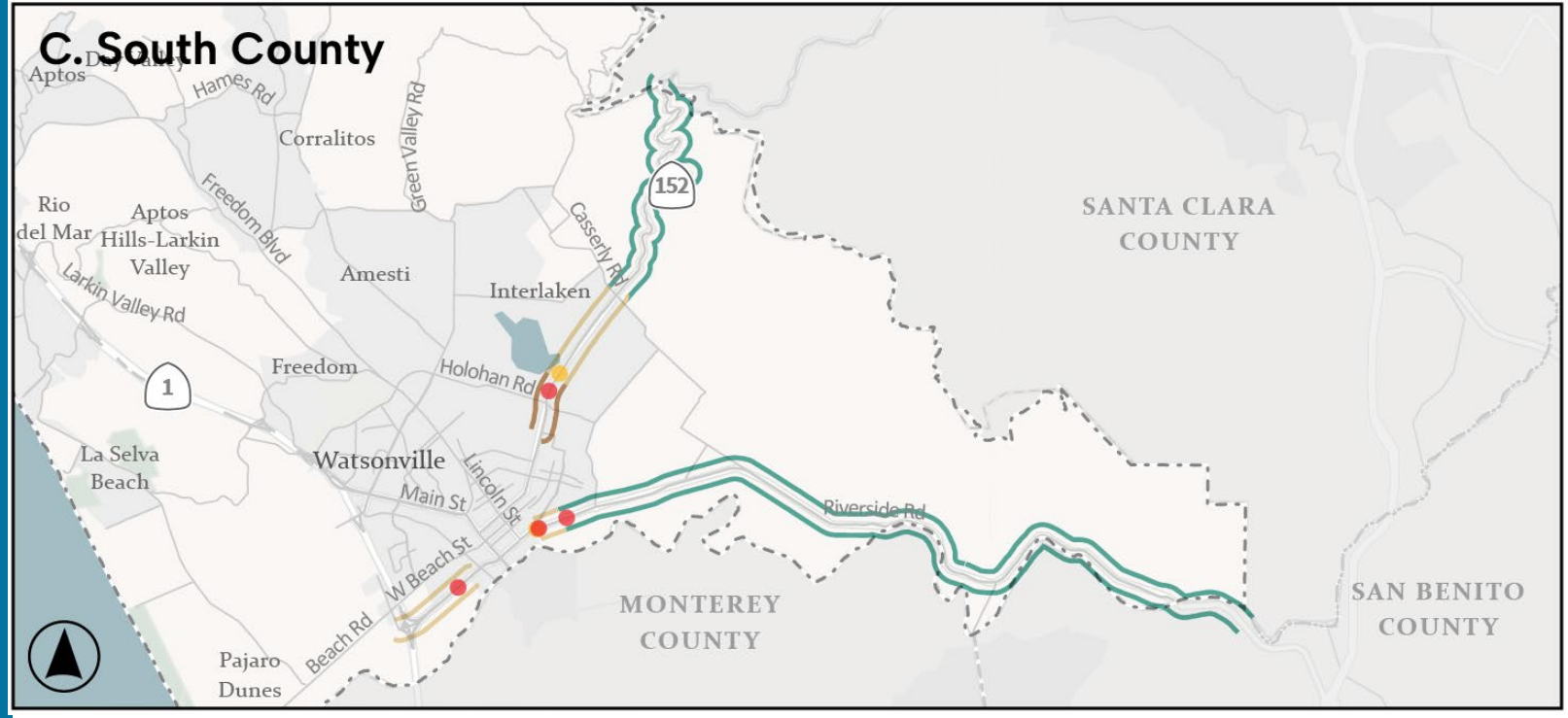
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS

Pedestrians at Night



Pedestrians at Night



Pedestrians at Night

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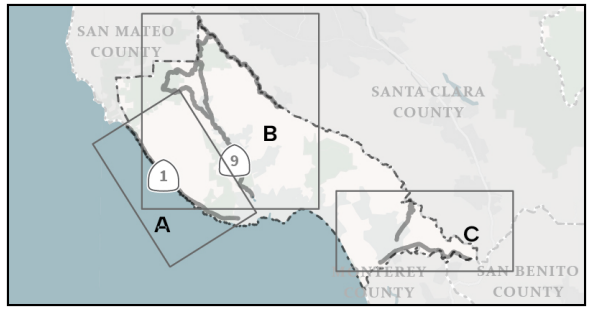
FEHR PEERS



Countermeasures

- Lighting at pedestrian crossings and other areas of high walking demand, potentially including user-activated lighting in undeveloped areas
- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, curb extensions, signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)

Appendix E. Milestone 1 Engagement Summary

Appendix E

Milestone 1 Engagement Summary

Originally Submitted March 2025

RTC and the project team conducted a series of community engagement activities in Fall 2024 as part of the project's existing conditions phase. These efforts were designed to gather input from a broad range of stakeholders and community members for the purposes of safety planning. Participants were asked to provide feedback pertaining to existing conditions, including their own experiences relevant to safety, transportation facilities, and collisions or near-miss incidents on the study corridors. Engagement activities included online tools, committee and stakeholder meetings, and a virtual workshop, which were supported by targeted promotion efforts.

Engagement Activities

This section summarizes the key Milestone 1 engagement activities conducted in Fall 2024.

Project Website: RTC launched a dedicated project webpage to serve as the central hub for project information, updates, and opportunities to provide input.

Online Survey: An online survey and interactive web map tool allowed community members to share feedback on safety concerns and near-miss incidents to help the project team better understand existing conditions and concerns.

Committee Meetings: RTC presented project updates and gathered input at these advisory committee meetings:

- October 8: Elderly & Disabled Transportation Advisory Committee (1:30–3:30 PM)
- October 14: Bicycle Transportation Advisory Committee (6:00–8:00 PM)
- October 17: Interagency Technical Advisory Committee (1:30–3:30 PM)
- December 3: Santa Cruz County Community Traffic Safety Coalition

Stakeholder Meetings: The project team held two stakeholder meetings conducted in a hybrid format, offering both in-person and virtual participation to ensure accessibility and expand participation. RTC leveraged existing contacts, from previous projects, to develop the stakeholder list, with a focus on engaging agency stakeholders, community organizations, and groups serving older adults and people with disabilities.

- October 21: South County Stakeholder Meeting (10:30 AM–12:00 PM) – Watsonville Civic Center. Sixteen stakeholders participated in this meeting.

- October 22: North County Stakeholder Meeting (10:00–11:30 AM) – RTC Office. Fifteen stakeholders participated in this meeting.

Community Workshop: The project team held a virtual community workshop on Wednesday, October 23, from 6:00–7:30 PM to engage the broader public. The workshop provided an overview of the project, opportunities for input, and small-group discussions with participants. Small group discussions were organized around key areas: North Coast (Highway 1), San Lorenzo Valley (Highways 9, 35, and 236), and South County (Highways 129 and 152).

The presentation shared at Committee meetings, stakeholder meetings, and community workshops are included in **Appendix E.**

Advertising and Promotion Strategies: RTC employed a variety of strategies to promote the virtual Community Workshop, online survey, and other engagement opportunities. This approach helped the project team reach a larger audience and collect input from diverse stakeholders and community members early in the planning process.

- Press Release: A press release was issued to local media outlets.
- Email Blasts: Project updates and workshop invitations were sent to RTC maintained email lists.
- Social Media: Information was shared via RTC's social media platforms (e.g., Facebook, X) to reach a wider audience.
- Partner Organizations: RTC collaborated with partner agencies and organizations, encouraging them to share workshop information with their respective communities.
- Flyers: RTC distributed and posted physical flyers throughout the adjacent communities
- All engagement activities were provided with bi-lingual options in Spanish.

Engagement Insights

This section summarizes the community and stakeholder feedback gathered from Milestone 1 engagement activities, organized by study highway. **Figure 16** shows the results of the community web survey including locations of comments and key themes. Statements reflect the opinions and preferences of the participants and have been edited only for flow and readability in this document.

Highway 1

Visitors and Recreation: Maintaining access to recreation is an important goal for the community and Highway 1 is an important recreational asset for cyclists, motorcyclists, and drivers. Understanding visitor patterns will be important to address safety needs, as many users come from outside the community.

Key Destinations and Crossings: High pedestrian activity occurs at Año Nuevo State Park, Moore Creek, Waddell Beach, 3-Mile and 4-Mile Beach, and Big Basin State Park. This activity level may pose safety risks, which are made worse by people parking along both sides of the road. High speeds combined with abrupt slowdowns near parks and beach destinations can lead to a greater risk of unpredictable driver behavior and near-misses. Another key destination mentioned was the City of Santa Cruz Resource Recovery Facility ("the dump") located on Dimeo Lane.

Parking Challenges: Existing parking lots cannot handle days with high visitor demand, which leads to spillover roadside parking and people crossing the street in unmarked areas, especially where

shoulders are narrow (e.g., near 3-Mile Beach). Drivers trying to park frequently stop in travel lanes and may re-enter traffic slowly due to unpaved or unmaintained parking areas, creating a greater chance of conflicts, particularly near beaches and trailheads. The absence of left-turn lanes into parking lots and attractions causes traffic backups and the potential for collisions involving slowing or turning vehicles.

Emergency Response: Clearer roadway naming and improved signage (e.g., for post miles) were suggested for enhanced crash response and water rescue along the North Coast. Additionally, poor cell phone coverage between Red, White, and Blue Beach and 4-Mile Beach can make emergency communication and response more difficult. Davenport residents frequently mentioned hearing sirens responding to crashes.

Davenport: The main pedestrian crossing in Davenport was noted a potential candidate for pedestrian safety improvements, such as a pedestrian hybrid beacon (PHB) or a properly marked crosswalk. Respondents mentioned the area near Cement Plant Road experiences high speeds, poor sight lines, shadows, and difficult left turns, particularly near the four-way intersection at Davenport Landing, where there is also high parking demand.

Cyclist Safety: People have witnessed or heard about crashes involving cyclists, especially near Pigeon Point Lighthouse and rolling stops at Bonny Doon Road. Better separation and parking design was discussed by participants as a potential option to reduce conflicts between bicycles and vehicles.

Potential Improvements: Enhanced infrastructure, such as improved shoulders and enhanced crossings (e.g., rectangular rapid flashing beacons (RRFBs) or PHBs), may help alert drivers to areas with high pedestrian activity. Areas around Año Nuevo, Moore Creek, and Dimeo Lane were cited as areas which could potentially benefit from traffic calming to reduce speeds and improve safety for all road users.

Highway 9

Rural Main Street Concept: People confirmed that Highway 9 should function as a "Rural Main Street" through all San Lorenzo Valley towns to better prioritize access and safety for people walking and biking. The "highway feel" around schools, combined with speeding and a lack of sidewalks or other pedestrian facilities, makes children and other pedestrians feel more exposed to traffic.

Informal Parking: People highlighted safety concerns related to informal parking along Highway 9, similar to Highway 1, with pedestrians crossing back and forth between parked cars. Haphazard parking near Boulder Creek and destinations like the Garden of Eden, can create conflicts between people walking, biking, and driving – including drivers backing up from parking areas into traffic. The idea of a reservation system for parking in high-demand areas, potentially in partnership with state parks, was discussed to enhance safety and manage congestion.

Bus Stops and ADA Access: Many bus stops lack paved pullouts and full ADA access accommodations, creating uncomfortable conditions for riders. Transit stops also generally lack sufficient lighting; respondents suggested improvements could include LED bus stop and crosswalk lighting.

Cyclist Safety: Participants mentioned concerns near mountain bike trails (both legal and illegal), with narrow, winding roads and vehicles often driving on the wrong side of the road to avoid cyclists.

Future projects at former "washout" areas were suggested to incorporate bicycle and pedestrian infrastructure to enhance multimodal safety and access.

Crosswalk Improvements: Some respondents called for crosswalk enhancements in Felton, with a specific request for more RRFBs, particularly near Rite Aid at Hihn Street. People suggested installing a stop sign instead of an RRFB at Forest Street in Boulder Creek as well.

Lighting: Poor lighting was also cited as an issue, especially in Boulder Creek, during early mornings and late night.

Highway 35

Recreational Driving and Speeding: People have observed speeding and reckless driving behavior by car clubs, motorcyclists, and recreational drivers, particularly north and west of Gist Road on Highway 35.

Parking Concerns: People walking from parked cars to state parks along the highway with no sidewalks can result in undesired exposure. The new parking lot at Castle Rock has helped alleviate some parking and pedestrian safety issues.

Highway 129

General Safety Concerns: People shared concerns across all modes on this high-speed roadway. Certain locations along Highway 129, particularly at crossings, were described as undesirable for those walking and biking due to high speeds and limited visibility. People are also concerned about drivers making unauthorized turning maneuvers at large intersections with limited road markings.

Cyclist Concerns: Cycling conditions are challenged by high speeds, truck traffic, and debris on shoulders, limiting usage to experienced cyclists. Farmworkers often commute by bicycle and people expressed a desire for further safety improvements to support this vulnerable user group. One community member spoke about former club bike rides on Highway 129 to Rogge Road that have been discontinued due to past crashes and general safety concerns among club members. The community also expressed a desire for enhanced bike facilities along sections of Highway 129, particularly around the Murphy Crossing Road and San Miguel Canyon Road intersections. Traffic calming measures could also help to moderate speeds and enhance conditions for farmworkers commuting by bike, particularly during dawn and dusk.

Roundabouts: The roundabout on Highway 129 at Lakeview Road has improved the perception of safety and reduced speeds, though some drivers are still adjusting to it. People were interested in whether additional roundabouts may be appropriate on the corridor.

Commercial Truck Collisions: There are concerns about the frequency of commercial truck-involved collisions along Highway 129 and neighboring corridors.

Maintenance and Debris: Road debris, partly due to nearby agricultural uses, were noted as a concern for both cyclists and vehicles.

Specific Locations: People highlighted concerns at the Rogge Lane intersection due to perceived speeding and impatient drivers trying to turn off of Rogge Lane. Murphy Crossing Road, Rogge Lane, and Riverside locations could benefit from additional traffic calming or roundabouts to reduce travel

speeds. Concerns related to poor visibility and tree obstructions were mentioned for the Lee Road and Rogge Lane intersections. People mentioned that conditions and sightlines at Carlton Road improved after intersection modifications, but further improvements could still be feasible.

Highway 152

Cyclist Safety: Highway 152 is generally challenging for bicycling due to the lack of shoulders and blind corners. Some cyclists mentioned avoiding this corridor entirely. Sections with wider shoulders, like on the north side of SR 152, are often used for parking, forcing cyclists into the roadway. Vehicles also park partially on the sidewalk between Bridge Street and Beverly Drive.

Concerns Related to the Fairgrounds: People often mentioned concerns about congestion near the fairgrounds, especially during school hours, flea markets, and events. This can cause drivers to make unpredictable maneuvers (e.g., U-turns, driving on shoulder or wrong side of road), creating potentially hazardous travel conditions. A lack of sufficient parking can cause attendees to park in surrounding areas and walk along or within the roadway, further exacerbating safety concerns for pedestrians and drivers. Travel demand management measures, additional crosswalks, and event traffic management strategies were requested, especially if adjusting the highway cross-section is not feasible. A proposed separated path to the fairgrounds from St. Francis High School and Lakeview Middle School, as well as adjacent park improvements were mentioned as a desired enhancement[1].

Congestion Impacts on Transit: Participants noted that SC Metro and other bus operations are often delayed in this area due to traffic congestion.

Flooding and Evacuation Challenges: loading along Highway 152 was noted as a concern given the need for it to be an effective evacuation route. Participants also mentioned concerns for emergency access and response.

Signage for Trucks: People mentioned that additional or enhanced signage would be beneficial to reinforce the prohibition of trucks over 45 feet on Hecker Pass. Current signs were noted to be lacking in visibility to moving traffic.

Specific locations: Recent improvements at the Holohan Road/College Road intersection with Highway 152 were noted, and people also acknowledged that more work is needed to better connect schools, the fairgrounds, and surrounding areas. People mentioned traffic backups at the Casserly Road/Carlton Road intersection, particularly during peak hours and weekends, causing congestion and delays.

Highway 236

Park Access: While Highway 236 came up less frequently in discussion, at least one person mentioned that campground locations experience increased pedestrian activity, creating potential conflicts with passing vehicles.

[1] This concern may be addressed as a part of the Caltrans Highway 152/Holohan Road Intersection Improvements project which proposes to construct safety improvements for pedestrian and bike access to and from both schools (see **Appendix B**.

General Comments

Other Ongoing Planning Efforts: Both the City of Santa Cruz and the County of Santa Cruz are working on related efforts: a Vision Zero plan in the City and a Local Roadway Safety Plan (LRSP) for unincorporated roads in the County. These plans, and the RHSP, should inform one another to maximize safety improvements and internal consistency. Some had questions about the status of and where to provide input on the Santa Cruz County LRSP.

Distracted Driving: One person mentioned how increased recreational use of Highways 1 and 9 has led to distracted driving and reckless maneuvers. Rumble strips may be considered in these areas.

Narrow Roadways: Participants noted that many areas have no shoulders, forcing cars to cross the double yellow line and drive on the wrong side of the road to pass cyclists.

ADA Access: Wheelchair users reported difficulties accessing crosswalk buttons, often needing to stand up to activate them. ADA accessibility needs to be improved across the corridor, especially where local roadways intersect with state highways.

Cell Service and Call Boxes: Participants requested enhanced communications infrastructure, including better cell service, to support emergency response to incidents on Highways 1, 9, and 129. Call boxes remain necessary due to poor cell coverage on these routes.

Potential Improvements: Some suggested that dedicated bike lanes should be implemented along all highways to improve safety and access. Others were interested in prioritizing concrete and hardscape solutions over signage and striping enhancements for long-term safety improvements. Some pointed to updates to driver education programs that may be needed to improve understanding of proper passing laws, sight lines, and the three-foot rule for cyclists.

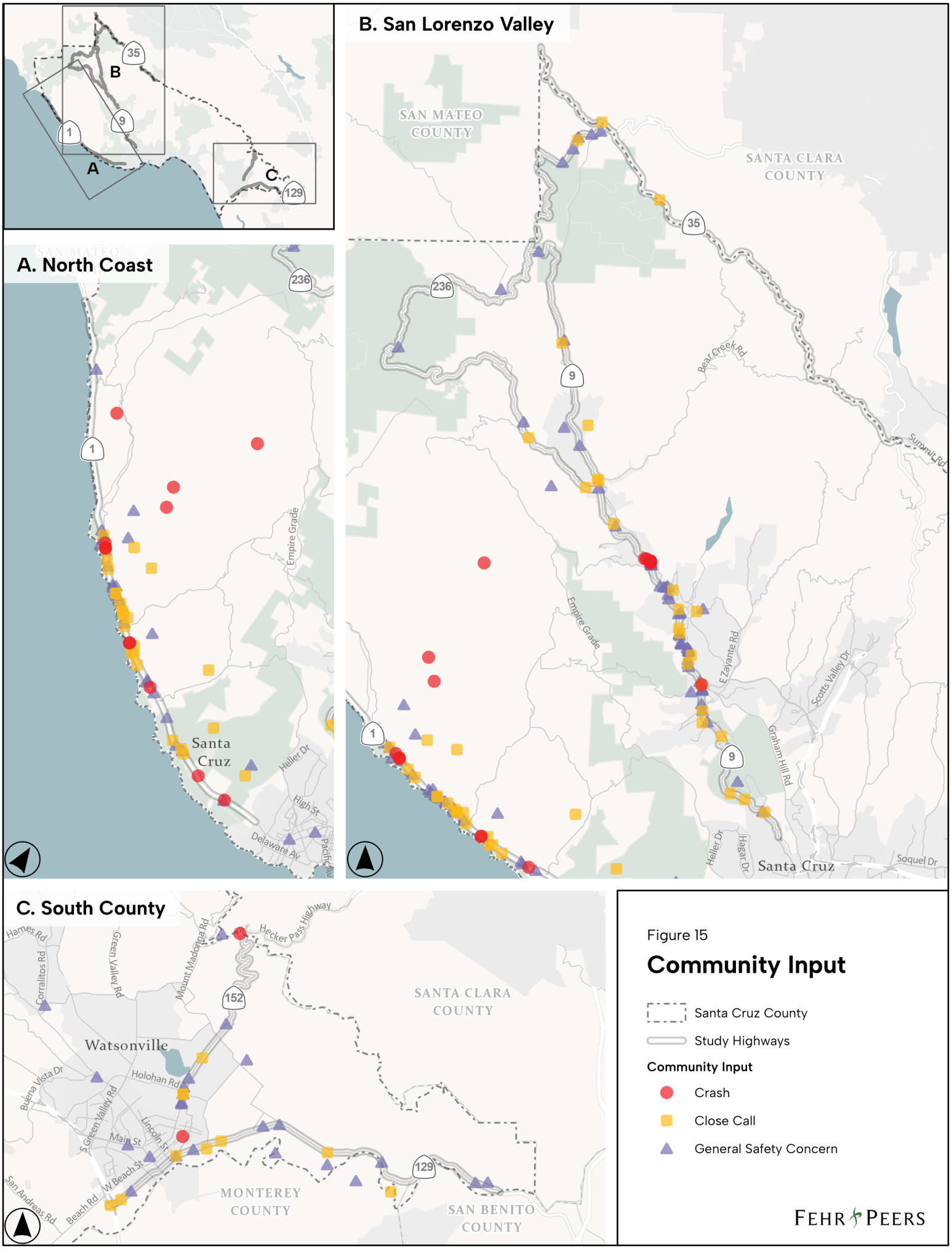


Figure 15

Community Input

- Santa Cruz County
- Study Highways

Community Input

- Crash
- Close Call
- General Safety Concern

FEHR PEERS

Rural Highways Safety Plan (RHSP)

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

Meeting Goals

Introduce the Rural Highways Safety Plan

Share the Vision, Goals, and Objectives

Receive input from you on your observations and experiences

RTC and Caltrans are committed to eliminating traffic fatalities and serious injuries on conventional State Highways in unincorporated Santa Cruz County by 2050 through the implementation of holistic Safe System Approach strategies.

Project Purpose

- ✓ Need for updated safety plan that proactively addresses safety issues in the County
  - ✓ Meets federal and state funding requirements
  - ✓ Builds on planned and constructed improvements from Highway 9/ San Lorenzo Valley Complete Streets Plan
  - ✓ Addresses rural highways that function as main streets
  - ✓ Supports other regional air quality, equity, mode share, and land use goals

This plan serves as a road map to achieve Vision Zero

Project Scope

Milestone 1: Vision & Objectives

July 2024 – October 2024

Milestone 2: Strategy Development

October 2024 – May 2025

Milestone 3: Rural Highways Safety Plan

March 2025 – November 2025

Study Corridors

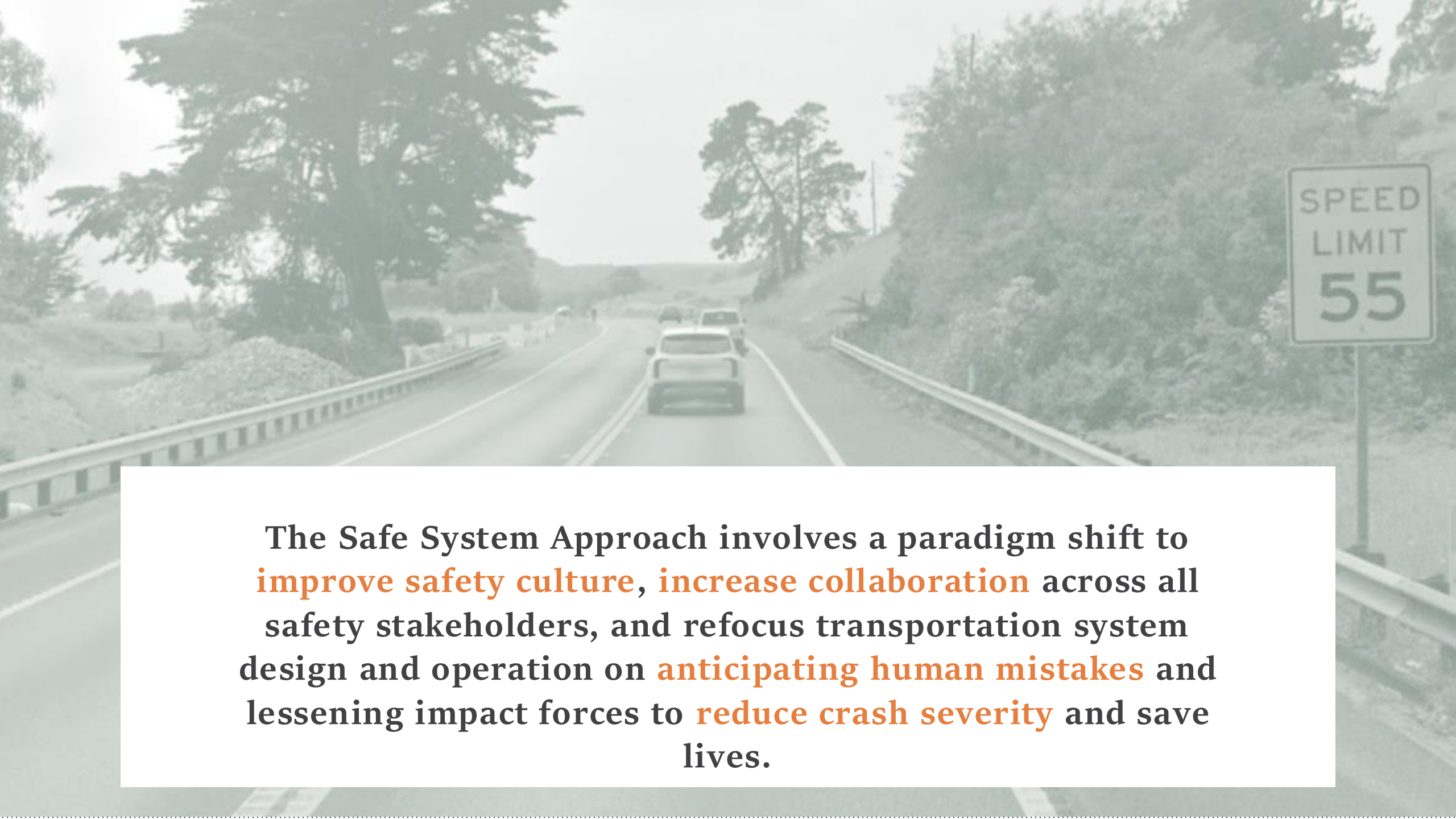
- Hwy 1 north of the City of Santa Cruz
- Hwy 9 north of the City of Santa Cruz
- Hwy 35
- Hwy 129 outside the City of Watsonville
- Hwy 152 outside the City of Watsonville
- Hwy 236

State-level safety planning has been determined to not be detailed enough to meet federal safety funding requirements. Cities have completed or are updating their own Comprehensive Safety Action Plans. The RHSP fills a gap in Santa Cruz County's ability to access federal safety enhancement funding.

Ongoing Related Work

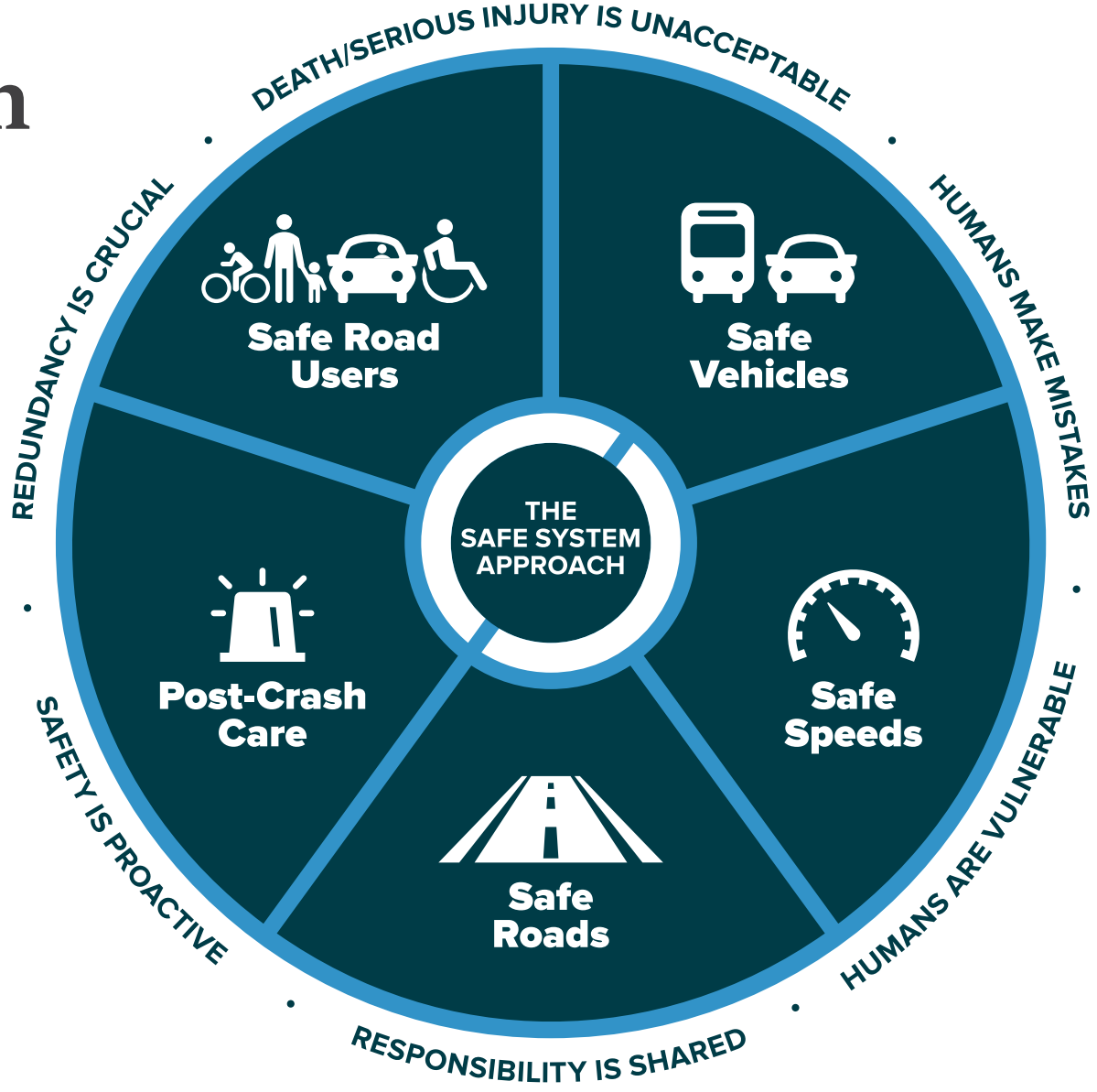
Ongoing Related Work

Safe System Approach



The Safe System Approach involves a paradigm shift to improve safety culture, increase collaboration across all safety stakeholders, and refocus transportation system design and operation on anticipating human mistakes and lessening impact forces to reduce crash severity and save lives.

Safe System Approach



6 Safe System Elements

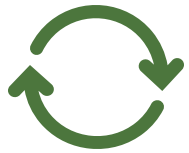
Death/serious injury is unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

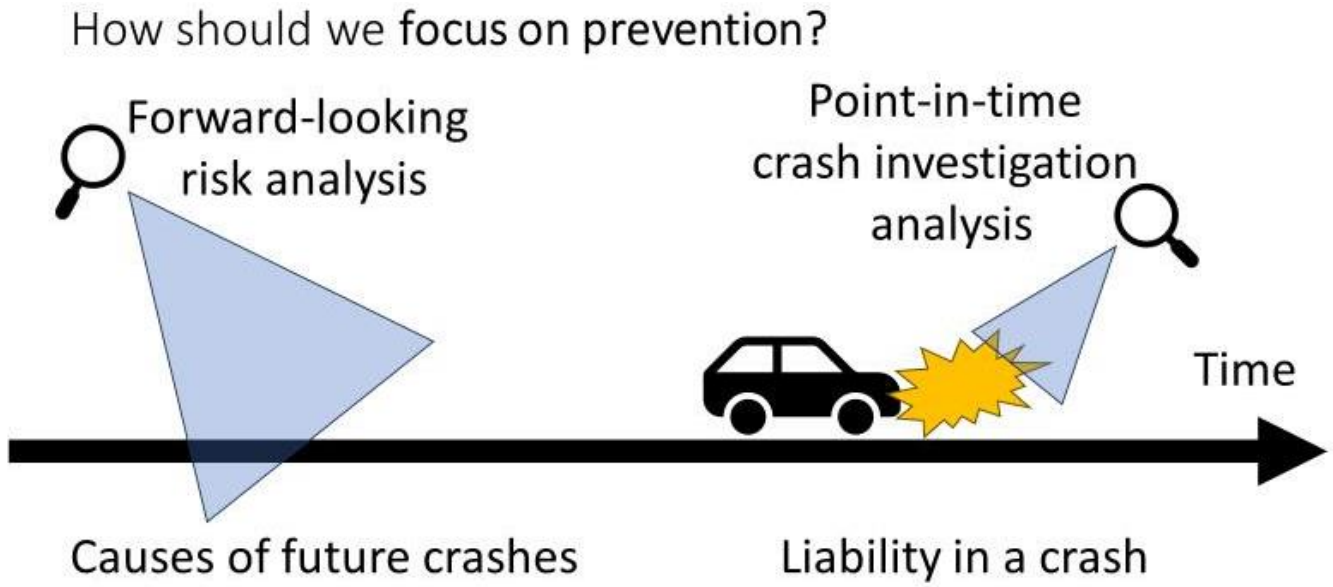


Redundancy is crucial

The 'W's of Safety

Extending the crash timeline to understand root causes

- ✓Who is involved in the crash?
- ✓What are the conditions of the crash?
- ✓Where does the crash occur?
- ✓When does the crash occur?
- ✓Why does the crash occur?
- ✓How does the crash happen?
- ✓Which policies led to the crash?



Adapted from Hauer, E. (2016). An exemplum and its road safety morals. *Accident Analysis & Prevention*, 94, 168-179.

Safe Systems Pyramid

Source: Ederer, et al

Risk Assessment

Crash Exposure

Where people are/ want to be traveling

Crash Likelihood

How travelers “conflict” with other travelers and system elements

Crash Severity

The injury potential if that conflict becomes a crash (mass, speed, angle)

Vision, Goals, Objectives

Goals

The RHSP goals support the vision by striving to reduce crashes that result in traffic fatalities and serious injuries as well as focusing on a collaborative approach to issue identification and strategy deployment.

Goal 1: Commit to Vision Zero

Goal 2: Advance Partnerships and Collaboration

Goal 3: Prioritize Equity and Engagement

Goal 4: Ensure Future Funding

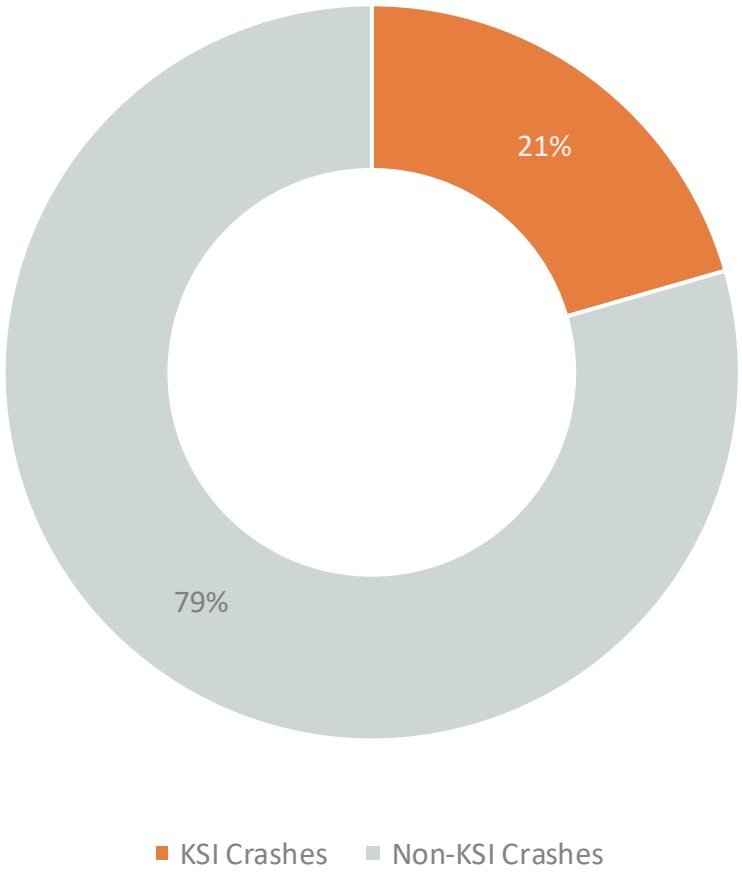
Safety Landscape

Risk Factors

- ✓Lack of alternative transportation options
- ✓High truck volumes
- ✓Mountainous roads with lower visibility
- ✓Lack of pedestrian and bicycle facilities – no separation in space and time
- ✓High vehicle speeds

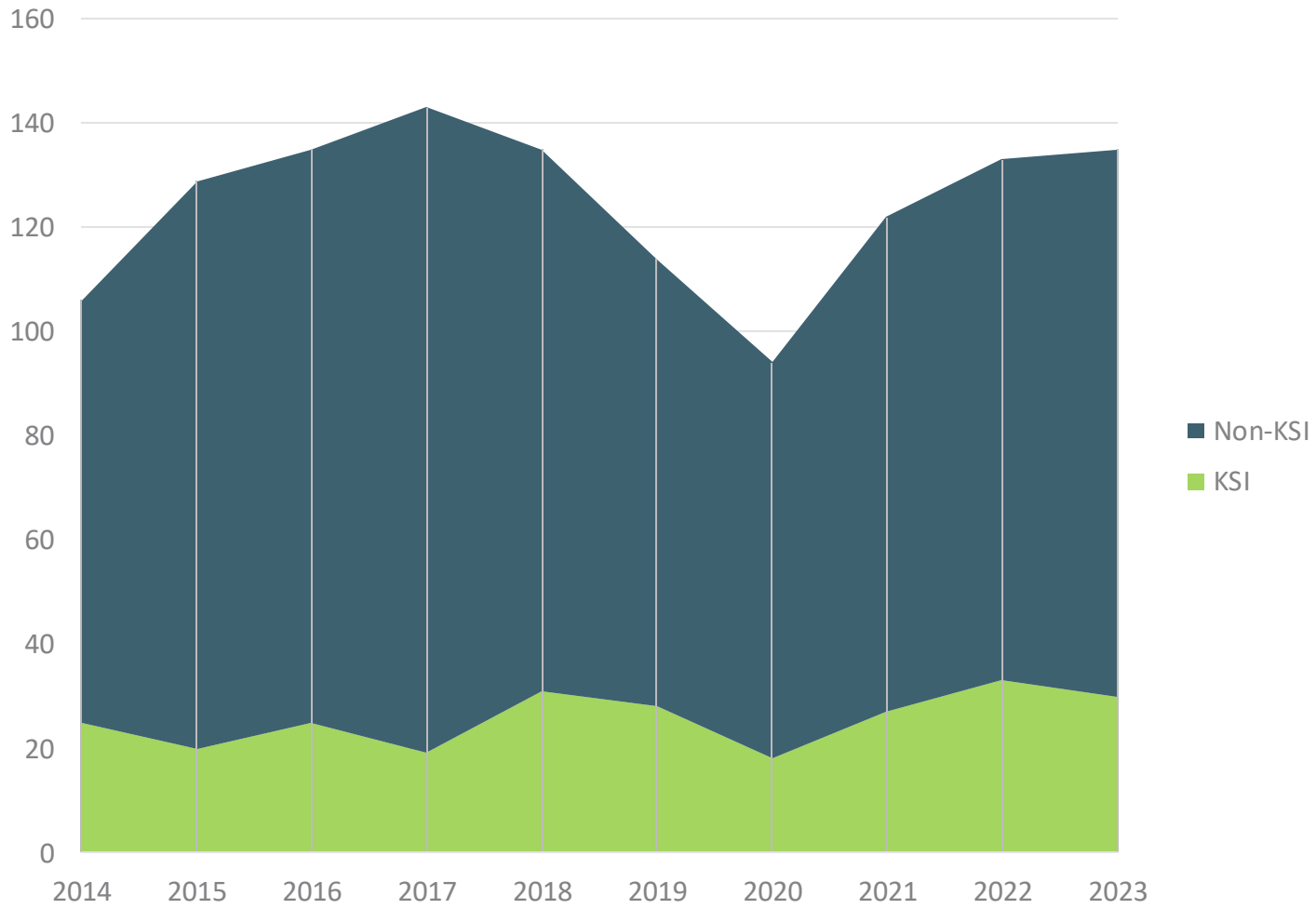
Eliminate Crashes Resulting in Killed and Severe Injuries (KSI)

RHSP will prioritize high risk locations to eliminate KSIs



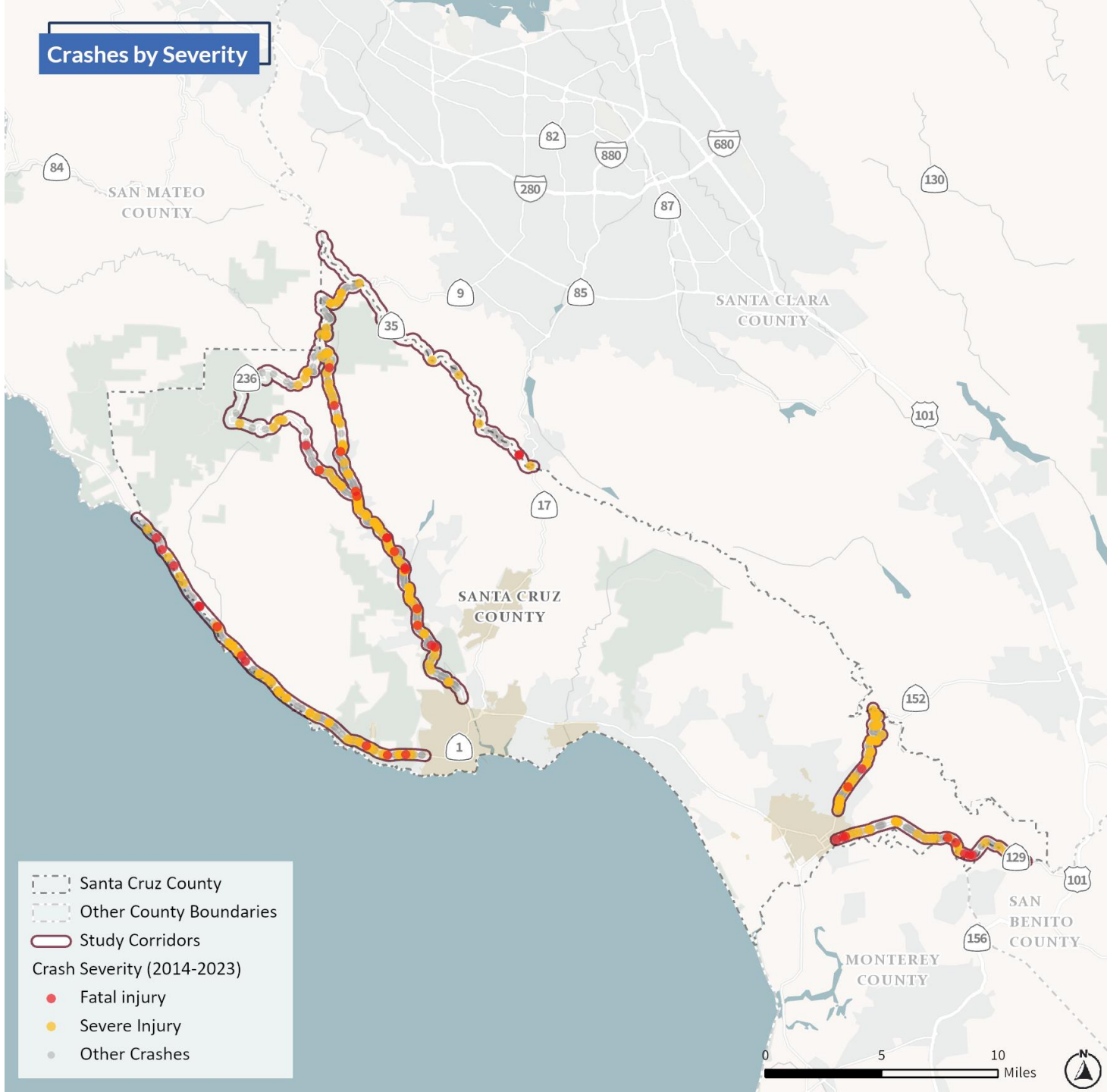
Crashes Remain Consistent Over 10 Years

- ✓Reported crashes remained relatively consistent pre-COVID with a peak in 2017
- ✓Post 2017, crashes were on a downward directory but have rebounded after COVID



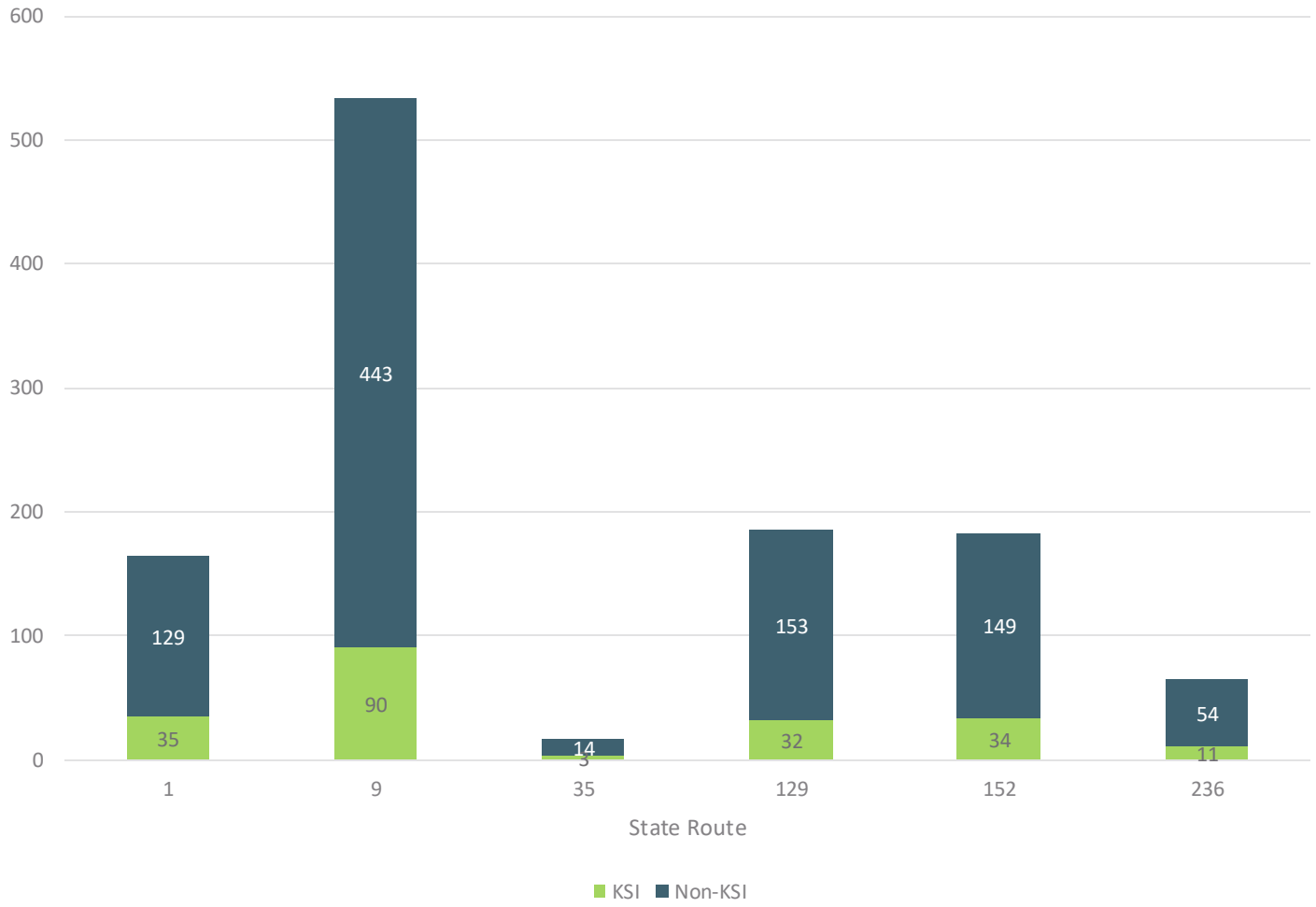
Crashes By Severity

- ✓Reported KSI crashes are concentrated in more developed areas



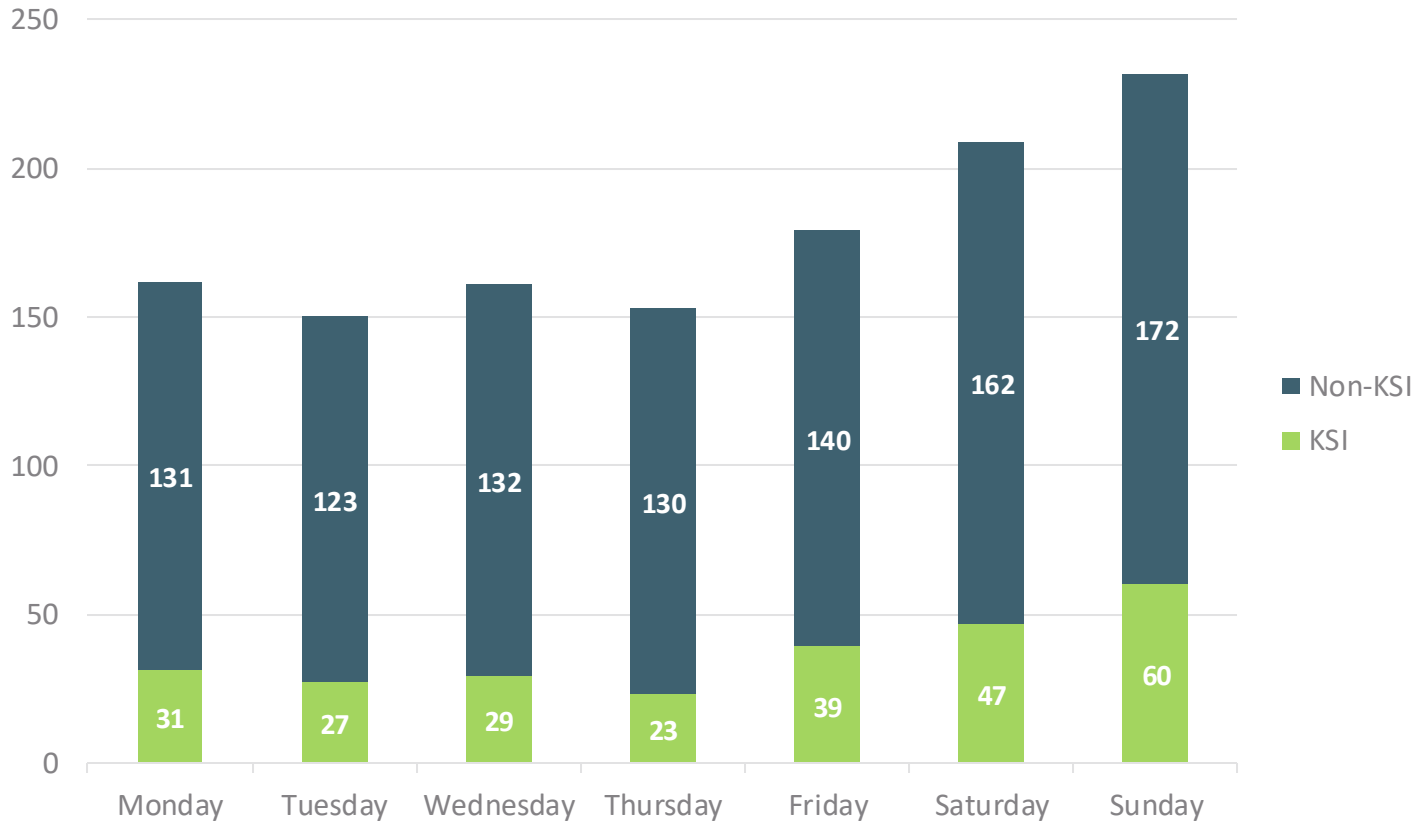
Crashes By State Route

- ✓Highway 9 has the highest proportion of crashes
- ✓Highways 1, 129, and 152 all have around 35 KSIs
- ✓Highway 1 has highest percent of KSIs compared to total injury crashes (21%)
    - ✓Generally, across all corridors, about 20% of all crashes are KSIs



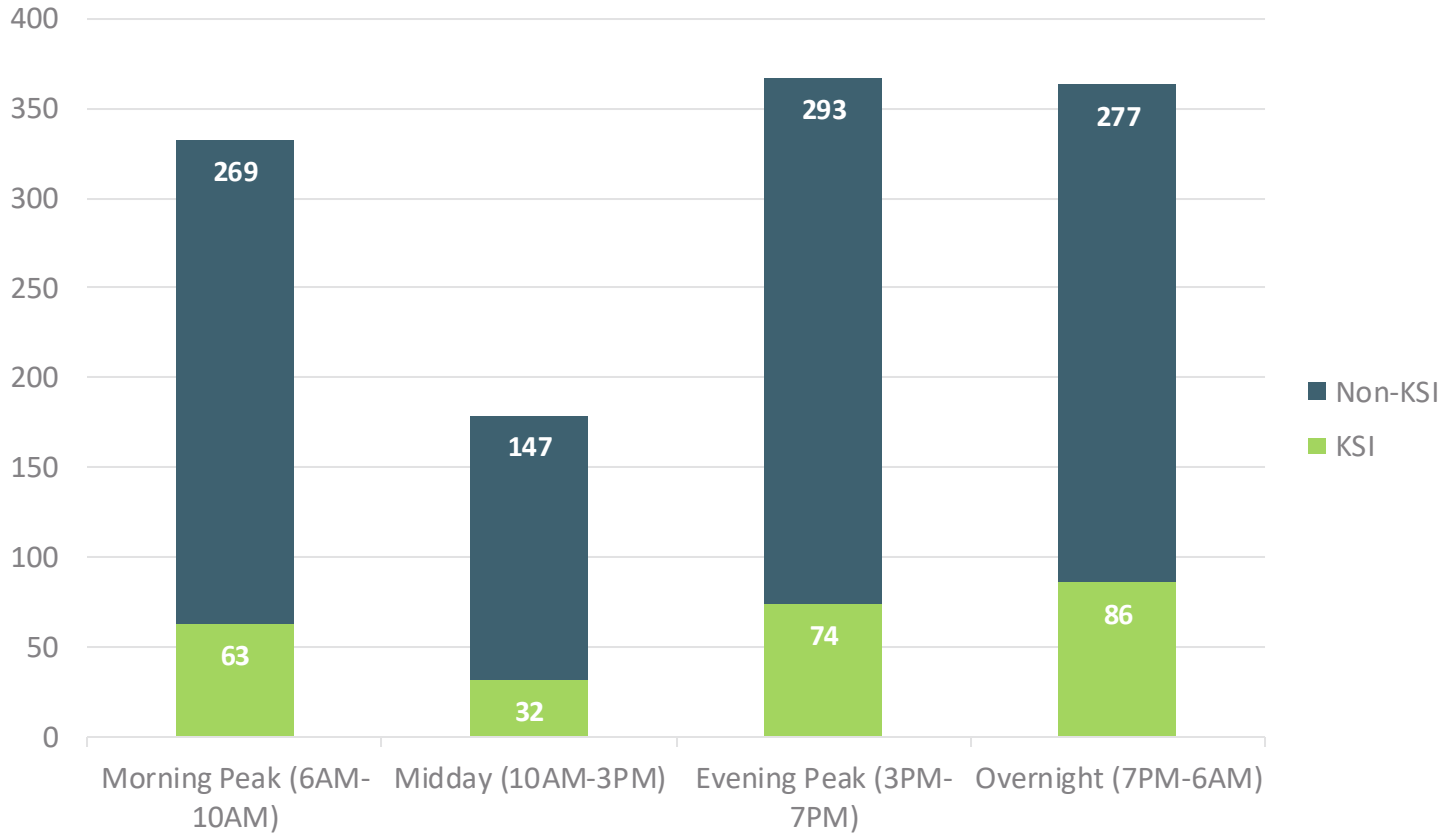
Crashes by Day of Week

- ✓Crashes are higher on weekends, consistent with travel patterns on these corridors
- ✓Reduce crash exposure through travel demand management and land use factors



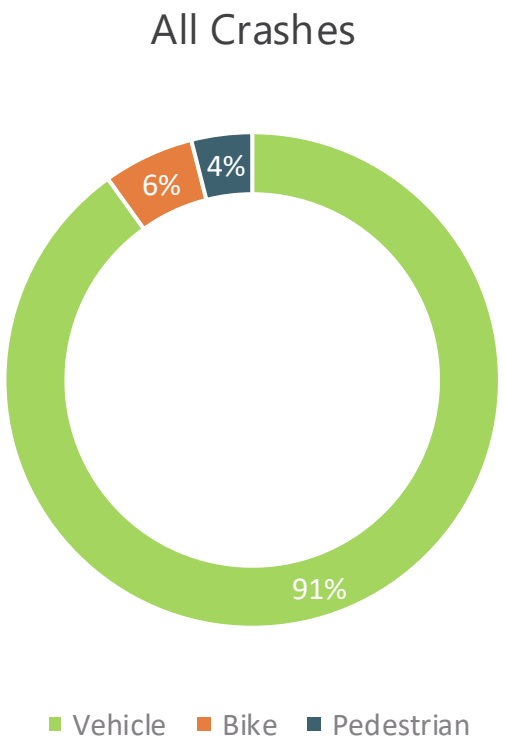
Crashes By Time of Day

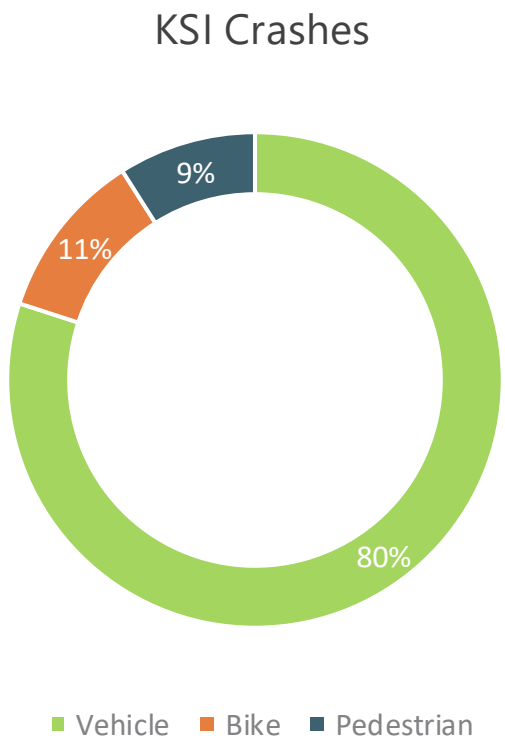
✓Improve facilities and infrastructure reduce KSIs in the evening and early morning



Crashes By Mode

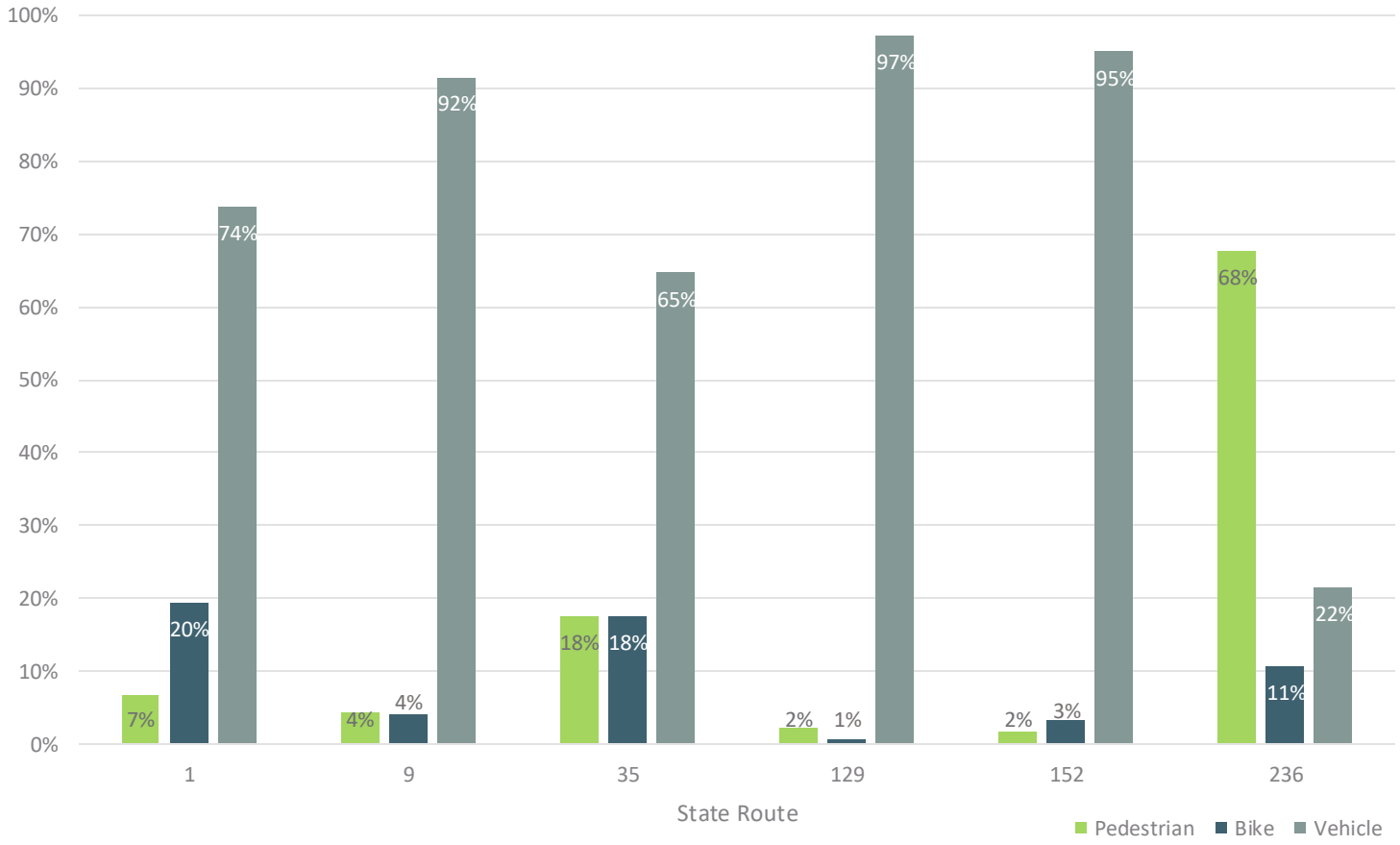
- ✓Pedestrians and bicyclists are over-represented in KSI crashes
- ✓Humans are vulnerable





Crashes By Mode on State Routes

✓Pedestrians and bicyclists range from
<10% of crashes on Highway 9 to
>75% of crashes on Highway 236

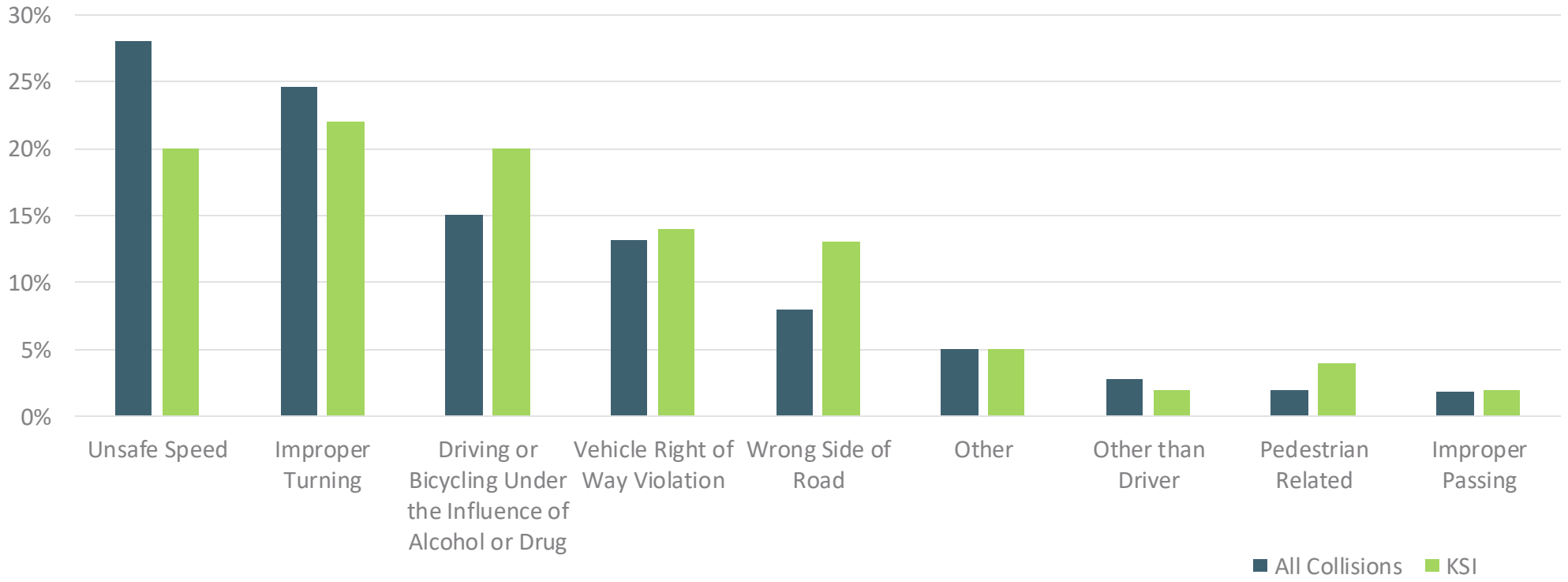


Crashes By Mode

- ✓Pedestrian and bicycle crashes are dispersed across Highway 1 and Highway 9 fairly evenly but tend to be more concentrated in more populated areas, including near Watsonville

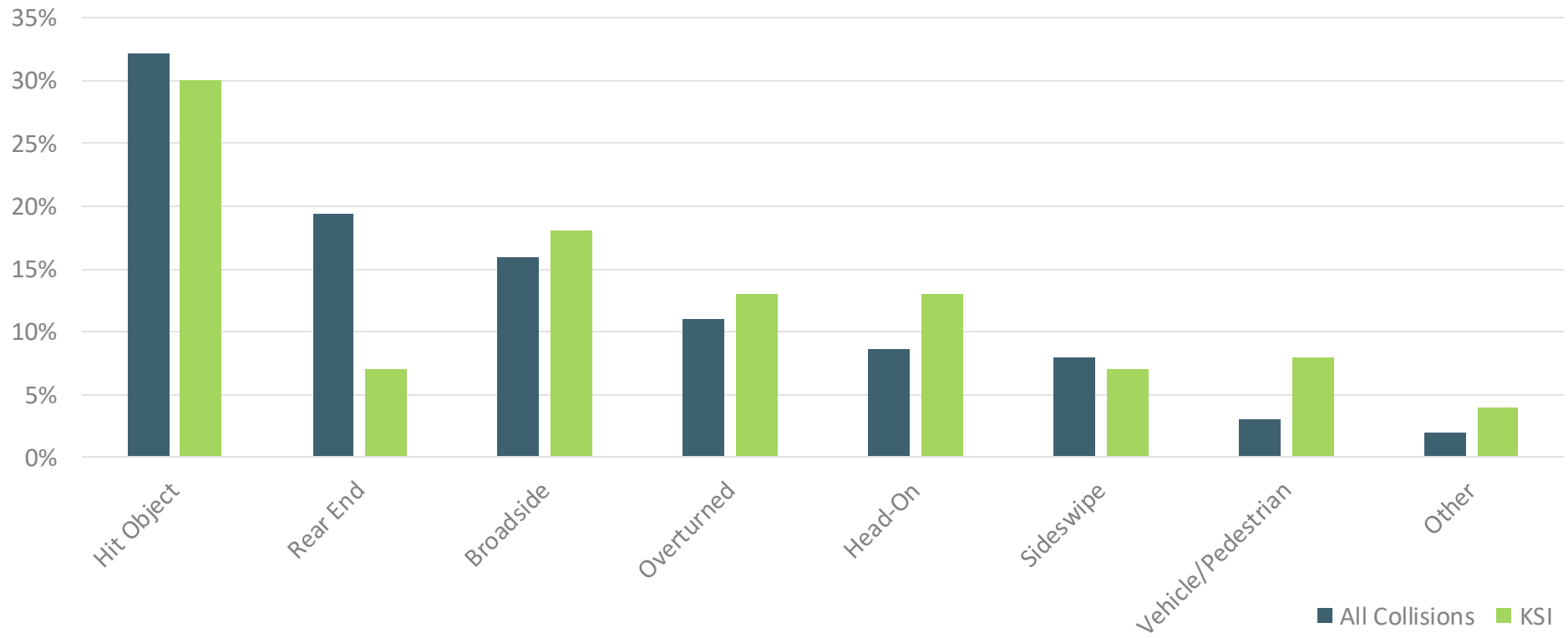
Crashes By Primary Collision Factor (PCF)

- ✓Speed, turning, and DUIs highlight the significance of kinetic energy on humans (higher kinetic energy results in more severe crash outcome)



Crashes By Crash Type

- ✓KSIs are highest from broadside, overturned, head-on, and vehicle/pedestrian crashes as a result of the higher transfer of kinetic energy
- ✓Highlights the importance of reducing conflict points



Thank you

Brianna Goodman

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Use the QR code to visit the project website for more information and to access the online survey!

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Appendix F. Milestone 2 Engagement Summary

Appendix F

Milestone 2 Engagement Summary

Originally Submitted September 2025

RTC and the project team conducted a second round of community engagement activities in the spring and summer of 2025 as part of the crash profiles and potential improvements phase (Milestone 2). These activities built on the Fall 2024 existing conditions input and provided community members and stakeholders the chance to review, react to, and refine the identified crash profiles and potential safety improvements for the study corridors. Participants were invited to review and share input on:

- Crash trends and safety concerns
- Potential safety enhancements
- Identified priority project locations and additional potential risk factors

Engagement activities included in-person workshops, online surveys, committee meetings, and targeted stakeholder discussions, supported by an outreach campaign to reach a broad and diverse audience.

Engagement Activities

This section summarizes the key Milestone 2 engagement activities conducted between April and August 2025.

Project Website Updates
RTC maintained and updated the dedicated project webpage with new materials, including a presentation summarizing the crash profiles and improvement ideas, event announcements, and opportunities for feedback.

Online Engagement Tools
An online survey and interactive mapping tool were used to collect input on the crash profiles, potential safety treatments, and priority areas for improvements. The survey was open from June 18 through August 14 and received 203 responses.

Technical Advisory Committee (TAC) Meetings
RTC provided project updates and received input at the following advisory committee meetings:

- May 6, 2025 – Watsonville Vision Zero Taskforce
- May 13, 2025 – Elderly & Disabled Transportation Advisory Committee

- May 15, 2025 – Interagency Technical Advisory Committee
- May 19, 2025 – Bicycle Transportation Advisory Committee
- June 3, 2025 – Santa Cruz County Traffic Safety Coalition
- July 1, 2025 – Watsonville Vision Zero Taskforce
- August 5, 2025 – Santa Cruz County Traffic Safety Coalition

Stakeholder Meetings
The project team hosted three targeted stakeholder sessions with agencies, community organizations, and groups serving vulnerable populations. Each meeting focused on a different part of the county in a hybrid meeting format to ensure accessibility and broaden participation.

- **North Coast (Highway 1)** – April 28, 2025, 3:30–5:30 PM, Pacific Elementary School, Davenport. *15 participants.* (Combined meeting with North Coast Transportation Demand Management Plan.)
- **South County (Highways 129 & 152)** – April 29, 2025, 10:30 AM–12:00 PM, Watsonville Public Library. *10 participants.*
- **San Lorenzo Valley (Highways 9, 35 & 236)** – April 30, 2025, 10:30 AM–12:00 PM, Felton Community Hall. *6 participants.*

Community Workshops / Open Houses
Two community workshops were held in Felton and Watsonville on May 20 and 21, respectively. Each included a brief presentation that covered a project overview, crash profiles, potential countermeasures, and draft priority project locations. Participants engaged with project team members, maps, and posters to provide detailed feedback on the crash profiles, potential countermeasures, and priority project locations.

- **North County Workshop** – May 20, 2025, 6:00–7:30 PM, Felton Community Hall. *40+ participants.*
- **South County Workshop** – May 21, 2025, 6:00–7:30 PM, Watsonville Civic Plaza Community Room. *10+ participants.*

Advertising and Promotion Strategies
RTC promoted workshops and online engagement through:

- Press release to local media
- Email blasts to RTC project interest lists and partner organizations
- Social media posts (Facebook, NextDoor, X, etc.)
- Flyering at community centers, schools, libraries, farmer's markets, churches, and other community hubs
- Bilingual English/Spanish translation at South County workshop

Supplemental Community Outreach Meetings Summary

In addition to the activities described above, RTC staff conducted meetings with school administrators from St. Francis High School and Lakeview Middle School, Santa Cruz County Fairgrounds management, Watsonville city staff, and community and business associations in Boulder Creek, Ben Lomond, and Davenport. These meetings were conducted to secure on-the-ground and lived experience at the identified priority project locations before drafting concepts. Through these

meetings, the main concerns mentioned included unsafe student drop off and crossing behaviors at schools along SR 152, inadequate school zone signage and traffic calming measures, congestion and safety Concerns during major events at the Fairgrounds, complex intersection conflicts at SR 129/Blackburn Street/Bridge Street, and speeding traffic through downtown areas, especially along SR 1 and SR 9. Key recommendations that emerged included:

- Installing overhead mast arms with flashing lights at school zones
- Adding designated student drop-off areas
- Implementing rectangular rapid flashing beacons (RRFBs) at key pedestrian crossings
- Narrowing travel lanes with curb extensions to calm traffic
- Establishing better multimodal connections, including sidewalks, bike lanes, and additional and enhanced crosswalks in town centers
- Modifying the built environment to correct unsafe driver behavior, including problematic parking, improper turning, and speeding
- Gateway treatments for downtown areas
- Tree removal when needed to create dedicated bicycle and pedestrian space

The meetings also revealed strong community support for transportation demand management strategies such as discounted transit fares and secure bike parking at the Fairgrounds, requests for improved lighting at intersections and crosswalks, and the need for better coordination between state highway improvements and local street connections. Several communities referenced the SR 9 Complete Streets Plan approved in 2019, with some expressing frustration over implementation delays since Measure D's passage in 2016, while others appreciated progress on environmental and design phases currently underway. Stakeholders consistently emphasized that safety improvements should prioritize pedestrian and bicycle access over vehicle throughput, particularly in school zones and downtown business districts where walkability is essential for economic vitality and community connectivity.

Engagement Insights

This section summarizes the feedback gathered during Milestone 2 engagement activities, namely the stakeholder meetings and community workshops. Participant input is organized by crash profile, potential countermeasures, and priority project locations. Statements reflect the personal opinions and preferences of participants only and have been edited for clarity.

Crash Profiles

At the workshops and stakeholder meetings, participants reviewed eight crash profiles developed by the project team to illustrate common crash patterns on study highways. Participants were asked whether these profiles reflected their own experiences and to identify other locations where similar issues occur. Feedback largely confirmed the relevance of these profiles and provided location-specific examples across both North and South County. While some people made comments on a profile that were not necessarily related to the profile, this summary attempts to organize feedback by profile and also document some comments that may be partially outside the scope of this study (e.g., on a nearby street) for documentation purposes.

Profile 1: Excessive Speed

Participants broadly confirmed that excessive speed is a major safety concern across multiple corridors. Feedback highlighted both persistent patterns (e.g., recreational racing culture, undesirable passing) and location-specific issues. Specific locations where this crash profile was observed include:

- State Route (SR) 1, 9, and SR 35
    - Racing/ "sideshow" culture, especially on straightaways, curves, and mountainous areas.
    - Frequent references of speeding through San Lorenzo Valley (SLV) town centers (e.g., Brookdale, Ben Lomond, Felton), especially when trying to "make lights" or not slowing at crossings/community hubs.
- SR 129
    - Near Lee Road and coming into town despite the new roundabout.
    - Highway 152
    - Near College Road, Interlaken area, and schools and churches in the area.

Participants expressed a desire for increased traffic calming measures and increased California Highway Patrol (CHP) speed enforcement in transition zones. Participants also suggested near-term improvements (e.g., roundabouts and "quick build" strategies) alongside longer-term projects. Many participants also expressed support for equitable speed camera enforcement strategies.

Profile 2: Pedestrian Crashes

Participants emphasized the safety concerns related to pedestrians along highways and through town centers, particularly where marked crossings are missing, poorly marked, or poorly lit. Specific locations highlighted include:

- SR 1
    - Crossing SR 1 to access beaches or parking areas along the North Coast. A request for more beachside parking or crossing improvements if parking is on other side of the street.
- SR 9
    - Crossings in Boulder Creek and Ben Lomond (e.g., at Mountain Street, Forest St, and intersection of SR9/SR236 in Boulder Creek; Hillside Avenue, Willowbrook Avenue, and Fillmore Avenue in Ben Lomond; and at downtown midblock crossing and Kirby Street in Felton).
    - Crossings near schools where students and youth are present (e.g., near Redwood Elementary, Glen Arbor to the SLV Schools Campus, Henry Cowell State Park, Camp Campbell, and Camp Harmon).
    - Sidewalk extensions, improvements, or at least shoulder maintenance, in Boulder Creek south of Bear Creek Road.
- Both SR 9 and SR 236
    - School bus stops (often unmarked, unlit, or informal).

Across locations, participants suggested Rectangular Rapid Flashing Beacons (RRFBs), bulb-outs, improved striping, ADA-accessible bus stop landings with shelters and lighting, as well as better pedestrian-scale lighting, parking, and shoulder maintenance. Participants recommended consistent crossing treatments (RRFBs and Pedestrian Hybrid Beacons (PHBs)) across corridors to improve driver awareness and suggested interim measures such as handheld crossing flags.

Profile 3: Turns on Transitional Streets

Participants generally agreed with the crash profile analysis that areas where highways transition into Main Streets in towns or intersect with other major local roads, present concerns. They cited poor visibility, high speeds, and conflicting turning movements at specific locations including:

- SR 1
    - Coastal parking lots where cars pull in and out unexpectedly.
- SR 9
    - Observed poor sight lines and sudden stops leading to turning and rear-end conflicts at Garahan Park, Bear Creek Road, Glen Arbor Road, Irwin Way, Willowbrook Drive, and Scenic Road.
    - Informal recreational visitor roadside parking near Garden of Eden and Rincon in Henry Cowell State Park affect site distance and is correlated with unexpected stops and starts.
- SR 129
    - Agricultural workers face challenges turning left (e.g., Thompson Road, Kelly Farms), often using hazard lights.
    - Some participants viewed curb extensions as hazardous for bicyclists and large trucks.
- Highway 152
    - High speeds on South Green Valley Road section of 152 near city limits make turning movements feel unsafe.
    - Turning conflict issues in front of Lakeview and St. Francis Schools and unsafe maneuvers during student drop-off.

Participants suggested increased CHP presence and equitable speed cameras to manage turning behavior. Additionally, some expressed a preference for signalized access and better visibility at intersections.

Profile 4: Weekend Driving on Undeveloped Non-Mountainous Roads

While feedback on this profile was more limited due to it primarily occurring on Highway 1 only, participants broadly confirmed the profile and added observed high vehicle speeds and undesirable passing movements as contributing factors. They added other locations where this crash profile was observed in addition to Non-Mountainous Roads including:

- SR 1
    - Throughout the North Coast where many people make unexpected turning maneuvers pulling in or out of informal parking areas.

    - Large speed differentials between vehicles passing through and those seeking to park in unpaved lots, often with deep potholes at the edge of the road. Primarily at popular informal beach parking lots but can occur throughout the project area.
    - Poor sight lines for vehicles entering from Cement Plant Road, especially northbound.
- SR 9
    - Observed speeding, recreational racing,and illegal passing on straightaways near schools, camps (Camp Harmon, Camp Campbell), and wildlife crossings.
    - Unpredictable driver behavior from visitors accessing state parks, Felton RV parks, and other weekend destinations.
- SR 152
    - Event-related congestion near the Santa Cruz County Fairgrounds ("Fairgrounds") and traffic to Mount Madonna/Gilroy contribute to undesirable driving behavior.

Profile 5: DUIs on Undeveloped Mountainous Roads

While feedback on this profile was more limited, participants confirmed the profile and highlighted ongoing concerns with impaired driving on winding mountain roads at the specific locations including:

- SR 9
    - Concerns about racers drinking at Vista Point /overlook, Redwood Elementary.
    - Concerns near bars such as Jack's in Boulder Creek.
- SR 152
    - Participants note frequent gatherings at scenic overlooks (e.g., Old Mt. Madonna Inn) involving drinking and sunset viewing, raising DUI potential crash risks.

Many local residents asked for data on how many DUIs were drivers who did not live locally, but such information is not captured in crash data. Participants also noted that there is low coverage or availability of transportation network companies such as Uber and Lyft in remote areas such as the San Lorenzo Valley, which limits them as effective measures to address DUIs.

Profile 6: Bicyclists on Narrow Roads

Participants confirmed challenges faced by people biking on narrow, winding roads with limited or poorly maintained shoulders:

- SR 1
    - Lack of separated bike facilities and narrow shoulders north of Cement Plant Road.
    - Lack of bicycle connections between Davenport and New Town neighborhood to the north
- SR 9
    - Narrow lanes due to limited right-of-way constrained by cliffs and trees, and poorly maintained or repaved shoulders (often forcing bicyclists into travel lanes) were key concerns. Hotspots included Twin Bridges, curve north of El Solyo Heights, and segments just north and south of downtown Felton.
    - Some supported tree removal to widen space for bicyclists.

- SR 129
    - "Dicey" cycling conditions due to heavy truck traffic, shoulder parking, and debris buildup (e.g., near Lee Road and Thompson Road); suitable for only experienced bicyclists.
- SR 152
    - Undesirable conditions near College Road and the county border, e.g., debris and maintenance needs.
    - Bicyclists discussed facing turning challenges in the shoulder on SR 1 and SR 152 due to rumble strips.
- Locations outside of study area
    - Freedom Boulevard and connecting roads (e.g., Browns Valley, Hazel Dell, Green Valley, Carlton, Whiting) are regularly used for group bicycle rides. Narrow widths cause vehicle backups and unsafe passing.

RTC committee members emphasized the need for bicycle facilities that provide physical separation on rural segments over 55 mph, beyond shoulders. The RTC Bike TAC also questioned different treatments for recreational vs. transportation bicycling and stressed designing for potential riders, not just current ones.

Profile 7: Lane Departures

In alignment with the crash profile, participants noted frequent conflicts where vehicles cross the centerline or leave their lane, often due to high speeds, sharp turns, or interactions with bicyclists and trucks. Specific locations highlighted included:

- SR 129
    - Tight turns near Rogge Lane and lead to frequent lane departures.
- SR 152
    - Queuing near the Fairgrounds (College Road) and corner-cutting on mountain curves contribute to lane departures and head-on risks.
- Locations outside of study area
    - Participants noted drivers pass across the centerline to pass farm equipment or bicyclists on Freedom Boulevard / Beach Road near the study area.

Participants expressed that they feel that existing geometry and congestion encourage lane departures and suggested countermeasures like physical barriers, clearer striping, or better management of multimodal interactions.

Profile 8: Pedestrians at Night

Participants highlighted the heightened concerns they felt walking (and biking) after dark due to poor lighting, limited crossings, and conflicts with high-speed traffic. Specific locations highlighted included:

- SR 1
    - Near Davenport where farmworkers and residents are biking or walking. Conflicts with recreational visitors accessing beaches after dark.

- SR 9
    - Near Redwood Elementary, youth camps, and downtown Boulder Creek north to Bear Creek Road. Participants highlighted there was a need for a crosswalk at Willowbrook Drive.
- SR 35
    - At the intersection with SR 9, participants felt unsafe due to street racing and lack of facilities.
- SR 129
    - Near schools and Bridge Street where there are high truck volumes and lack of sidewalks.
- SR 152
    - Near the county border and College Road, there are few pedestrian facilities and parked cars on shoulders which can push pedestrians into the highway. This can feel uncomfortable especially for pedestrians without reflective gear.

Participants requested better lighting, reflective pavement markings or rumble strips, and greater access to safety gear for pedestrians and bicyclists.

Countermeasures

At the workshops and stakeholder meetings, participants reviewed a set of potential safety countermeasures identified by the project team. They were asked which treatments they preferred, which they felt might be desirable in their community, and to share any additional ideas. Feedback highlighted both strong support for certain strategies (e.g., enhanced crossings, traffic calming) and concerns about feasibility or unintended affects for others. Community feedback is summarized in **Table 1** below.

Overall, participants expressed the strongest support for enhanced pedestrian crossings with pedestrian activated flashers such as RRFBs, improved lighting, and gateway treatments to slow traffic through town centers and near key destinations. Roundabouts were also viewed positively, particularly where they have already been implemented; however, participants noted that they can be challenging at larger intersections. Median hardening and rumble strips generated more mixed reactions, with concerns about effects on bicyclists, motorcyclists, and parking access in commercial areas. Across nearly all countermeasures, participants stressed the need for consistent enforcement, particularly automated speed cameras, to complement physical design changes.

Table 1. Potential Countermeasures – Community Feedback

Countermeasure	Community Feedback & Key Takeaways
Speed Feedback & Other Activated Signs	Mixed views. Some saw value in raising awareness, but many noted they are ineffective without enforcement. Strong preference for pairing with automated speed enforcement as feasible.
Gateway Treatments	Broad support. Interest in treatments (e.g., landscaping elements, decorative signage, banners, pavement treatments) to signal entry into town centers such as Boulder Creek, Ben Lomond, Felton, and Watsonville. Seen as helpful for slowing drivers before pedestrian areas. Committees indicated strong

	interest in more roundabouts and gateway treatments, and supported lower speed limits, particularly on SR 9 through towns.
Roundabouts	General support once drivers adjust. Participants cited as effective for slowing traffic and enhancing safety at intersections (e.g., SR 9/Bear Creek and along SR 129). Some concerns about large or complex roundabouts being harder to navigate.
Enhanced Pedestrian Crossings	Strongest support of all measures. Participants wanted RRFBs, bulb-outs, medians, and more visible markings near schools, senior facilities, and downtown areas or activity centers (e.g., Willowbrook Care Center and Boulder Creek). Committees raised a concern about RRFB visibility during daylight hours and asked for consistency across corridors to improve compliance.
Median Hardening	Mixed reactions. Some support it as a way to slow traffic and protect pedestrians. In Boulder Creek particularly, some had concerns about affects on parking, deliveries, and emergency access concerns.
Lighting	General support. Participants emphasized poor nighttime visibility for pedestrians and drivers. Requests included better downward directed Dark Skies-friendly lighting and illuminated crossings.
Landscaping / Visibility Improvements	Requests for better shoulder and vegetation maintenance, especially along bus routes and bike facilities. Cyclists noted hazards like poison oak and overgrowth.
Rumble Strips	Mixed opinions. Support for centerline rumble strips for speed reduction and lane departure prevention, others were concerned for hazards for motorcyclists and bicyclists from shoulder line rumble strips (especially on curves), and noise concerns for neighbors.
Guardrails	Suggested to implement where steep drop-offs or fixed-object hazards exist. Some participants proposed placing sidewalks or bike paths behind guardrails for added protection.
Other Ideas	Expanded signage for SR 1 tourist destinations (distances, parking availability), apps to show parking lot capacity, more cameras for enforcement, and radar/automated ticketing. Protected intersections that physically separate people walking and biking from traffic lanes in towns like Boulder Creek, Ben Lomond, and Felton.

	RTC committee members expressed interest in quick-build strategies (e.g., planter protected lanes, raised crossings) to help reduce speeds in the near-term before Caltrans capital projects are delivered. Committee members were also interested in the feasibility of implementing speed cameras to deter both racers and everyday speeding.

Potential Risk Factors and Priority Locations

Participants also reviewed maps showing potential risk factors and potential priority project locations across the study highways. They were asked whether the maps reflected their experiences, and to identify additional areas or conditions they feel are higher risk. Feedback highlighted recurring issues such as speeding, poor visibility, inadequate pedestrian infrastructure, and conflicts with heavy vehicles, while also pinpointing specific locations where improvements are most urgently needed.

SR 1

- Conflicts at state parks and beaches where pedestrians cross high-speed traffic.
- Strong requests for more formalized parking and more bike/pedestrian facilities south of Davenport.
- Requests for providing formalized parking on coast-side at all beaches to help prevent crossing highways to access destinations.
- Emphasis on the high volumes of tourists (including international tourists) and the need for clearer signage, turn-out lanes, and transit/shuttle options to manage demand at destinations like beaches, State Parks (e.g., Wilder Ranch and Big Basin), and Cotoni-Coast Dairies.
- Request for wildlife crashes to be tracked/considered even if they don't result in injuries (currently not in the dataset).

SR 9

- Concerns about persistent speeding and street racing (noted in Boulder Creek, Bear Creek Road, SR 236/SR 9 intersection, and stretch near Redwood Elementary).
- Concerns about pedestrian crossings in Boulder Creek and Brookdale that feel unsafe; including close calls at Willowbrook Drive and Highland Park.
- Crosswalk visibility concerns. Participants noted drivers reportedly fail to yield even at RRFBs.
- Observed poor visibility due to redwood trees and roadside brush that can also reduce space for bicyclists/pedestrians.
- Sharp curve in Boulder Creek at River Street and Bridge north of Felton at Brackney described as difficult to navigate.
- Nighttime construction lighting near Ben Lomond cited as blinding for oncoming drivers.
- Stakeholders added that many school and Metro bus stops along SR 9 and SR 236 are unmarked or lack lighting, creating risks for students waiting in dark, wooded areas.

SR 35

- Concerns about street racing (although concentrated on SR 9).
- Seasonal debris hazard from Christmas trees falling off vehicles near the summit.

SR 129

- Congestion leaving Watsonville and near Bridge Street.

- Roundabout suggested at Blackburn Street.
- Highway seen as high-risk for bicyclists: no shoulders, truck interactions, only for "experienced bikes."

SR 152

- Despite truck restrictions, oversize trucks continue to use this highway which can lead to tipping incidents
- Congestion/queuing around Casserly Road, Carlton Road, Holohan Road, the Fairgrounds and St. Francis High may cause unexpected driver maneuvers, including using the two-way left turn lane at St Francis High and Lakeview Middle School illegally as a through lane.
- People walking to church/school with no sidewalks presents pedestrian concerns.
- Requests for sidewalks and protected bike lanes to the Fairgrounds and turn pockets for event traffic.
- Visibility concerns at intersections, especially near Casserly Road.
- Roundabout suggested at Holohan Road/College Avenue, after when Corralitos Creek bridge replacement.
- General speeding through town toward city limits and Interlaken area.
- Stakeholders and South County participants also called for quicker interim safety improvements (e.g., tactical urbanism or quick-build projects) to address speeding and pedestrian concerns in the near-term, rather than waiting for full Caltrans capital projects.

Outcomes

Feedback gathered during Milestone 2 will help refine priority project locations and shape draft recommendations for more specific safety improvement projects. Along with crash data patterns, this input will directly shape the conceptual designs carried forward into Milestone 3.

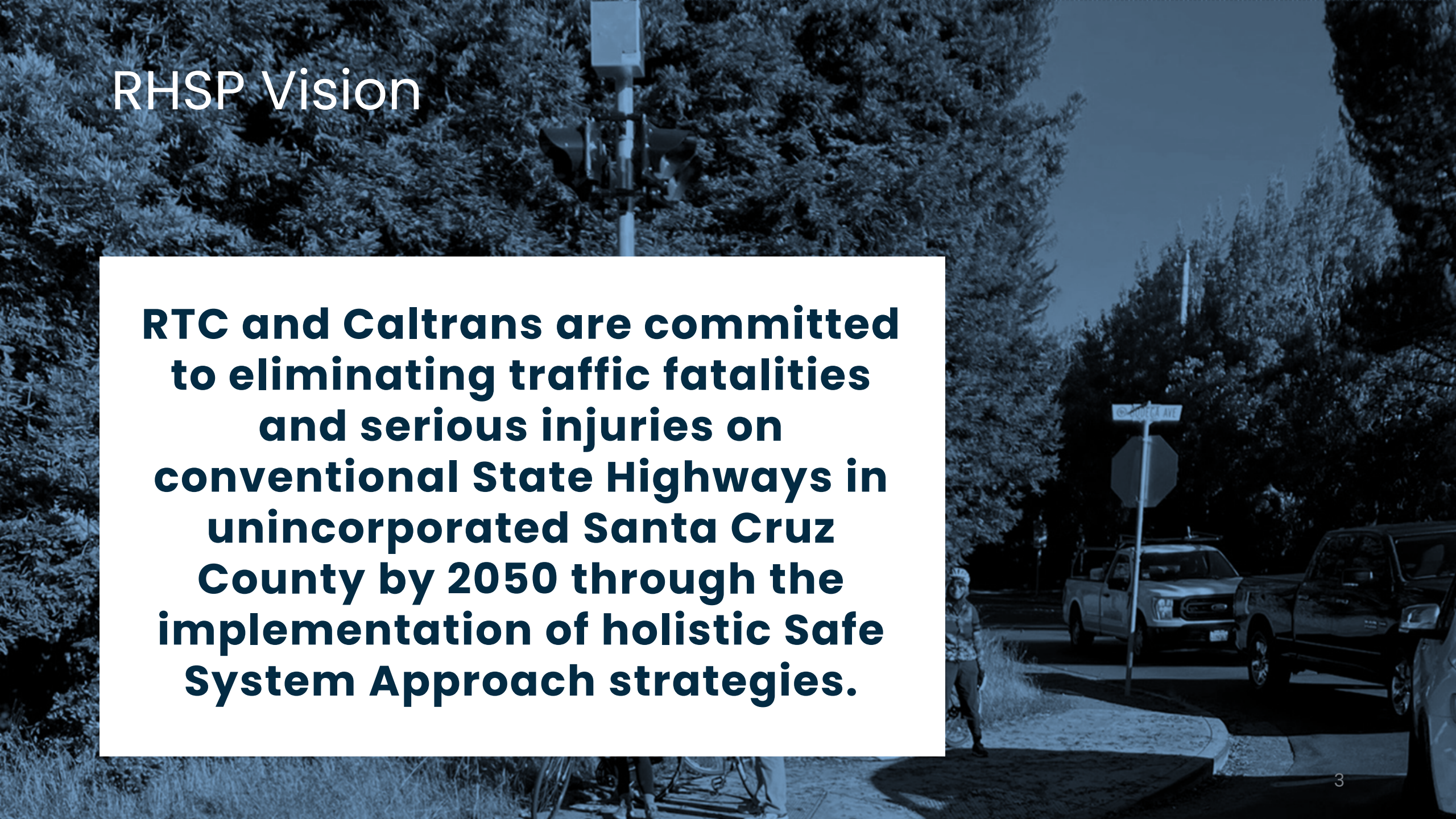
Rural Highways Safety Plan (RHSP)

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

Meeting Agenda

- Project Background
  - Project Scope/Schedule
  - Place Types
  - Potential Risk Factors
  - Crash History
  - Community Feedback
- Profiles & Countermeasures
  - Do these profiles match your experiences?
  - Are there any other factors that we are missing?
  - Which countermeasures are preferred in your area?
- Priority Locations
  - What locations would you like to see prioritized first?

RHSP Vision



RTC and Caltrans are committed to eliminating traffic fatalities and serious injuries on conventional State Highways in unincorporated Santa Cruz County by 2050 through the implementation of holistic Safe System Approach strategies.

Project Schedule

Milestone 1: Vision & Objectives

July 2024 – October 2024

Milestone 2: Strategy Development

October 2024 – May 2025

Milestone 3: Rural Highways Safety Plan

March 2025 – December 2025

Outreach & Engagement

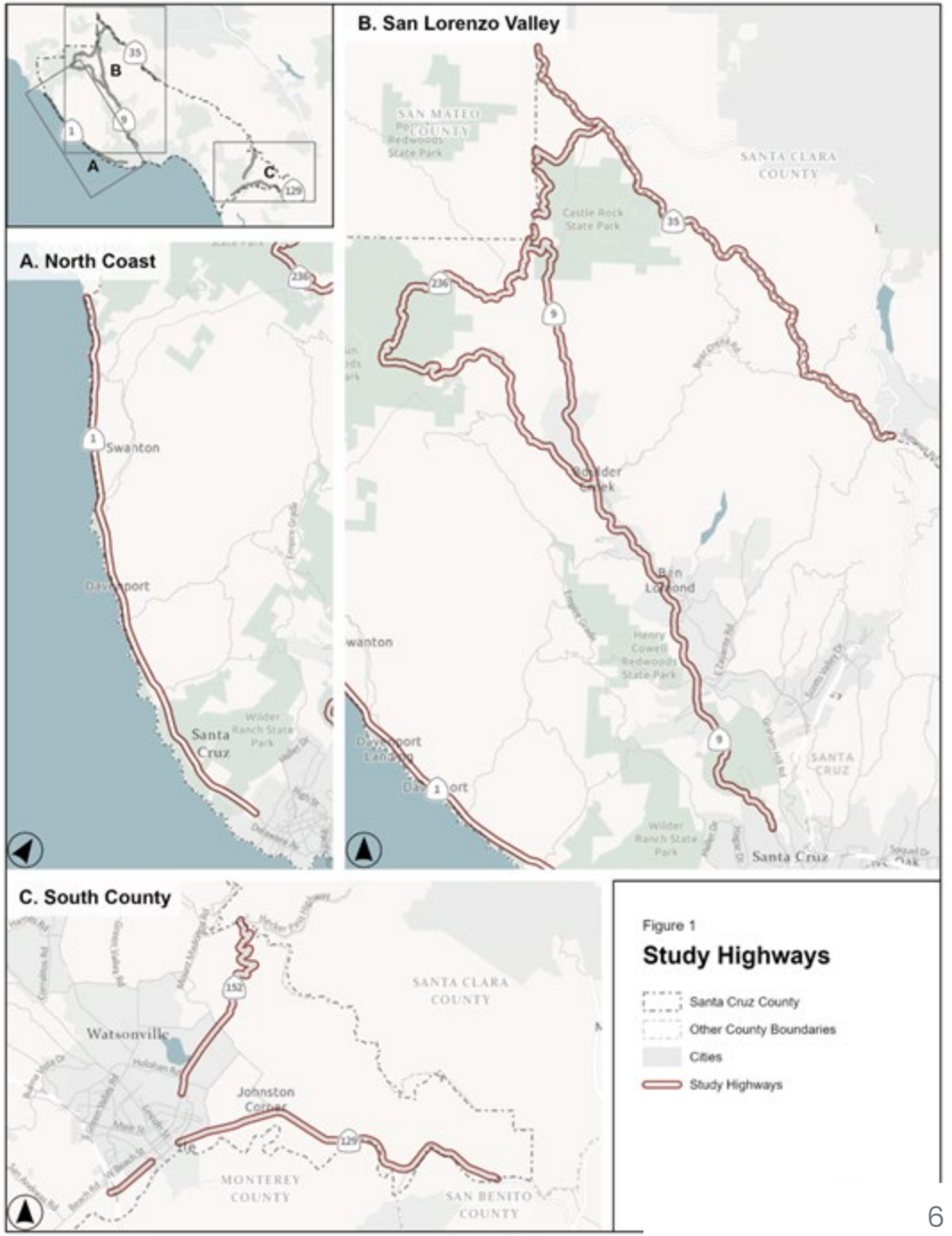
Existing Conditions

- Place Types
- Risk Network
- Crash Landscape

Study Highways

- **Hwy 1** north of the City of Santa Cruz
- **Hwy 9** north of the City of Santa Cruz
- **Hwy 35**
- **Hwy 129** outside the City of Watsonville
- **Hwy 152** outside the City of Watsonville
- **Hwy 236**

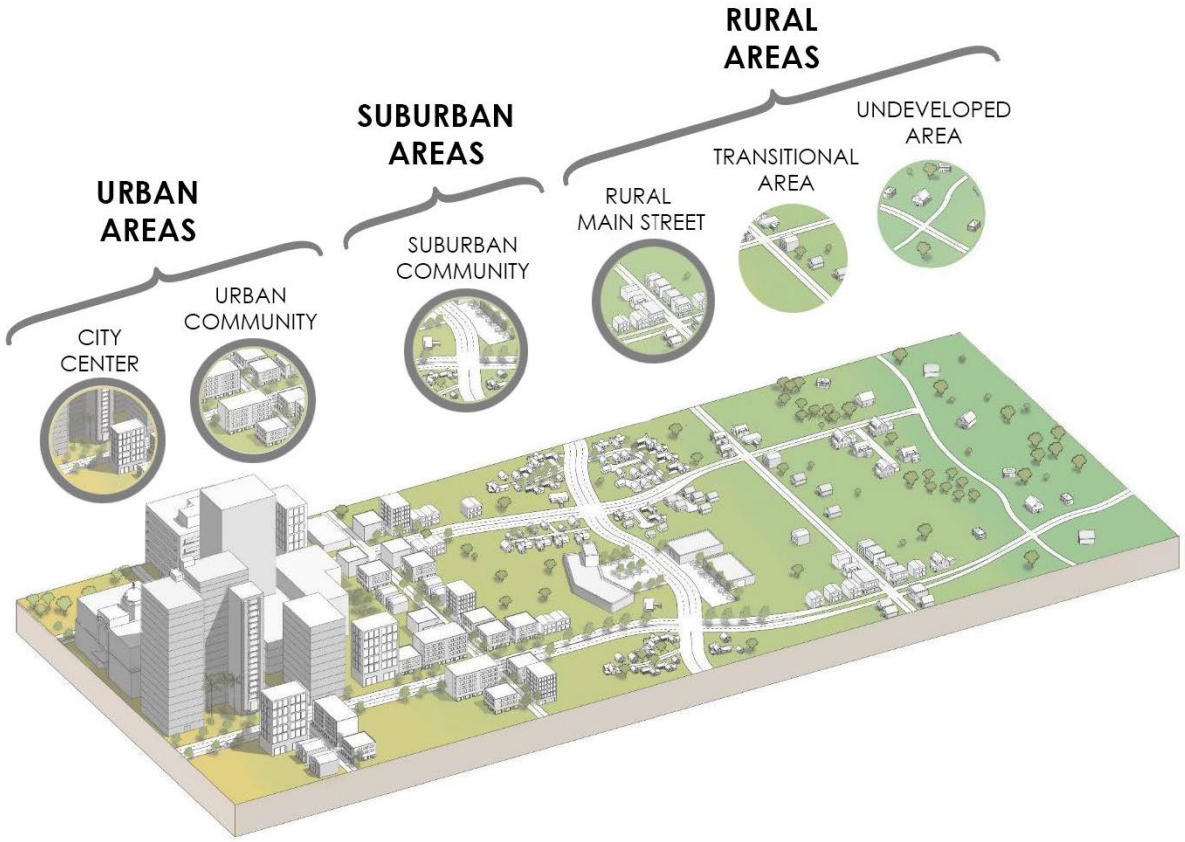
State-level safety planning has been determined to not be detailed enough to meet federal safety funding requirements. Cities have completed or are updating their own Comprehensive Safety Action Plans. The RHSP fills a gap in Santa Cruz County's ability to access federal safety enhancement funding.



Place Types

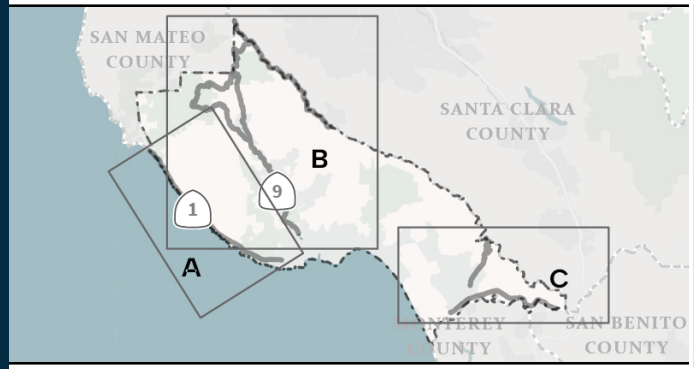
Determined based on street context

- **Rural Main Street**
  - Serve as town/neighborhood main street
- **Transitional**
  - Serve as the link between Main Street and Undeveloped streets
- **Undeveloped**
  - Prioritize efficient movement over longer distances
  - **Mountainous**
    - More rolling and curvy
  - **Non-Mountainous**
    - Generally flat



Caltrans Place Types for Contextual Design Guidance (Caltrans, DIB 94)

Place Types
North Coast



Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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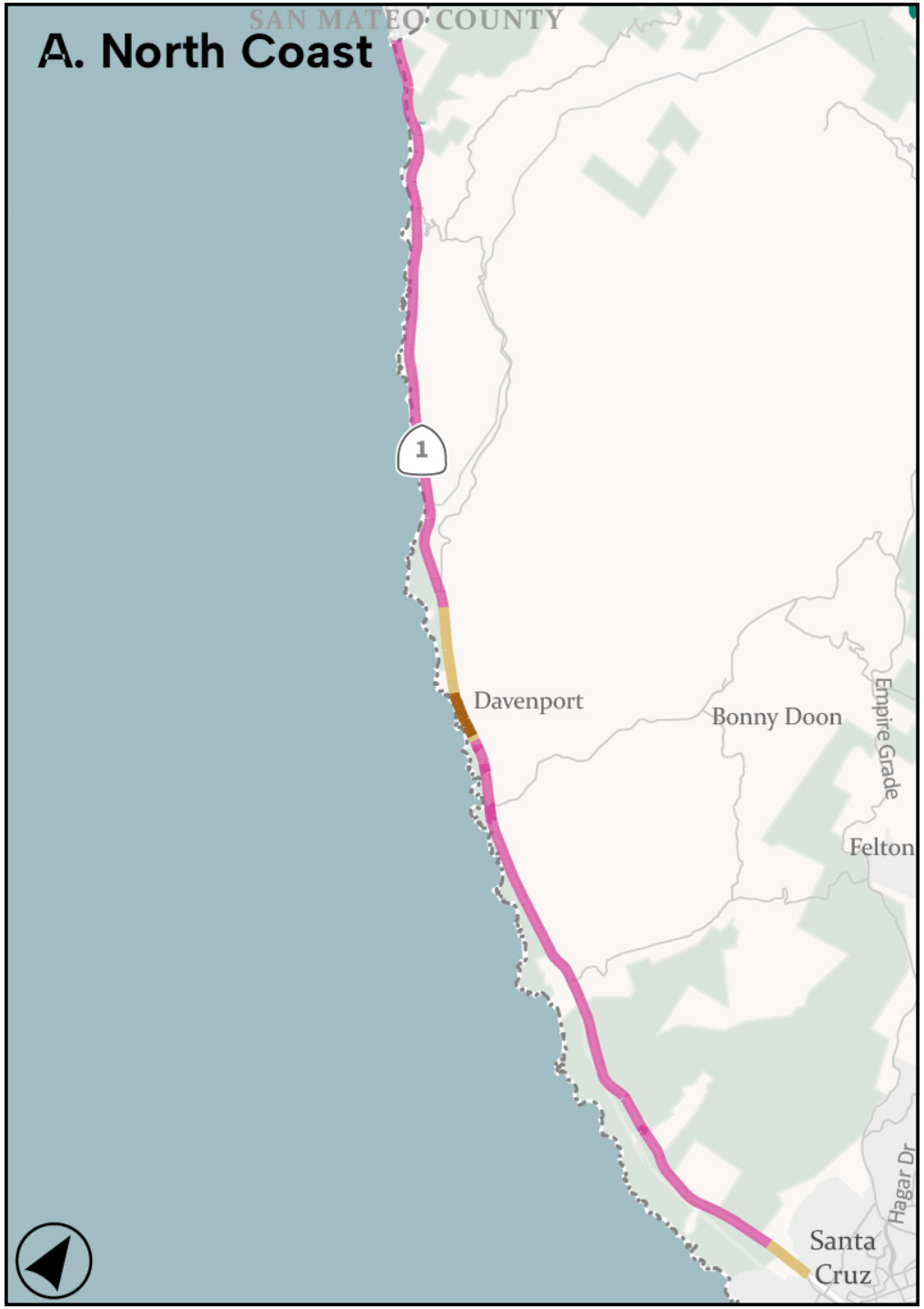
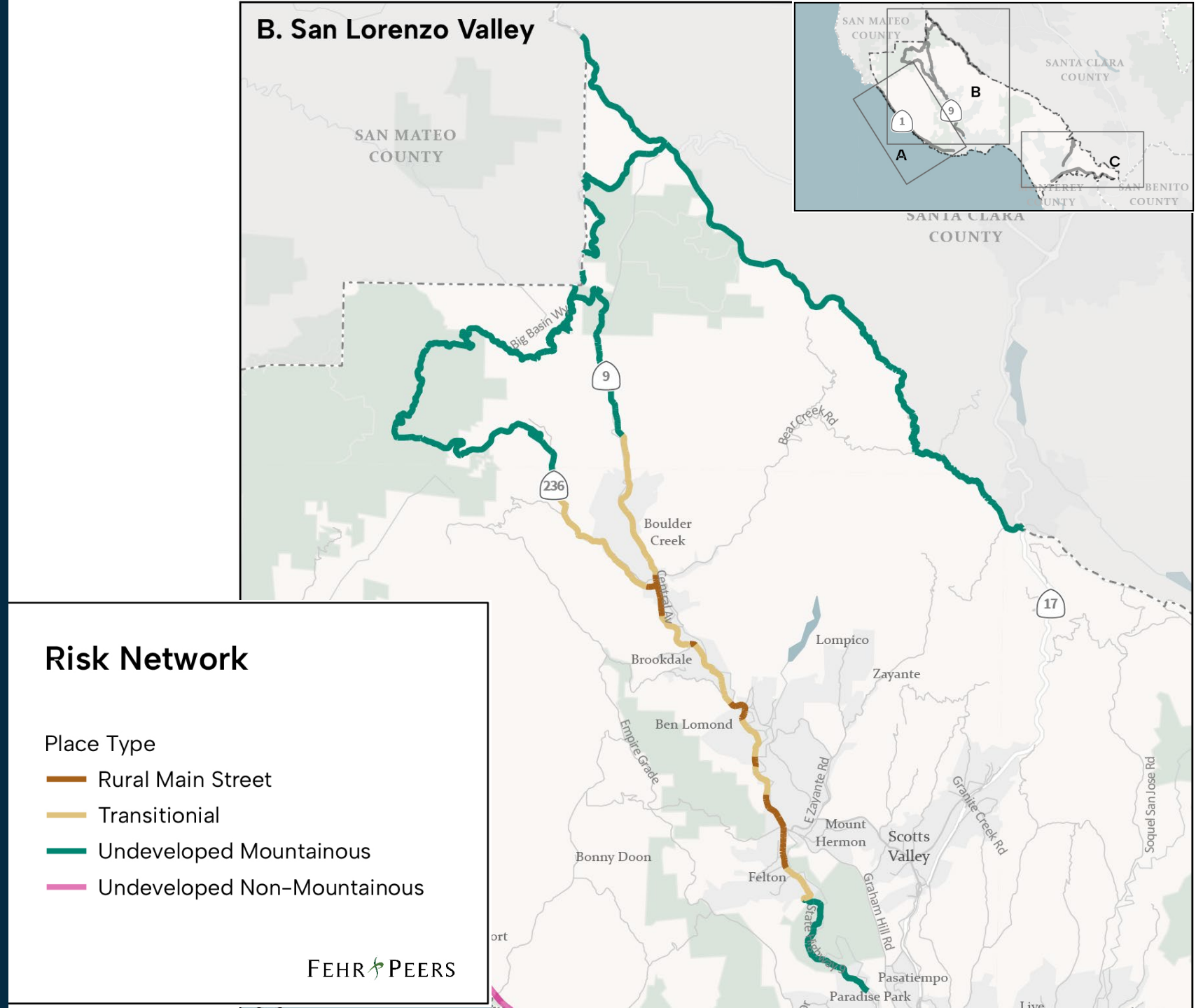
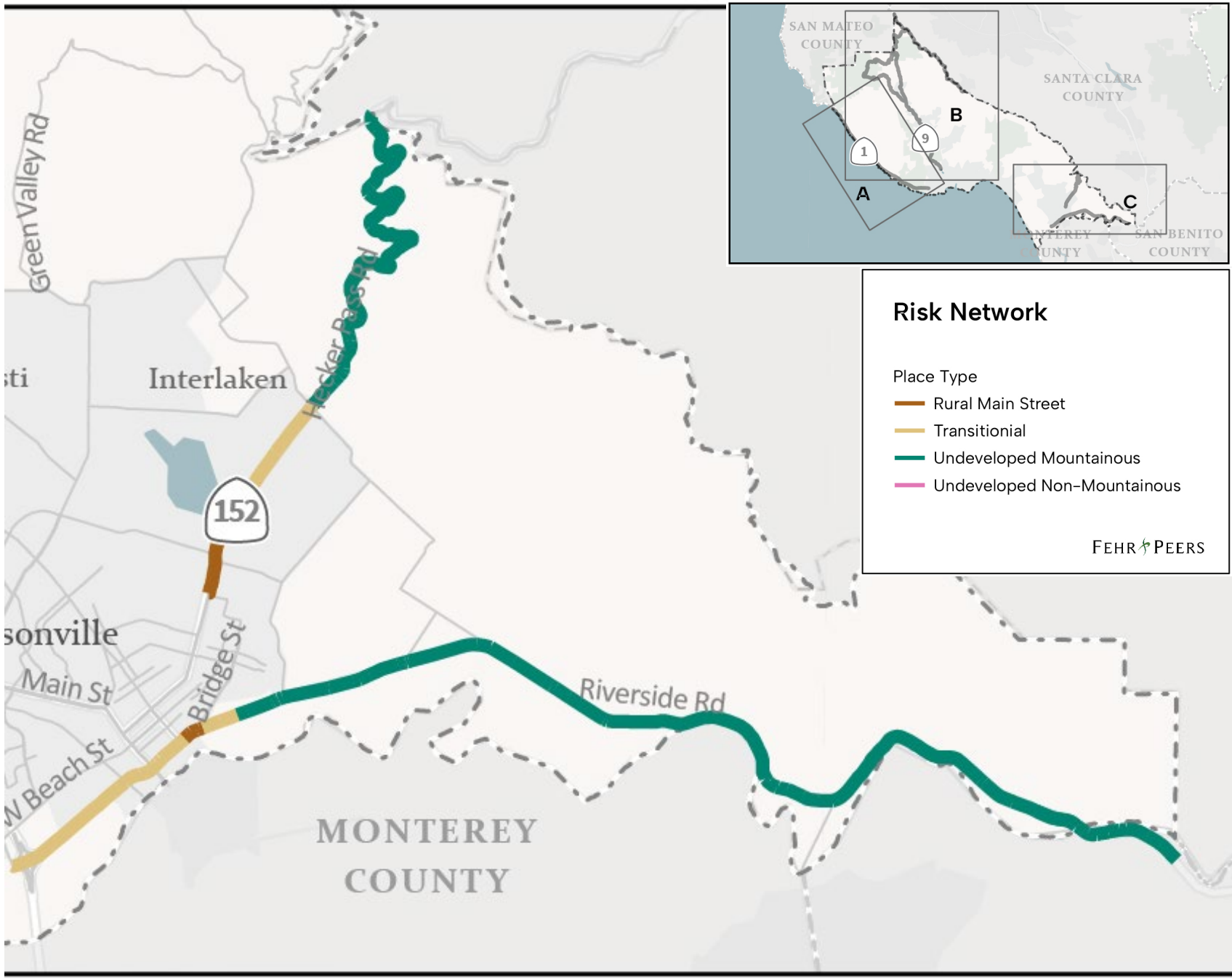


Place Types San Lorenzo Valley



Place Types South County



Risk Assessment

By focusing on locations where these potential risk factors are prevalent, the RHSP moves beyond a reactive reliance on crash data to a proactive risk assessment approach aligned with Safe System principles.

Crash Exposure

Where people are/ want to be traveling

Crash Likelihood

How travelers “conflict” with other travelers and system elements

Crash Severity

The injury potential if that conflict becomes a crash (mass, speed, angle)

Potential Risk Factors

Crash Exposure

- Limited transit & active transportation options
- High pedestrian and bicycle activity (schools, parks, Main Streets)
- High vehicle & freight volumes

Crash Likelihood

- Mountainous roads with low visibility
- Lack of pedestrian/bike facilities & separation
- Narrow lanes & shoulders

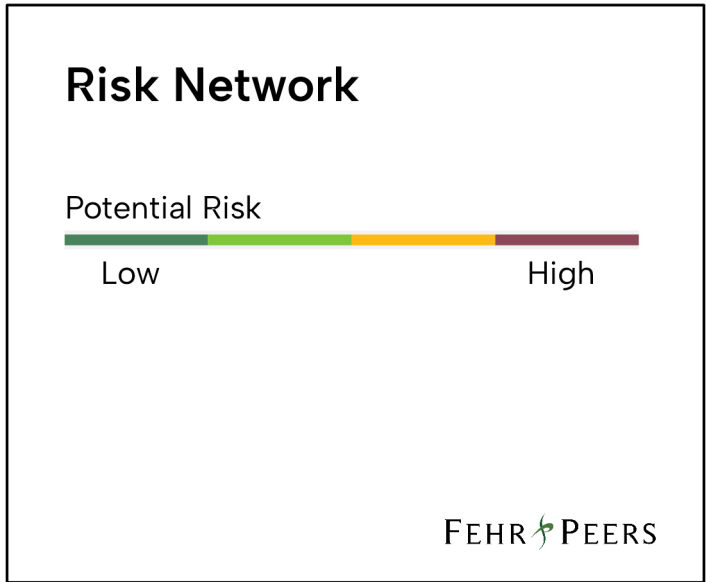
Crash Severity

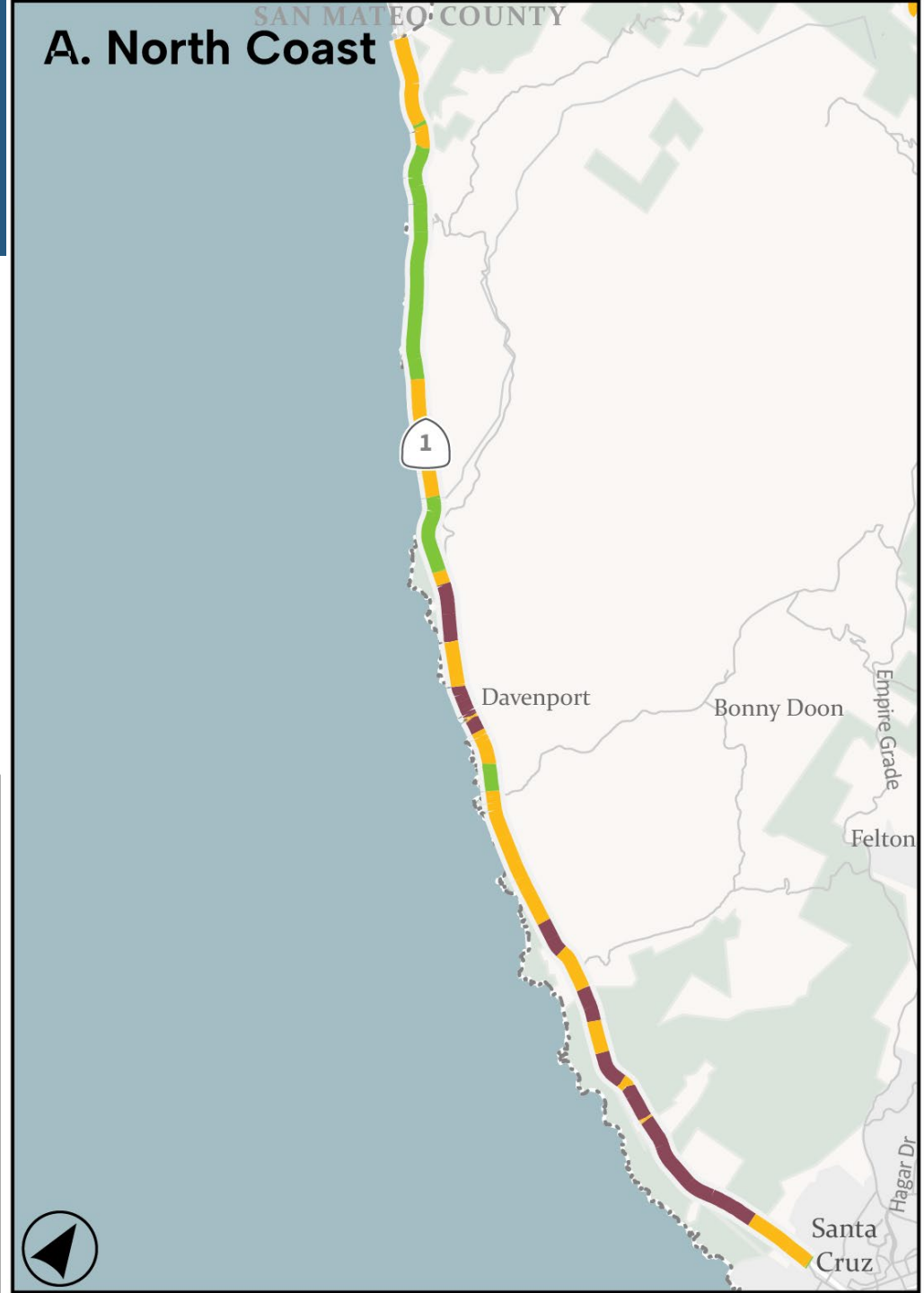
- High truck volumes & vehicle speeds
- Sharp curves & steep grades
- Vulnerable road users at risk

Aggregate of Risk Factors

North Coast

- Each segment is scored based on how many risk factors are present
- Darker red means more risk factors are present

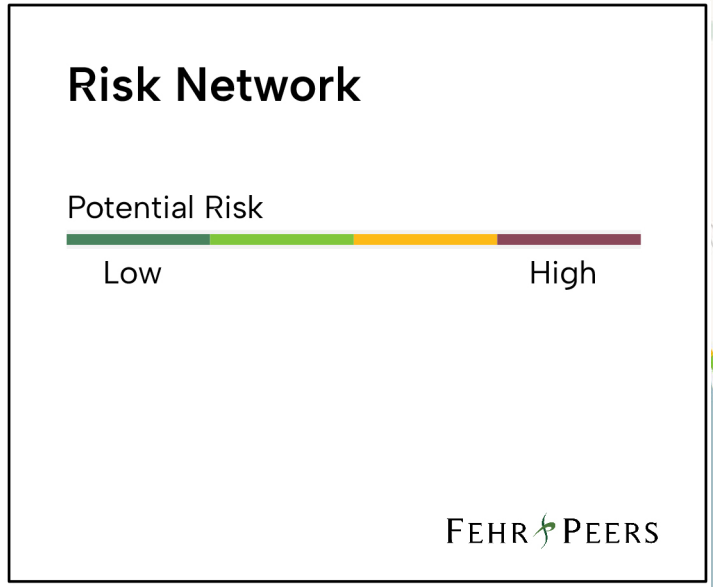


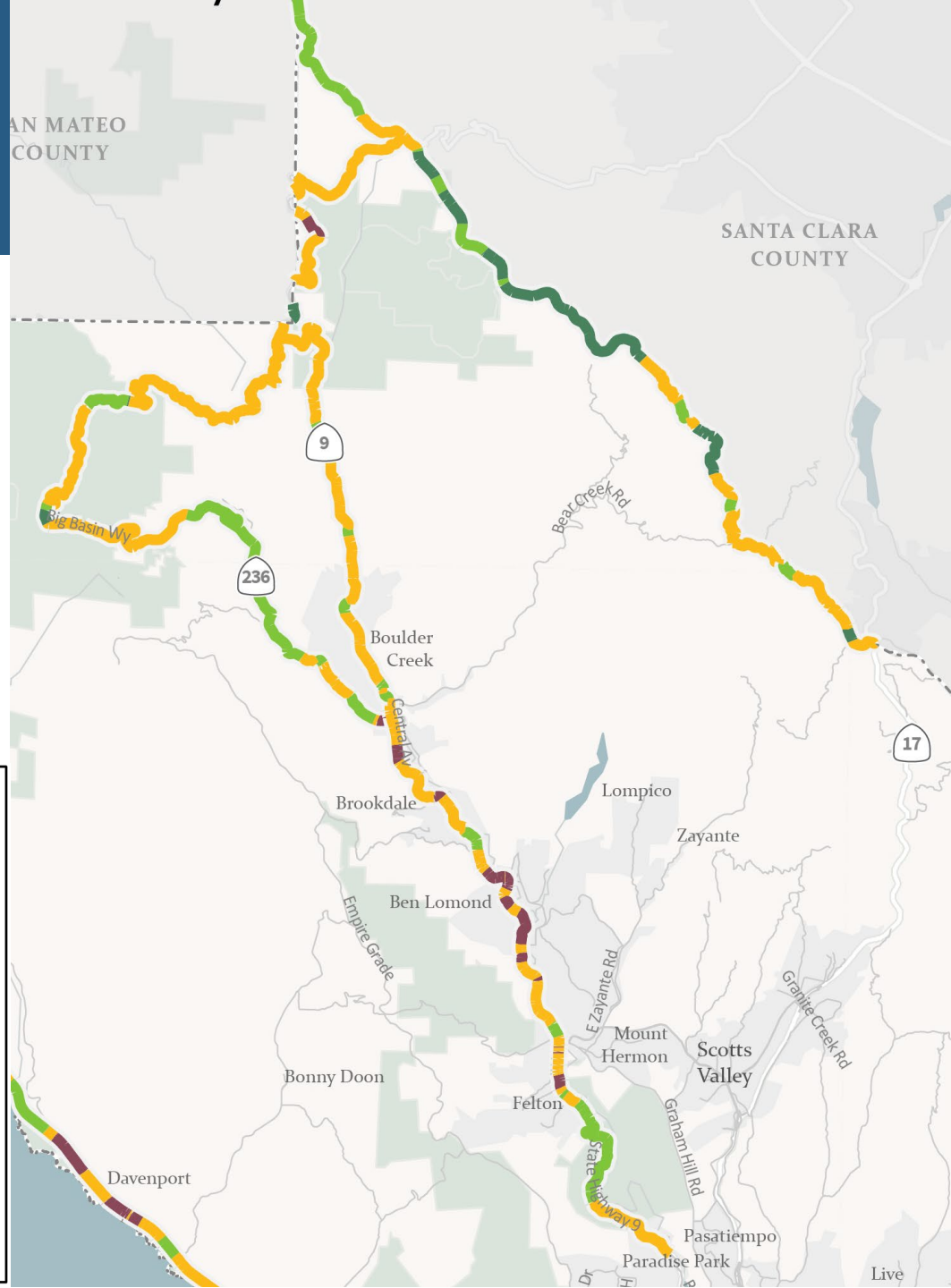


Aggregate of Risk Factors

San Lorenzo Valley

- Each segment is scored based on how many risk factors are present
- Darker red means more risk factors are present

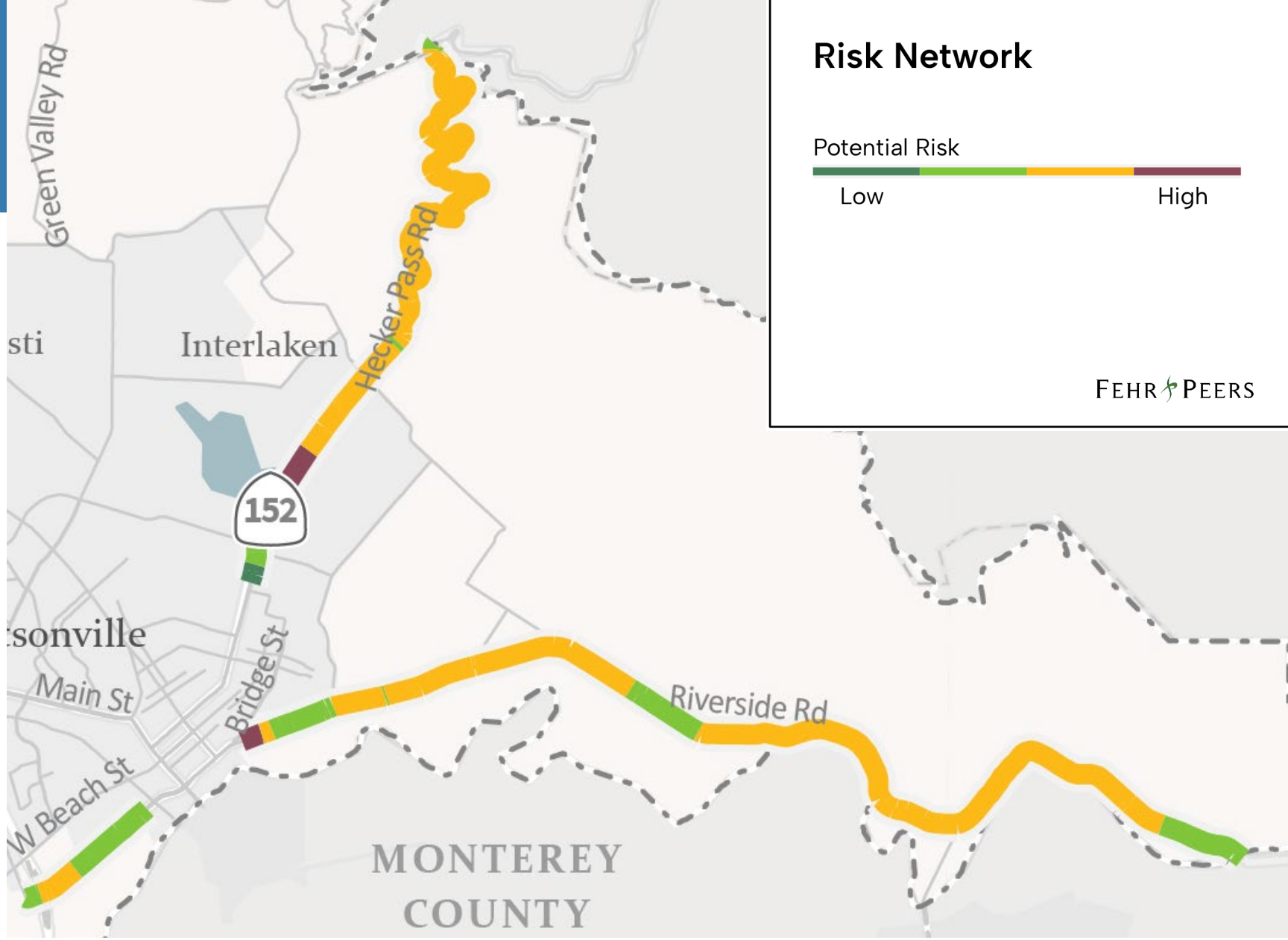




Aggregate of Risk Factors

South County

- Each segment is scored based on how many risk factors are present
- Darker red means more risk factors are present

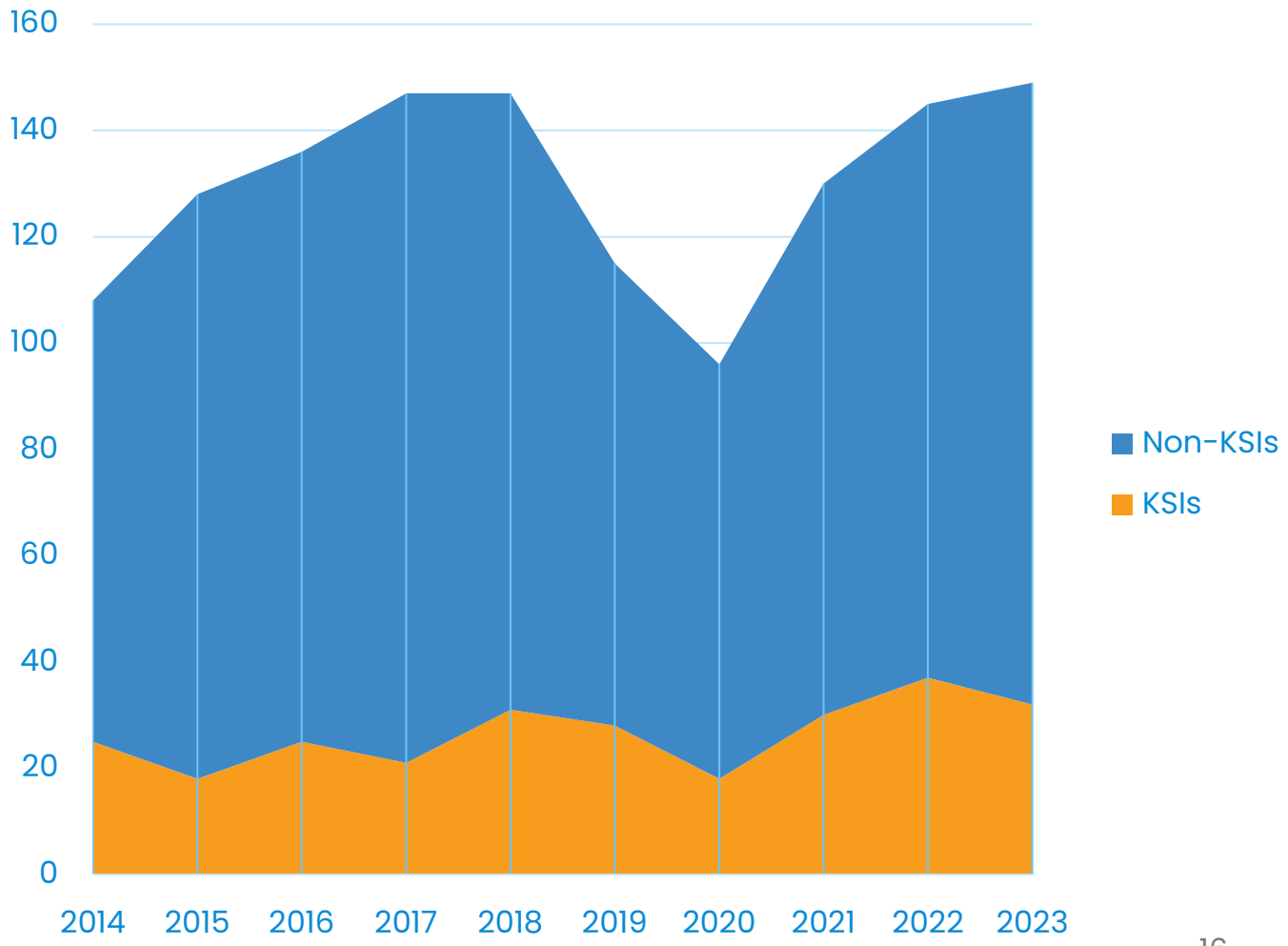


Eliminate Crashes Resulting in Fatalities and Severe Injuries (KSI)

RHSP will prioritize high risk locations to eliminate KSIs

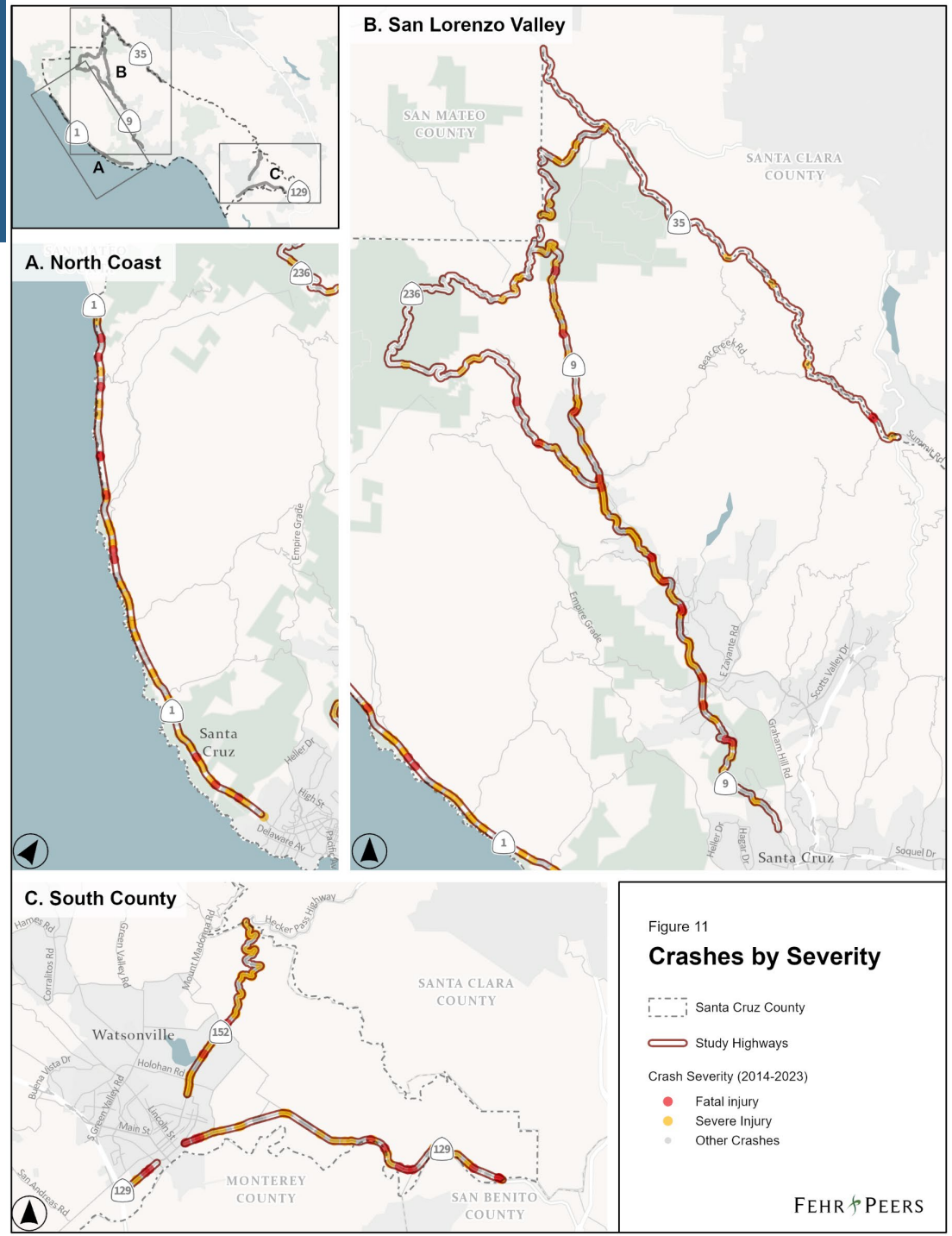
There were a total of 1,301 injury crashes from 2014 – 2023

There were 265 KSIs (18% of all injury crashes)



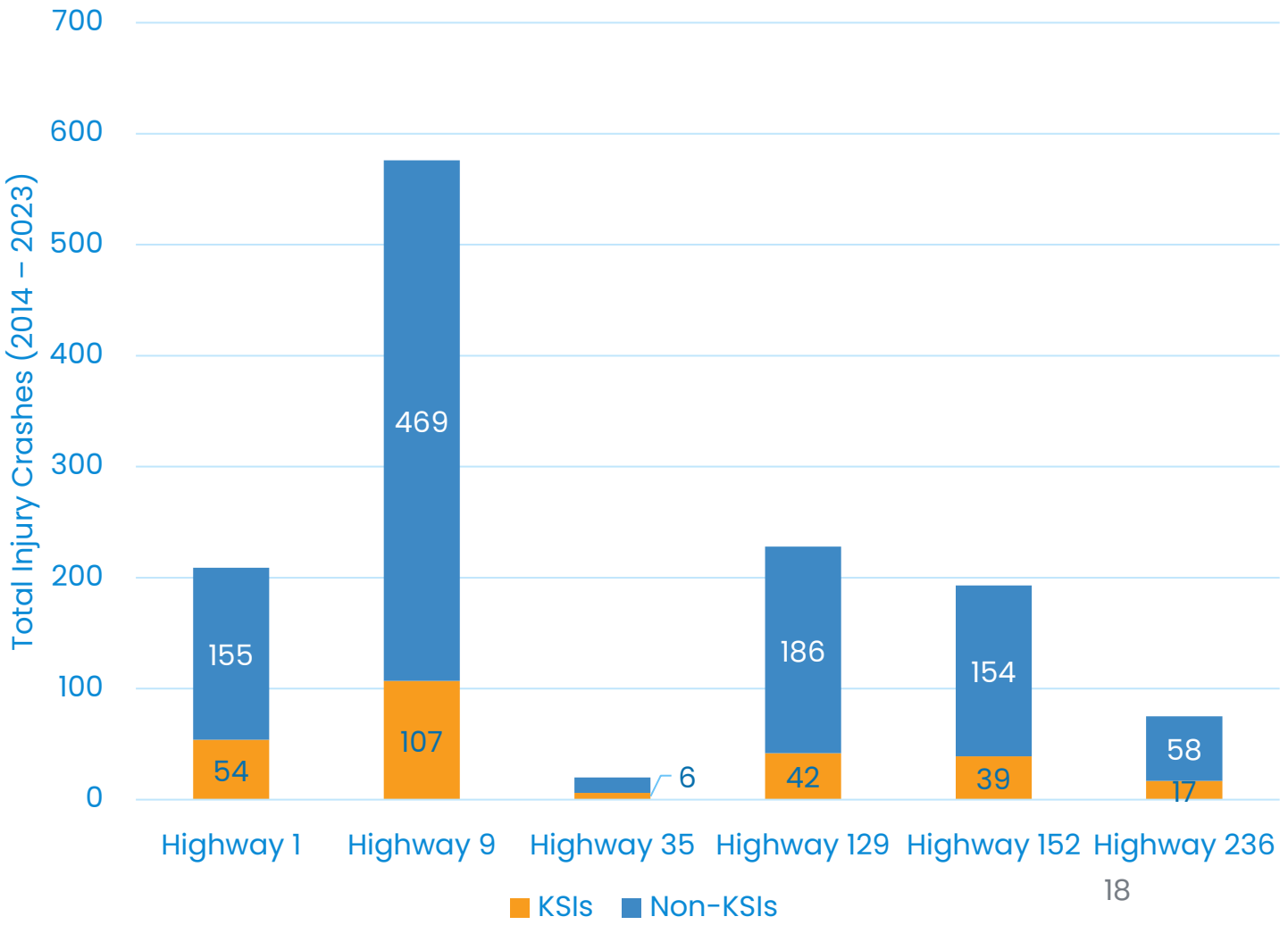
Crashes by Severity

- Reported KSI crashes occurred throughout the study area
- Greater concentration of KSI crashes is seen in a few places:
  - Developed areas
  - Near key destinations
  - High speed rural roadways



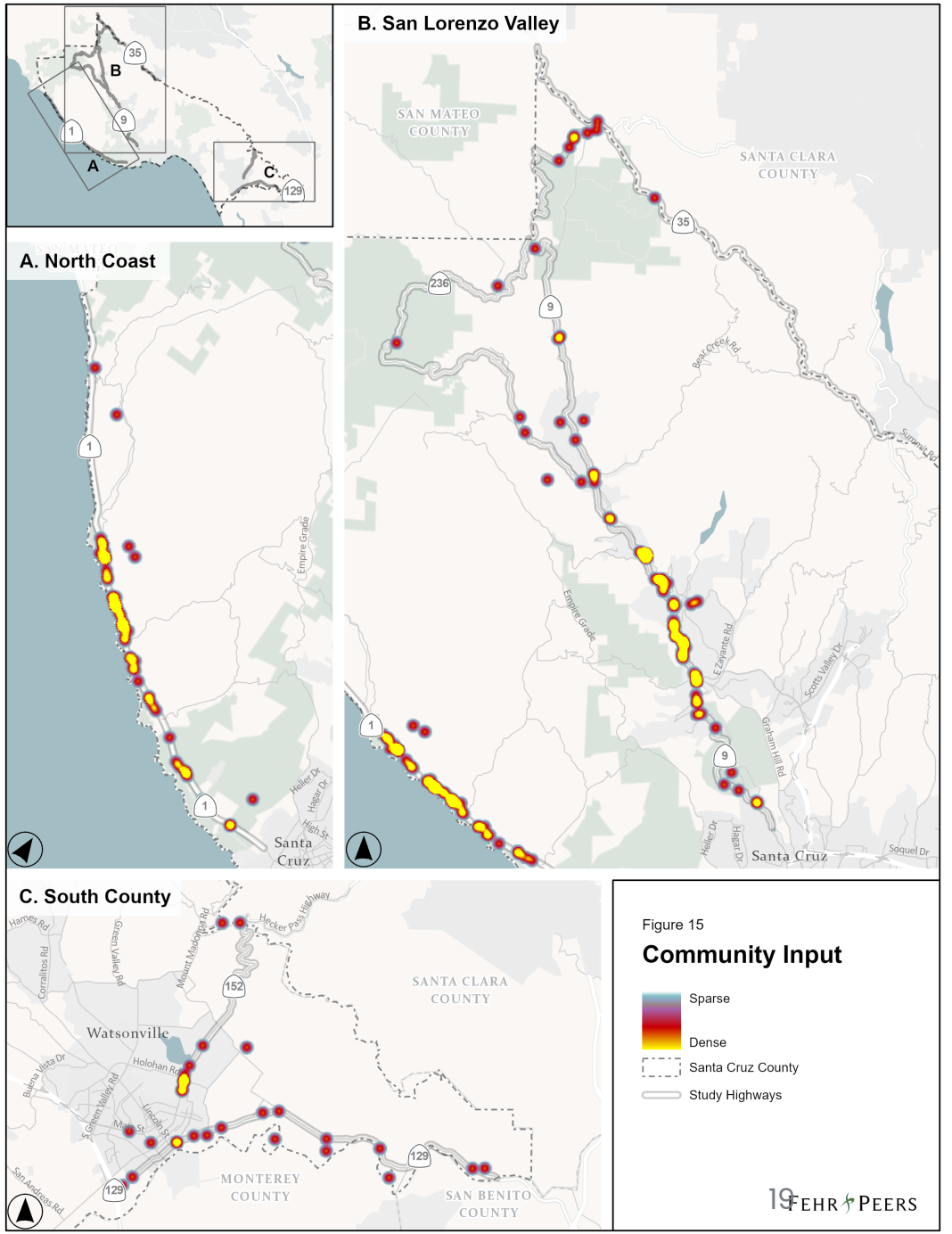
Crashes by State Route (2014-2023)

- **Highway 9** has the highest proportion of crashes
- **Highways 1, 129, and 152** all have around 35 KSIs total
- **Highway 1** has highest percent of KSIs compared to total injury crashes (21%)
  - Generally, across all corridors, approximately 18% of all crashes are KSIs



M1 Community Feedback

- **Highway 1**
  - Interactions between travel modes and limited parking cause unpredictable conditions
- **Highway 9**
  - Desire for “Rural Main Street” feel, safer crossings
- **Highway 35**
  - Speeding and discomfort parking on highway
- **Highway 129**
  - Challenges due to truck traffic and poor visibility
- **Highway 152**
  - Congestion, blind corners, and people making unsafe maneuvers
- **Highway 236**
  - Pedestrian conflicts near campgrounds and facilities



Crash Profiles

- Conditions where KSI crashes are occurring
- Developed using crash data, contextual data, and community input
- Identifies systemic patterns linked to 5–15% of total KSIs

Countermeasures (Risk Management)

- **Demand Management**
- **Speed Management**
- **Conflict Management**

Demand Management

- **What is Demand Management?**
  - Strategies, policies, and design features that can reduce exposure (i.e, number or length of driving trips)
  - Goal is to reduce the number of roadway users potentially experiencing crashes
  - Requires holistic approaches beyond the roadway network that may include land use mix, transportation alternatives, etc.
- **Examples**
  - Transportation alternatives to reduce SOV use in high demand areas
  - Enhanced infrastructure that allows walking/biking rather than driving for walkable/bikeable trips
  - Targeted education on transportation alternatives

Speed Management

- **What is Speed Management?**
  - Strategies and roadway design features aimed at reducing vehicle speeds to match the local context
  - Goal is to reduce severity in a crash should it occur
  - Generally applied systemically across the roadway network
- **Examples**
  - Traffic calming features like traffic circles/roundabouts, gateway treatments, and vertical/horizontal deflection
  - Roadway width reductions
  - Speed feedback signs
  - Modified speed limit setting and application of warning/advisory speeds
  - Enhanced enforcement

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Conflict Management

- **What is Conflict Management?**
  - Strategies and roadway design features that seek to remove conflicts or reduce their severity (i.e., reduce likelihood of crash)
  - Goal is to reduce number of collisions that result in fatalities or serious injuries (KSIs)
  - Applied systemically across the roadway network or in response to collision profiles and risk factors at specific locations
- **Examples**
  - Installation of signs and pavement markings
  - Enhanced bicycle or pedestrian facilities, particularly at crossings
  - Modifications to roadway width, alignment, or travel lanes
  - Rumble strips, guardrails, and other shoulder treatments

Excessive Speed

Observed speed is over 10 mph above the target speed

Mode:
All modes

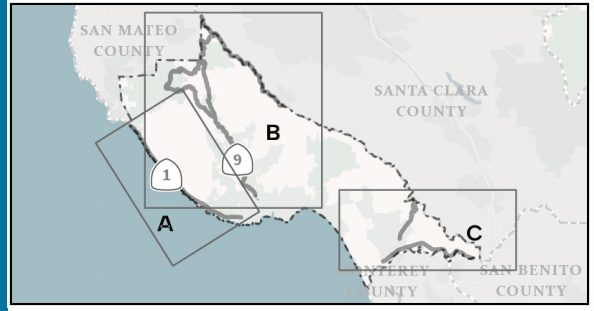
Represents **40% of all KSIs**, including:

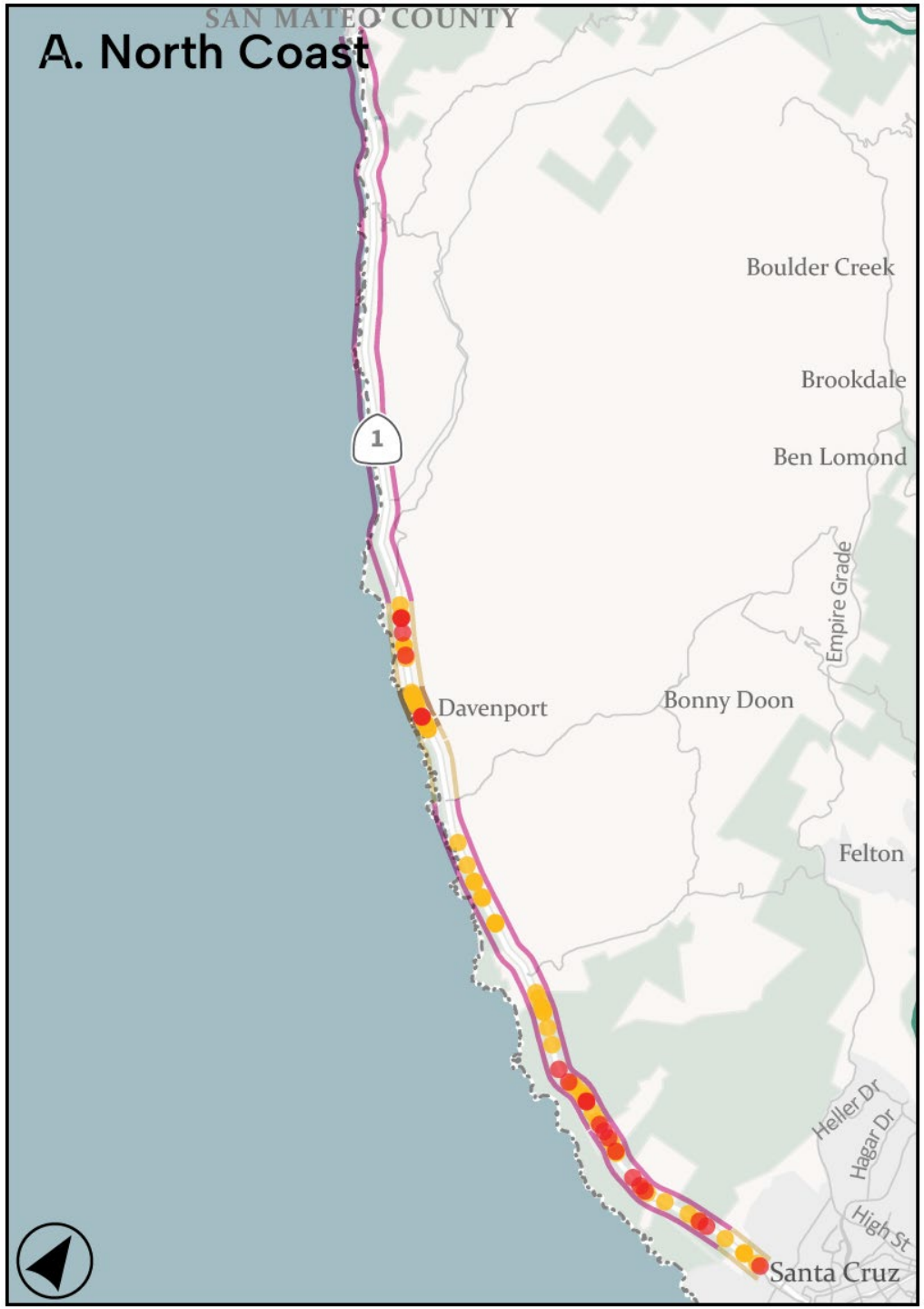
- **72%** of KSIs on Main Streets
- **42%** of KSIs on Transitional Streets
- **28%** of KSIs on Undeveloped Non-Mountainous Streets
- **32%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- High speeds (increased likelihood of KSI)
- Presence of vulnerable users

Excessive Speed



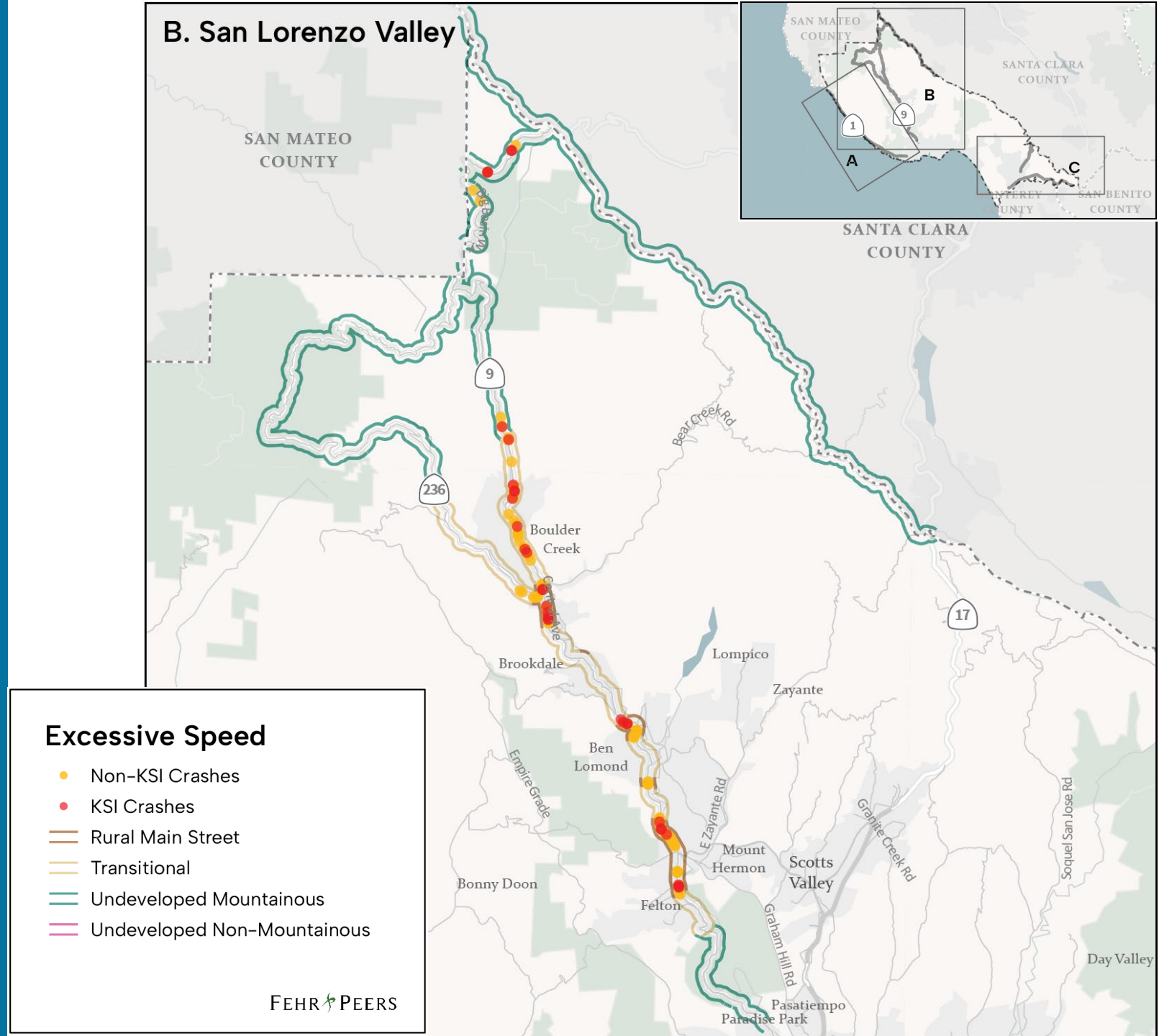


Excessive Speed

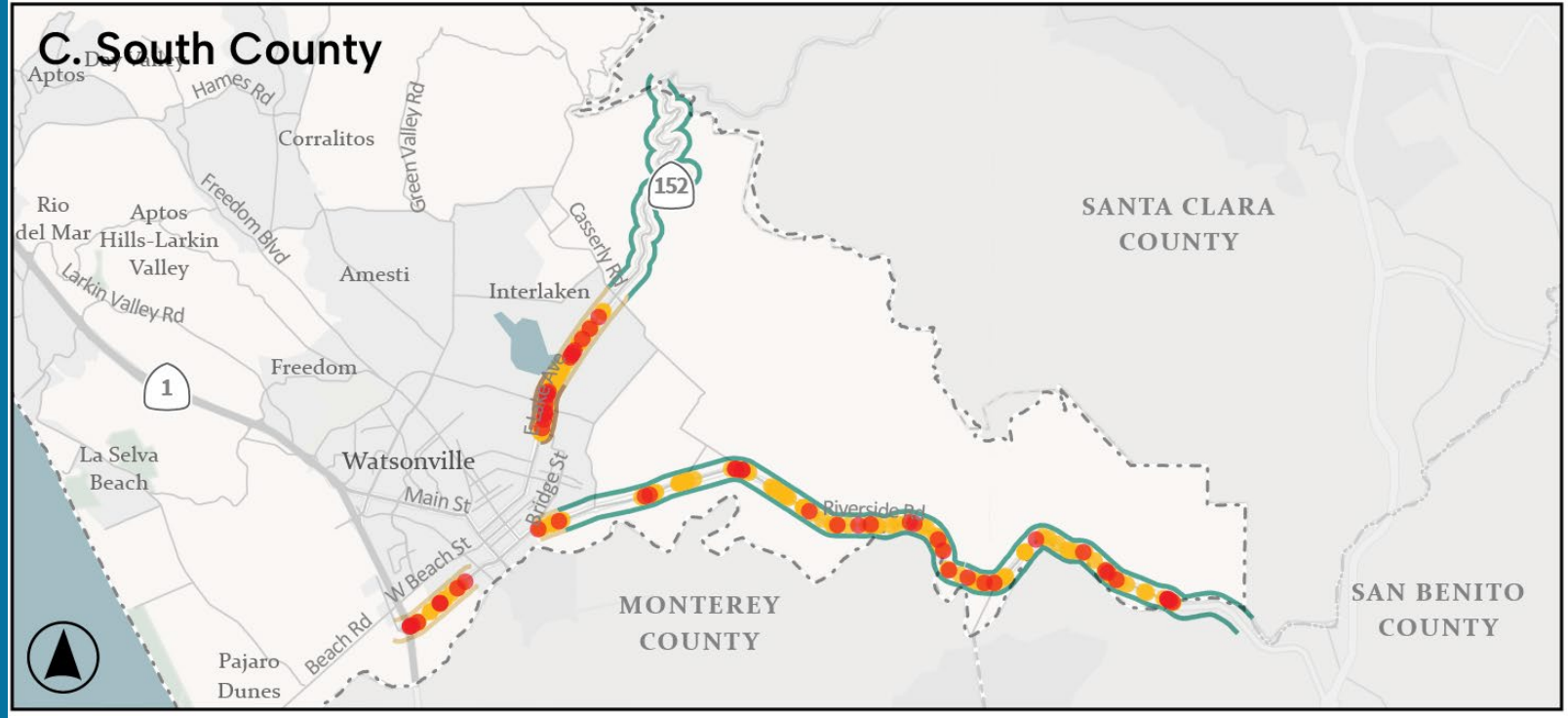
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS

Excessive Speed



Excessive Speed



Excessive Speed

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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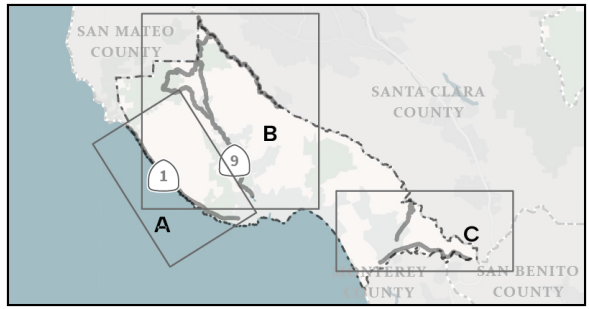


Countermeasures

- **Main Streets & Transitional Streets**
  - Sidewalk installation, reduced lane width, horizontal deflection, gateway treatments, traffic circles/roundabouts, speed feedback signs
- **Undeveloped Mountainous & Non-Mountainous Areas:**
  - Shoulder treatments, rumble strips, speed feedback and other vehicle activated signs

Pedestrian Crashes

Pedestrian crashes throughout the corridors

Mode:
Pedestrian

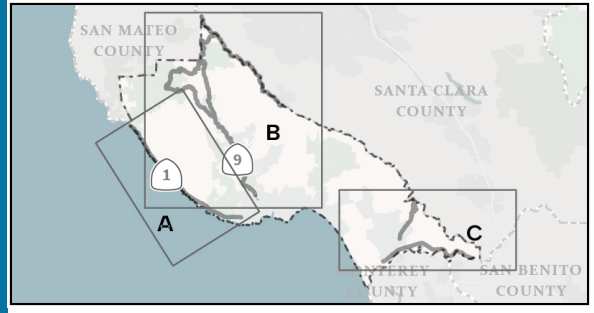
Represents **9%** of all KSIs, including:

- **31%** of KSIs on Main Streets
- **9%** of KSIs on Transitional Streets
- **9%** of KSIs on Undeveloped Non-Mountainous Streets
- **1%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- Sight distance
- High speeds
- Presence of vulnerable users
- Pedestrian facilities

Pedestrian Crashes



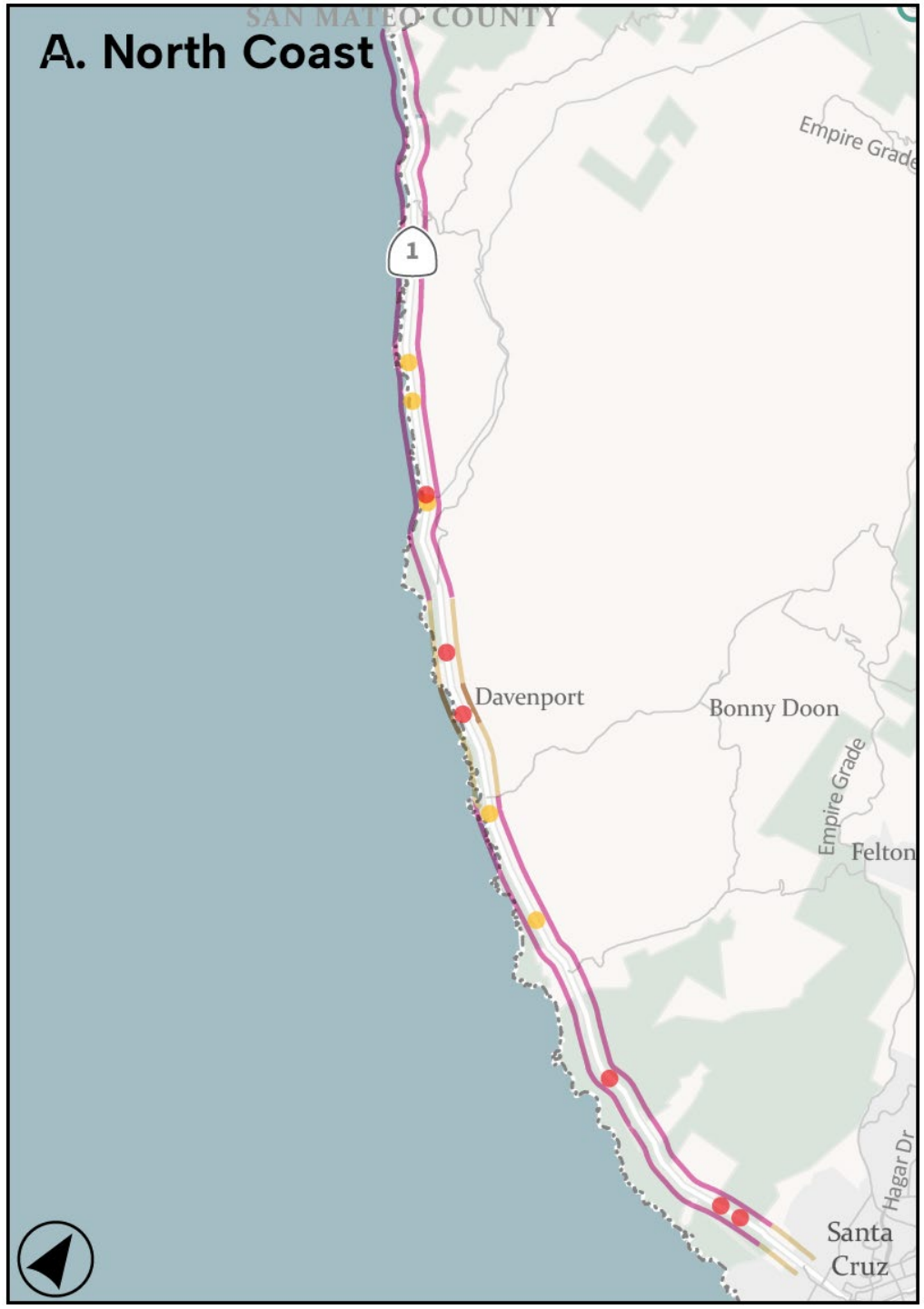
Pedestrian Crashes

- Non-KSI Crashes
- KSI Crashes

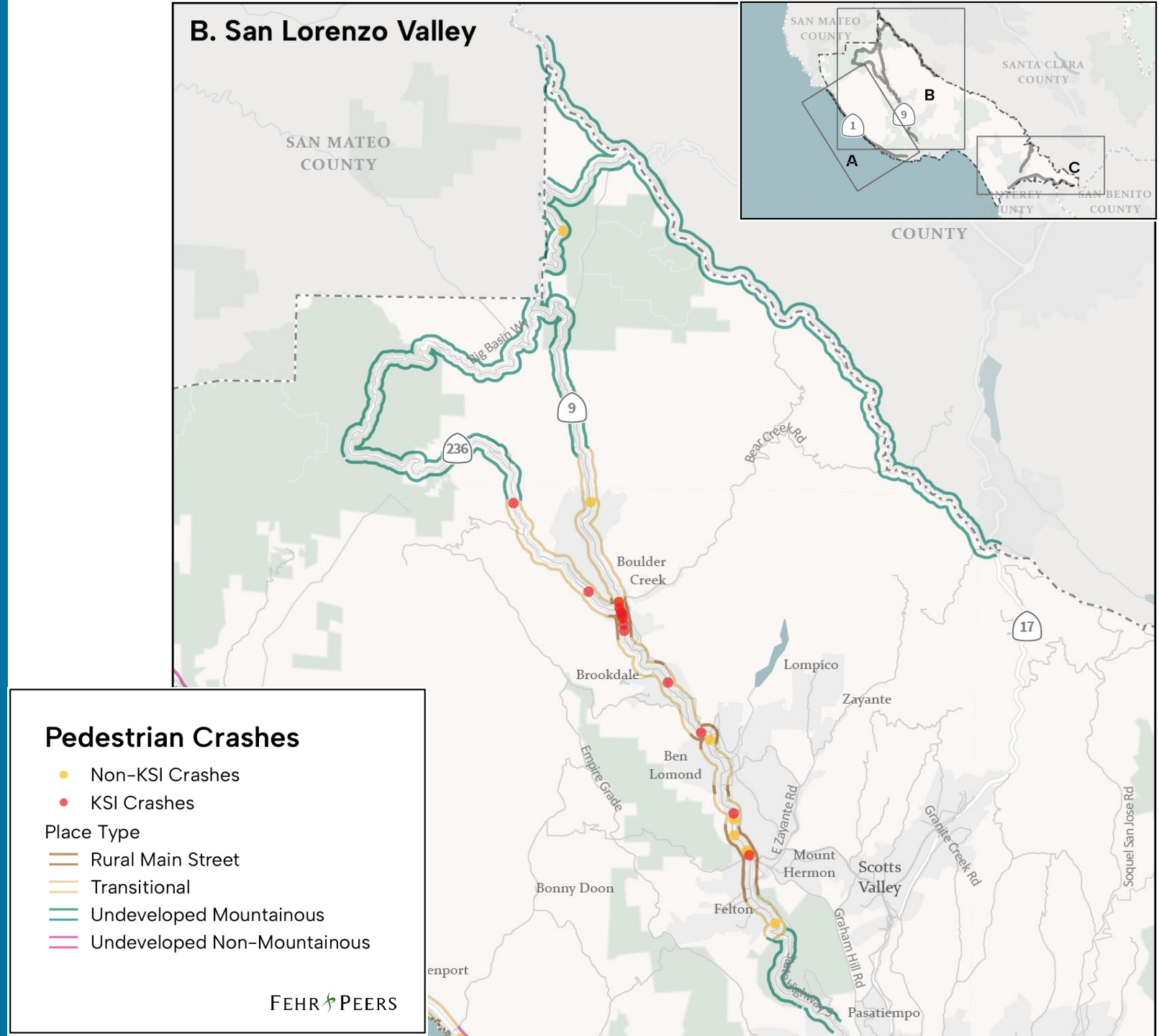
Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

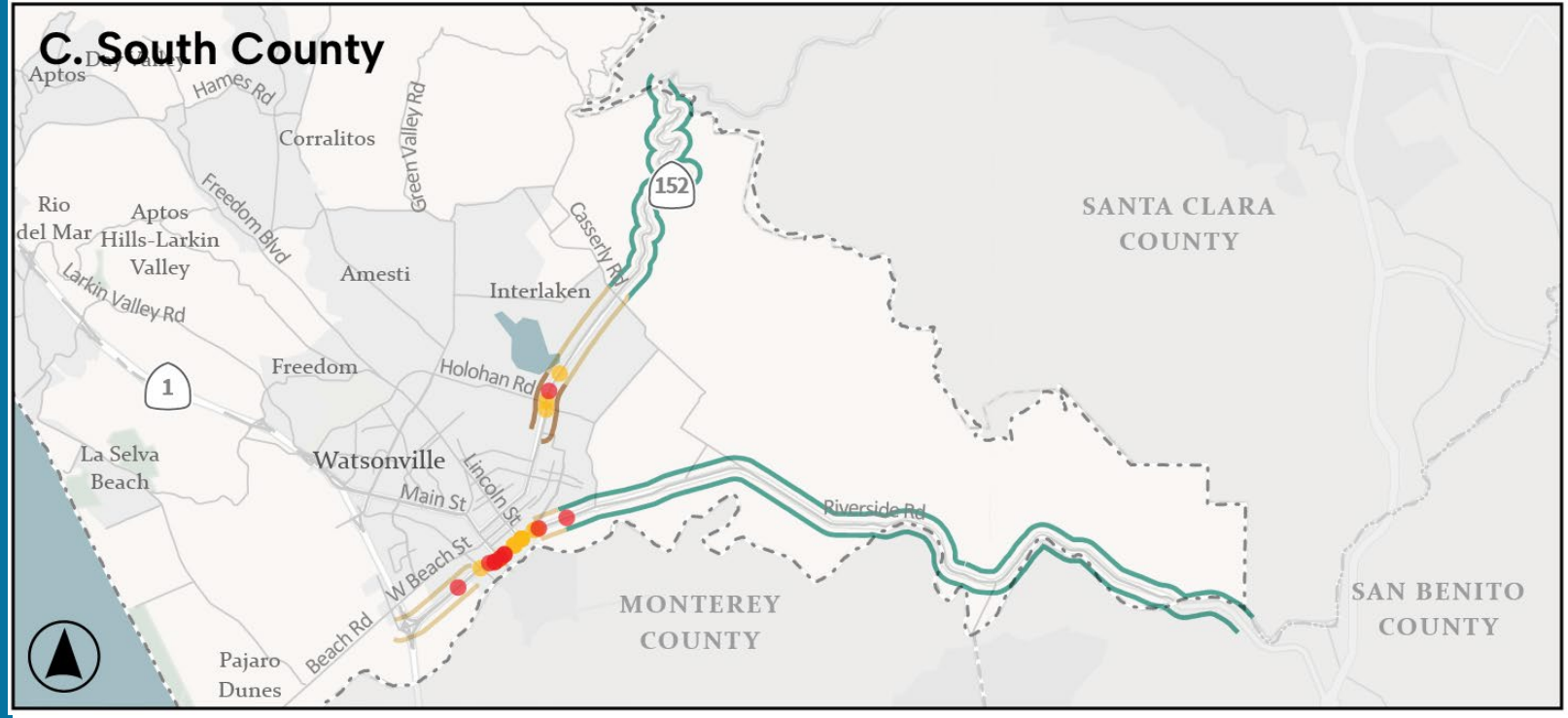
FEHR PEERS



Pedestrian Crashes



Pedestrian Crashes



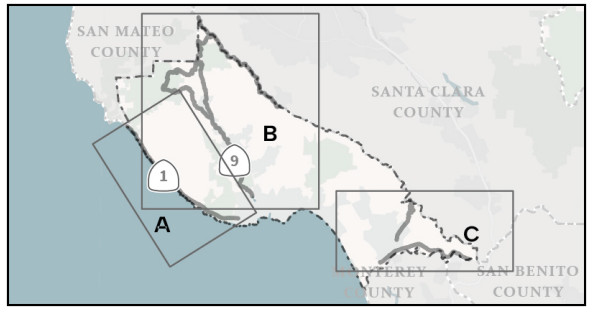
Pedestrian Crashes

- Non-KSI Crashes
- KSI Crashes

Place Type

- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS



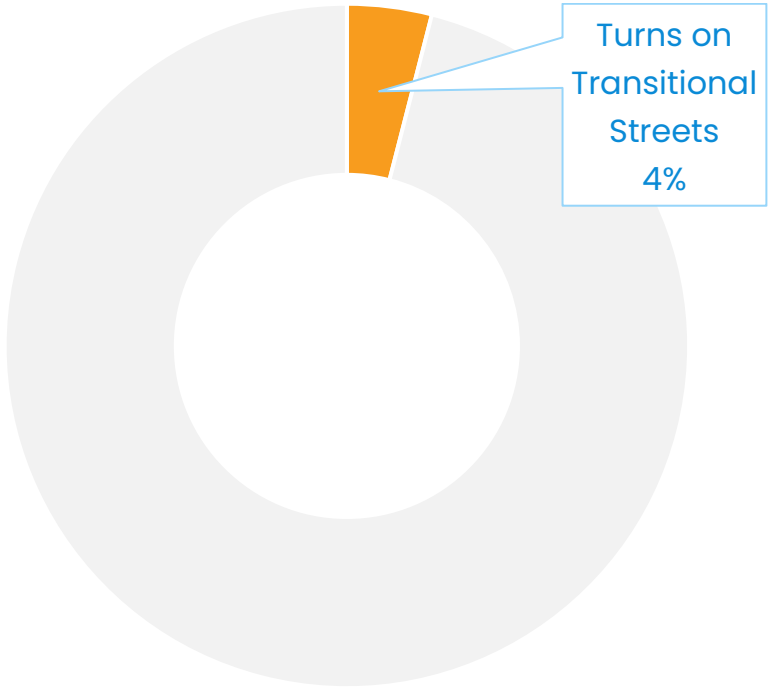
Countermeasures

- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)

Turns on Transitional Streets

Midblock vehicle-only crashes involving turns on transitional streets

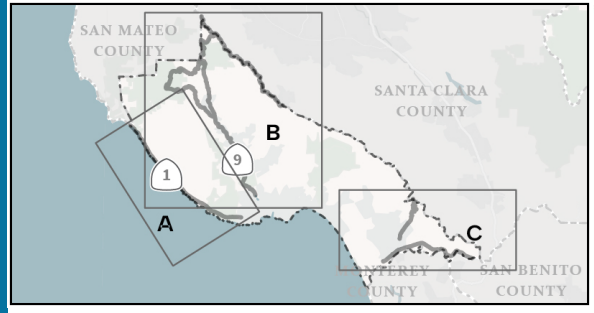
Mode: Vehicle on Vehicle

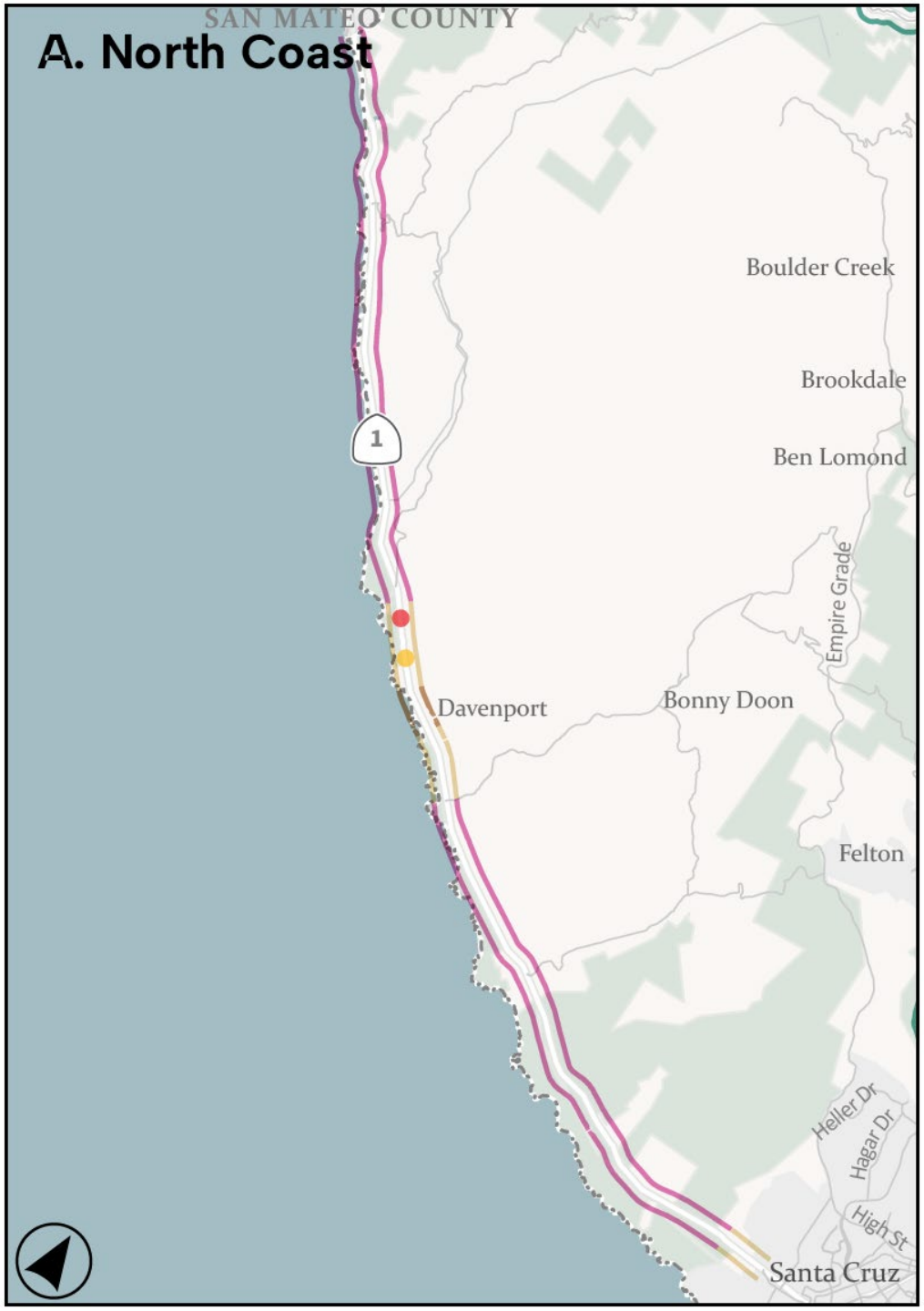


Key considerations:

- Driveway spacing/locations
- Sight distance
- Traversing high-traffic areas
- Observed speed exceeds target speed

Turns on Transitional Streets





Turns from Driveways In Transitional Streets

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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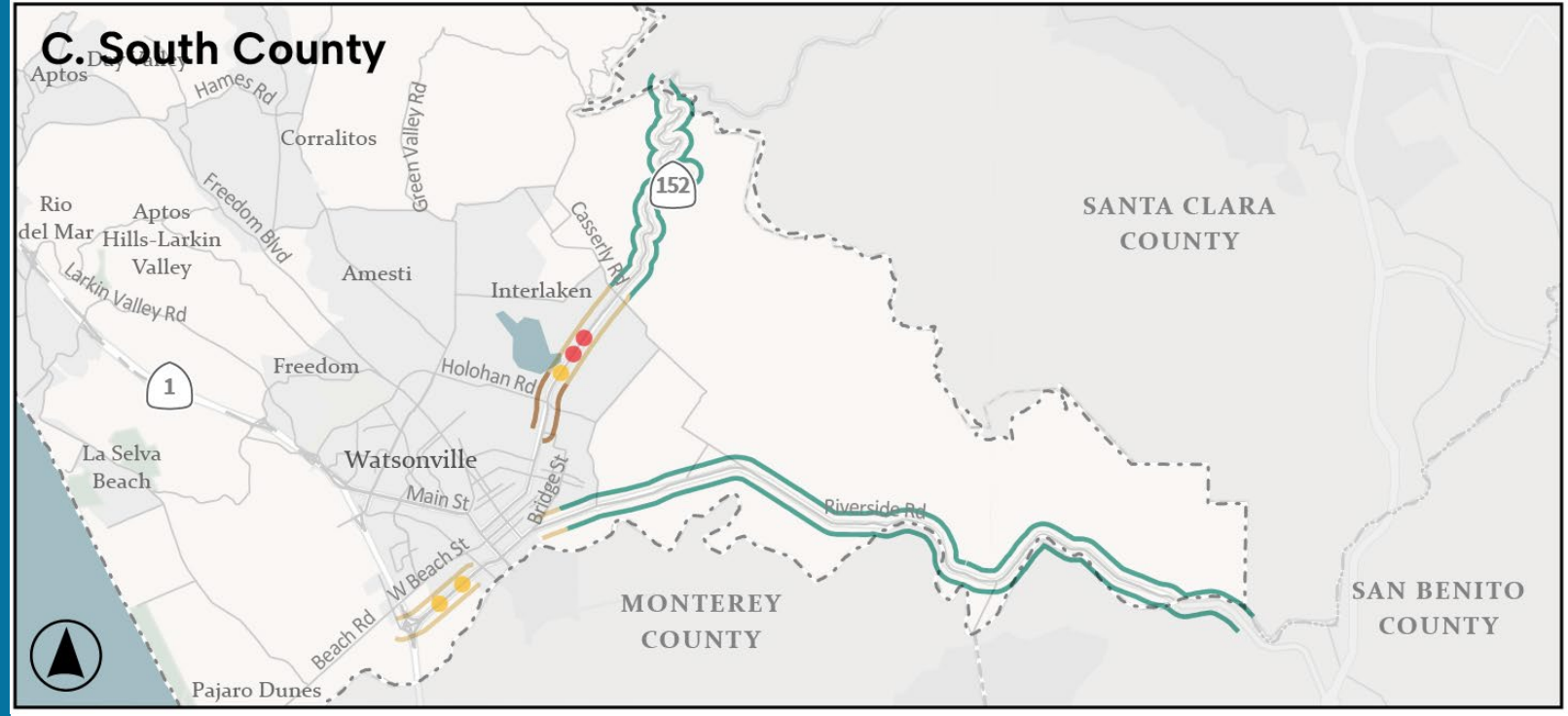
Turns on Transitional Streets

Turns on Transitional Streets



Turns from Driveways In Transitional Streets

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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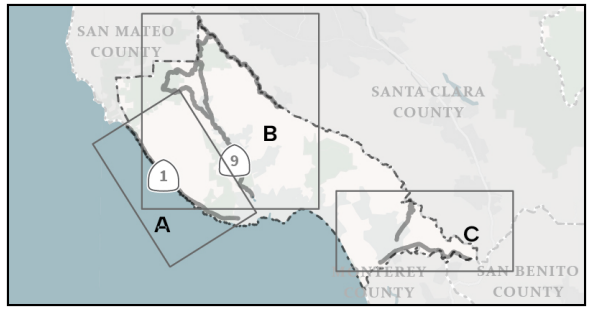


Countermeasures

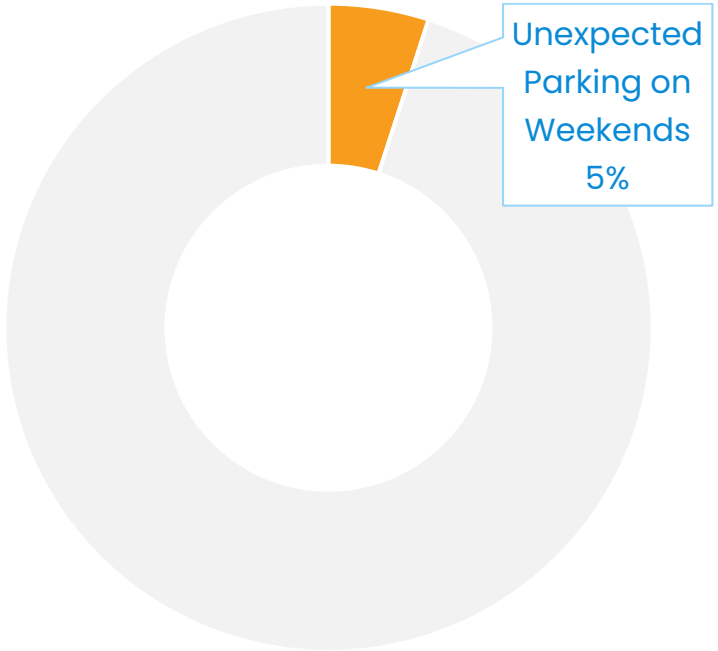
- Sight distance improvements at driveways through vegetation management, mirrors, and enhancements to codes and plan review for placement of driveways, fences, and other improvements
- Signage or active warning devices at key locations
- Geometric enhancements such as turn lanes (including two-way center turn lanes) and horizontal realignments
- Driveway consolidation where feasible

FHWA, Picasa

Weekend Driving on Undeveloped Non-Mountainous Roads

Vehicle crashes on weekends on Undeveloped Non-Mountainous roads

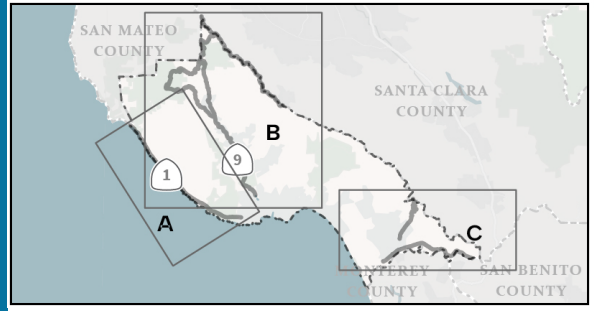
Mode:
Veh-Veh

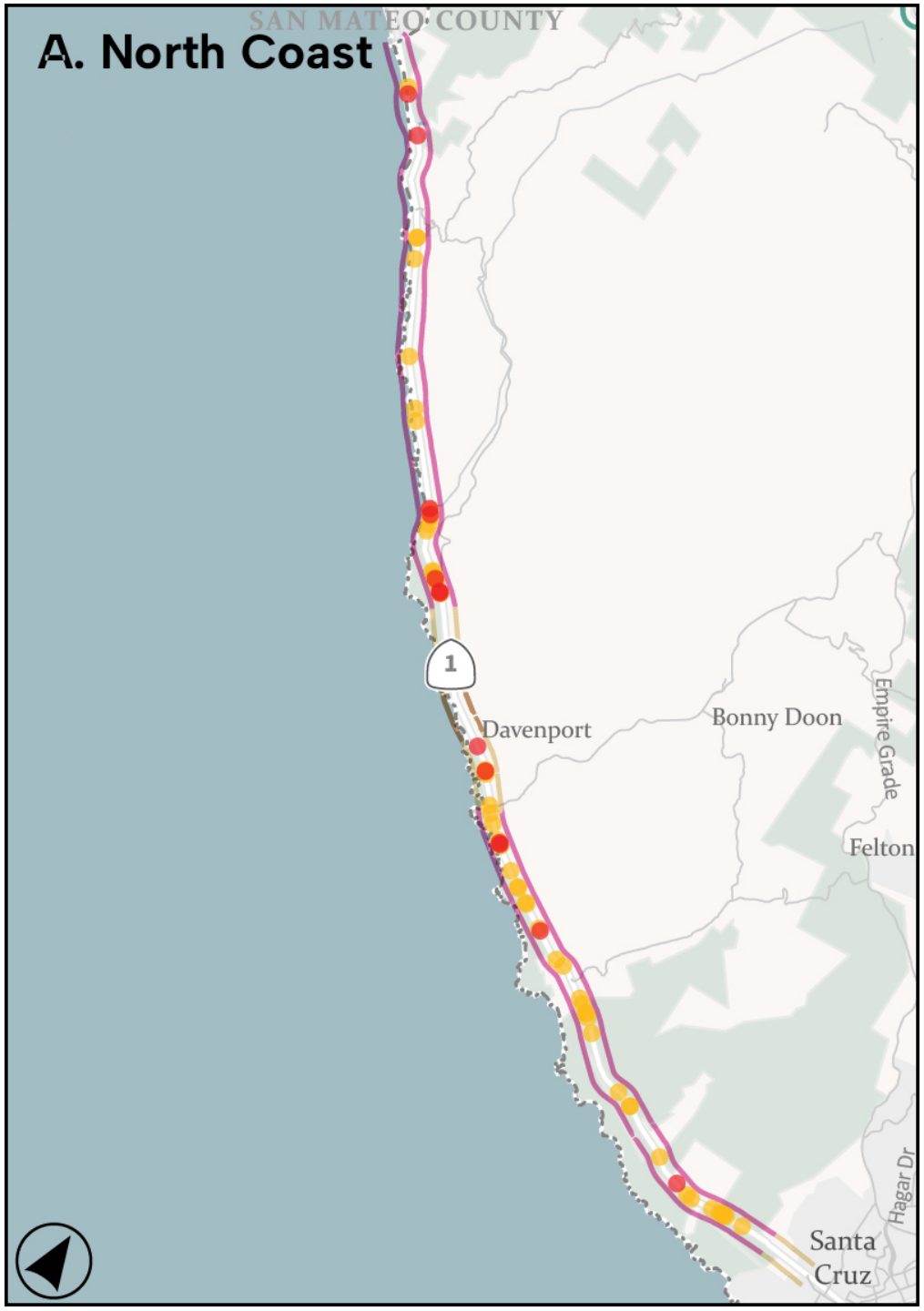


Key considerations:

- Sight distance
- Parking challenges at key destinations
- Presence of vulnerable users
- Drivers less familiar with roadways
- Observed speed exceeds target speed
- TDM strategies

Weekend Driving on Undeveloped Non-Mountainous Roads





Weekend Driving on Undeveloped Non-Mountainous Roads

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR & PEERS

Countermeasures

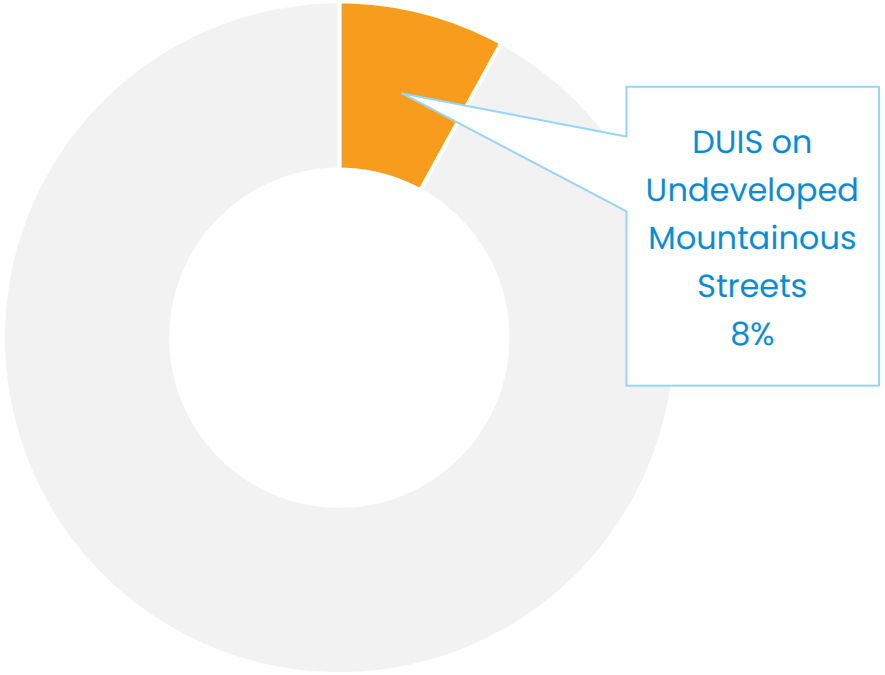
- Establish alternatives to driving to key destinations (demand management)
- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, signage
- Improved placement of and access to parking areas at key recreational sites to address informal parking along roadways
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)
- Shoulder treatments, rumble strips, speed feedback and other vehicle activated signs

Floyd County Georgia, 2024

DUIs on Undeveloped Mountainous Roads

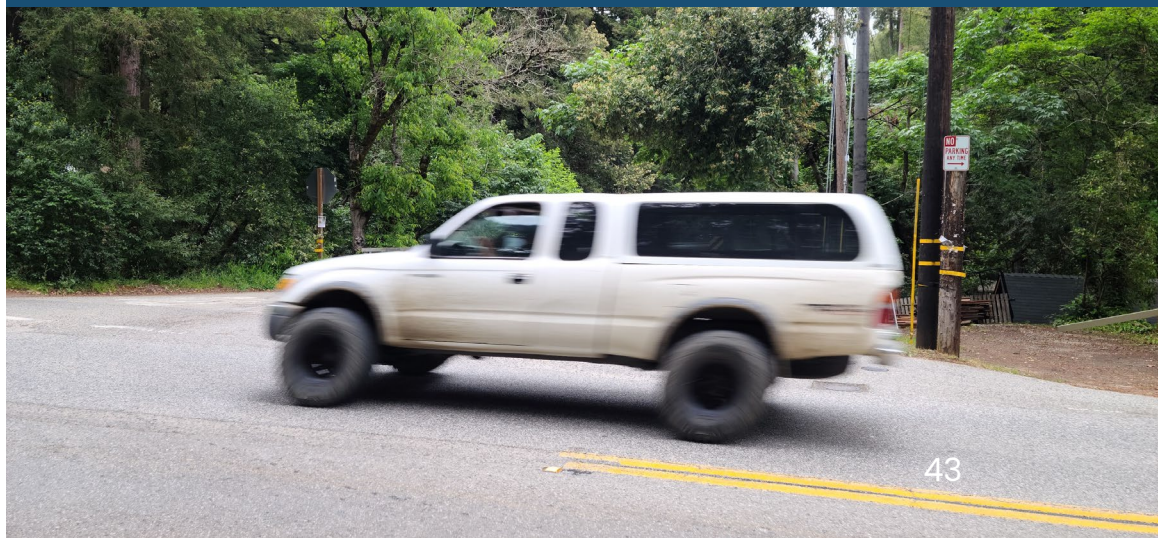
DUI related crashes on Undeveloped Mountainous Roads

Mode: Vehicle on Vehicle

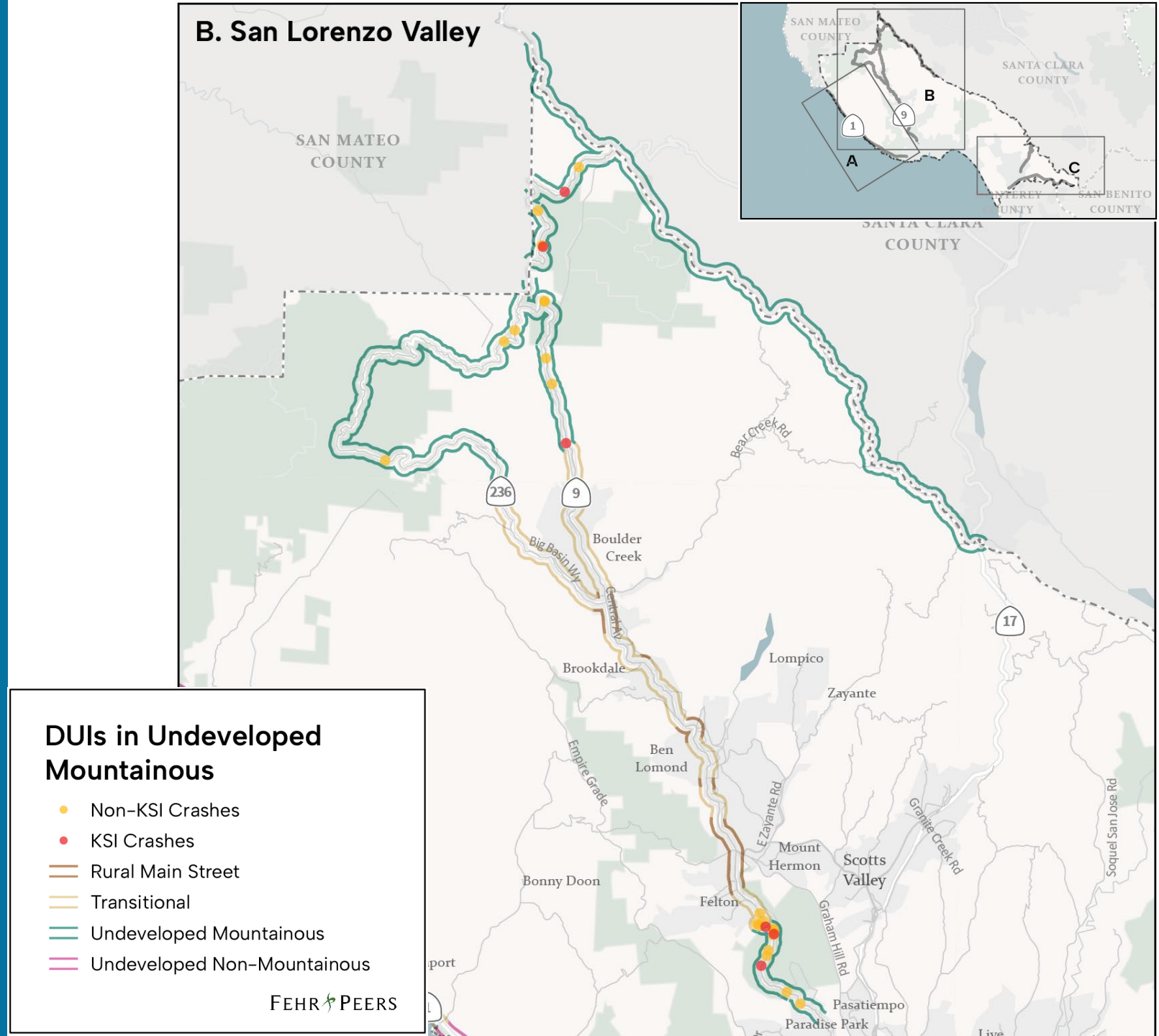


Key considerations:

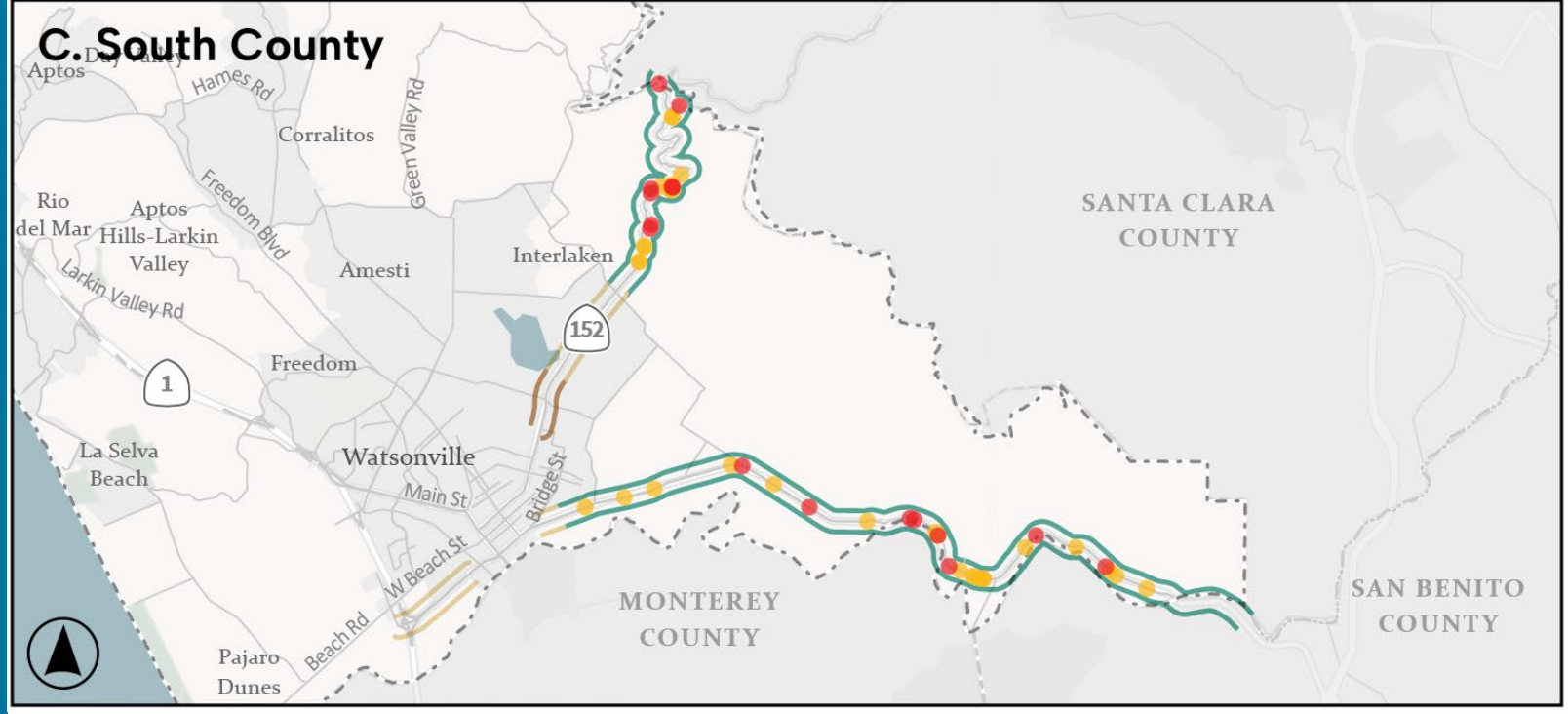
- Alternative travel options to driving drunk
- Observed speed exceeds target speed
- Reduce severe impacts of crashes by focusing on reducing speeds and addressing conflict points



DUIs on Undeveloped Mountainous Roads



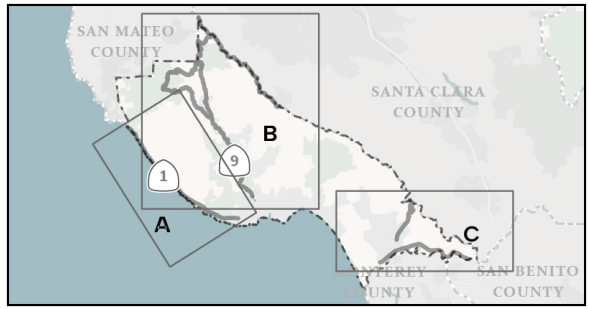
DUIs on Undeveloped Mountainous Roads



DUIs in Undeveloped Mountainous

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

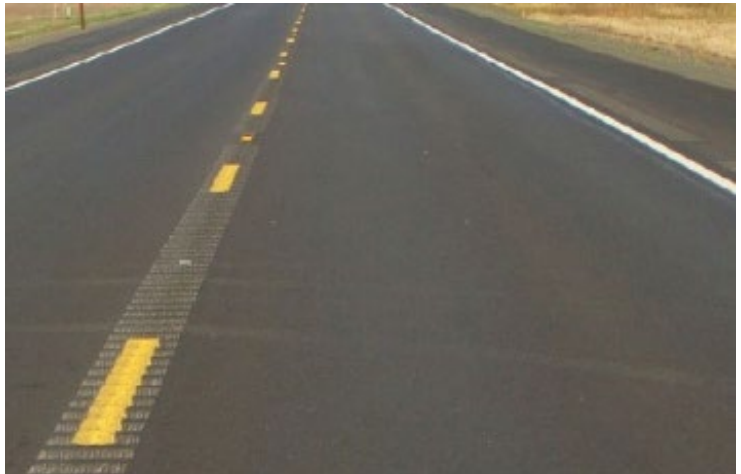
FEHR PEERS



Countermeasures

- Transportation alternatives/business partnerships with rideshare or taxi services (demand management)
- Rumble strips, shoulder treatments, and centerline enhancements
- Enhanced warning for geometric inconsistencies, potentially including vehicle activated signs
- Guardrail

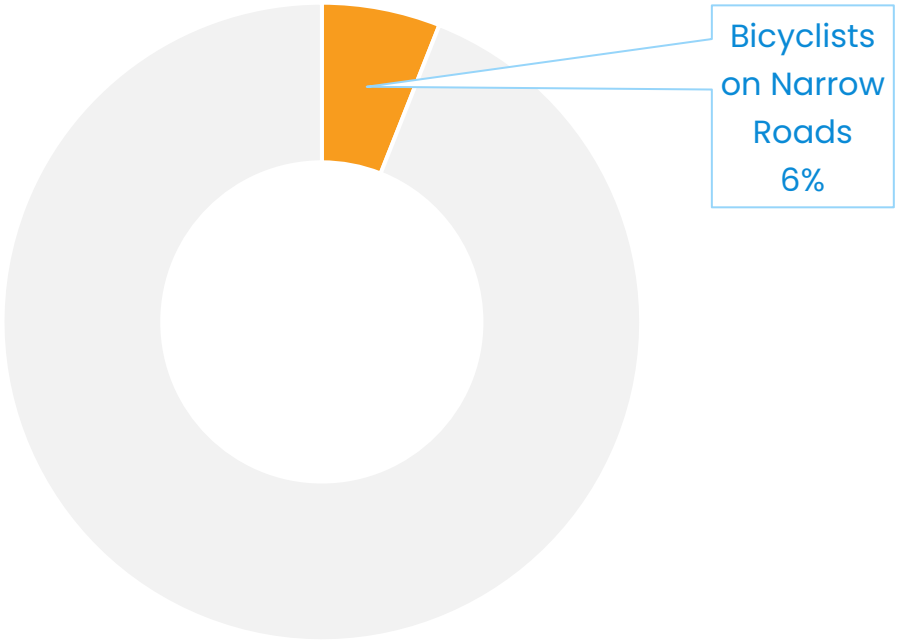
FHWA, Augusta, ME



Bicyclists on Narrow Roads

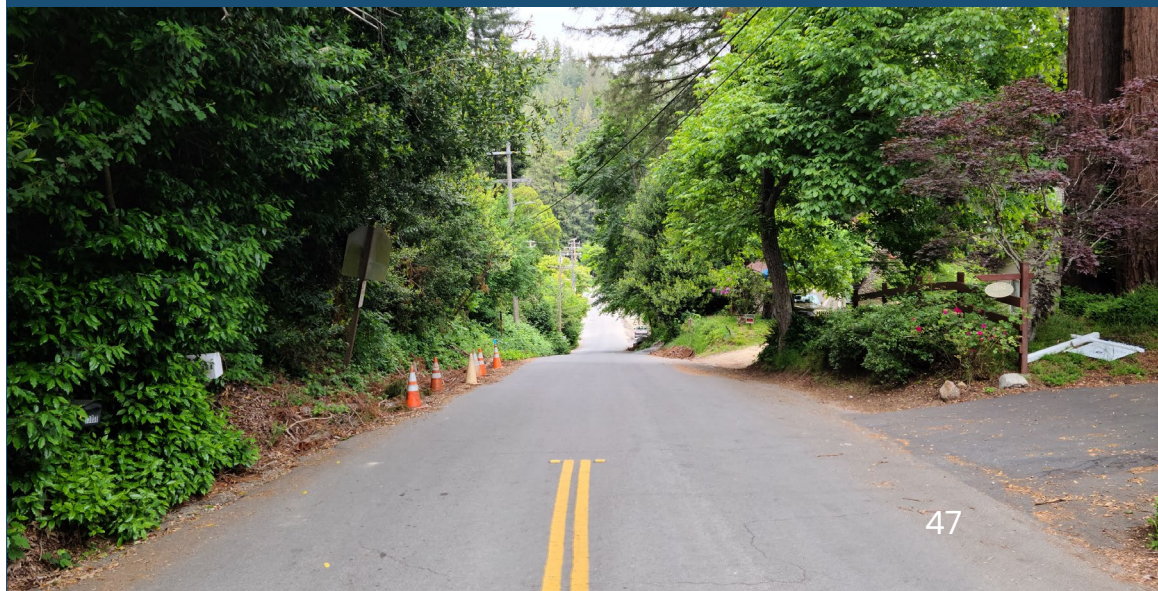
Bike crashes on narrow roadway segments (<36 feet roadway)

Mode:
Bicyclists

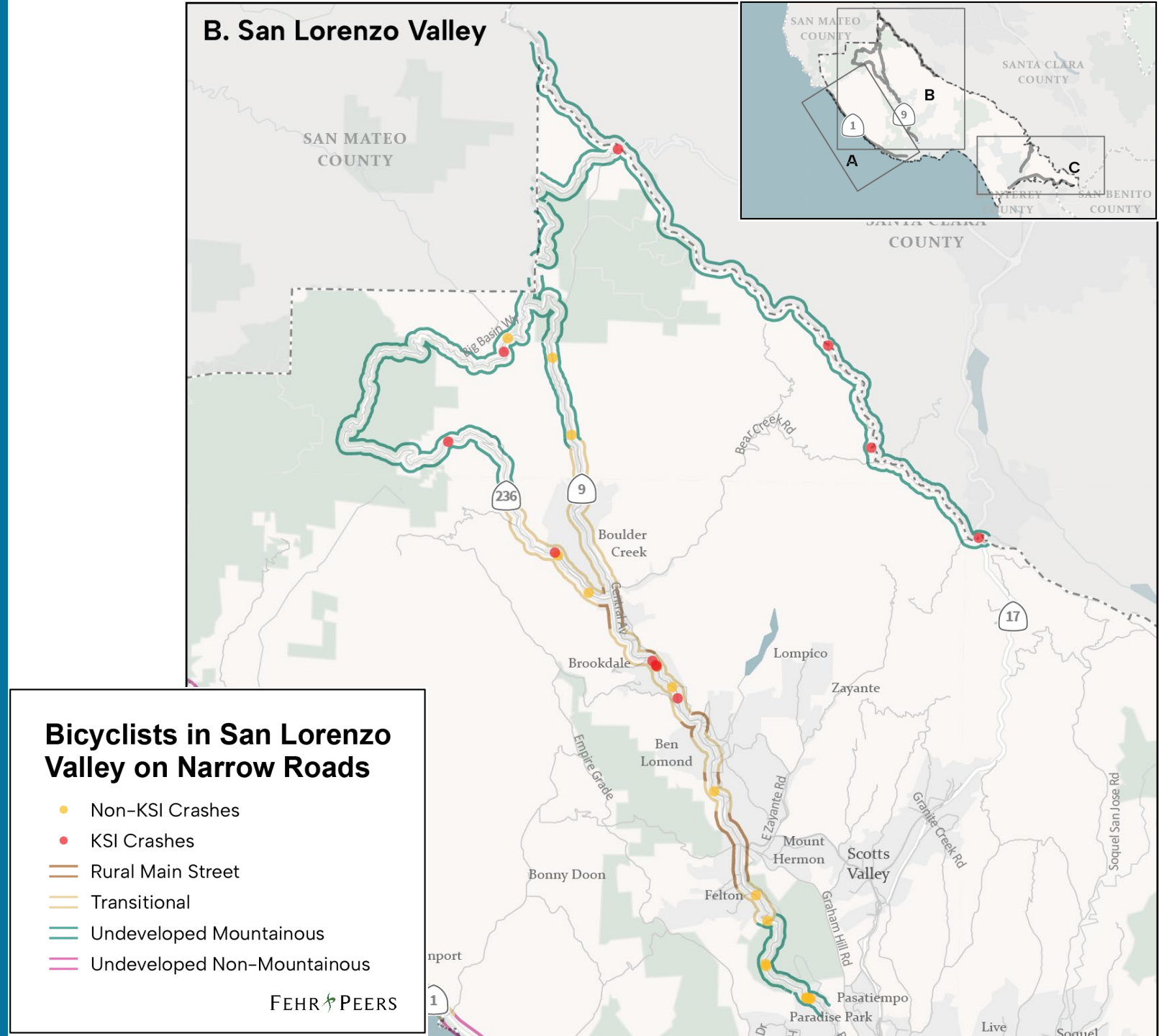


Key considerations:

- High levels of bicycle activity
- Lacking space for bicycle facilities
- Sight distance often reduced by horizontal or vertical constraints
- Observed speed exceeds target speed



Bicyclists on Narrow Roads



Countermeasures

- Bike lanes or separated paths along key corridors, particularly Highway 9
- Enhanced signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)
- Speed feedback and other vehicle activated signs, potentially including active signs to warn motorists of present bicyclists in constrained roadway sections

Lane Departures

Head-On or Hit Object vehicle crashes

Mode:
Veh-Veh

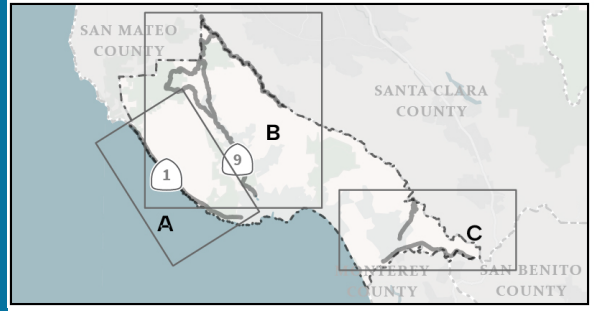
Represents **42%** of all KSIs

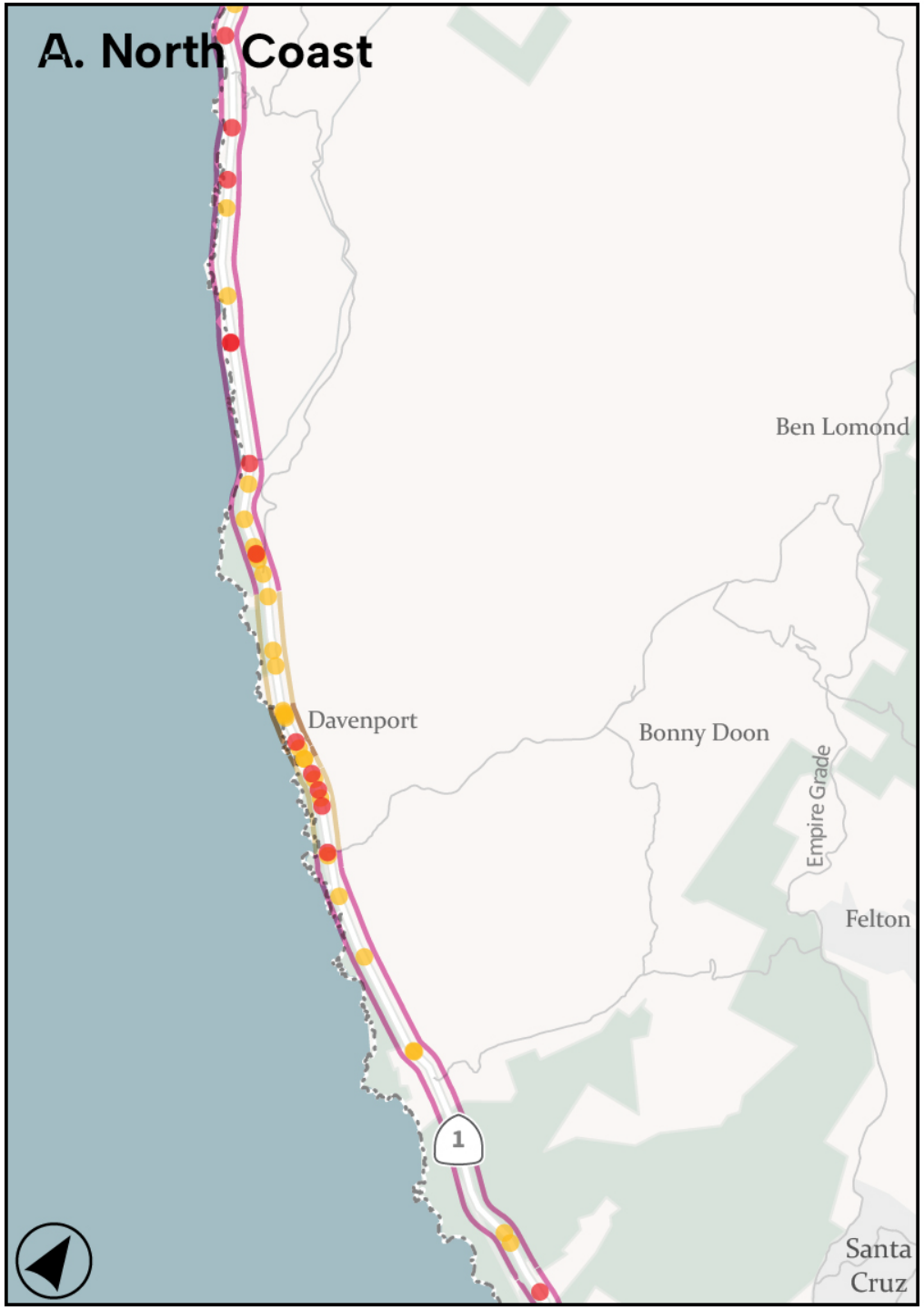
- **18%** of KSIs on Main Streets
- **45%** of KSIs on Transitional Streets
- **28%** of KSIs on Undeveloped Non-Mountainous Streets
- **55%** of KSIs on Undeveloped Mountainous Streets

Key considerations:

- Lane width
- Shoulder width
- Median type
- Horizontal and vertical curvature
- Presence of guardrail or other protective devices
- Sight distance
- Observed speed exceeds target speed

Lane Departures



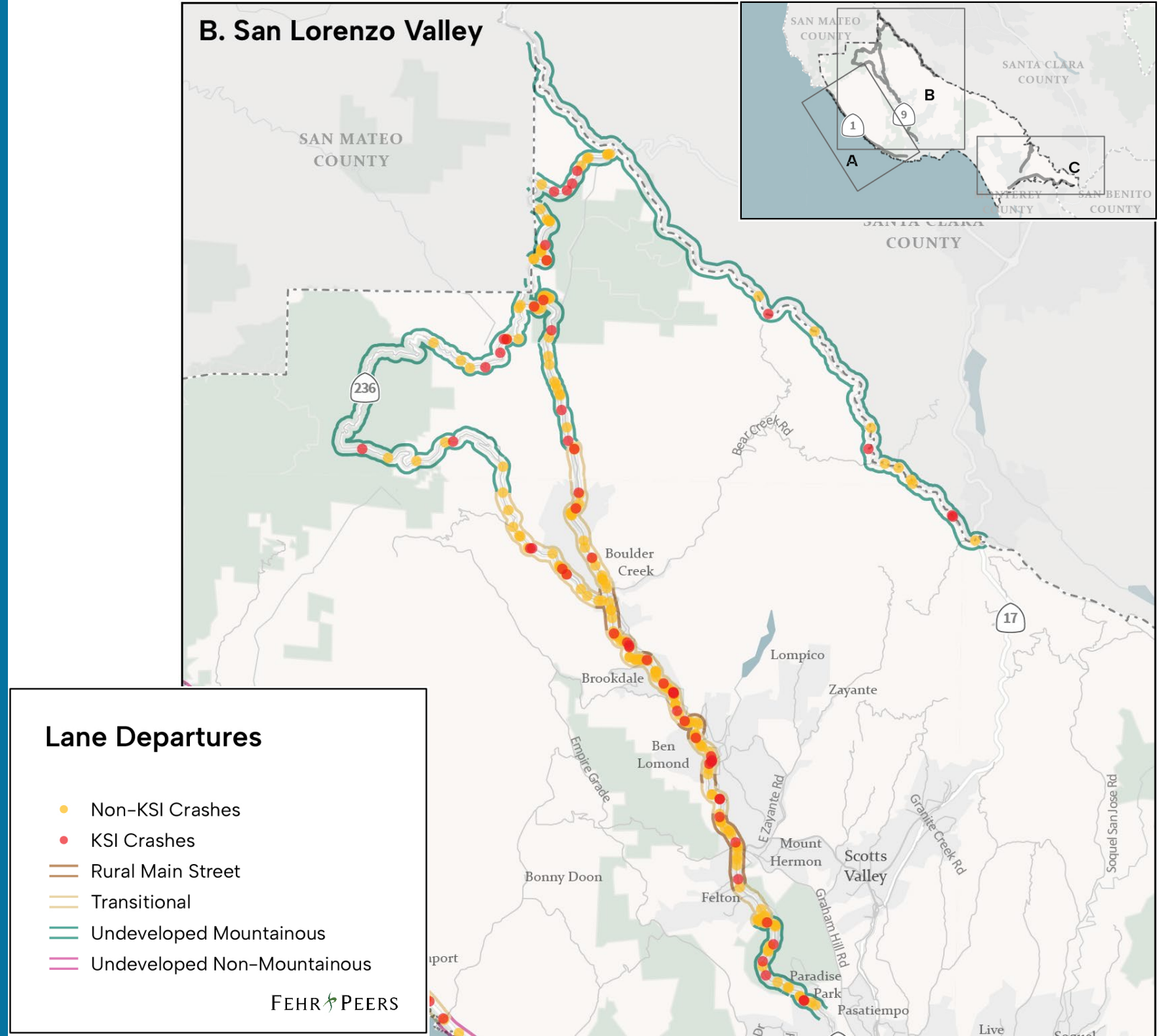


Lane Departures

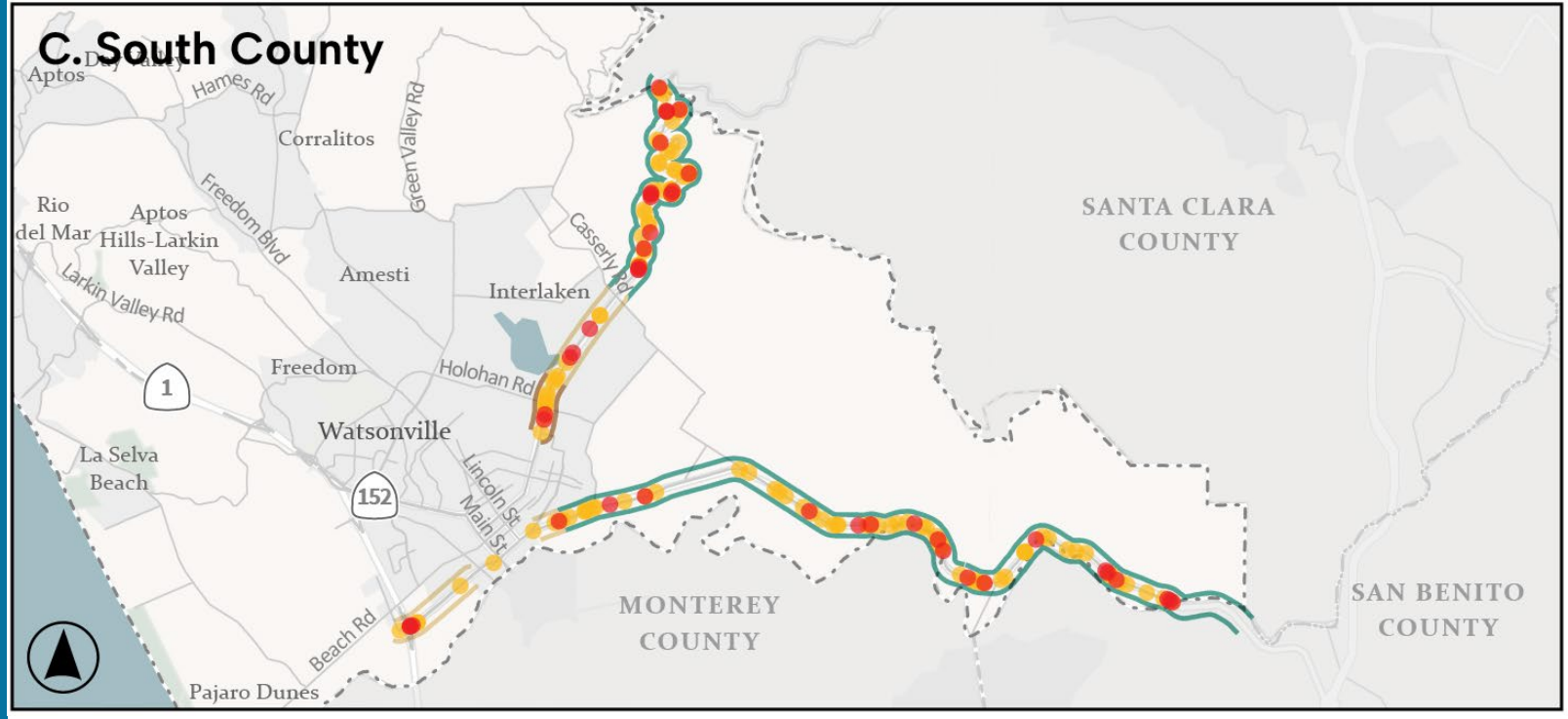
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR & PEERS

Lane Departures



Lane Departures



Lane Departures

- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

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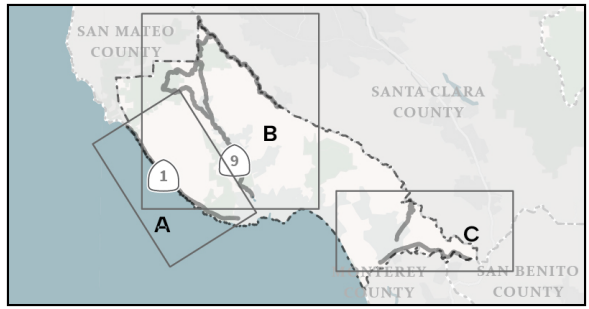
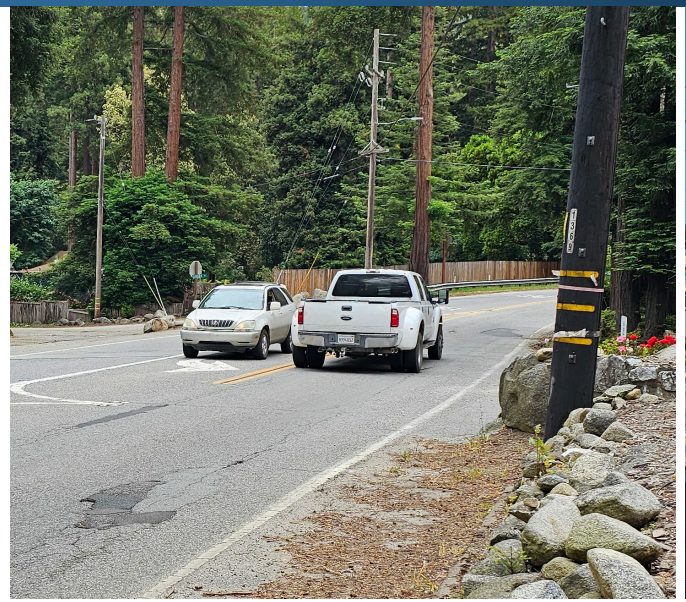


Countermeasures

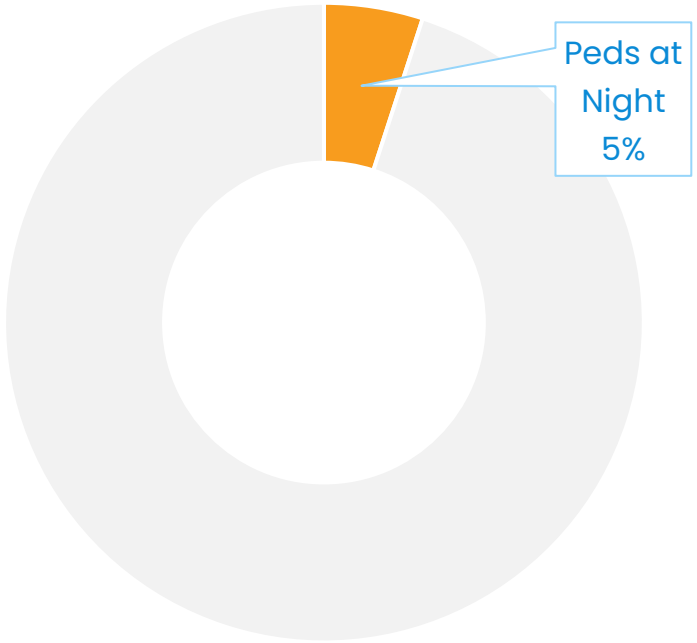
- **Main Streets & Transitional Streets**
  - Enhancing clear zone and using breakaway couplings
  - Raised medians/edges or two-way center turn lanes where appropriate
  - Provision of suitable parking areas to better define space
  - General traffic calming enhancements, particularly speed feedback signs
- **Undeveloped Mountainous & Non-Mountainous Areas**
  - Enhancing clear zone and using breakaway couplings
  - Guardrail
  - Rumble strips (edge and centerline)
  - Shoulder width enhancements
  - Speed feedback and other vehicle activated signs



Pedestrians at Night

Pedestrian crashes when lighting conditions were noted as Not Daylight

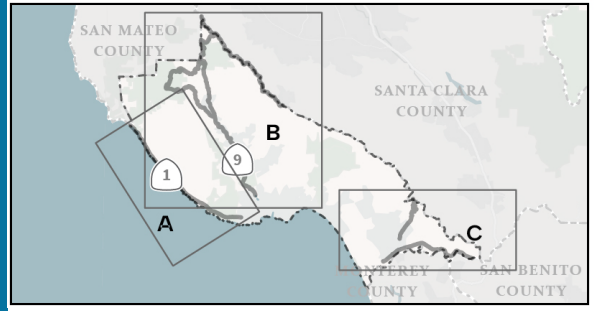
Mode:
Pedestrian

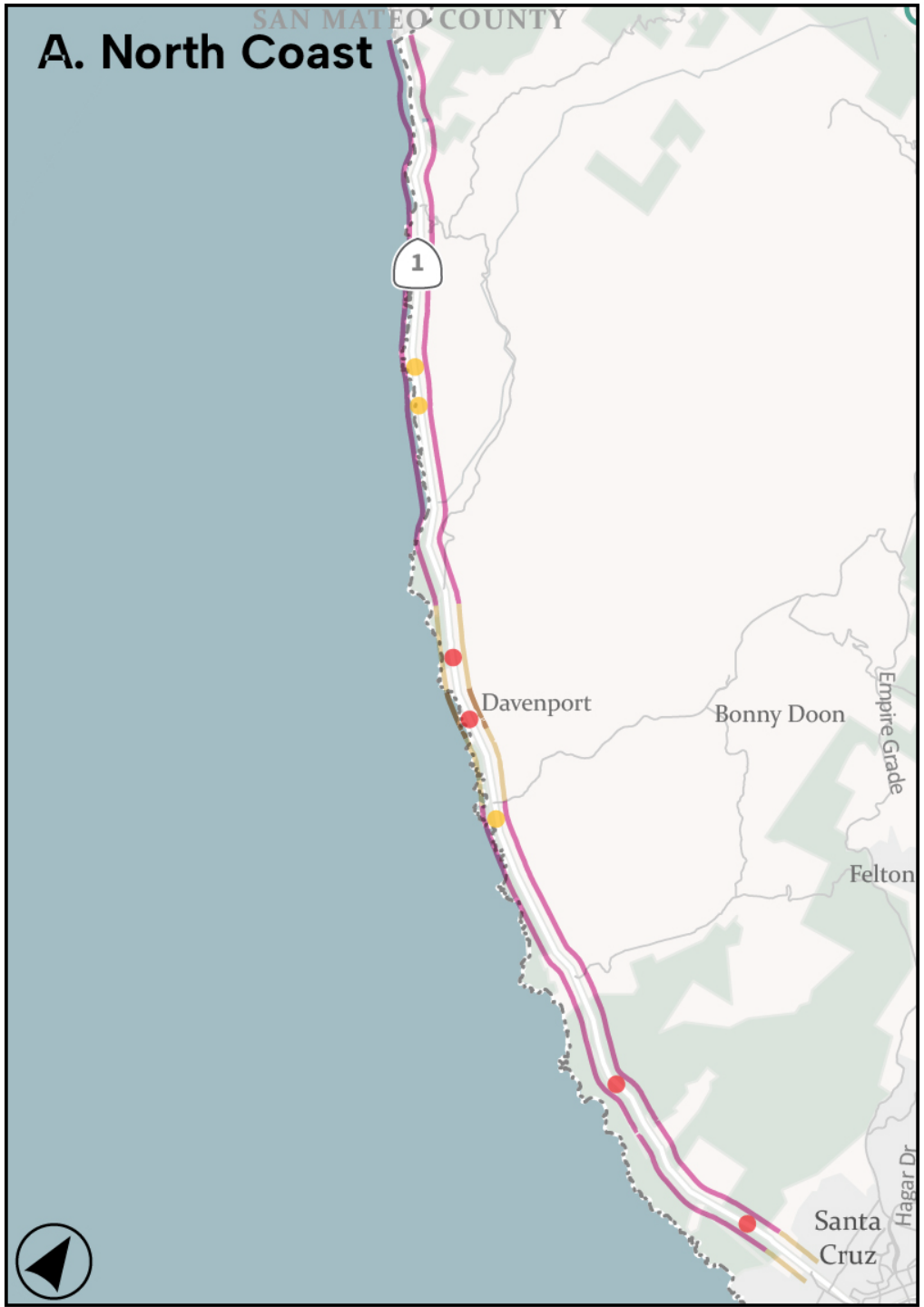


Key considerations:

- Lighting
- Presence of pedestrian facilities
- High pedestrian traffic

Pedestrians at Night



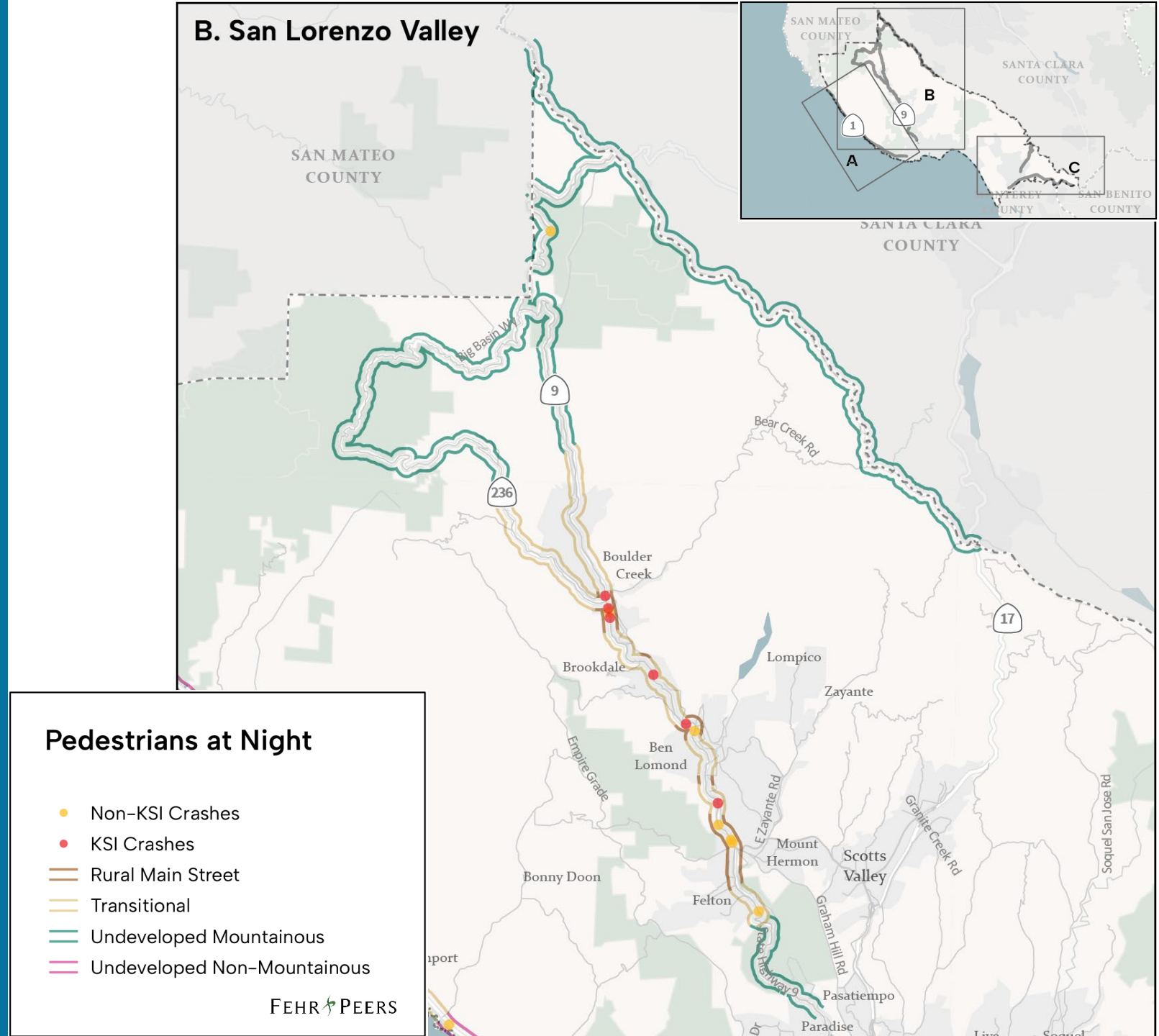


Pedestrians at Night

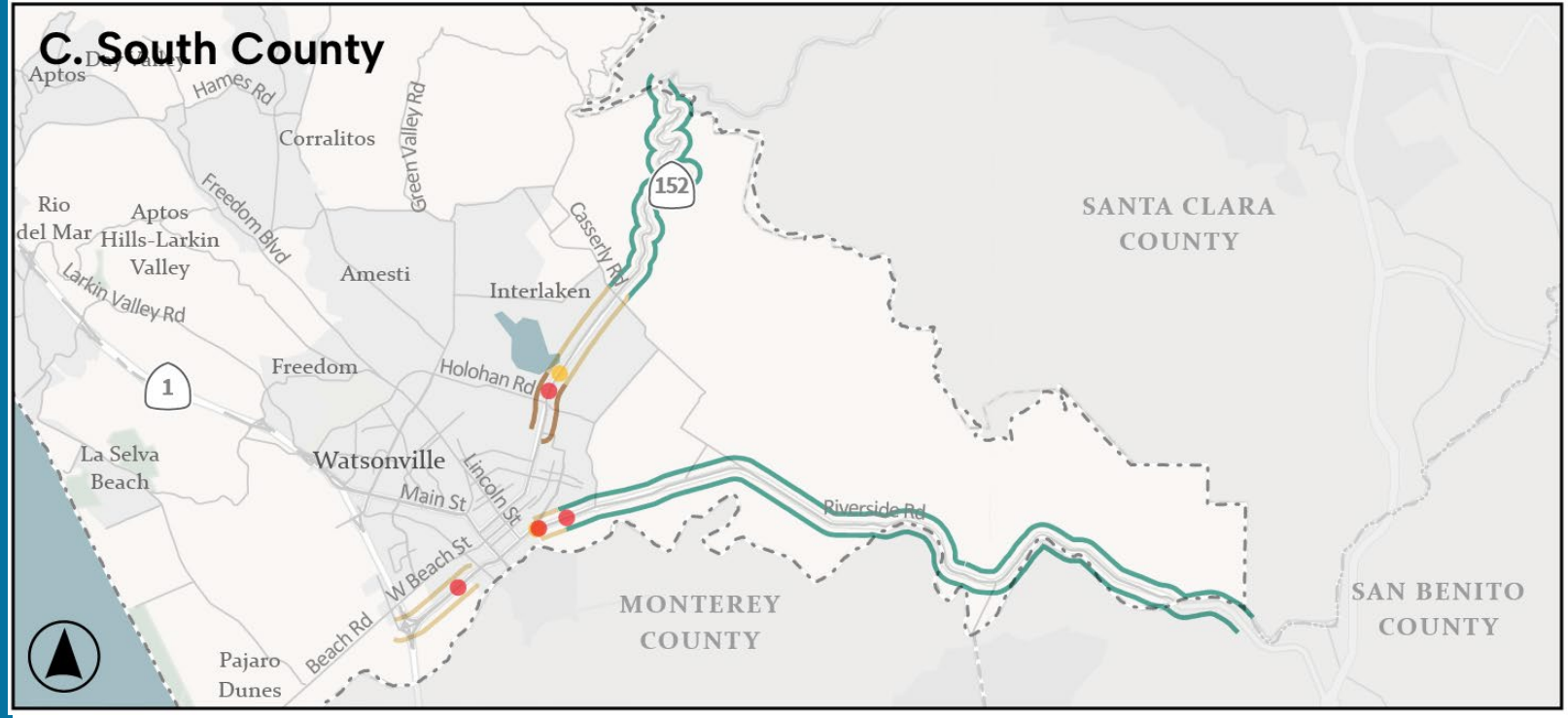
- Non-KSI Crashes
- KSI Crashes
- Rural Main Street
- Transitional
- Undeveloped Mountainous
- Undeveloped Non-Mountainous

FEHR PEERS

Pedestrians at Night



Pedestrians at Night



Pedestrians at Night

- Non-KSI Crashes
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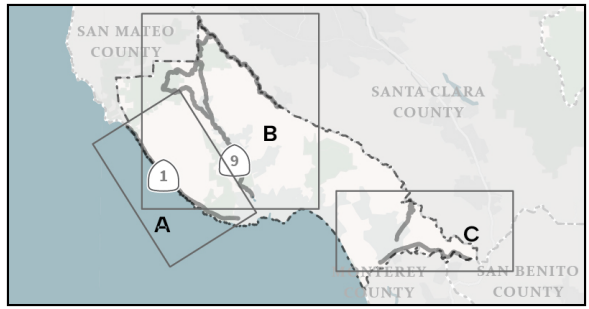
FEHR PEERS

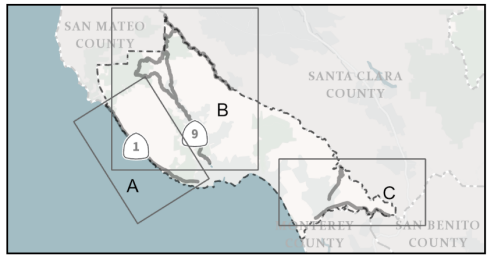


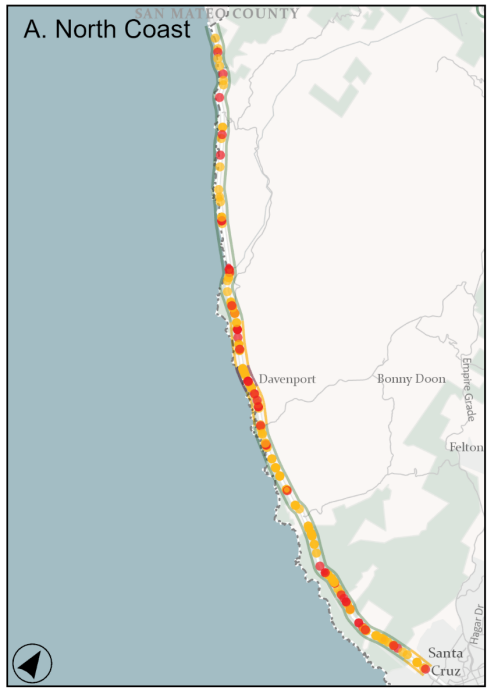
Countermeasures

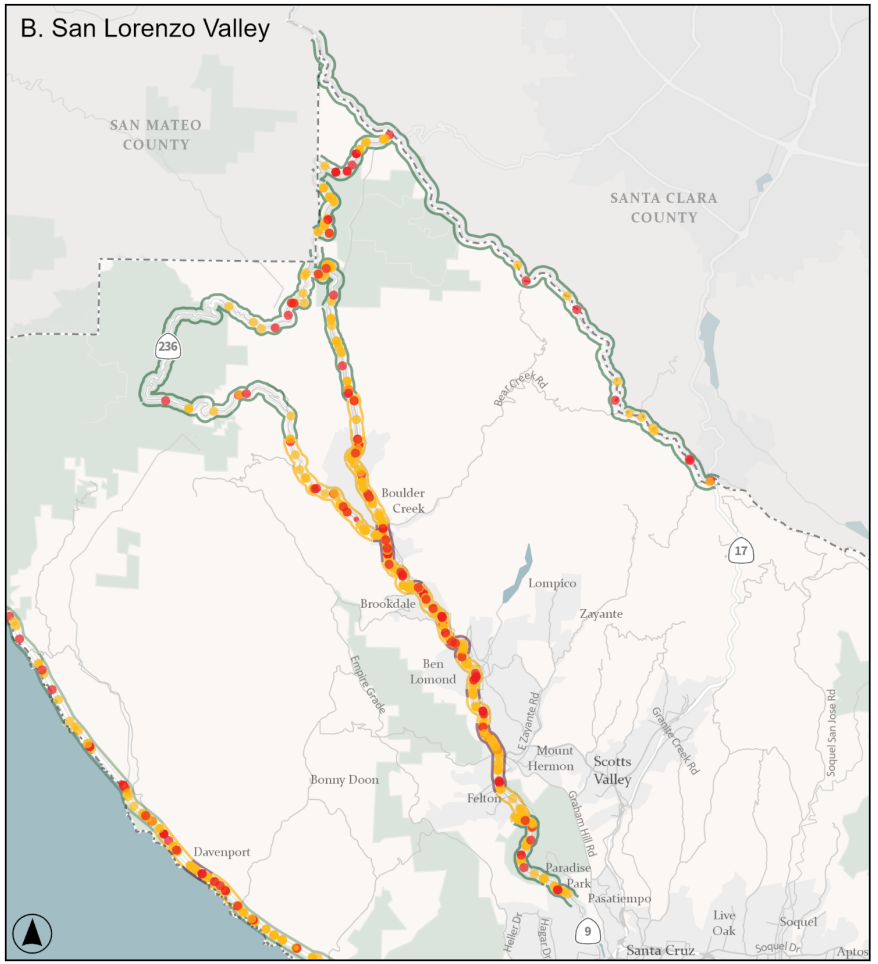
- Lighting at pedestrian crossings and other areas of high walking demand, potentially including user-activated lighting in undeveloped areas
- Sidewalks or paths at key pedestrian demand areas
- Enhanced crosswalks, crossing treatments, curb extensions, signage
- Sight distance enhancements (horizontal/vertical alignment, vegetation management)

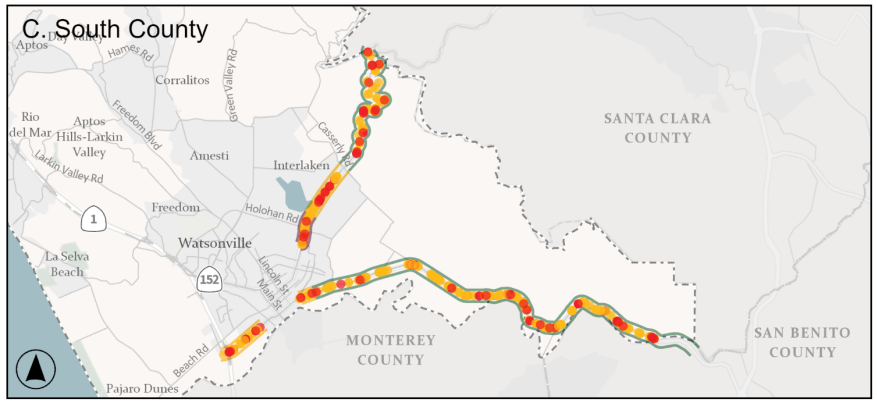
Do these profiles match your experience?

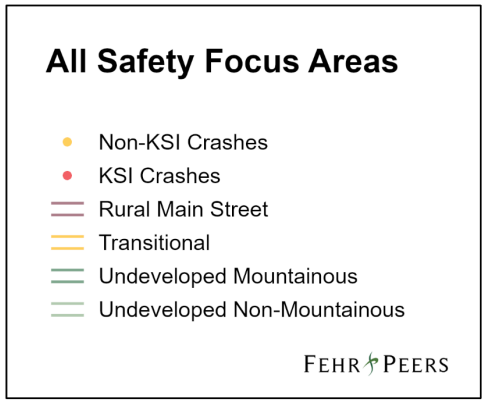
Are there any factors that we are missing?





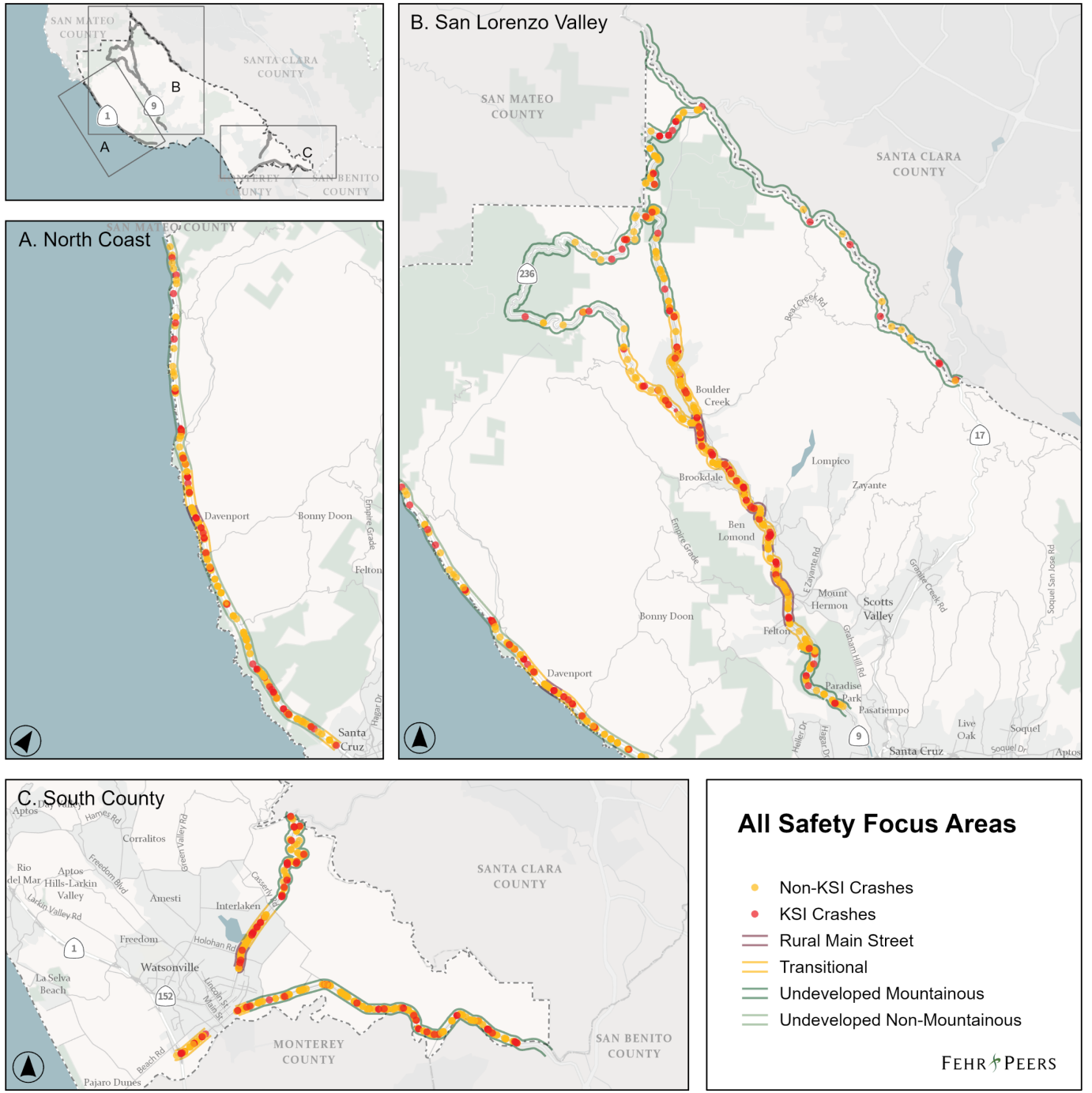






These countermeasures are determined based on national best practice.

Are there specific types of countermeasures that address these safety concerns that you prefer?



Priority Locations

- Locations to prioritize for project improvements
- Informed by concentration of potential risk factors and community input

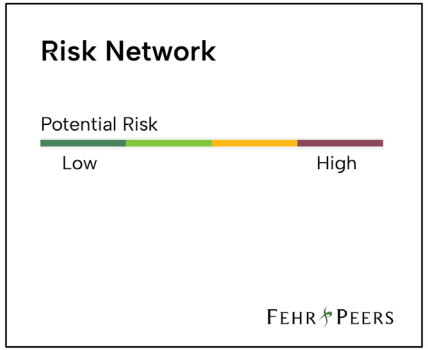
Potential Risk Factors

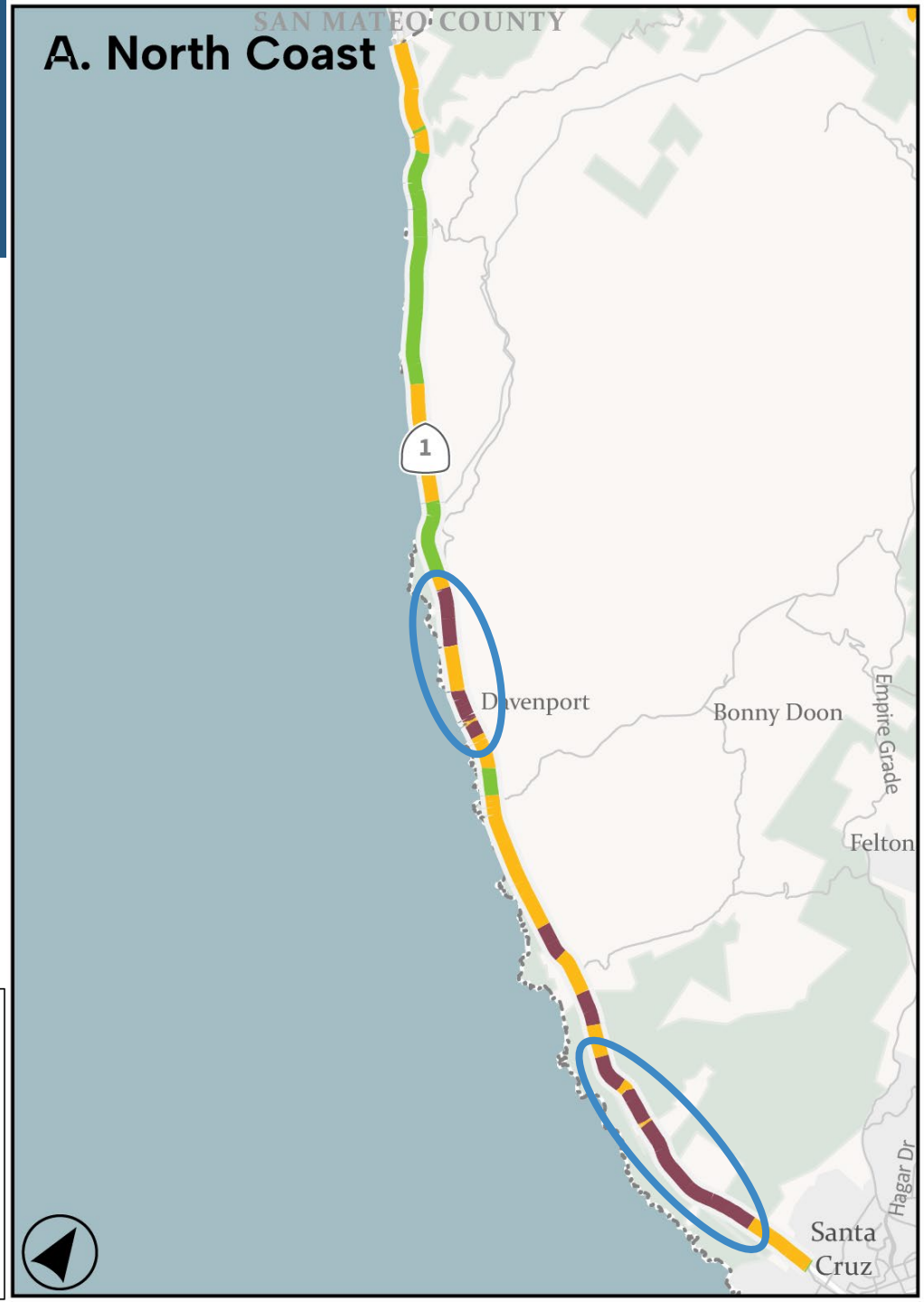
Key considerations:

- High observed speeds
- Lack of pedestrian/bicycle facilities
- People accessing/existing parking conflict with through traffic

Based on Community input

Based on Potential Risk





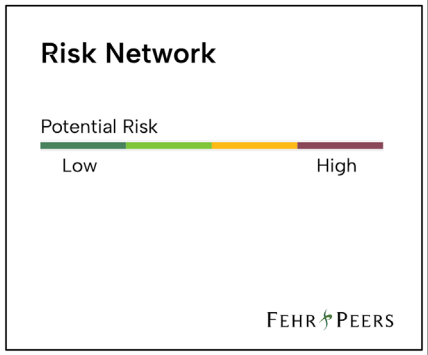
Potential Risk Factors

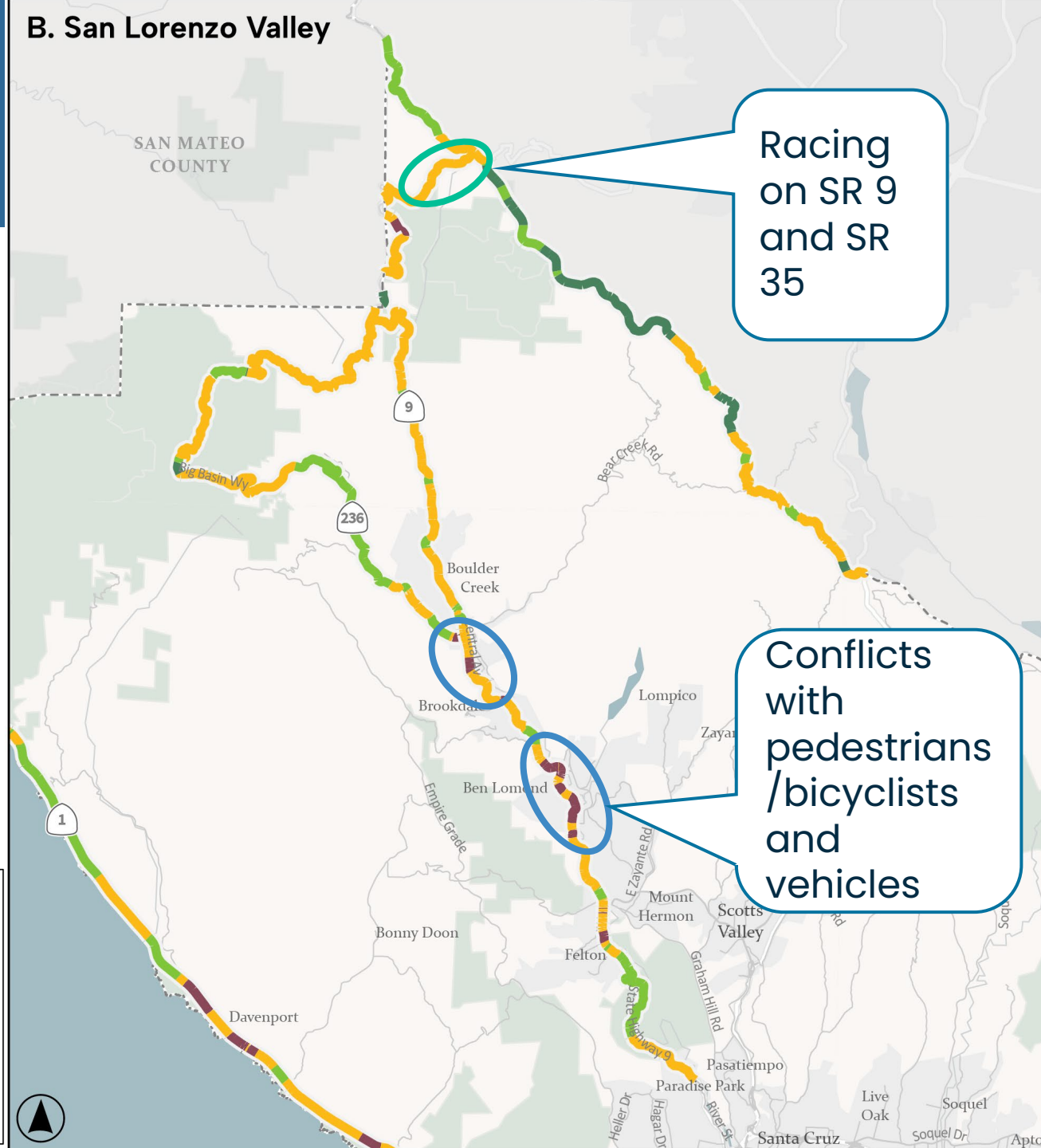
Key considerations:

- High observed speeds
- Lack of pedestrian/bicycle facilities
- Low visibility causes conflicts with pedestrians
- Turns are taken at high speeds

Based on Community input

Based on Potential Risk





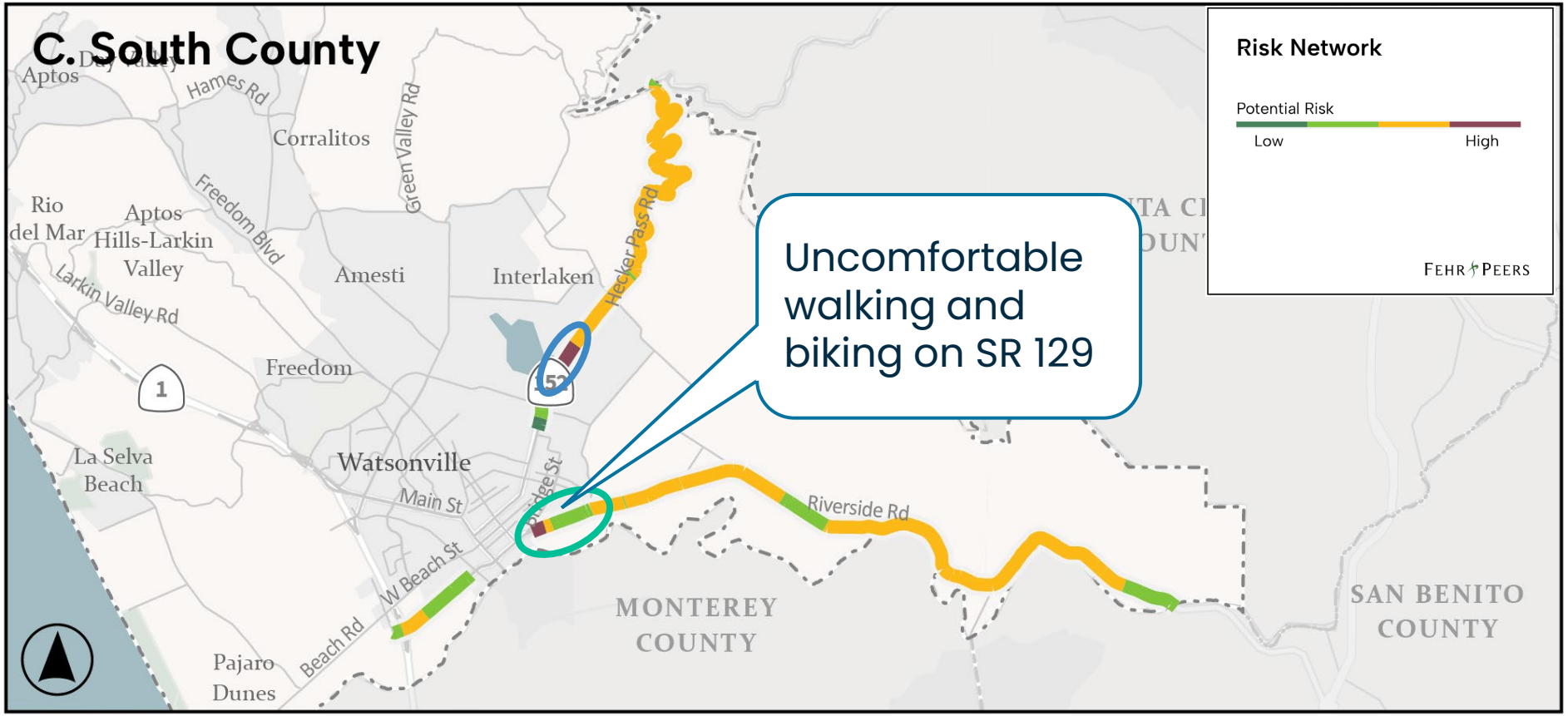
Potential Risk Factors

Key considerations:

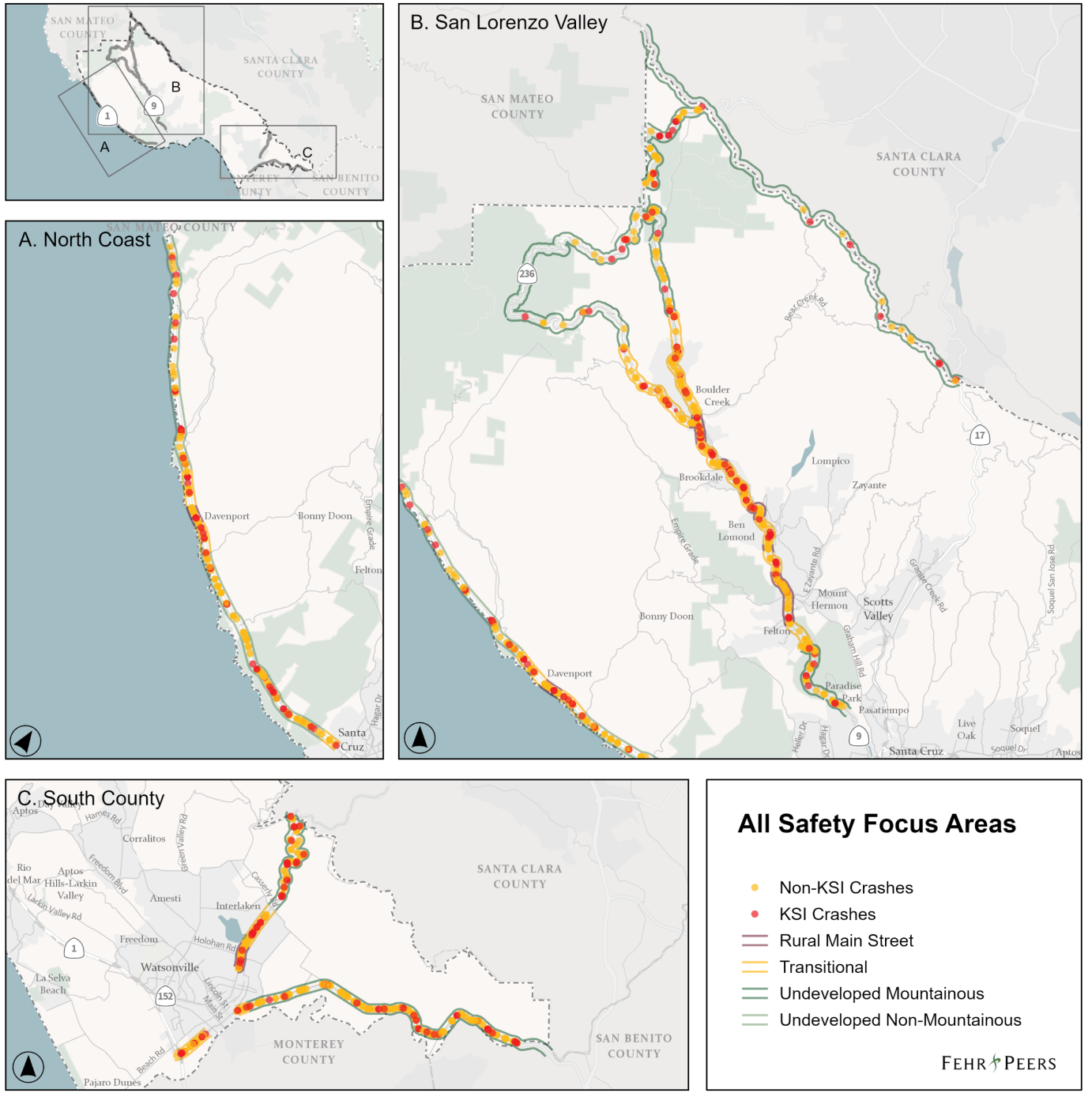
- High observed speeds
- Uncomfortable bicycle and pedestrian facilities
- High truck traffic

Based on Community input

Based on Potential Risk



What locations would you like to see prioritized first?



Next Steps

- Milestone 2 Engagement (April/May)
  - Stakeholder Workshops (April 28-30)
  - Public Workshops (May 20-21)
- Develop priority projects based on stakeholder and community input on crash profiles, priority locations, and countermeasures
- Develop RHSP Plan documentation
  - Milestone 3 Public Input – Virtual Public Workshop and comment submittal