



CalSTA Report of Findings

AB 2363

Zero Traffic Fatalities Task Force

January 2020

Table of Contents

1.0	Executive Summary	1
2.0	Introduction and Background	3
2.1.	Traffic Fatalities and Injuries, Speed, and Safety	3
2.2.	Trends, Context, and Considerations	6
2.3.	The 85 th Percentile Speed – An Overview	7
2.4.	AB 2363 – Zero Traffic Fatalities Task Force	8
2.5.	Zero Traffic Fatalities Task Force and Advisory Group Members	9
2.6.	Report of Findings – Approach and Timeline	10
3.0	Establishing and Adjusting Speed Limits in California	13
3.1.	Authority to Establish Speed Limits	13
3.2.	Types of Speed Limits	13
3.3.	Establishing and Deviating from Speed Limits	14
3.4.	Engineering and Traffic Surveys – An Overview	18
3.5.	Adjusting Speed Limits from the 85 th Percentile Speed.....	20
4.0	The 85 th Percentile Speed Methodology – An Analysis	23
4.1.	History, Evolution, and Limitations of the Idea.....	23
4.2.	Using the 85 th Percentile in Urban and Rural Settings.....	24
4.3.	Effect of Bicycle and Pedestrian Plans on the 85 th Percentile	25
5.0	Alternatives to the 85 th Percentile – Local, State, National, and International Trends in Setting Speed Limits.....	27
5.1.	Summary.....	27
5.2.	International Trends.....	28
5.3.	Recent National Trends	30
5.4.	Conclusion: Shifting Paradigms	32
6.0	Engineering and Designing for Safety – Roads and Vehicles	33
6.1.	Engineering Countermeasures	33
6.2.	Emerging Vehicle Technologies	40
7.0	Speed Enforcement	43
7.1.	Overview of Speed Enforcement	43
7.2.	Automated Speed Enforcement.....	44
7.3.	High Visibility Enforcement	47
8.0	Additional Steps to Improve Safety.....	49
8.1.	Improving Education through Funding Allocations	49
8.2.	Improving Safety Data	50
8.3.	Linking Crash and Medical Data	51
9.0	Findings and Recommendations for Policy Consideration	53
9.1.	Establishing Speed Limits (S) – Findings and Recommendations for Policy Consideration.....	54
9.2.	Engineering (EN) – Findings and Recommendations for Policy Consideration.....	60
9.4.	Education (ED) – Findings and Recommendations for Policy Consideration.....	66
10.0	Appendices	67
A.	AB 2363 – Zero Traffic Fatalities Task Force	67
B.	University of California, Institute of Transportation Studies, Research Synthesis.....	68
C.	List of Abbreviations.....	69

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1.0 Executive Summary

While the overarching objective of the transportation system is to provide mobility, transportation professionals dedicate significant resources to create a system that is safe for all users. Yet transportation professionals and policy makers continue to grapple with increases in road traffic fatalities, injuries, and crashes at the local, state, national, and even global levels.

Today, the traditional notion that roads should be designed to maximize vehicle throughput is increasingly challenged as cities and counties rethink the function and purpose of their streets, the different needs of road users such as bicyclists, pedestrians, and scooter users, and the exponential dangers of excessive speed. There is clear evidence, supported by statistical analyses, that traffic fatalities and serious injuries increase with individual vehicle speed.

While roadway safety has long been the primary consideration in establishing speed limits, speeding-related fatalities continue to represent a large portion of California's total traffic fatalities. Current procedures for setting speed limits in California rely on the 85th percentile methodology, an approach developed decades ago for vehicles primarily on rural roads. Although California has become highly urbanized and its roadways have changed significantly, reflecting different modes of transportation including bicycling, walking, and scooters, the method for setting speed limits has not been modified to reflect these changes. And while the current methodology allows traffic engineers to consider other factors when setting speed limits, the 85th percentile speed remains the primary factor used in determining posted speed limits regardless of the intended use of the street.

While the way that speed limits are calculated have remained essentially static, the population, vehicles, and street uses have evolved over time. CalSTA's vision is to transform the lives of all Californians through a safe, accessible, low-carbon, 21st-century multimodal transportation system. However, the 85th percentile methodology relies on driver behavior. Greater flexibility in establishing speed limits would offer agencies an expanded toolbox in order to better combat rising traffic fatalities and injuries especially for the most vulnerable roadway users.

Consistent with international trends, other U.S. states, including Oregon, Washington, and New York, are enabling their cities to lower their speed limits and are exploring alternative methods to establish speed limits based on safety goals and local context instead of the 85th percentile speed. California has the opportunity to evaluate how it sets speed limits and explore new approaches that prioritize safety and meet the needs of all road users. It also has the opportunity to offer agencies greater flexibility to establish lower speed limits through the revision of speed-limit-setting procedures and the expansion of special low-speed zones.

Additionally, the State can support other strategies to make its roadways safer and reduce traffic fatalities to zero. These interventions include roadway infrastructure changes through engineering, enhancing traffic safety enforcement, supporting public education and traffic safety campaigns as well as practitioner-focused education, and improving safety data to make better-informed policy and program decisions.

Pursuant to AB 2363, Zero Traffic Fatalities Task Force, CalSTA convened a statewide Task Force and conducted an academic research synthesis to identify findings and recommendations for policy consideration to reduce traffic fatalities to zero. This Report of Findings reflects the culmination of activities that CalSTA initiated in March 2019. The findings and recommendations for policy consideration begin on page 53.

Exhibit 1-1 cross-references the topics mandated by AB 2363 with the pertinent sections of this document.

Exhibit 1-1 – Crosswalk: AB 2363 Topics and Report of Findings

AB 2363 Topic	Report Sections
1) The existing process for establishing speed limits, including a detailed discussion on where speed limits are allowed to deviate from the 85 th percentile.	3.0
2) Existing policies on how to reduce speeds on local streets and roads.	3.3., 3.4, 5.0, 6.1, 7.0
3) A recommendation as to whether an alternative to the use of the 85 th percentile as a method for determining speed limits should be considered, and if so, what alternatives should be looked at.	5.0, 9.0
4) Engineering recommendations on how to increase vehicular, pedestrian, and bicycle safety.	6.0, 9.0
5) Additional steps that can be taken to eliminate vehicular, pedestrian, and bicycle fatalities on the road.	7.0, 8.0, 9.0
6) Existing reports and analyses on calculating the 85 th percentile at the local, state, national, and international levels.	4.0
7) Usage of the 85 th percentile in urban and rural settings.	4.2
8) How local bicycle and pedestrian plans affect the 85 th percentile.	4.3

2.0 Introduction and Background

2.1. Traffic Fatalities and Injuries, Speed, and Safety

While the overarching objective of the transportation system is to provide mobility, transportation professionals dedicate significant resources to create a system that is safe for all users. Yet transportation professionals and policy makers continue to grapple with increases in road traffic fatalities, injuries, and crashes at the local, state, national, and even global levels. According to the World Health Organization, deaths from road traffic crashes have continued to climb, reaching 1.35 million in 2016, and representing the eighth leading cause of death globally.¹

Within the U.S. in 2017, there were 37,133 people killed in motor vehicle traffic crashes. Additionally, in the same year 2,746,000 people were injured.² Traffic crashes have economic costs as well, which was estimated at \$242 billion nationally.³ In California, nearly 3,600 people die each year in traffic crashes and more than 13,000 people are severely injured.⁴ Collectively, these traffic crashes cost California over \$53.5 billion.⁵

Many factors contribute to traffic fatalities and injuries, including speeding, distracted driving, and impaired driving. However, the relationship between speeding and traffic fatalities and injuries is an increasing subject of attention. Of the 37,133 traffic fatalities in 2017, 9,717 (26%) were involved in crashes where at least one driver was speeding. Nationwide, speeding contributes to approximately one-third of all motor vehicle fatalities.⁶ It is important to note that the notation of “speeding” for the purpose of crash reporting includes vehicle speeds that are unsafe for conditions as well as in excess of the speed limit; see Section 8.2 for more information.

Recent important studies have highlighted excessive speed as a key risk factor in road traffic injuries and fatalities. According to a 2017 National Transportation Safety Board (NTSB) report, speed increases crash risk in two ways: it increases the likelihood of being involved in a crash and it increases the severity of injuries sustained by all road users in a crash.⁷ While the relationship between speed and crash involvement is complex, the relationship between speed and injury severity is consistent and direct.⁸ There is clear and convincing evidence, supported by statistical analyses, that crash severity increases with individual vehicle speed.⁹

¹ World Health Organization, *Global Status Report on Road Safety 2018* (2018), vii.

² National Highway Traffic Safety Administration (NHTSA), *Summary of Motor Vehicle Crashes 2017 Data* (2019), 1.

³ *Ibid.*, 5.

⁴ California Office of Traffic Safety, *California Highway Safety Plan* (2019), 5.

⁵ This estimate was calculated by the University of California, Institute for Transportation Studies using Strategic Highway Safety Plan data and the National Safety Council’s *Guide to Calculating Costs of Motor-Vehicle Injuries*.

⁶ National Highway Traffic Safety Administration (NHTSA), *Summary of Motor Vehicle Crashes*, 7.

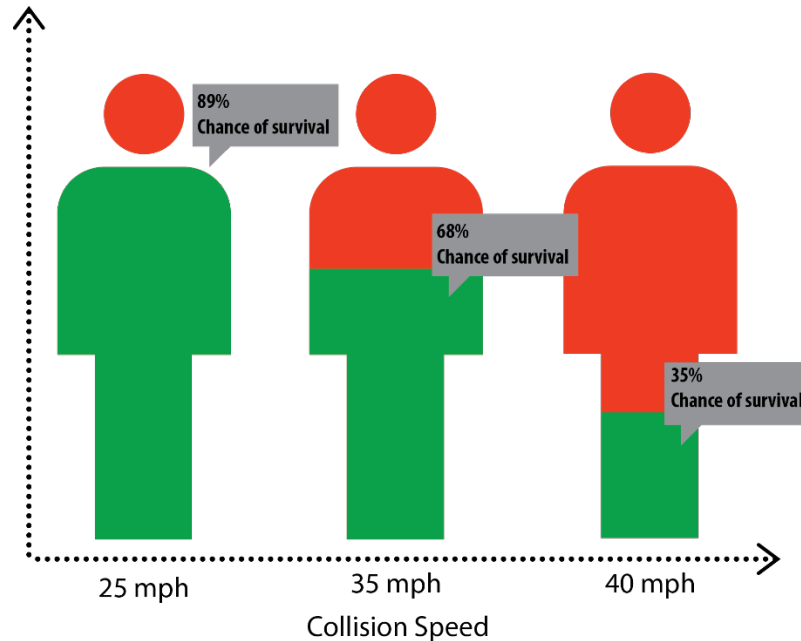
⁷ National Transportation Safety Board (NTSB), *Safety Study: Reducing Speed-Relating Crashes Involving Passenger Vehicles* (2017), ix.

⁸ *Ibid.*, 12.

⁹ Federal Highway Administration (FHWA), *Speed Concepts: Informational Guide* (2009), 8.

The relationship between speed and injury severity is especially critical for vulnerable road users such as bicyclists and pedestrians. In the U.S., on average, a pedestrian is killed in a motor vehicle crash every 88 minutes.¹⁰ In the event of a crash between a vehicle and a pedestrian or bicyclist, the vehicle's speed will largely determine whether the person hit will survive. **Exhibit 2-1** depicts this relationship, demonstrating that the faster a vehicle is traveling, the less likely it is that the person will survive.

Exhibit 2-1 – Relationship between Vehicle Speed, Crashes, and Fatalities¹¹



For the purposes of crash reporting, “speeding” is used to identify vehicles that are traveling at speeds which are: 1) unsafe for conditions or 2) exceed the speed limit. Speeds that are unsafe for conditions are based on basic speed law which is defined as driving at a speed greater than is reasonable or prudent considering weather, visibility, traffic, and roadway conditions. Because the definition of speeding includes these two different conditions, it is unknown to what degree exceeding a posted or statutory speed limit contributes to the total number of speeding-related crashes.

In addition to the impact of absolute vehicle speed on both crash severity and crash frequency, speed variance within a traffic flow is often cited as contributing to crash risk. However, the University of California Institute of Transportation Studies (UC ITS) Research Synthesis commissioned specifically for this report found that research on speed variation and safety is limited and generally inconclusive. Furthermore, there is an absence of research related to speed variation impacts on crash frequency or severity of collisions involving pedestrians and bicyclists in urban environments.

¹⁰ NHTSA, *Summary of Motor Vehicle Crashes 2017 Data* (2017), 1.

¹¹ Tefft, B.C. “Impact speed and a pedestrian’s risk of severe injury or death,” *Accident Analysis & Prevention* 50 (2013), 871-878.

Given the rise in traffic fatalities and injuries, the contributing role of excessive speed to those crashes, and the particular vulnerability of pedestrians, bicyclists, and scooter users, transportation professionals and policymakers in the U.S. are struggling to find solutions to make roadways safer. The issue of speed limits and speed management is an increasingly important topic among stakeholders as speeding has been repeatedly demonstrated to be a main factor in crash injury and severity.

Speeding, however, is a multi-faceted problem. There are many factors that can influence how fast drivers choose to operate their vehicles. These include the design of the roadway, the road's posted speed limit, the enforcement of speed limits, and the driver's behavior. In their efforts to get drivers to slow down, practitioners use multiple tools, including lowering speed limits, increasing enforcement, and changing the roadway infrastructure. Ultimately "any measures that can achieve reductions in average operating speeds, including lower speed limits, enhanced enforcement, and communications campaigns, as well as engineering measures, are expected to reduce fatal and injury crashes."¹²

While many consider road design and engineering the effective countermeasure to reduce operating speed, many cities, including Portland, Seattle, and New York City, have also lowered the posted speed limits on their roadways. Although some subject matter experts maintain that lowering posted speed limits does not cause drivers to slow down, recent research has indicated that this approach is effective. The UC ITS research synthesis found that research studies clearly indicate speed limit changes cause changes in drivers' speed. Moreover, "reducing vehicle speed limits will likely reduce vehicle speeds and improve safety across most road environments."¹³ UC ITS concluded that "even though reducing speed limits may only have a small effect on vehicle speeds, those changes in speed result in meaningful safety improvements" especially for vulnerable road users such as bicyclist and pedestrians."¹⁴

Other studies support the finding that even a small change in vehicle operating speed can have large safety impacts. According to one, "a reduction of 3 mph in average operating speed on a road with a baseline average operating speed of 30 mph is expected to produce a reduction of 27% in injury crashes and 49% in fatal crashes."¹⁵ Furthermore, since pedestrians and bicyclists are particularly vulnerable to severe injury and death when struck by higher-speed vehicles, "countermeasures aimed at reducing vehicle speeds have the potential to save lives."¹⁶ National research results, as well as the results of the UC ITS research synthesis, support the notion, which is advocated by many California cities and local governments, that lowering speed limits will make streets safer.

In California and the rest of the U.S., establishing the speed limit is based on a long-standing methodology known as the 85th percentile speed. This methodology is discussed in Section 3.0 of this report. However, it is important to note that studies have shown that using the 85th percentile speed to establish speed limits has actually

¹² NHTSA, *Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices Ninth Edition* (2017), 3-7.

¹³ University of California Institute of Transportation Studies (UC ITS), *Research Synthesis for AB 2363 Zero Traffic Fatalities Task Force* (2019), 23.

¹⁴ *Ibid.*, 23.

¹⁵ NHTSA, *Countermeasures that Work*, 3-7.

¹⁶ *Ibid.*, 8-7.

increased drivers' operating speeds as an "unintended consequence."¹⁷ This approach creates a phenomenon known as "speed creep," in which higher speed limits prompt motorists to drive faster, which in turn prompt higher speed limits.¹⁸

While recent research has shown that changing speed limits is an effective method for reducing vehicle operating speeds and increasing road safety, the absolute magnitude of operating speed changes from speed limit changes alone are small but meaningful. Further, there are many broader trends and contexts to consider, including the inherent trade-off between speed and safety, the safety advances presented by emerging vehicle technologies, and recent statewide developments related to safety and transportation. These trends and contexts are discussed in the next section.

2.2. Trends, Context, and Considerations

Historically in the U.S., roadways have been designed with vehicles in mind, as typical design standards "tend to look at streets as thoroughfares for traffic and measure their performance in terms of speed, delay, throughput and congestion."¹⁹ The field of traffic engineering has traditionally approached road design from the perspective of moving vehicles from one point to another as quickly as possible. As highway networks expanded to accommodate increasing numbers of vehicles in the first half of the 20th century, early attempts to regulate speed for safety gave way to the "consistent focus on improving traffic service for ever-expanding motor vehicle fleets."²⁰ According to the FHWA, "the automobile has irrefutably altered the way in which transportation systems and the built environment are designed and constructed, often at the expense of pedestrians."²¹

Today, the traditional notion that roads should be designed to maximize vehicle throughput is increasingly challenged as cities rethink the function and purpose of their streets, the different needs of road users such as bicyclists and pedestrians, and the exponential dangers of excessive speed. Most cities today strive to make their streets more complete, less dominated by driving, and safer.²² As NACTO puts it, "roadways once conceived singularly as arterials for traffic have been recast and retrofitted as public spaces crucial to the economic success, safety and vitality of the city."²³

This trend away from roads designed for vehicle throughput calls attention to the contradiction between level of service and safety. Cities who wish to increase safety by reducing vehicle operating speeds must often balance these needs with the desires of its commuters who do not want an increase in traffic congestion and slower vehicle throughput. As UC ITS researchers put it, the crux of this issue is "the intuitive trade-off between speed and safety."²⁴

¹⁷ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 54.

¹⁸ *Ibid.*, 54.

¹⁹ National Association of City Transportation Professionals (NACTO), *Urban Street Design Guide* (2012), 6.

²⁰ UC ITS, *Research Synthesis*, 36.

²¹ NHTSA, *How to Develop a Pedestrian Safety Action Plan* (2009), 7.

²² UC ITS, *Research Synthesis*, 39.

²³ NACTO, *Urban Street Design Guide*, 4.

²⁴ UC ITS, *Research Synthesis*, 45.

In the last several years, states across the U.S., including Washington and Oregon, are adopting speed-limit-setting laws that grant local agencies more flexibility to lower posted speeds within their jurisdictions. While these national developments in speed management are fairly recent, international speed management programs began to develop best practices in the mid-1990s that aimed to “minimize the severity of road traffic crashes through such programs as Vision Zero, Sustainable Safety, and Safe Systems.”²⁵

In addition to the countermeasures designed to improve safety by reducing vehicle operating speeds, it is important to note that rapidly emerging vehicle technologies will also likely impact safety. Already a considerable amount of research is beginning to describe the safety benefits of various levels of emerging technology.²⁶ These vehicle technologies include forward collision warning (FCW), automatic emergency braking (AEB), lane departure warning (LDW), intelligent speed adaptation (ISA), lane keeping assistance (LKA), and blind spot warning (BSW) systems.

Generally, these enhanced safety features are designed to reduce traffic crashes and fatalities and improve safety for both the vehicle occupants and non-occupants. A recently AAA research synthesis found that while such features have their limitations, “current and future vehicle safety systems have the potential to dramatically reduce the number of crashes, injuries and fatalities on our roadways,” and that these systems, “if installed on all vehicles, would have had the potential to help prevent or mitigate roughly 40% of all crashes involving passenger vehicles, and 37% of all injuries and 29% of all fatalities that occurred in those crashes.”²⁷ It will be important for transportation and traffic safety professionals to track the latest vehicle safety technologies as they continue to develop.

Within California, it is also critical to consider the work of the Zero Traffic Fatalities Task Force within the broader context of the *California Strategic Highway Safety Plan* (SHSP). The SHSP is a coordinated, data-driven safety plan that provides a comprehensive framework for reducing fatalities and serious injuries on California’s public roads with a goal of zero deaths. A federal requirement, the plan guides investment decisions towards strategies and countermeasure with the most potential to save lives and prevent injuries. Spearheaded by CalSTA and its departments, over 900 safety stakeholders from across the state contributed to the original SHSP. The 2020-2024 SHSP has recently been finalized and the SHSP Implementation Plan, which identifies specific actions, is currently underway.

2.3. The 85th Percentile Speed – An Overview²⁸

Drivers play an important role in how posted speed limits are set. Many U.S. states and California rely on a long-standing and widespread methodology known as the 85th percentile speed to establish speed limits. As its name implies, the 85th percentile speed is the velocity at which 85% of vehicles drive at or below on any given road. This approach was developed in the U.S. in the mid-20th century and is still the dominant

²⁵ Ibid., 50.

²⁶ Ibid., 69.

²⁷ AAA Foundation for Traffic Safety, *Potential Reductions in Crashes, Injuries, and Deaths from Large-Scale Deployment of Advanced Driver Assistance Systems Research Brief* (2018), 9.

²⁸ This summary is drawn from numerous sources including: UC ITS’s *Research Synthesis* (2019); FHWA’s *Speed Concepts: Informational Guide* (2009); FHWA’s *Methods and Practices for Setting Speed Limits* (2012); and California Department of Transportation’s (Caltrans) *California Manual for Setting Speed Limits* (2014).

factor in how speed limits are set in the U.S today. The 85th percentile methodology assumes that most drivers will drive at a safe and reasonable speed based on the road conditions. It is also based on the idea that speed limits are safest when they conform to the natural speed driven by most drivers and that uniform vehicle speeds increase safety and reduce the risks for crashes.

Using the 85th percentile methodology to establish a posted speed limit is a two-step process. First, traffic engineers calculate the 85th percentile speed for a given roadway by conducting an engineering and traffic survey, also known as a speed or traffic survey. Engineers select a roadway and measure the speed of free-flowing traffic with radar or lidar guns. The survey results are then analyzed, yielding the speed at which 85% of the drivers are traveling at or below.

However, the 85th percentile speed does not automatically become the speed limit that is posted for that road. In the second step, engineers can apply rounding and adjustment allowances based on a variety of other conditions, resulting in a speed limit that deviates from the 85th percentile speed. California law places parameters and limits on these deviations. When using engineering and traffic surveys to post lower speed limits, the maximum amount that a posted speed limit can deviate from the 85th percentile speed is 7 mph. Ultimately, the speed at which 85% of road users drive at or below exercises a profound influence on the final speed limit that is posted for the road. UC ITS refers to this reliance on driver behavior as “crowdsourcing” speed limits.²⁹

Section 4.0 contains a detailed analysis of the 85th percentile speed methodology including its history, limitations, and usage in urban and rural settings.

2.4. AB 2363 – Zero Traffic Fatalities Task Force

AB 2363 (Friedman – Chapter 650, Statutes of 2018) directed the Secretary of Transportation to establish and convene the Zero Traffic Fatalities Task Force. Based on the Task Force’s efforts, the Secretary shall prepare and submit a report of findings to the Legislature by January 1, 2020 on the following issues:

- 1) The existing process for establishing speed limits, including a detailed discussion on where speed limits are allowed to deviate from the 85th percentile.
- 2) Existing policies on how to reduce speeds on local streets and roads.
- 3) A recommendation as to whether an alternative to the use of the 85th percentile as a method for determining speed limits should be considered, and if so, what alternatives should be looked at.
- 4) Engineering recommendations on how to increase vehicular, pedestrian, and bicycle safety.
- 5) Additional steps that can be taken to eliminate vehicular, pedestrian, and bicycle fatalities on the road.
- 6) Existing reports and analyses on calculating the 85th percentile at the local, state, national, and international levels.
- 7) Usage of the 85th percentile in urban and rural settings.
- 8) How local bicycle and pedestrian plans affect the 85th percentile.

²⁹ UC ITS, *Research Synthesis*, 27.

2.5. Zero Traffic Fatalities Task Force and Advisory Group Members

CalSTA established and first convened the Task Force on June 25, 2019, which included representatives from all of the mandated organizations as well as other interested stakeholders. A list of Task Force members and their organization is presented in **Exhibit 2-2**. In addition, CalSTA formed an Advisory Group designed to provide subject matter expertise to the Task Force. A list of Advisory Group members and their organization is presented in **Exhibit 2-3**.

Exhibit 2-2 – Task Force Members

Agency/Organization	Task Force Member
AAA Southern California	Hamid Bahadori, Manager, Transportation Policy and Programs
Amalgamated Transit Union and Teamsters	Shane Gusman, Representative
American Association of Retired Persons	Bob Prath, Executive and National Policy Council member
California Bicycle Coalition (CalBike)	Dave Snyder, Executive Director
California Highway Patrol	James Epperson, Chief
California Walks (Cal Walks)	Tony Dang, Executive Director
City of Fresno	Jill Gormley, Traffic Engineering Manager
City of Glendale	Carl A. Povilaitis, Chief of Police
City of Palm Springs	Lisa Middleton, Councilmember
City of Sacramento	Jennifer Donlon Wyant, Transportation Planning Manager
City of San Jose	Laura Wells, Director, Department of Transportation
Department of Public Health	Jeffery Rosenhall, Chief, Policy and Partnership Development Unit
Department of Transportation	Jeanie Ward-Waller, District 2 Director (Acting)
Electronic Frontier Foundation	Lee Tien, Senior Staff Attorney
Los Angeles Department of Transportation	Seleta Reynolds, General Manager
NACTO/California City Transportation Initiative	Jenny O'Connell, Program Manager
Office of Traffic Safety	Barbara Rooney, Director
Rural Counties Task Force	Dan Landon, Executive Director Nevada County Transportation Commission
San Francisco Municipal Transportation Agency	Kate Breen, Director of Government Affairs
Southern California Association of Governments	Meghan Sahli-Wells, Regional Council Member & Culver City Mayor
Safer Streets Los Angeles	Jay Beeber, Founder
UC Berkeley – Institute of Transportation Studies	Offer Grembek, Co-Director, UCB Safe Transportation Research and Education Center
Vision Zero Network	Leah Shahum, Founder and Director
Subject Matter Expert	Rock E. Miller, Consultant – Traffic Engineering Expert Witness, Safety, and Urban Bikeways implementation

Exhibit 2-3 – Advisory Group Members

Agency/Organization	Advisory Group Member
City and County of San Francisco, Department of Public Health	Megan Wier, Director of Program on Health, Equity and Sustainability
Arup	Megan Gee, Civil and Environmental Engineer; Senior Planner
City of Long Beach, Public Works	Luke Klipp, Special Projects Officer
City of Santa Clarita	Gus Pivetti, City Traffic Engineer
City of Santa Monica, Planning and Community Development Department	Andrew Maximous, Principal Traffic Engineer
County of Los Angeles, Public Works	Mathew Dubiel, Senior Civil Engineer
County of Los Angeles, Department of Public Health	Jean Armbruster, Director, PLACE Program
San Francisco Metropolitan Transportation Commission	Shruti Hari, Principal, Safety & Asset Management
Walk San Francisco	Jodie Medeiros, Executive Director
Remix	Rachel Zack, Policy Strategist
Streetlight Data, Inc.	Sean Co, Director of Special Projects
Subject Matter Expert	Henry Coles III, Retired Mechanical Engineer
Subject Matter Expert	Ribeka Toda, Traffic Safety Consultant

2.6. Report of Findings – Approach and Timeline

The findings and recommendations for policy consideration in this Report of Findings are based on numerous sources including Task Force meetings, Advisory Group meetings, a University of California academic research synthesis, market research, and results from multiple surveys completed by the Task Force and the Advisory Group.

Exhibit 2-4 depicts the high-level approach that guided this effort and **Exhibit 2-5** depicts the high-level timeline and corresponding activities.

Exhibit 2-4 – High-Level Approach

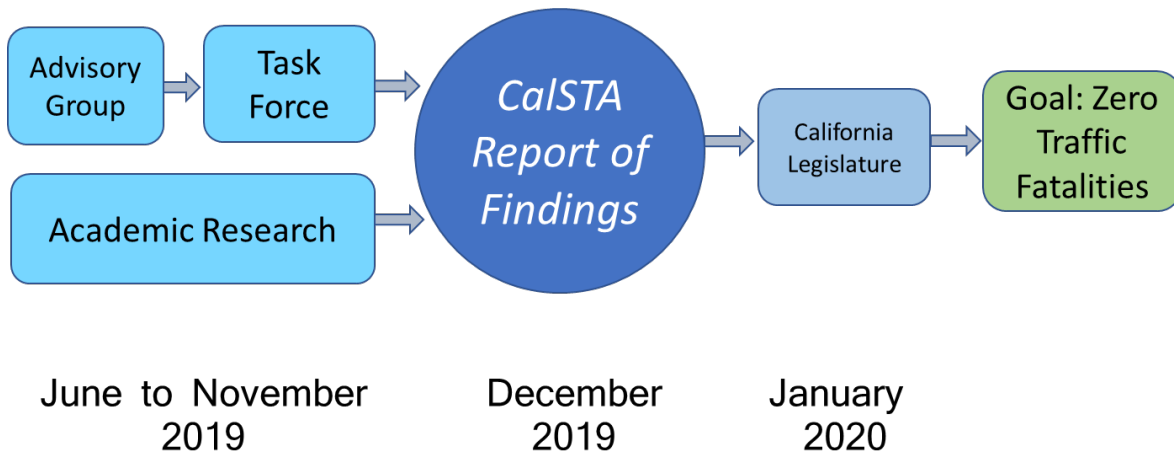


Exhibit 2-5 – Timeline

Timeframe	Activity
June 2019	Conduct Task Force Survey
June 25, 2019	Convene Task Force Meeting #1
July 2019	Conduct Advisory Group Survey
July 2019	Initiate Academic Research
August 21, 2019	Convene Task Force Meeting #2
September 12, 2019	Convene Advisory Group Focus Group
October 1, 2019	Conduct Market Research Webinar
October 22, 2019	Convene Task Force Meeting #3
October 2019	Conclude Academic Research
November 2019	<ul style="list-style-type: none"> Develop Report Distribute Draft Findings and Recommendations for Policy Consideration to Task Force for Comment
December 2019	Finalize Report
January 2020	Submit Report to Legislature

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3.0 Establishing and Adjusting Speed Limits in California

This section describes how speed limits are established in California. It covers the authority to set types, types of speed limits, establishing and deviating from speed limits, and the role of engineering and traffic surveys in establishing speed limits.

3.1. Authority to Establish Speed Limits

Establishing speed limits on California roadways is a responsibility shared by different state and local agencies. The California Department of Transportation (Caltrans) has authority to establish speed limits on the State Highway System, but roadways outside of the State Highway System generally fall under the responsibility of the respective city or county. Allowing cities or counties to establish speed limits on the roadways under their jurisdiction acknowledges the importance of recognizing unique local conditions when setting speeds. The fact that multiple agencies are involved in establishing speed limits contributes to the complexity of establishing standards while also respecting unique local conditions. Ultimately, “speed management and the setting of appropriate speed limits requires a coordinated effort among State and local highway safety offices, engineering offices, and law enforcement agencies.”³⁰

In California, the basis, principles, and methodology for establishing speed limits are outlined in several source documents. The California Vehicle Code (CVC) contains statutes adopted by the California Legislature relating to the operation, ownership, and registration of vehicles in California, and changes to it are made through state legislation. Caltrans publishes and maintains technical documents used to implement the Vehicle Code. These include the *California Manual for Setting Speed* and the *California Manual on Uniform Traffic Control Devices (CA MUTCD)*. When local agencies set speed limits, they must follow specific speed-procedures established by Caltrans in these documents. At a high level, the procedures involve justifying and documenting the chosen speed limit using an engineering and traffic survey. Engineering and traffic surveys are discussed in further detail in Section 3.4.

In addition to roadways under the jurisdiction of Caltrans or local agencies, some roads are overseen by tribal governments, National Parks, and private entities, who are advised (but not mandated) to follow the CA MUTCD setting speeds.

3.2. Types of Speed Limits

California state law establishes speed limits on all roads in the state according to the CVC. Speed limits defined by state law are called statutory limits. There are different statutory limits depending upon the type of road being limited—such as city streets, county roads, or state highways—and on the zone being limited, such as school zones, business districts, and residential areas. Certain road types and zones have default speed limits that are in effect even if no speed limit sign is posted. Codified in the CVC, these default speed limits are called *prima facie* speed limits.

³⁰ NHTSA, *Countermeasures that Work*, 3-8.

Exhibit 3-1 summarizes the common types of speed limits that pertain to this report.

Exhibit 3-1 – Common Types of Speed Limits





Type	Definition
Statutory	Statutory speed limits are established by the State legislature. They are enforceable by law even if the speed limit sign is not posted.
Prima Facie	Prima facie speed limits are a type of statutory speed limit that apply in designated special areas or zones, including school zones, business districts, and residential areas. They are enforceable by law even if the speed limit sign is not posted.
Posted	Posted speed limits can be the same as Statutory speed limits, or they can be different limits established by a local authority on the basis of an engineering and traffic survey. They must be posted in order to be enforceable.
Absolute	Absolute speed limits are statutory speed limits. They designate an upper limit beyond which any speed is illegal.




3.3. Establishing and Deviating from Speed Limits


While the CVC establishes speed limits for the state, it also allows local agencies to establish specific speed limits for streets within their boundaries. When agencies want to deviate from the statutory limits by either raising or lowering them, they adjust these limits according to procedures and parameters established by Caltrans.



Exhibit 3-2 depicts California’s statutory speed limits and the amount that agencies are permitted to adjust them. Crucially, in order to adjust speed limits, agencies must follow legally-mandated procedures which usually entail conducting engineering and traffic surveys, which are discussed in Section 3.4.

Exhibit 3-2 – Speed Limits and Adjustment Authority on Road Types and Zones

Example	Road Types	Speed Limit (MPH)	Adjustment Authority
	Highways	65	Below 65
	Freeways	65	70**
	Two-lane undivided roadways	55	Below and over 55
	Uncontrolled railway crossing*	15	None

Example	Road Types	Speed Limit (MPH)	Adjustment Authority
	Uncontrolled intersection*	15	None
	Alley*	15	None
Example	Road Zones	Speed Limit (MPH)	Adjustment Authority
	Business districts without other posted speed limits**	25	15 or 20

Example	Road Zones	Speed Limit (MPH)	Adjustment Authority
	Residential districts without other posted speed limits**	25	15 or 20

Example	Road Zones	Speed Limit (MPH)	Local Adjustment Authority
	School zones*	25	15 or 20
	Areas immediately around senior centers**	25	15 or 20

*These speed limits are called prima facie limits and they do not need to be physically posted (via a sign) in order to be enforceable.

Non-State-highway only

**Raising speed limits on State freeways to 70 MPH can be accomplished without an E&TS, based on geometric criteria.

Image Sources:

1. Highways
https://www.sustainablehighways.dot.gov/FHWA_Sustainability_Activities_June2014.aspx
2. Freeways
Caltrans photo database
3. Two-lane undivided roadway
<http://www.gribblenation.org/2017/06/california-state-route-89-lassen.html>
4. Uncontrolled railway crossing
https://en.wikipedia.org/wiki/File:Railroad_Junction2004_x.JPG
5. Uncontrolled intersection
https://safety.fhwa.dot.gov/intersection/other_topics/fhwas08008/ue4_stop_bar.pdf
6. Alley
<https://www.fhwa.dot.gov/publications/publicroads/10mayjun/05.cfm>
7. Business districts
https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/ch3.cfm
8. Residential districts
<https://safety.fhwa.dot.gov/uslimits/documents/appendix-l-user-guide.pdf>
9. School zones
<https://www.kashlawpc.com/school-zone-safety-things-to-keep-in-mind-when-driving-through/>
10. Senior centers
<https://www.cityofnapa.org/Facilities/Facility/Details/Senior-Activity-Center-18>

3.4. Engineering and Traffic Surveys – An Overview

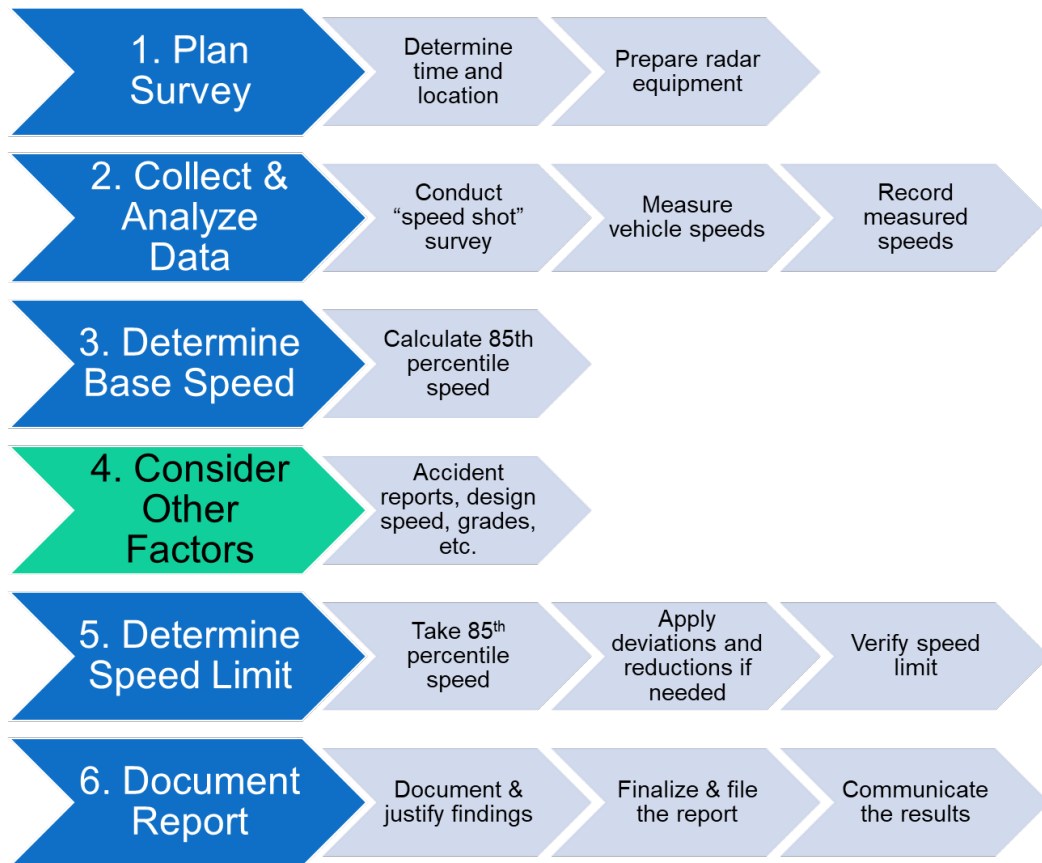
Transportation agencies are not permitted to adjust speed limits on their streets at their own discretion. Specific rules and procedures established by the state must be followed in order to establish a new speed limit. The most important of these rules is the requirement to conduct an engineering and traffic survey, also known as speed surveys or traffic surveys. Traffic surveys must be completed for the posted speed limit to be enforceable. As Caltrans notes in its *California Manual for Setting Speed Limits*, “the setting of speed limits requires a rational and defensible procedure to maintain the confidence of the public and legal systems.”³¹ The survey procedures encourage agencies to follow a structured, methodologically sound approach that will result in a reasonable speed limit.

Engineering and traffic surveys are the basis for the “engineering approach” to setting speed limits, which is the most commonly used approach to setting speed limits in the U.S. The approach follows a two-step process in which an engineer measures the 85th percentile speed of vehicles and subsequently adjusts it based on a variety of factors to arrive at a speed limit. While there is no universal process for conducting these surveys, the FHWA provides guidance related to the process and most states have also developed their own procedures.

Section 627 of the CVC defines engineering and traffic surveys. The detailed procedures for conducting these surveys in California are described in the *California Manual for Setting Speed Limits*. **Exhibit 3-3** visualizes the main procedural steps at a high level.

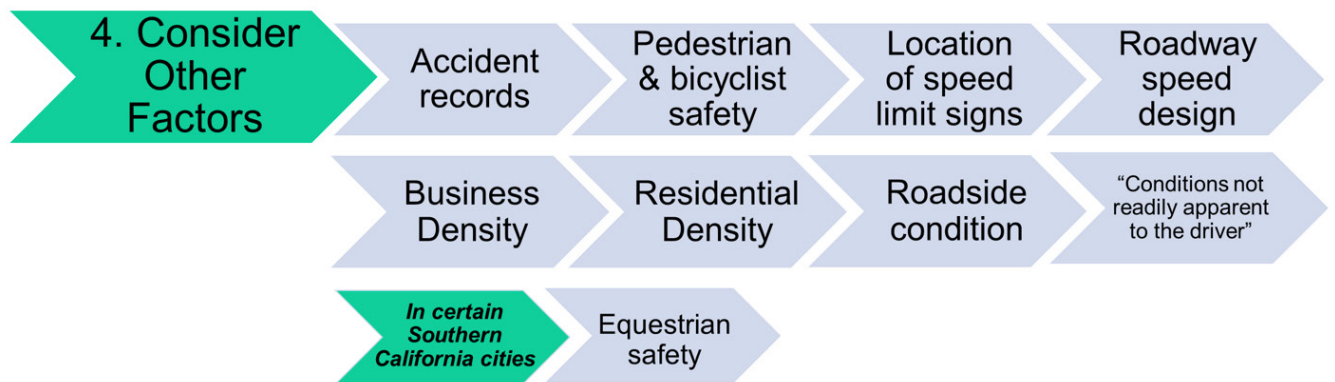
³¹ Caltrans, 2014 *California Manual for Setting Speed Limits*, 13.

Exhibit 3-3 – Conducting an Engineering and Traffic Survey: Main Components



In Step 4, traffic engineers are allowed to “consider other factors” in addition to the 85th percentile speed of vehicles. The *California Manual for Setting Speed Limits* and the CVC specifically identifies the factors listed in **Exhibit 3-4**.

Exhibit 3-4 – Other Factors that Impact Establishing Speed Limits



The premise of Step 4, in which engineers may consider other factors including “conditions not readily apparent to the driver,” is that it enables agencies to consider unique local conditions when determining deviations to the 85th percentile speed. Some cities have also been granted special provisions in the CVC that allow them to consider additional factors. For example, in 2019 four southern California cities were legally authorized to consider equestrian safety when conducting an engineering and traffic survey on designated streets due to the unique circumstances of certain areas with equestrian trails.³²

According to current law, a traffic survey is valid for 5 years, upon which it must be renewed. However, under certain conditions, traffic surveys may be extended to 7 or 10 years.³³

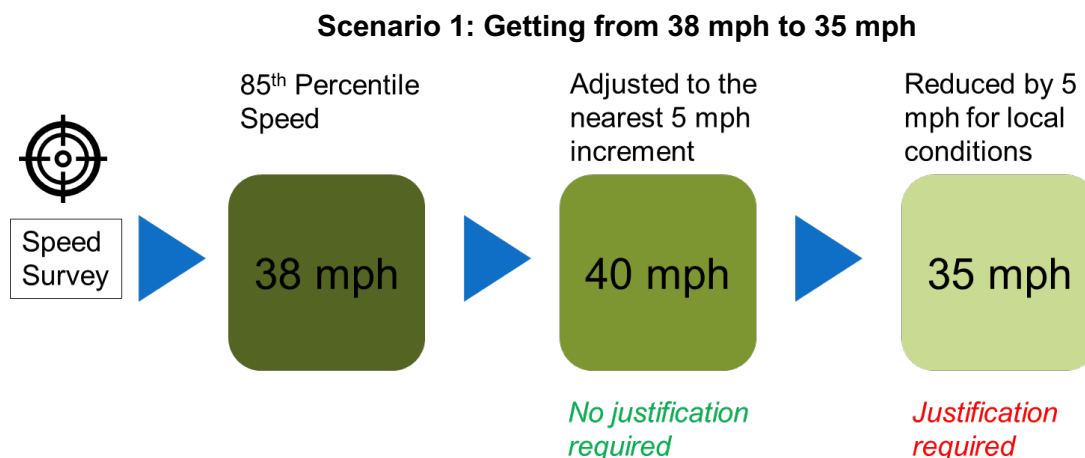
3.5. Adjusting Speed Limits from the 85th Percentile Speed

Though agencies can adjust the 85th percentile base speed limit, the adjustments themselves are limited. In order for posted speed limits to be enforceable by law enforcement and the court system, agencies can only deviate so much from the speed limits established by the State.

According to the *California Manual for Setting Speed Limits*, speed limits are to be posted at the nearest 5 mph increment of the 85th percentile speed. For example, if the 85th percentile speed was taken to be 33 mph, then the speed limit would be established at 35 mph because it's the closest 5 mph increment to the 33 mph.

Under some circumstances, practitioners can deviate from the nearest 5 mph increment when posting the speed limit. Specifically, the posted speed limit may be reduced by 5 mph from the nearest 5 mph increment of the 85th percentile speed. The following two scenarios, drawn from the *2014 California Manual for Setting Speed Limits*, explain the application of the 5 mph reduction.

Scenario 1 graphically depicts the technical rounding process when the nearest 5 mph increment is *greater than* the 85th percentile speed. In this scenario, the final speed limit differs from the 85th percentile speed by only 3 mph.



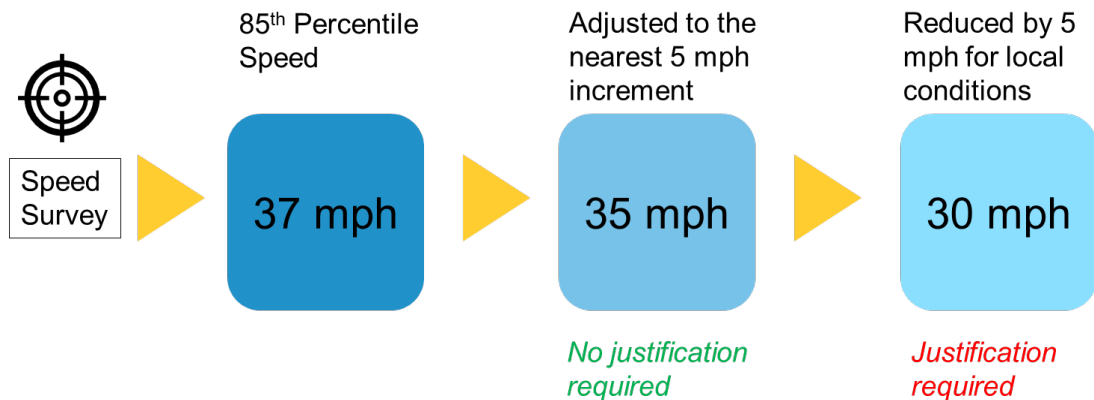
In Scenario 1 the final difference between the speed limit and the 85th percentile speed is only 3 mph. However, the rounding process can produce greater differences.

³² California Vehicle Code (CVC) 22353.

³³ CVC 40802.

Scenario 2 demonstrates how an 85th percentile speed of 37 mph can result in a 30 mph speed limit – with a total deviation of 7 mph. This example describes when the nearest 5 mph of the 85th percentile is *less than* the 85th percentile speed.

Scenario 2: Getting from 37 mph to 30 mph



In Scenario 2, the rounding process results in a speed limit (30 mph) that is 7 mph lower from the 85th percentile speed (37 mph). Thus, **7 mph is the maximum amount that a speed limit can be reduced from the 85th percentile speed.**

Further, the speed limit can be posted at the 5 mph increment *below* the 85th percentile even if mathematical rounding would require the speed limit to be posted *above* the 85th percentile. If this option is used, the 5 mph reduction cannot be applied. For example, if the 85th percentile is 34 mph, the speed limit can be posted at 30 mph instead of the closest 5mph increment which is 35 mph. However, the 30 mph cannot be rounded further.

As these scenarios and examples demonstrate, the cornerstone of establishing speed limits entails determining the 85th percentile speed via an engineering and traffic survey and then adjusting it through a rounding process. While adjustments are permitted, the 85th percentile speed of motor vehicles is the most prominent factor in determining a speed limit. As Caltrans notes, “speed limits set by E&TS are normally set near the 85th percentile speed.”³⁴ Similarly, the Federal Highway Administration notes that “the typical procedure is to set the speed limit at or near the 85th percentile speed.”³⁵

There are several scenarios in which it is not necessary for agencies to conduct traffic surveys in order to post a lower speed limit. For example, in 25-mph prima facie school zones, agencies have the option to lower the speed limit from to 20 mph or 15 mph without conducting a traffic survey if certain criteria are met. Agencies may opt to either conduct a traffic survey to support the lower limit, or they may pass a local ordinance provided that the roadway design meets certain conditions stipulated in the CVC.

Despite this scenario, establishing speed limits using the 85th percentile as part of the engineering and traffic survey process remains the most common way to establish speed limits on California’s roadways.

³⁴ Caltrans, *California Manual on Setting Speed Limits*, 14.

³⁵ FHWA, *Methods and Practices for Setting Speed Limits*, 12.

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4.0 The 85th Percentile Speed Methodology – An Analysis

This section provides a detailed analysis of the 85th percentile speed methodology, including its history, evolution, and limitations; its usage in urban and rural settings; and its relationship to local bicycle and pedestrian plans.

4.1. History, Evolution, and Limitations of the Idea

UC ITS researchers traced the origins of the 85th percentile concept to influential studies in the mid-20th-century, but noted that these studies supported the conventional wisdom at the time and were “widely accepted with little scrutiny.”³⁶ Over time, the 85th percentile speed came to be associated with a collection of qualitative concepts “deeply rooted in government and law,”³⁷ which are depicted in **Exhibit 4-1**. Today, the modern rationale for the 85th percentile speed remains codified in traffic manuals, including the national *Manual on Uniform Traffic Control Devices*, as well as California’s manual. The *California Manual for Setting Speed Limits* maintains that “speed limits established on the basis of the 85th percentile conform to the consensus of motorists of the reasonable and prudent speed,”³⁸ a practice that UC ITS refers to a crowdsourcing speed limit. Most other countries, including Europe and Australia, do not use the 85th percentile speed to set speed limits.

Exhibit 4-1 – The 85th Percentile Methodology: Fundamental Concepts

Key Concepts	
<ul style="list-style-type: none"> The majority of drivers will naturally drive at safe, reasonable speeds. 	<ul style="list-style-type: none"> Speed limits are safest when they conform to the speed driven by most drivers.
<ul style="list-style-type: none"> The norms of a reasonable person should be considered legal. 	<ul style="list-style-type: none"> Uniform vehicle speeds increase safety and reduce the risks for crashes.

These concepts are coming under increasing scrutiny in response to rising traffic fatalities. The 2017 NTSB *Safety Study* found that there is no strong evidence that traveling at the 85th percentile speed results in safer outcomes and recommended that the FHWA “remove the guidance that speed limits in speed zones should be within 5 mph of the 85th percentile speed.”³⁹ UC ITS similarly analyzed the limitations of the 85th percentile methodology and concluded “after eight decades, vehicles are different, our aspirations for the uses of streets are different, and our safety goals are more ambitious.”⁴⁰

³⁶ UC ITS, *Research Synthesis*, 39.

³⁷ FHWA, *Methods and Practices for Setting Speed Limits*, 14.

³⁸ Caltrans, *California Manual for Setting Speed Limits*, 40.

³⁹ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 54-57.

⁴⁰ UC ITS, *Research Synthesis*, 40.

Exhibit 4-2 summarizes the major limitations of the 85th percentile methodology according to Task Force and Advisory Group members, the UC ITS research synthesis, and leading national research, including studies issued by the NTSB and FHWA.

Exhibit 4-2 – The 85th Percentile Methodology: Major Limitations

Major Limitations	
<ul style="list-style-type: none"> Not supported by scientific research 	<ul style="list-style-type: none"> Privileges driver behavior
<ul style="list-style-type: none"> Based on a set of historical assumptions 	<ul style="list-style-type: none"> Does not require consideration of other road users such as pedestrians and bicyclists
<ul style="list-style-type: none"> Same methodology applied to different roadway types 	<ul style="list-style-type: none"> Assumes drivers will choose reasonable and prudent speeds
	<ul style="list-style-type: none"> Can lead to speed creep

Research results and the majority of Task Force and Advisory Group members support the fact that lowering speed limits can produce meaningful safety improvements. However, a minority Task Force perspective maintains that the only way to improve roadway safety is through engineering and design countermeasures, and that policymakers should not be overly focused on reducing vehicle operating speeds by lowering speed limits. Moreover, there are risks associated with lowering speed limits too far, as the National Cooperative Highway Research Program Project notes: “artificially low speed limits can lead to poor compliance as well as large variations in speed within the traffic stream. Increased speed variance can also create more conflicts and passing maneuvers.”⁴¹

4.2. Using the 85th Percentile in Urban and Rural Settings

The 85th percentile methodology was established based on research primarily conducted on rural roads. Rural roads are generally long stretches of uninterrupted roadway, while urban areas are generally characterized by frequent interactions between cars and vulnerable users of the roadway, including pedestrians and bicyclists.

Calculating the 85th percentile speed via engineering and traffic surveys is the same regardless of roadway type. Given the differences between urban and rural settings, applying the same methodology to different road types creates specific limitations, which are discussed below.

4.2.1. Limitations of the 85th Percentile for Highways in Rural Settings

One of the primary limitations of using the 85th percentile in rural highway settings is the cyclical phenomenon of speed creep. As recent research has indicated, raising speed limits to match the 85th percentile speed of vehicles leads to higher operating speeds, which can then contribute to a higher 85th percentile speed.⁴² Research has shown that over time, vehicle operating speeds continue to increase even if the road and vehicle

⁴¹ National Cooperative Highway Research Program Project 3-67, *Expert System for Recommending Speed Limits in Speed Zones* (2006), 1.

⁴² NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, x.

conditions remain the same, demonstrating that the posted speed limit has the most impact on a driver's travel speed.⁴³

4.2.2. Limitations of the 85th Percentile for Local Streets in Urban Settings

On local streets in urban environments, speed creep is also a limitation associated with the 85th percentile approach. Studies have demonstrated that “spatial” speed creep on local roads can be caused by high speeds on connecting highways. Higher speed limits on highways can thus have a “carry-over” effect on local roads.

Additionally, many limitations of the 85th percentile approach specific to local streets are behavioral. These behavioral limitations expose the difficulties associated with basing speed limits on driver's habits. Driver behavior lies at the root of the 85th percentile methodology, which assumes that most drivers will naturally choose to drive at a safe and reasonable speed. Yet UC ITS researchers contend that drivers tend to underestimate their speed by 10-30% and that drivers have “limited capacity” to choose a safe speed.⁴⁴ When drivers exceed the posted speed limit, one of the key reasons is their belief that excess speed does not threaten safety. Additionally, poor weather conditions and the lack of strong visual cues on local roads (such as guardrails or trees) can further cause drivers to underestimate their speeds.

These research results indicate that drivers are not good at “naturally” selecting safe speeds and suggests that it is not prudent to use driving habits as a basis for establishing speed limits. Ultimately, “the conjecture that safe speed limits should be determined based on the actual driving habits of drivers cannot be used to establish safe travel speeds on local streets.”⁴⁵

4.3. Effect of Bicycle and Pedestrian Plans on the 85th Percentile

Increasing numbers of California cities and counties are creating bicycle and pedestrian transportation plans. These local planning documents, which are defined in the *California Transportation Commission's Active Transportation Program Guidelines*, as the first step to either initiate or continue with programs, policies, and projects that provide safe and efficient travel modes for bicyclists and pedestrians. In 2017, Caltrans released the first-ever statewide bicycle and pedestrian plan called *Toward an Active California* which outlines the policies and measures that the State and local governments can take to increase bicycling and walking.

However, local government bicycle and pedestrian plans do not impact posted speed limits, which is primarily determined by the 85th percentile speed of motor vehicles. When calculating the 85th percentile speed of vehicles, there is no existing mandate to consider where future bicycle and pedestrian facilities are planned or in progress.

⁴³ UC ITS, *Research Synthesis*, 46.

⁴⁴ *Ibid.*, 46-47.

⁴⁵ *Ibid.*, 47.

However, if a city implements bicycle and pedestrian elements from its plan that changes roadway infrastructure, the project might affect the 85th percentile speed of vehicles. For instance, if a local jurisdiction implemented certain traffic calming interventions such as speed bumps, it could cause drivers to slow down which then impacts the 85th percentile speed of vehicles. Studies in Denmark and the United States have shown that the installation of a single speed bump reduced average speeds by 2.7 to 3.4 mph.⁴⁶

⁴⁶ UC ITS, *Research Synthesis*, 57.

5.0 Alternatives to the 85th Percentile – Local, State, National, and International Trends in Setting Speed Limits

This section describes alternatives to the 85th percentile methodology to setting speed limits. It explores recent changes in setting speeds limits at the local, state, national, and international levels.

5.1. Summary

AB 2363 mandates that this report include “existing reports and analyses on calculating the 85th percentile at the local, state, national, and international levels.” While data collection methods and procedures may differ slightly, the 85th percentile speed is a well-documented methodology that does not significantly vary in its calculation at the local, state, national, and international levels. However, there are entirely different approaches to establishing posted speed limits that do not take the 85th percentile speed into account. **Exhibit 5-1** provides a summary of the different approaches to setting speed limits.

Exhibit 5-1 – Approaches to Setting Speed Limits⁴⁷

Approach	Description	Jurisdictions
Engineering (or Operating)	A two-set process where a base speed limit is set according to the 85 th percentile speed and adjusted slightly according to road and traffic conditions, crash history, and other factors.	United States
Safe System	Speed limits are set according to the crash types that are likely to occur, the impact forces that result, and the tolerance of the human body to withstand these forces.	Sweden, Netherlands, Australia
Expert System	Speed limits are set by a computer program that uses knowledge and inference procedures that simulate the judgement and behavior of speed limit experts. In the U.S., USLIMITS2 is a web-based expert speed zoning software advisor adapted from similar expert systems used in Australia.	United States, Australia

⁴⁷ FHWA, *Methods and Practices for Setting Speed Limits*, 24. (Adapted).

Approach	Description	Jurisdictions
Engineering (or Road-Risk)	Speed limit is determined by the risks associated with the design of the road. The speed limit is based on the function of the road and/or the adjacent land use and then adjusted based on road and traffic conditions and crash history.	Canada, New Zealand
Optimization / Optimal	Setting speed limits to minimize the total societal costs of transport. Travel time, vehicle operating costs, road crashes, traffic noise, and air pollution are considered in the determination of optimal speed limits.	Conceptual approach that has not been adopted by any road authority

5.2. International Trends

Many countries including the Netherlands, Sweden, and Australia approach setting speed limits from a different conceptual framework. Instead of establishing speed limits based on driver operating behavior, many countries begin with the premise that the human body is vulnerable and unlikely to survive impact speeds more than 40 mph. According to UC ITS, based on this understanding, other countries minimize the severity of road traffic crashes through programs such as Vision Zero, Sustainable Safety, and Safe Systems.⁴⁸ Although these programs have different names in different countries, they share common principles and strategies with an emphasis on safety. The 2017 NTSB *Safety Study* presents a summary description of the safe systems approach:

*The safe system approach to speed limits differs from the traditional view that drivers choose reasonable and safe speeds. In the safe system approach, speed limits are set according to the likely crash types, the resulting impact forces, and the human body's ability to withstand these forces. [...] It allows for human errors (that is, accepting humans will make mistakes) and acknowledges that humans are physically vulnerable (that is, physical tolerance to impact is limited). Therefore, in this approach, speed limits are set to minimize death and serious injury as a consequence of a crash.*⁴⁹

Sections 5.2.1, 5.2.2, and 5.2.3 present international case studies of this different approach to establishing speed limits. These case studies are adapted from the UC ITS Research Synthesis.

5.2.1 Netherlands

The Netherlands adopted “Sustainable Safety” as a vision in 1992. This paradigm shift used safety as a design principle for the road traffic system and emphasized how to prevent human errors to the extent possible and how to minimize the severity of a crash. Specifically, the Netherlands:

⁴⁸ UC ITS, *Research Synthesis*, 49.

⁴⁹ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 28.

- Expanded 30 km/h (18.6 mph) zones from 15.5 percent of their urban residential streets to 54.5 percent by adopting a “low-cost” approach that phased the introduction of the lower speed limits. In the short-term, communities posted the new speed limits with some support of traffic calming devices with the goal to further transform the area through additional engineering features.
- Introduced 60 km/h (37.3 mph) zones, down from 80 km/h (49.7 mph), for rural access roads that met specific criteria warranting reduced speeds to improve safety for vulnerable users and/or located in transition zones.

5.2.2 Sweden

Sweden adopted the Vision Zero road safety philosophy in 1997 with the long-term goal that no person should be killed or seriously injured in road traffic. Their system relies on two principles: 1) human life and health are the top priority when designing roads; and 2) road traffic safety is a shared responsibility between all road users and system designers. Under the safe system approach in Sweden, speed limits were reduced to prioritize the highest levels of safety.

Sweden designed their road system based on what the human body can endure in both a vehicle-vehicle and vehicle-unprotected user (e.g., pedestrian, bicyclist) crash scenario. As part of the safe system approach, Sweden introduced median barriers to prevent head-on crashes, safer roadsides, traffic calming, roundabouts, separation, and reduced speed limits.

Sweden made a distinction between urban and rural roads, resulting in the implementation of parallel efforts. They reviewed their national rural road network and established guidelines for each road type classification balancing traffic safety, environment, and mobility and accounting for regional differences. This resulted in a statistically significant reduction in the mean operating speed of passenger cars. For speeds in urban areas, Sweden established guidelines that consider the city’s character, accessibility, security, traffic safety, and health and environment. This resulted in a mean operating speed decrease of 2-3 km/h (1.2-1.9 mph).

5.2.3 Australia

The New South Wales (NSW) Roads and Traffic Authority adopted the Safe Systems approach to develop and implement its road safety programs, with lower speeds and speed limits as essential components. The Safe Systems approach was adopted in 2004 and is guided by the vision that no person should be killed or seriously injured on Australia’s roads.

Australia’s approaches include safer people, roads, vehicles, and speeds collectively and reinforces that the determination of safe speed limits must account for a myriad of factors, including hazards, the road environment, and the movement and presence of different road users. It suggests that those who design, operate, and manage the road system are responsible for the safety of the network.

NSW uses a 50 km/h (31 mph) default urban speed limit, increasing to 60 km/h (37.3 mph) on major arterial roads. A speed limit of 70 km/h (43.5 mph) and 80 km/h (49.7 mph) may be applied but requires restricted abutting access and low to no pedestrian activity. Higher speeds are restricted to motorways and top out at 110 km/h (68.4 mph). Shared zones are restricted to 10 km/h (6.2 mph) while school zones and other areas with high pedestrian traffic or local traffic are restricted to 40 km/h (24.9 mph).

Work zones also have reduced speed limits. NSW uses variable speed limits which adapt to changes in traffic management and incident responses, weather, and roadwork.

5.3. Recent National Trends

In the U.S. the safe systems approach to traffic safety is gaining momentum, influenced by international best practices and by recent important safety studies. In 2017, the NTSB safety study found that the safe system approach to setting speed limits in urban areas represented an improvement over conventional approaches because it considers the vulnerability of all road users.⁵⁰ The study also advised the Federal Highway Administration “remove the guidance that speed limits in speed zones should be within 5 mph of the 85th percentile speed.”⁵¹

The growing popularity of the safe systems approach is also reflected by the growth of Vision Zero, an initiative that strives to eliminate all traffic fatalities and severe injuries by targeting local jurisdictions and encouraging them to adopt speed-management policies and roadway design practices. As of early 2019, more than 40 U.S. cities – including Sacramento, San Francisco, and Los Angeles – have adopted policies from this initiative and are designated as Vision Zero Cities.⁵²

Reflecting these trends, states across the U.S., including Oregon, Washington, and New York are adopting speed-limit-setting laws that grant local agencies more flexibility to establish lower speed limits. Localities, in turn, are leveraging this ability to reduce speed limits and make safety improvements.

Sections 5.3.1, 5.3.2, 5.3.3, and 5.3.4 of this report present U.S. case studies that reflect this trend. These case studies are adapted from the UC ITS Research Synthesis.

5.3.1. Oregon

In 2017 the Oregon legislature gave the City of Portland the authority to lower its residential speed limits from 25 mph to 20 mph. The Legislature extended this authority to all Oregon cities in 2019 via Senate Bill 558.

All of Portland's 3,000 miles of residential streets now have a maximum speed of 20 mph. Portland also has permission to use an “alternative method”⁵³ for non-arterial streets that references the 85th percentile speeds but places greater emphasis on vulnerable users and the risk of a future crash. Locations where this alternative method is used will require an evaluation report after a two-year trial period focusing on the changes in the number of injury and fatal crashes. This methodology was approved in 2016 and the experimental period was extended to four-years to account for crash data report lag time.

⁵⁰ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 54.

⁵¹ *Ibid.*, 57

⁵² Vision Zero Network, *Vision Zero Cities* (2019).

⁵³ Oregon Department of Transportation, *Article 595455* (2016).

5.3.2. Washington

In 2013 the Washington Legislature passed a law allowing municipalities to establish a maximum speed limit of 20 mph in a residential or business district. Enabled by this legislation, in 2016 Seattle City Council lowered the speed limit on residential streets from 25 mph to 20 mph and the lowered the default speed limit from 30 mph to 25 mph on arterials (larger streets that are primarily in downtown and nearby neighborhoods).

Additionally, the Legislature passed a law amending the State's Manual on Uniform Traffic Control Devices (MUTCD) that provides local jurisdictions with considerations about what requirements they need to meet in order to revise speed limits.

The Seattle Department of Transportation (SDOT) compiled a data-based justification in support of the lower speed limits. SDOT made the case that the design of the road the city's Vision Zero commitment, and recent mode shift away from driving and toward walking, biking, and taking transit all signaled a need for lower, safer speed limits. SDOT also included speed and safety data from all of their recent Vision Zero pilot projects.

Since the law passed, SDOT has built on the momentum of reducing speed limits across the city to leverage existing state-level authority to reduce speed limits on three high-crash corridors using a context-sensitive engineering study. They are also leveraging both of these tools to reduce speed limits at a neighborhood scale in particular zones.

5.3.3. New York

In 2014 the New York State Legislature allowed New York City to reduce the citywide default speed limit from 30 mph to 25 mph.

In addition to lowering citywide speed limits to 25 mph, the city also created numerous Neighborhood Slow Zones across the five boroughs in response to applications from communities. These zones typically include 20 mph on-street markings, signs, speed humps, and other traffic calming treatments and are typically small residential areas with low traffic volumes and minimal through traffic. According to the city, the ultimate goal of the Neighborhood Slow Zone program is to lower the incidence and severity of crashes. Slow Zones also seek to enhance quality of life by reducing cut-through traffic and traffic noise in residential neighborhoods.⁵⁴

The State Legislature also granted permission to establish an automated speed enforcement program involving cameras located in school zones. In 2019, having lowered speeding by over 60 percent in camera locations, the City obtained new authority to expand this program from 140 to 750 zones.

5.3.4. Massachusetts

Massachusetts state law allows local jurisdictions to adopt a 25 mph default citywide speed limit on municipal roads in "thickly settled" areas. They may also establish 20 mph safety zones based on criteria of their choosing. Communities that decide to reduce the statutory speed limit to 25 mph are required to "opt in" to the program by notifying the state Department of Transportation. As of September 2019, 42 have opted in, including Cambridge and Boston.⁵⁵

⁵⁴ New York City Department of Transportation, *Neighborhood Slow Zones* (2019).

⁵⁵ Massachusetts Department of Transportation, *Speed limits in thickly settled or business districts* (2019).

In 2016, Cambridge lowered speed limits to 25 mph citywide and began implementing 20 mph safety zones later that same year. In 2017, Boston reduced the default speed limit from 30 mph to 25 mph. A before-and-after by the Insurance Institute of Highway Safety found that the estimated odds of a vehicle exceeding 35 mph fell 29.3%, the estimated odds of a vehicle exceeding 30 mph fell 8.5%, and the estimated odds of a vehicle exceeding 25 mph fell 2.9%.⁵⁶ The study concluded that updated state laws that allow municipalities to set lower speed limits on urban streets without requiring costly engineering studies can provide flexibility to municipalities to set speed limits that are safe for all road users.

5.4. Conclusion: Shifting Paradigms

At all levels – international, national, state, and local – establishing speed limits based on safety is increasingly widespread. As more agencies emphasize the safety of all road users as fundamental to establishing speed limits, the traditional 85th percentile approach and its inherent privileging of vehicle throughput and driver behavior is giving way to more multi-faceted, context-sensitive, safety-based approaches. However, as the NTSB safety study notes, “although local officials may wish to incorporate the safe system approach by proposing speed zones with lower limits in urban areas with vulnerable road users, they may be unable to do so because state transportation departments require engineering studies that are driven by the 85th percentile speed.”⁵⁷

In the U.S., states are passing legislation that grants local agencies more flexibility to establish lower speed limits, which local jurisdictions are using to lower speed limits to increase safety. Ultimately, increased safety outcomes require cooperation and coordination at both the state and local levels.

⁵⁶ Insurance Institute for Highway Safety, *Lowering the Speed Limit from 30 to 25 mph in Boston: Effects on Vehicle Speeds* (2018), cited in UC ITS, *Research Synthesis*, 54-55.

⁵⁷ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 29.

6.0 Engineering and Designing for Safety – Roads and Vehicles

This section explores roadway engineering and design countermeasures and emerging vehicle technologies to increase safety.

6.1. Engineering Countermeasures

A road's posted speed limit is not the only factor that drivers consider when choosing how fast to drive. The physical design of a roadway (such as lane numbers and width, the presence of intersections, roundabouts, and the surrounding landscape) also influences a driver's velocity and is an important component in speed management. As a recent study noted, "our preferences and judgments of appropriate speed are strongly influenced by setting and perspective."⁵⁸ The speed at which we choose to operate our vehicles is known as *operating speed*. A driver's operating speed can be influenced by many complex factors, but generally speaking, motorists will drive faster on wide, uncongested roads. They will drive slower on narrow roads with sight markers (such as trees) that provide subconscious feedback on their speeds.

Engineering countermeasures have been identified as one of three types of countermeasures (the others are education and enforcement) that can mitigate a speeding-related safety problem.⁵⁹ Engineering countermeasures are predicated on the fact that roads can be designed to increase or decrease a driver's operating speed. This *design speed* is an important component of overall speed management and as defined by the FHWA "is the selected speed used to determine the various geometric design features of the roadway."⁶⁰

Traffic engineers use a variety of technical terms to discuss changing roadway infrastructure to force drivers to change their behavior. These terms include *engineering countermeasures*, *traffic-calming devices*, *self-enforcing roadways*, *geometric design*, *roadway geometry*, *physical measures*, and *roadway design features*.

While these terms are not synonymous, they are generally used when discussing "any intentional, long-term alteration to the roadway or its environment that causes changes in motorists' driving behavior."⁶¹ According to the FHWA's *Traffic Calming ePrimer*, while the exact wording may differ, "the essence remains that traffic calming reduces automobile speeds or volumes, mainly through the use of physical measures, to improve the quality of life in both residential and commercial areas and increase the safety and comfort of walking and bicycling."⁶²

⁵⁸ FHWA, *Speed Concepts: Informational Guide*, 7

⁵⁹ NHTSA, *Speed Enforcement Camera Systems Operational Guidelines* (2008), 8.




⁶⁰ *Ibid.*, 9

⁶¹ FHWA, *Speed Management Countermeasures Fact Sheet* (2017), 1.



⁶² FHWA, *Traffic Calming ePrimer* (2017). Module 2.1.

Exhibit 6-1 provides images, descriptions, and costs of common engineering and design solutions.

Exhibit 6-1 – Common Roadway Engineering Elements and FHWA Estimated Cost*

Example	Description	FHWA Estimated Construction Cost
	<p>Curb extensions Curb extensions visually and physically narrow the roadway and increase the overall visibility of pedestrians by reducing the crossing distance for pedestrians.</p>	<p>\$8,000-\$12,000</p>
	<p>Chicanes A chicane is a series of alternating mid-block curb extensions or islands that narrow the roadway and require vehicles to follow a curving, S-shaped path.</p>	<p>\$8,000-\$10,000</p>
	<p>Chokers Chokers are types of curb extensions that narrow a street by widening the sidewalks or planting strips, effectively creating a pinch-point along the street.</p>	<p>\$10,000-\$25,000</p>

Example	Description	FHWA Estimated Construction Cost
	<p>Median islands Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings.</p>	<p>\$15,000- \$55,000</p>
	<p>Raised crosswalks Raised crosswalks bring the level of the roadway to that of the sidewalk, forcing vehicles to slow before passing over the crosswalk and providing a level pedestrian path of travel from curb to curb.</p>	<p>\$4,000-\$8,000</p>
	<p>Roundabouts A roundabout is a type of circular intersection that is different than a traffic circle. Traffic travels counterclockwise around center island and vehicles entering the roundabout must yield to enter.</p>	<p>\$150,000- \$2 million</p>

Example	Description	FHWA Estimated Construction Cost
	<p>Speed humps/speed table Speed humps and tables are devices that encourage people driving to slow down. Speed humps and tables are raised areas that extend across the street. A speed hump is rounded whereas a speed table has a flat top to accommodate a car's entire base.</p>	<p>Speed hump: \$2,000-\$4,000</p> <p>Speed table: \$2,500-\$8,000</p>
	<p>Traffic circles Traffic circles guide vehicles through an intersection in one direction around a central island. They are usually installed at intersections of neighborhood streets.</p>	<p>\$10,000-\$25,000</p>

*Sources: U.S. Department of Transportation Federal Highway Administration Traffic Calming ePrimer (https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm#eprimer); National Association of Transportation Officials Urban Street Design Guide (<https://nacto.org/publication/urban-street-design-guide/>)

Image Sources:

1. Curb Extensions
https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3.cfm
2. Chicanes
https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3.cfm
3. Chokers
https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3pt2.cfm
4. Median Islands
<https://www.fhwa.dot.gov/publications/publicroads/11marapr/03.cfm>
5. Raised Crosswalks
https://safety.fhwa.dot.gov/ped_bike/step/docs/TechSheet_RaisedCW_508compliant.pdf
6. Roundabouts
<https://safety.fhwa.dot.gov/hsip/hrrr/manual/sec43.cfm>
7. Speed humps/speed table
https://safety.fhwa.dot.gov/local_rural/training/fhwasa010413spmgmt/
8. Traffic circles
https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3.cfm

Within the context of reducing speed and calming traffic, engineering countermeasures are commonly used to slow down traffic, reduce overall traffic volume, reduce cut-through traffic, provide more space for bicyclists and pedestrians, and increase their visibility to drivers. Engineering and design countermeasures can offer a more holistic approach instead of treating streets solely as a conduit for vehicles and balance traffic on streets with other needs of the community. As the exhibit depicts, costs can vary widely depending on the type of solution.

Many studies find that engineering changes are the most effective interventions at reducing pedestrian injury and fatality rates.⁶³ UC ITS documented the safety improvements associated with multiple engineering solutions. Studies in Denmark and the United States, for instance, have shown that the installation of a single speed bump reduced average vehicle speeds by 2.7 to 3.4 mph, and another American study found that installing multiple speed bumps in succession can reduce average vehicle speeds by 8 to 12 mph in some areas.⁶⁴ Horizontal deflections such as chicanes and lane shifts have also been demonstrated to reduce vehicle speeds. Chicanes have been found to reduce average speed by 1.3 to 3.2 mph.⁶⁵ Roundabouts have also been found to reduce the speed of vehicles at intersections and have consistently shown to reduce all crashes in all intersection contexts in the range of 35-76% in the United States.⁶⁶

Task Force members overwhelmingly agree that changing a road's infrastructure is the most important factor to reduce vehicle operating speeds. When surveyed, 13 of 15 survey respondents said that design elements effectively reduce speeds. One Task Force member noted that a local city had recently reduced the speed limit in school zones. However, the accompanying wide streets encouraged drivers to ignore the signs and continue driving fast; the lowered speed limit was in itself "not enough to make our streets truly safe."

The effect of roadway design on safety is widely accepted, and the Federal Highway Administration recently released a national pedestrian safety action plan that focuses significant attention on improving pedestrian safety through street redesign and engineering-related countermeasures, as well as the policies that influence street design choices. There are a variety of other sources for cities who wish to pursue engineering countermeasures; these include the National Association of City Transportation Officials' design guides, the Federal Highway Administration's *Traffic Calming ePrimer*, and the *Highway Design Manual* published by Caltrans.

However, there are many challenges associated with changing roadway infrastructure to reduce operating speeds. The Caltrans *Highway Design Manual* does not include standards and specifications for many types of horizontal and vertical traffic calming devices. While large cities such as San Francisco and Los Angeles have developed their own engineering and design guides, smaller cities do not have the resources to produce their own standards and rely on a variety of other sources. Currently, no definitive document exists that provides California cities and counties with comprehensive engineering and design options to reduce vehicle operating speeds.

⁶³ UC ITS, *Research Synthesis*, 57.

⁶⁴ *Ibid.*, 57.

⁶⁵ *Ibid.*, 57.

⁶⁶ *Ibid.*, 58.

Roadway engineering solutions to reduce operating speed can widely vary in cost, and can include complex multi-million-dollar construction projects. Changing roadway infrastructure on a large scale can be a costly and time-consuming process that can take years. The process involves planning, prioritizing, securing funding, designing, and installation. According to the FHWA, “once constructed, transportation infrastructure is enduring [...] Alterations may be costly and disruptive. Since the consequences of roadway design are significant and long-lasting, decisions should be deliberate.”⁶⁷ Task Force and Advisory Group members noted that cost and length of time as obstacles to using engineering countermeasures to achieve safer speeds.

In addition to these obstacles, another potential barrier to lowering vehicle operating speeds is the need to meet Level of Service (LOS) requirements. In city planning documents, through state permitting processes, and through the environmental review process, acceptable vehicle LOS for specific roadways is often identified and used in order to avoid excessive traffic congestion and delay. LOS is a metric used to rate the quality of vehicle traffic service based on performance measures like speed, travel time, delay, and congestion. There are six levels of service ranging from "A" through "F," with LOS "A" representing the best range of operating conditions and LOS "F" representing the worst.

When implementing engineering countermeasures designed to reduce vehicle operating speeds, agencies may have to consider the LOS level on a given roadway. For instance, the City of El Centro requires that projects with a significant impact on its transportation system and LOS criteria must mitigate the impact through physical improvements and/or impact fees.⁶⁸ In contrast, the City of Roseville notes in its general plan that the implementation of pedestrian districts may slow cars down and reduce the level of service. It thus exempts pedestrian districts from its LOS policy.⁶⁹

Roseville’s exemption illustrates the tradeoff between safety and vehicle level of service within the context of roadway engineering: lower speed limits reduce the probability of crashes but also reduce vehicle levels of service. According to the National Highway Traffic Safety Administration (NHTSA), U.S. communities that privilege levels of service have wide roads with minimal pedestrian accommodations and “consequently, they often experience higher crash rates for all roadway users, as both motorists and pedestrians suffer from the less safe conditions created to achieve these higher levels of vehicle mobility.”⁷⁰

In addition to this fundamental tension, Advisory Group members indicated that roadway funding is sometimes contingent on Level of Service-based improvements such as street widening and capacity enhancements, which tend to increase vehicle operating speeds.

⁶⁷ FHWA, *Speed Concepts: Informational Guide*, 33.

⁶⁸ City of El Centro, *El Centro General Plan Circulation Element* (2004), 18.

⁶⁹ City of Roseville, *General Plan 2035 Circulation Element* (2016), III-15.

⁷⁰ NHTSA, *How to Develop and Pedestrian Safety Action Plan* (2009), 10.

Exhibit 6-2 summarizes the primary barriers to the implementation of engineering solutions designed to lower vehicle operating speed.

Exhibit 6-2 – Engineering and Design Solutions: Barriers to Implementation

Barrier	Description
<ul style="list-style-type: none"> • Cost 	Roadway infrastructure can range from \$2,000 to \$2 million depending on the design treatment.
<ul style="list-style-type: none"> • Long timeline 	Implementing new roadway infrastructure can take years to plan, fund, design, and implement.
<ul style="list-style-type: none"> • Funding 	Funding for infrastructure can be difficult to obtain and can be contingent upon certain criteria.
<ul style="list-style-type: none"> • Level of Service standards 	Level of Service standards stipulate acceptable thresholds for traffic congestion and delay.

As agencies work to balance the proven effectiveness of engineering countermeasures to reduce operating speed with their cost, length, and complexity, it is important to note that some can be low-cost and low-intervention. These include pavement markings (e.g., lane narrowing), static signing (e.g., chevron signs), and dynamic signing (e.g., speed activated speed limit signs, speed activated warning signs). For instance, research has demonstrated that speed feedback signs, which display a vehicle’s current speed to remind the driver to slow down, have been effective at reducing speeds by 5 mph.⁷¹

In order to identify the most effective engineering countermeasures, traffic and transportation professionals can also employ a research-based baseline to quantify the expected safety effectiveness of a countermeasure. One commonly method to achieve that is using crash modification factors (CMF).

As described by UC ITS, a CMF is an estimate of the change in crashes expected after implementation of a countermeasure. CMFs are applied to the estimated crashes without treatment to compute the estimated crashes with treatment. The FHWA CMF Clearinghouse is a web-based database of CMFs along with supporting documentation to help users identify the most appropriate countermeasure for their safety needs. The CMF Clearinghouse contains more than 3,000 CMFs for various design and operational features.⁷²

In a preliminary effort to identify the most pertinent crash types for California, UC ITS generated descriptive crash statistics for California based on analysis of data from the Statewide Integrated Traffic Records System (SWITRS) for the years 2014-2018. Results indicated that large number of fatal and severe crashes are head-on or overturned vehicle crash types. These specific crash types can be alleviated by road design features that provide better road side barriers and better separation from head on traffic. The CMF clearinghouse provides a list of quality CMF’s that are expected to reduce such crashes.

⁷¹ FHWA, *Speed Management Countermeasures Fact Sheet*.

⁷² UC ITS, *Research Synthesis*, 64.

Additionally, UC ITS identifies certain key resources (maintained by NHTSA, FHWA, and CDC) that can support practitioners in identifying a set of road design improvements to reduce crashes of all modes. Crash modification factors are listed for many of the countermeasures, and such factors can be used to calculate cost-benefit estimates. The documents demonstrate that continued application of currently available proven countermeasures can extend the decades-long trends toward greater road safety.

6.2. Emerging Vehicle Technologies

Emerging vehicle technologies that are designed to help drivers avoid crashes are quickly entering the motor vehicle marketplace in the U.S. These technology systems, known as advanced driver assistance systems, rely on external sensors to gather information about possible hazards and deploy various interventions, including collision warnings and automated emergency braking, to help drivers avoid crashes. Many vehicle safety and crash avoidance systems are offered to consumers as optional and are not standard. However, adoption of these emerging technologies by consumers and automakers is growing.

For instance, in 2016 the National Highway Traffic Safety Administration and the Insurance Institute for Highway Safety announced the commitment of 20 major automakers to make automatic emergency braking a standard feature on virtually all new cars by 2022.⁷³ Through this commitment, consumers will have access to this technology more quickly than would be possible through the regulatory process.

Such urgency is due to the safety improvements demonstrated by these driver-assisted technologies. Research is beginning to describe the safety benefits of various levels of emerging technology.⁷⁴ For example, the NTSB concluded that intelligent speed adaptation (ISA) technology has been studied extensively and that it is “an effective vehicle technology to reduce speeding.”⁷⁵ ISA works by comparing a vehicle’s global position system (GPS) to the road’s speed limit and either warning the driver or slowing the vehicle in the case of excessive speed.

Exhibit 6-3 provides an overview of common advanced driver assistance systems (ADAS). Some of these technologies provide warnings and rely on the driver to take corrective action; others are designed to automatically brake or steer, taking a more active approach.

Exhibit 6-3 – Advanced Driver Assistance Systems

Feature	Acronym	Description
Intelligent speed adaptation	ISA	ISA systems compare a vehicle’s global position system (GPS) to the road’s speed limit and either warn the driver or slow the vehicle in the case of excessive speed.
Blind spot warning	BSW	BSW systems detect vehicles traveling in the vehicle’s blind spot and provide some form of warning to the driver.

⁷³ [NHTSA, Fact Sheet: Auto Industry Commitment to IIHS and NHTSA on Automatic Emergency Braking \(2016\).](#)

⁷⁴ UC ITS, *Research Synthesis*, 68.

⁷⁵ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 45.

Feature	Acronym	Description
Automatic emergency braking	AEB	AEB systems determine the distance between the vehicle and other vehicles/objects directly ahead and automatically apply brakes when it senses a crash is imminent. Many current-generation AEB systems are also designed to detect and respond to pedestrians and cyclists.
Forward collision warning	FCW	FCW systems determine the distance between the vehicle and other vehicles/objects directly ahead and warn the driver when the system determines an imminent threat. Many current-generation FCW systems are also designed to detect and respond to pedestrians and cyclists.
Lane Departure Warning / Lane Keeping Assist	LDW/LKA	LDW and LKA systems use cameras to determine the position of the vehicle in relation to lane markings. LDW systems are designed to prevent crashes in which the vehicle leaves its travel lane unintentionally.

A recent research brief on advanced driver assistance systems, sponsored by the AAA Foundation for Traffic Safety, provided new estimates on the number of crashes, injuries, and deaths that such systems could potentially help prevent based on 2016 U.S. crash characteristics. The brief estimates that these technologies, if installed on all vehicles, would have had the potential to help prevent or mitigate roughly 40% of all crashes involving passenger vehicles, and 37% of all injuries and 29% of all fatalities that occurred in those crashes. It concludes that “Current and future vehicle safety systems have the potential to dramatically reduce the number of crashes, injuries and fatalities on our roadways.”⁷⁶

⁷⁶ AAA Foundation for Traffic Safety, *Potential Reductions in Crashes, Injuries, and Deaths from Large-Scale Deployment of Advanced Driver Assistance Systems* (2018), 9.

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7.0 Speed Enforcement

This section provides an overview of speed enforcement considerations with a focus on automated speed enforcement.

7.1. Overview of Speed Enforcement

Speed limits and speed limit enforcement are intertwined. Appropriately set speed limits must be enforced to be optimally effective, and the purpose of enforcement strategies is to increase compliance with traffic laws, including the legal speed limit.⁷⁷ Enforcement is one of three categories of countermeasures (in addition to engineering and education) identified by the FHWA that can mitigate a speeding-related safety problem, as enforcement can deter speeding and penalize violators. There are many methods to conduct enforcement, including, regular traffic patrols, high visibility enforcement, and automated speed enforcement. Automated speed enforcement is discussed in Section 7.2 and high visibility enforcement is discussed in Section 7.3.

However, speed limit enforcement is only one of the duties of an officer. With competing resource needs, law enforcement agencies must make decisions how much time to devote to speed enforcement and how to structure an effective speed enforcement program. The NHTSA's *Speed Enforcement Program Guidelines* provides guidance for local agencies on speed enforcement programs and notes that there is no single best method for enforcing speeds:

Each jurisdiction needs to customize a combination of technologies and tactical methods to enforce speeds that works best for its community. [...] Speed enforcement countermeasures need to be tailored to the particular problems identified in the community and local circumstances. The selected enforcement methods should be based on analysis of data on speeds and crashes and on citizen reports.⁷⁸

In California, speed limit enforcement programs face several challenges, including the lack of adequate law enforcement staffing. Following the 2008 recession, law enforcement agencies severely cut back their resources for traffic safety enforcement activities. While traffic fatalities in California have continued to rise, law enforcement staffing levels have not rebounded. The California Office of Traffic Safety (OTS) provides some Federal funds for traffic safety enforcement, and some California jurisdictions would not have dedicated traffic safety enforcement officials without these funds.

According to the California Vehicle Code, a speed trap is defined as a section of a highway with a prima facie speed limit if the limit is not justified by an engineering and traffic survey conducted within 5-10 years prior to the date of the alleged violation and if the enforcement of the limit involves the use of radar or other electronic devices.⁷⁹ In short, if the roadway's speed limit is not supported by a current traffic survey, the limit cannot be enforced using lidar or radar. However, this does not apply on State-defined local roads, which are exempt from speed trap regulations. This exemption enables authorities to enforce speed limits on local roads without a valid traffic survey.

⁷⁷ NHTSA, *Countermeasures that Work*, 8-36.

⁷⁸ NHTSA, *Speed Enforcement Program Guidelines* (2008), 14-15.

⁷⁹ CVC 40802.

Local agencies on the Task Force state that they struggle to meet the State requirement to update their engineering and traffic surveys. Posted speed limits in California are not enforceable if the underlying traffic speed surveys have expired. To enforce posted speed limits using lidar or radar, local agencies must update a street's engineering and traffic survey every 5 to 10 years. Some city representatives on the Task Force maintain that they struggle to find the resources needed to update the traffic surveys on their roads. Without a current traffic survey on file for a particular roadway, speeding tickets issued using lidar or radar are not defensible in court since these conditions meet the statutory definition of a speed trap.

According to its city documents, Los Angeles experienced a backlog of engineering and traffic surveys in 2015. Unable to update speed surveys at the rate at which they were expiring, the city noted that only 19% of its speed limits within its high injury networks were able to be enforced with radar.⁸⁰ (High Injury Networks are streets where high numbers of fatal and serious crashes are concentrated.) The City Council directed the Department of Transportation to update all eligible surveys. Based on the survey results, the City passed an ordinance in 2018 to raise the speed limit on over 100 miles of its streets.⁸¹

This example illustrates a particular predicament that is the byproduct of current law: if cities do not update their traffic surveys, they cannot enforce the speed limit using radar, but if they do update their traffic surveys, speed limits are likely to rise, since speed creep is an unintended consequence of using the 85th percentile methodology.

Despite these challenges, enforcing speed limits is an effective countermeasure to reducing speeding and eliminating crashes, serious injuries, and fatalities on California's roadways. Effective enforcement is an important additional step that can be taken to make roadways safer as part of a multifaceted approach, and it is even more effective when combined with public education. As the FHWA notes, "traffic enforcement is most effective when it is highly visible and publicized, to reinforce the required behavior and to raise the expectation that failure to comply may result in legal consequences."⁸²

7.2. Automated Speed Enforcement

While there are many enforcement methods available to law enforcement agencies, automated speed enforcement (ASE) harnesses technology to reduce speeding. ASE detects speeding violations and records identifying information about the vehicle and/or driver. Typically, radar or lidar is set to detect vehicles going above a certain speed. Once a speed vehicle is detected by the radar system, the camera is triggered. Cameras are either permanently fixed on poles or are mobile. The camera takes a picture of the license plate and, depending on the program specifics, the driver. (Some programs require drivers to be identified while others do not.) At a later time, a back-office processor reviews and processes the violation. This processor can be a law enforcement officer or a third-party vendor. In processing, the individual determines if a violation occurred and matches the camera information to vehicle registration information. Lastly, a citation is mailed to the vehicle driver or owner (depending on the specifics of the program).

⁸⁰ City of Los Angeles Department of Transportation, *Enhanced Speed Enforcement and Tools to Reduce Speeding* (2015), 5.

⁸¹ City of Los Angeles Board of Transportation Commissioners, *Ordinance Approval for Recommended Speed Limit Revisions and Additions*, (2018).

⁸² NHTSA, *Countermeasures that Work*, 8-36.

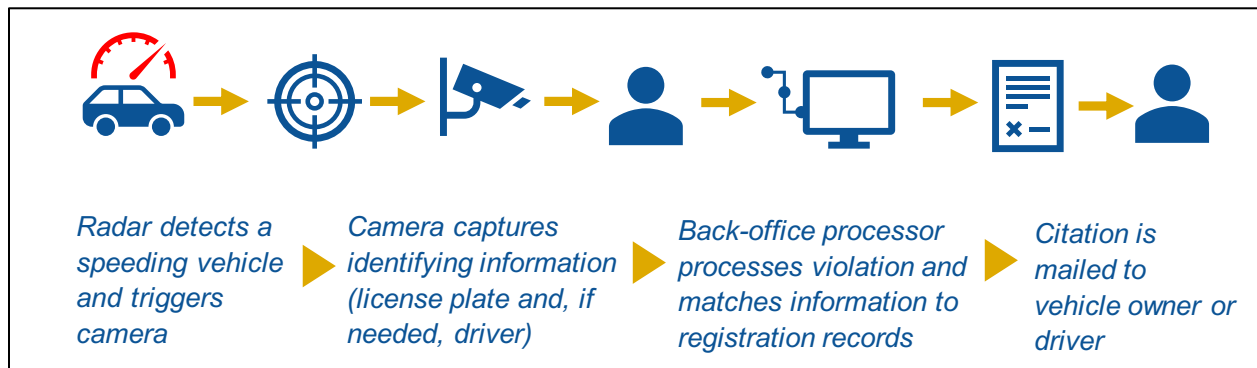
All ASE systems have three basic components:

- 1) Speed measuring (typically using radar or its laser equivalent lidar)
- 2) Data processing and storage
- 3) Image capture

Exhibit 7-1 provides a visual high-level overview of this process.

ASE has been in use worldwide and its effects on traffic speeds and crashes has been studied for more than two decades. ASE has proven to be an effective countermeasure to reduce speed-related crashes and injuries.⁸³ In its 2017 *Safety Study*, the NTSB analyzed studies of ASE programs, including U.S. programs. These studies demonstrated significant safety improvements in the forms of reduction in mean speeds, reduction in the likelihood of speeding more than 10 mph, and reduction in the likelihood that a crash involved a severe injury or fatality.⁸⁴ In the City of Scottsdale, which implemented an ASE program in the mid-2000s, ASE was effective in reducing speeding and improving safety.⁸⁵

Exhibit 7-1 – High-Level Overview of ASE Process



Like any type of enforcement methodology, ASE has its specific benefits and limitations. Because automated speed enforcement does not require a law enforcement officer to be present, it has the ability to continuously enforce the speed limit while freeing up officers for other duties. ASE can also operate in areas, such as busy intersections, where in-person traffic stops would be impractical or distracting to other drivers. ASE can be used on higher speed roadways where traffic calming devices may not be appropriate. On the other hand, ASE does not immediately stop speeding drivers. Furthermore, due to the lack of direct contact between the officer and driver, there is no opportunity for education, to observe suspicious activities and identify additional offenses (such as impaired driving) nor does it afford the exercise of judgment in issuing a citation (such as a written or verbal warning) that an officer would have. **Exhibit 7-2** depicts the benefits and limitations of ASE, as drawn from the NTSB's study *Reducing Speeding-Related Crashes Involving Passenger Vehicles* and NHTSA's *Speed Enforcement Camera Systems Operational Guidelines*.

⁸³ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 37.

⁸⁴ *Ibid.*, 37.

⁸⁵ Simon Washington, *Evaluation of the City of Scottsdale Loop 101 Photo Enforcement Demonstration Program* (2017), 135.

Exhibit 7-2 – Benefits and Limitations of ASE

Benefits of ASE	Limitations of ASE
<ul style="list-style-type: none"> • Frees up law enforcement resources to be used elsewhere and can serve as “force multiplier” 	<ul style="list-style-type: none"> • Driver does not stop and may continue to speed
<ul style="list-style-type: none"> • Can operate where: 1) in-person traffic stops would be dangerous; and 2) on higher speed roadways where traffic calming devices may not be appropriate 	<ul style="list-style-type: none"> • Limited scope of enforcement and lack of direct contact with motorists
<ul style="list-style-type: none"> • May reduce congestion from other drivers distracted by traffic stops 	<ul style="list-style-type: none"> • Time lag between violation and penalty
<ul style="list-style-type: none"> • Ability to continuously enforce speed limit 	<ul style="list-style-type: none"> • Challenged on several constitutional grounds, including: <ul style="list-style-type: none"> ○ Rights of due process ○ Rights of equal protection ○ Rights of privacy
<ul style="list-style-type: none"> • Proven to be an effective countermeasure to reduce speed-related crashes and injuries 	<ul style="list-style-type: none"> • Criticized by the public as a tool to generate revenue rather than increase safety

The NHTSA *Speed Enforcement Camera Systems Operational Guidelines* address the considerations that should be taken into account when implementing and operating an ASE program. *The guidelines emphasize that an ASE program is supplement to, not a replacement for, traditional law enforcement operations.* The guidelines describe general considerations and planning; program start-up; program operations; violation notice processing and delivery; violation notice receipt and adjudication; and program evaluation.

In addition to these general topics, NHTSA also provides more specific policy considerations for any potential ASE program, many of which were echoed by Task Force members. These considerations include:

- Locations
- Citation Type and Amount
- Warning Phase
- Adjudication
- Use of Revenue
- Operation
- Public Notice
- Speed
- Privacy and Use of Data
- Equity
- Camera Calibration
- Oversight

The Task Force spent some time discussing automated speed enforcement and its potential safety benefit and the following recommendation for policy consideration reflects that. However, it is important to acknowledge the sensitive and complex issues surrounding automated speed enforcement.

Although it is used extensively internationally, ASE has not been widely adopted in the U.S. at a Statewide level. It is currently used in 142 U.S. cities and is not currently authorized in California. In the late 1990s, the City of San Jose operated an ASE program but it was halted following a judicial ban. As an effective speeding countermeasure, ASE is underutilized due to various obstacles, including the lack of enabling legislation.⁸⁶ According to NHTSA, which gives ASE the maximum 5-star effectiveness rating, “many States have prohibitions in their laws to prevent the use of automated enforcement technology; others have enabling legislation and/or parameters on the use of the technology; and others still have no legislation that addresses the technology’s use.”⁸⁷

The importance of Statewide support for any ASE program is reflected in the NTSB’s 2017 recommendations on ASE in its *Safety Study*. It concludes that in order to be effective, ASE programs need to be explicitly authorized by State legislation without operational and location restrictions, and to this end, the NTSB recommended that all states remove obstacles to ASE programs in order to increase its use.⁸⁸

7.3. High Visibility Enforcement

A High Visibility Enforcement (HVE) strategy combines enhanced patrols, enhanced visibility efforts, and publicity campaigns to educate the public and promote voluntary compliance with the traffic laws. For example, an HVE campaign includes increasing patrols and blitzes, installing visibility elements such as message boards and road signs, and implementing a comprehensive communications and media plan. These efforts are coordinated and designed to make enforcement efforts obvious to the public with the goal of changing driver behavior. According to the NHTSA, which offers an online High Visibility Enforcement Toolkit, when the perceived risk of getting caught by law enforcement goes up, the likelihood that people will engage in unsafe driving behaviors goes down.⁸⁹ Similarly, FHWA notes that traffic enforcement is most effective when it is highly visible and publicized.⁹⁰

Authorities must consider many factors when implementing an HVE campaign, including types of enforcement (e.g., waves, saturation patrols, multi-jurisdictional); types of publicity (e.g., paid media, earned media, social media), and types of visibility elements (e.g., electronic message boards, billboards, specially marked squads). HVE programs can take 4 to 6 months to plan and incur significant costs for both publicity and increased officer patrols. They require extensive time from the State highway safety office and media staff and often from consultants to develop, produce, and distribute publicity and time from law enforcement officers to conduct the enforcement.⁹¹

Communications and public outreach are an integral component of HVE programs. To assist state and local agencies to plan and implement HVE programs, NHTSA annually prepares resources for individual HVE program areas, including impaired driving, occupant protection (e.g., Click it or Ticket), and distracted driving. Since states must conduct traffic safety campaigns in order to receive some federal highway safety grant funds, national participation rates are high.⁹²

There is no national traffic safety campaign focused on the dangers of excessive speed although campaign material is available from NHTSA. Likewise, California lacks a statewide

⁸⁶ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 41.

⁸⁷ NHTSA, *Countermeasures that Work*, 3-20.

⁸⁸ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 54-57.

⁸⁹ NHTSA, *High Visibility Enforcement Toolkit* (2019), “Visibility Elements.”

⁹⁰ NHTSA, *Countermeasures that Work*, 8-36.

⁹¹ *Ibid.*, 2-17.

⁹² NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 49.

speeding-related traffic safety campaign and HVE program. While the NTSB concludes that “traffic safety campaigns that include highly publicized, increased enforcement can be an effective speeding countermeasure, [however] their inconsistent and infrequent use by states hinders their effectiveness.”⁹³

The California OTS, in partnership with NHTSA, administers traffic safety grants to local and state law enforcement agencies for programs to help them enforce traffic laws. HVE is promoted as a best practice for enforcement operations, including impaired driving, distracted driving, pedestrian and/or bicyclist safety, motorcycle safety, and other traffic enforcement operations that target primary collision factors (including speed) within the jurisdiction.

From October 2016 to September 2017, the City of San Francisco conducted a HVE campaign focused on speeding. The collaborative “Safe Speeds SF” campaign was led by the San Francisco Municipal Transportation Agency (SFMTA) and the San Francisco Police Department (SFPD), with the program evaluation led by the San Francisco Department of Public Health (SFDPH). Law enforcement targeted 11 corridors on the city’s High Injury Network and these enforcement efforts were accompanied by media campaigns and community outreach. During the campaign over 1,800 speeding citations were issued to drivers on the HVE corridors.

Following its conclusion, researchers evaluated the campaign. Results indicated that HVE was effective in lowering vehicle speeds *during* the enforcement period, and was modestly effective in lowering vehicle speeds *before* and immediately *after* enforcement. However, these impacts were not sustained in the long term and reductions in driver speeds began to diminish one week after the HVE ended. SFDPH concluded that enforcement must be regular and sustained in order to achieve lower vehicle speeds.⁹⁴

⁹³ Ibid., 50.

⁹⁴ Vision Zero SF, *Safe Speeds SF High Visibility Enforcement Campaign Findings* (November 2019), 1-8.

8.0 Additional Steps to Improve Safety

This section describes additional steps that can be taken to eliminate vehicular, pedestrian, and bicycle fatalities on the road, including improving education countermeasures, improving safety data, and linking crash and medical data to create a more comprehensive understanding of traffic crashes.

8.1. Improving Education

Traffic safety campaigns use communications and outreach to increase public education and awareness of a traffic safety topic. Nationally, NHTSA is responsible for coordinating and sponsoring national traffic safety campaigns, address occupant protection (*Click it or Ticket*), distracted driving (*U Drive. U Text. U Pay.*), and alcohol impairment, among other issues. In California, the OTS coordinates with NHTSA to solve key highway safety problems in the state by allocating federal funds to state and local agencies to implement traffic safety programs and grants.

However, public awareness of the dangers of speeding is lacking at both the federal and state level. There is no national campaign devoted to speeding, and, given this absence, “there is incomplete participation among states, and little consistency among the individual state campaigns.”⁹⁵ The NTSB found that the dangers of speeding are not well-publicized and that citizens generally underappreciate the risks of speeding. While other traffic safety issues are highly visible and have national leadership, speeding lacks this support, especially when contrasted with more visible campaigns:

A 2011 study found that 32 states funded public awareness efforts for speeding; 25 of these states reported using a total of 30 different campaign slogans, and 8 states used the NHTSA slogans. In contrast, all 50 states participate in the national occupant protection campaign, and they all use the campaign’s “Click It or Ticket” slogan. Participation in the NHTSA-coordinated, national traffic safety campaigns is high because states are required to participate in order to receive some federal highway safety grant funds.⁹⁶

Currently, California lacks a state funding mechanism for a statewide coordinated traffic safety campaign focused on speeding. As the state leader in behavioral traffic safety, OTS is in the unique position to create campaigns and marketing that can change roadway user’s behavior and decrease fatalities throughout the State. OTS directs \$4.5 million in federal funding each year to marketing activities and public awareness campaign planning and execution, video and audio public service announcement (PSA) production, social media, media event planning, print, and graphic materials. The current funding level limits the amount of marketing, public relations and outreach related to traffic safety (with a focus on speeding) to the ethnically diverse population of 39 million Californians. The California Department of Public Health can also be consulted in the design, evaluation, and dissemination of evidenced-based campaigns. CDPH created the campaign, “It’s Up to All of Us,” which could be reintroduced to help increase awareness of the dangers of vehicle speeding to pedestrians and bicyclists. There are numerous ongoing traffic safety campaigns being implemented at the regional and local levels. An example of a regional campaign is the Southern California Association of

⁹⁵ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 49.

⁹⁶ *Ibid.*, 49.

Governments (SCAG's) Go Human campaign, which is a community outreach and advertising campaign, with the goals of reducing traffic collisions and encouraging people to walk and bike more. Go Human deploys regional media campaigns (radio, social media, gas pump ads, billboards, and print media), local co-branding partnerships via advertisements and events, and demonstration projects.

Education countermeasures can change public knowledge, attitudes, and behavior related to speeding, especially when combined with enforcement campaigns. Public campaigns and education can promote a culture of safety-consciousness and research has shown that the communications component of a traffic safety campaign increases safety benefits; for example, a review of traffic safety campaigns in 12 countries found that public information and education reduced crashes by 9% on average.⁹⁷ Improving the education and public outreach regarding the dangers of excessive speed represents an important step that can be taken to help eliminate crashes, serious injuries, and fatalities on California's roadways.

8.2. Improving Safety Data

At both a federal and statewide level, the limitations of speeding-related crash data poses another challenge to the practitioners who evaluate and implement countermeasures to increase safety. Common limitations include poor data quality, lack of timeliness, underreporting, and inconsistencies. Yet according to NHTSA, "states need timely accurate, complete, accessible, and uniform traffic records to identify and prioritize traffic safety issues and to choose appropriate safety countermeasures and evaluate their effectiveness."⁹⁸

Based on its analysis of the national Fatality Analysis Reporting System (FARS), the NTSB found that involvement of speeding passenger vehicles in fatal crashes is underestimated and that "the lack of consistent law enforcement reporting of speeding-related crashes hinders the effective implementation of data-driven speed enforcement programs."⁹⁹ Similarly, within the context of pedestrian and bicyclist safety, NHTSA found that pedestrian and bicyclist crashes tended to be underreported.¹⁰⁰

For the purposes of crash reporting, "speeding" is used to identify vehicles that are traveling at speeds which are: 1) unsafe for conditions or 2) exceed the speed limit. Speeds that are unsafe for conditions are based on basic speed law which is defined as driving at a speed greater than is reasonable or prudent considering weather, visibility, traffic, and roadway conditions. Because the definition of speeding includes these two different conditions, it is unknown to what degree exceeding a posted or statutory speed limit contributes to the total number of speeding-related crashes.

Current crash data is required to make evidence-based traffic safety funding decisions, inform enforcement activities, and help direct critical infrastructure investments. The CHP has made substantial progress toward the goal of statewide electronic crash report submission and automated crash data collection. Internally, beginning in 2016, the CHP deployed a fully paperless electronic crash reporting system. Once a completed CHP crash report is approved at the local level, it is electronically submitted, and pertinent crash data is captured in SWITRS. From 2017 to present, 100 percent of CHP generated

⁹⁷ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 48.

⁹⁸ NHTSA, *Traffic Records Program Assessment Advisory* (2018), 2.

⁹⁹ NTSB, *Reducing Speeding-Related Crashes Involving Passenger Vehicles*, 32-33.

¹⁰⁰ NHTSA, *Countermeasures that Work*, 8-5.

crash reports are processed electronically; this represents approximately 46 percent of crash reports statewide. The benefits of the system include near real-time submission of crash reports, as well as enhanced quality control due to business rules and filters built into the programming that prevent entry of data incompatible with the field filled.

In 2019 the CHP expanded this program by developing a Web portal to permit allied agencies outside the CHP to also submit crash reports to SWITRS electronically. The first participating allied agency, Bakersfield Police Department, began submitting electronic crash reports in March 2019. To date, there are four allied agencies fully utilizing the Web portal for electronic crash report submission, and five additional agencies submitting reports in a test environment. Those agencies in the test environment continue to batch and forward printed crash reports. The CHP continues to engage with crash reporting software vendors to accelerate the on-boarding of client agencies. Currently one vendor has achieved full integration; two additional vendors are in the testing process.

Although the CHP has received relatively few allied agency crash reports electronically through the Web portal (2,174 as of November 2019), the impact on timeliness has been dramatic. Using 2019-to-date data, the raw average time from the day of crash to data entry in SWITRS for a non-electronically submitted crash report is 81 days. Crash reports submitted by agencies using an electronic format and the Web portal are entered into SWITRS in an average of 6 days.

While progress has been made, there are still opportunities to expedite allied agencies' submissions of traffic crash data reports electronically. Specifically, NHTSA offers federal grants to improve the timeliness, accuracy, completeness, uniformity, accessibility, and integration of the crash data. Within California, OTS administers these 405(c) grants and is prepared to award these grants to local law enforcement agencies to assist in efforts to electronically transmit crash records into the SWITRS system. Expediting allied crash reports into SWITRS will provide significant improvement in traffic crash data availability.

8.3. Linking Crash and Medical Data

Transportation professionals and policymakers have long relied on crash data collected at the scene by law enforcement officials to inform traffic safety decisions. Yet recent efforts have highlighted the limitations of crash data and the corresponding opportunity to improve it by linking it with medical data. According to the Collaborative Sciences Center for Road Safety, a federally-funded academic research project, "traditionally, safety and injury analysis have occurred in isolated fields, with road safety researchers relying predominately on police-recorded crash reports, and public health researchers relying on health records (e.g., hospital, emergency department, and ambulatory care data)."¹⁰¹ This division has led to an incomplete and inconsistent picture of traffic crashes, with different records reflecting different findings. For example, research comparing police data reported in SWITRS (California's Statewide Integrated Traffic Records System) and San Francisco hospital data found that police records did not include approximately 20% of pedestrian injuries and 25% of cyclist injuries.¹⁰²

¹⁰¹ Collaborative Sciences Center for Road Safety, *Completing the Picture of Traffic Injuries: Understanding Data Needs and Opportunities for Road Safety* (2018), 2.

¹⁰² San Francisco Department of Public Health (SFPDH), *San Francisco's Transportation-related Injury Surveillance System* (2017), 1.

Efforts to provide a more complete picture of transportation-related injuries by linking existing traffic and health data were initiated at the national level in the early 1990s. From 1992 to 2013 NHTSA worked with individual states to develop data linkage programs under the Crash Outcome Data Evaluation Systems (CODES). In 2013, CODES was discontinued and some states retired their programs while others have continued their data linkage projects independently. In California, the Department of Public Health maintains the statewide data linkage effort through the Crash Medical Outcomes Data (CMOD) Project, which electronically links police crash reports with health and death data. This dataset enables policymakers and professionals to understand the geographic distribution, causes, costs, and consequences of traffic injuries and fatalities, and ultimately to develop targeted injury prevention strategies to eliminate them.

At the local level, the San Francisco Department of Public Health spearheaded the effort to develop the Transportation-related Injury Surveillance System (TISS). In 2017, San Francisco was the first city in the country to use the resulting linked data to update its High Injury Network (HIN) and analyze spatial patterns of severe and fatal injuries. With this more robust data, San Francisco was able to identify locations of unreported traffic injuries, better capture injury severity, and focus its HIN on the most severe outcomes.¹⁰³

Cities that want to create their own linked datasets must confront a key challenge, namely the need to accurately link records while also adhering to privacy laws for personally identifiable information (PII) and protected health information (PHI). While there are many linkage methodologies, the quality and success of the linkage is highly dependent on multiple unique identifiers that are subject to privacy laws such as name, date of birth, and other personally identifying information.¹⁰⁴ For example, law enforcement does not usually collect social security numbers, and if they do so, this information is subject to the Health Insurance Portability and Accountability Act (HIPAA).¹⁰⁵

Such factors must be kept in mind as part of the renewed interest in developing linked datasets, which can provide a more complete picture of traffic injuries and fatalities and, ultimately, help policymakers develop strategies to prevent them.

¹⁰³ SFDPH, *San Francisco's Vision Zero High Injury Network: 2017 Update* (2017), 2.

¹⁰⁴ Collaborative Sciences Center for Road Safety, *Completing the Picture of Traffic Injuries*, 3-4.

¹⁰⁵ *Ibid.*, 3.

9.0 Findings and Recommendations for Policy Consideration

The findings and recommendations for policy consideration (recommendations) are organized as follows (not in priority order):

- Establishing Speed Limits (S)
- Engineering (EN)
- Enforcement (EF)
- Education (ED)

Findings are abbreviated as “F.” Recommendations are abbreviated as “C.” In some cases, a finding may have multiple recommendations

The recommendations have been developed based on input from the Task Force, Advisory Group, the literature synthesis prepared by the University of California Institute of Transportation Studies (UC ITS), and other research findings. It is important to note that all Task Force members may not agree with all the findings and recommendations. These recommendations are being offered for further policy discussion and review by interested stakeholders and do not reflect an official position or endorsement of the Administration. The following Guiding Principles were established for the recommendations:

1. Data-driven / evidence based: studied and shown to be effective in improving safety.
2. Implementable statewide: supported and realistic to implement statewide, for both State and local agencies.
3. Supports partnerships and innovation: inclusive of the multiple disciplines with traffic safety and would benefit from a partnered approach across state, regional, local, and external stakeholders.

9.1. Establishing Speed Limits (S) – Findings and Recommendations for Policy Consideration

F-S1: Existing law does not provide enough flexibility in urban areas to set speed limits that are appropriate for these complex environments.

Current procedures for setting speeds limits in California rely mainly on the 85th percentile methodology, an approach developed decades ago for vehicles primarily on rural roads. Although California’s population, roads, and streets have changed significantly, reflecting different modes of transportation including bicycling and walking, the method for setting speed limits has not. While the way that speed limits are calculated has remained essentially static, vehicles and street uses have evolved over time. CalSTA’s vision is to transform the lives of all Californians through a safe, accessible, low-carbon, 21st-century multimodal transportation system. Yet the 85th percentile methodology relies on driver behavior. Greater flexibility in establishing speed limits would allow agencies an expanded toolbox to better combat rising traffic fatalities and injuries.

F-S2: Developing a different approach to setting speed limits would enable the State to prioritize safety outcomes to meet the needs of all road users.

The current approach to setting speed limits relies on driver behavior. With fatalities and serious injuries on the rise, many authorities are reevaluating this current approach. Consistent with international trends, other U.S. states, including Oregon, Washington, Minnesota, and New York, are enabling their cities to lower their speed limits and are exploring alternative methods to establish speed limits based on safety goals and local context instead of the 85th percentile speed. California has the opportunity to reevaluate how it sets speed limits to develop a new approach that prioritizes safety for all road users.

Number	Recommendation for Policy Consideration
C-S1	<p>Develop and implement a new roadway-based context sensitive approach to establish speed limits that prioritizes the safety of all road users. This approach should be based on how a street is used and by whom, how protected non-motorized users are from vehicles, how likely it is that there will be a conflict between vehicles and other street users, and how likely it is that a collision will result in a fatal or serious injury.</p> <p>Possible implementation steps may include convening an expert advisory group in 2020 to evaluate national and international data-driven approaches to establishing speed limits; examine evidence-based research; and solicit public input and comment.</p> <p>Note: This is a long-term recommendation. In contrast, the recommendations regarding changes to the speed-limit-setting process are short-term.</p>

F-S3: Recent research has demonstrated that reducing posted speed limits reduces vehicle operating speeds and improves safety across most road environments.

Current evidence supports the use of reducing speed limits to increase safety in general. In a research synthesis commissioned specifically for this report, the University of California, Institute of Transportation Studies found that reducing posted speed limits also reduces drivers’ operating speeds and improves safety across most road environments. While reducing posted speed limits only reduce drivers’ operating speeds by a few miles per hour, these small changes in operating speed result in meaningful safety improvements. This is especially the case for environments with vulnerable road users as they greatly benefit from even small changes in operating speeds. Although historical research between safety and speed asserted that posting the speed limit at the 85th percentile speed resulted in the lowest crash rate, recent studies indicate that there is not strong evidence to support this claim.

F-S4: Current procedures for establishing speed limits do not offer agencies enough flexibility to set appropriate speed limits.

The process for setting speed limits through engineering and traffic surveys does not require consideration of factors such as road use and pedestrian and bicyclist safety. Although engineers may consider additional factors to the 85th percentile speed and crash history when establishing speed limits, many stakeholders believe that consideration of these other factors should be required and prioritized. In addition, speed data collection procedures are not always thorough enough to reflect the complexity of the street. In the two-step process to establish speed limits, engineers determine the 85th percentile speed and may then apply rounding allowances to arrive at a lower, adjusted speed limit. However, the procedures limit these allowances and adjustments. Many stakeholders, including local agencies and CalSTA departments, believe that the current procedures are overly restrictive and prevent the establishment of appropriate speed limits. Further, fatal and serious crashes are often clustered on a relatively small number of streets/areas (i.e., High Injury Networks and high collision concentration locations) and disproportionately impact vulnerable road users yet existing rounding allowances do not allow further reduction in speed in these areas.

Number	Recommendations for Policy Consideration
C-S2	Once the National Cooperative Highway Research Program (NCHRP) 17-76 “Guidance for the Setting of Speed Limits” research project is complete (anticipated summer 2020), and the final report published, explore implementation of the research results. A realistic assessment includes examining the applicability of the research results for California as well as any impediments to implementation.
C-S3	Revise traffic survey procedures to specifically require consideration be given to bicyclist and pedestrian safety and develop guidance to describe how to consider bicyclist and pedestrian safety in a traffic survey.
C-S4	Allow state and local agencies to post speed limits below 25 mph when supported by a traffic survey.

Number	Recommendations for Policy Consideration
C-S5	<p>Increase the reduction allowance for posted speed limits to allow greater deviations from the 85th percentile speed. Currently, the posted speed may only be reduced by 5 mph from the nearest 5 mph increment of the 85th percentile speed. Classes of locations where the posted speed may be reduced further should include:</p> <ul style="list-style-type: none"> • High Injury Networks (HIN). Steps to implement include developing a statewide definition of a HIN. Possible criteria may include: <ul style="list-style-type: none"> ○ A minimum of three years of the most current crash data ○ Weighting of fatal and serious injury crashes ○ Weighting of crashes that occurred in disadvantaged communities <p>The resultant HIN should: identify specific locations with high crash concentrations; identify corridor-level segments with a pattern of crash reoccurrence; and be able to be stratified by mode.</p> <ul style="list-style-type: none"> • Areas adjacent to land uses and types of roadways that have high concentrations of vulnerable road users. Steps to implement include defining vulnerable populations (e.g., pedestrians, bicyclists, scooter users, transit users, seniors, children) and developing criteria to identify eligible streets (e.g., streets close to transit centers, homeless shelters, urban parks/playgrounds, and healthcare facilities as well as types of streets like bicycle boulevards and neighborhood greenways).

F-S5: There is consistent evidence that increased vehicle speed results in an increased probability of a fatality given a crash. Vulnerable road users are disproportionately impacted by the relationship between speed and crash survivability. State and local agencies would benefit from additional classes of locations eligible for prima facie speed limits which do not require an engineering and traffic survey.

Prima facie speed limits are those that are applicable on roadways when no posted speed limit is provided. They do not require an engineering and traffic survey to be enforceable. Current law defines two prima facie speed limits covering six classes of locations. The first speed limit is 25 mph and is applicable to business and residential areas, school zones and areas around senior facilities. The second speed limit is 15 mph and is applicable to railway crossings, uncontrolled intersections and alleyways. Some allowances are currently provided to reduce these speed limits further, for example, to 15 mph and 20 mph in school and senior zones. State and local agencies on the Task Force stated that additional classes of locations should be eligible for prima facie speed limits especially in areas that have high concentrations of vulnerable road users.

Number	Recommendations for Policy Consideration
C-S6	<p>Add “business activity district” as an additional class of location eligible for a prima facie speed limit. Steps to do this include developing a statewide “business activity district” definition which could include urban villages, neighborhood downtowns, and other business-oriented locations. Ensure “business activity district” prima facie speed limits are applicable to the State Highway System.</p> <p><i>Note: Consideration should be given to the existing statutory definition of a Business District which is based on a land use/geography definition and does not accurately reflect the characteristics and use of streets within a dense urban business/downtown area (e.g., high volume of road users and frequent street crossings). Currently, the State Highway System is not eligible for prima facie speed limits in Business Districts.</i></p>
C-S7	<p>Revise requirements related to posting prima facie speed limits in school zones (i.e., a reduced “When Children are Present” speed limit):</p> <ol style="list-style-type: none"> a. Allow an authority to determine and declare a prima facie speed limit as low as 15 mph without requiring justification by a traffic survey. Currently, if a local jurisdiction wants to lower the speed limit in a school zone below 25 mph they must conduct a traffic survey unless the local jurisdiction passes an ordinance and the road geometry meets specific conditions stipulated in the CVC. b. Expand the roadway conditions that allow for school zone prima facie speed limits. Currently, the prima facie limits for school zones only applies to roadways that have certain posted speed limits and a limited number of traffic lanes. c. Clarify the definition of “WHEN CHILDREN ARE PRESENT.” Currently, school zone prima facie limits are only applicable when children are present, however the meaning of “when children are present” is subjective.

F-S6: Current procedures for establishing speed limits have produced the unintended consequence of speed creep, or rising vehicle operating speeds over time.

Studies have shown that using the 85th percentile speed to establish speed limits has increased drivers’ operating speeds as an unintended consequence. Raising speed limits to match the 85th percentile speed of vehicles leads to higher operating speeds, which can then contribute to a higher 85th percentile speed. Research has shown that over time, vehicle operating speeds continue to increase even if the road and vehicle conditions remain the same.



Number	Recommendation for Policy Consideration
C-S9	<p>Allow for a traffic survey to retain the existing speed limit (or revert to one determined in a prior traffic survey) unless a registered engineer determines that significant design changes have been made to the roadway since completion of the last traffic survey with the specific intent of increasing the safe operating speed.</p> <p>Currently, if a speed survey shows that vehicle operating speeds have increased, agencies must raise the posted speed limit even if the roadway design has not changed, contributing to speed creep over time.</p>

F-S7: State and local agencies need statutory clarification on the rules, procedures, and exceptions to posted speed limits.

The rules and procedures governing posted speed limits are found in an inconsistent set of codes and manuals, including the California Vehicle Code and the California Manual for Setting Speed Limits. Many stakeholders, including local agencies and CalSTA departments, find some of the statutory language in these sources unclear and ambiguous. For example, speed allowances in senior zones need to be clarified. Technical clarification may help agencies better understand how and under what conditions speed limits below the 85th percentile speed can be established.

Number	Recommendation for Policy Consideration
C-S10	Consolidate and clarify statutory sections related to speed setting methodology.

F-S8: State and local agencies would benefit from a single source of guidance on how to establish speed limits.

California is divided into 58 counties and 482 cities. Many large local agencies are familiar with policies, procedures, and statutory mandates on posted speed limits and prima facie zones. However, smaller jurisdictions are not as well-versed in these topics and some are unaware of the myriad of existing rules that allow them to deviate from the 85th percentile speed. The opportunity exists to provide consistent step-by-step guidance for state and local agency staff on how to establish speed limits below the 85th percentile speed.

Number	Recommendations for Policy Consideration
C-S11	<p>Revise the <i>California Manual for Setting Speed Limits</i> to comprehensively cover speed setting methodology and law in easy to understand terminology. This update should be guided by a committee of state and local subject matter experts. New material should include guidance on developing a High Injury Network (HIN) and any new methods developed in the future.</p>

Number	Recommendations for Policy Consideration
C-S12	Develop state-sponsored training on the <i>California Manual for Setting Speed Limits</i> . The training should include general speed concepts, regulatory and advisory speeds, engineering and traffic survey procedures, renewal requirements, common misconceptions, FAQs as well as any new methods developed in the future. The audience for this training would include city officials, state and local traffic engineers, state and local law enforcement, legal staff, judicial council, and traffic safety practitioners.
C-S13	Establish technical assistance resources, including a webpage, to provide practitioners with an overview of speed setting methodology, best practices, and case studies, as well as any new methods developed in the future. Provide State support to local agencies with less capacity to develop HINs by providing a resource that summarizes existing data and mapping tools available to develop a network.

9.2. Engineering (EN) – Findings and Recommendations for Policy Consideration

F-EN1: Engineering countermeasures designed to reduce vehicle operating speeds can be costly and time-consuming to implement.

Roadway engineering solutions range from low-cost options such as pavement markings and signs to complex, multi-million-dollar construction projects such as roundabouts. Especially for large-scale engineering designs, there are many barriers to implementation, including lengthy and costly approval, permitting, funding, and construction processes.

Number	Recommendations for Policy Consideration
C-EN1	Review and consider revising the allocation of Highway Safety Improvement Program (HSIP) funds between local roads and the State Highway System (SHS) from a data-driven perspective. Analyze the current HSIP allocations and determine if revisions to the allocations could improve statewide safety outcomes. As part of the evaluation, review other funding sources (e.g., sales tax measure funds) and amounts for both State and local safety projects. Currently, the total HSIP funding allocation received from the federal government is divided in approximately equal amounts between local roads and the SHS.
C-EN2	Regularly review the Caltrans encroachment permitting process to identify inefficiencies and determine new methods to expedite safety-related projects. In 2019, Caltrans implemented a Lean 6 Sigma project to decrease the time needed to approve or deny an encroachment permit application. Regular evaluation would provide an opportunity to make modifications in order to continually improve this process.

F-EN2: Agencies who want to lower the operating speed of vehicles to improve safety using engineering interventions would benefit from Statewide policies, guidance, and standards.

While large cities such as San Francisco and Los Angeles have developed their own engineering and design guides, smaller cities do not have the resources to produce their own standards and rely on a variety of other sources. This includes federal guidelines, guidance produced by professional associations, and the Caltrans' *Highway Design Manual* (developed for State highway design functions). Currently, no definitive document exists that provides agencies with comprehensive engineering and design standards to design low speed roadways that prioritize people walking, bicycling, and taking transit. For instance, the Caltrans *Highway Design Manual* does not include standards for many types of horizontal and vertical traffic calming devices.

Number	Recommendations for Policy Consideration
C-EN3	<p>Develop policies related to the following topics and incorporate them into the Highway Design Manual:</p> <ul style="list-style-type: none"> • Traffic calming • Lane narrowing • Reallocation of the roadway cross-section • “Target speed” <p><i>Note: While Design Speed is a selected speed used to determine the various geometric features of the roadway, the “Target Speed” is the intended velocity for drivers. The intent of “target speed” is to geometrically redesign roadways in order to decrease operating speed. The topic of “Design Speed” versus “Target Speed” typically centers on roadways with speed limits between 25 mph and 45 mph especially where the 85th percentile speed is higher than the posted speed limit.</i></p>
C-EN4	<p>Require Caltrans to regularly convene a committee of external roadway design experts to advise on revisions to the Highway Design Manual. Meetings of this committee will serve as a forum to gather, review and evaluate proposals concerned with rules and regulations prescribing design standards contained in the Highway Design Manual (HDM). This committee will develop an experimentation process for design standards not currently in the HDM and procedures for updating the HDM based successful experiments. Through the California Traffic Control Devices Committee (CTCDC), Caltrans is able to fulfill statutory requirements to consult with local agencies (and the public) before revising the California Manual on Uniform Traffic Control Devices (CA MUTCD). The intent is to develop a committee, similar to the CTCDC in concept, to provide guidance on the Caltrans Highway Design Manual. Consideration should be given to including public health professionals in the newly formed Caltrans’ design committee.</p>
C-EN5	<p>Formalize existing traffic control device uses in the CA MUTCD. The purpose of traffic control devices is to promote safety and efficiency by providing for the orderly movement of all road users. Develop and conduct a biennial survey to understand how agencies are implementing traffic control devices then analyze whether updates to the CA MUTCD should be made through the CTCDC or whether statewide experiments should be created.</p>
C-EN6	<p>Develop a statewide traffic safety monitoring program that identifies and addresses locations with speeding-related crashes, with the long term goal of substantially reducing speeding-related fatalities and serious injuries. Newly developed traffic calming devices (see C-EN3) will be the toolbox for this speeding-related monitoring program. An evaluation of the completed monitoring program investigations will help to inform a possible recommendation on modification to the definition of “speeding-related” in crash reporting.</p>

Number	Recommendations for Policy Consideration
C-EN7	Make the pilot State-led traffic safety monitoring programs that identify and address locations with pedestrian- and bicyclist-related crashes permanent. Expand this pilot to include both reactive (i.e., crash-based) location identification, proactive (i.e, systemic) location identification and all public roads (i.e., on and off SHS) . Currently, there are four ongoing traffic safety monitoring programs that identify and address locations statewide that have experienced vehicle-related crash types but none of these programs provide regular mechanism to evaluate and improve locations for pedestrian- and bicyclist-safety.

F-EN3: Local agencies voiced concern about the impact of Level of Service requirements on their efforts to lower vehicle operating speeds through engineering interventions.

In city planning documents, through state permitting processes, and through the environmental review process, acceptable vehicle Levels of Service (LOS) for specific roadways is often identified and used in order to avoid excessive traffic congestion and delay. LOS is a metric used by engineers to rate the quality of traffic operating conditions on a scale from best (A) to worst (F) and to define what level is acceptable. While further investigation is needed, preliminary findings suggest that the need to maintain or improve Level of Service is a barrier for local jurisdictions who want to design their roads for slower speeds to accommodate other road users such as bicyclists and pedestrians.

Number	Recommendations for Policy Consideration
C-EN8	Further investigate the impact of Level of Service requirements on the implementation of engineering interventions designed to reduce operating speed.
C-EN9	With the implementation of Senate Bill 743 (Chaptered 2013), LOS will be replaced by Vehicle Miles Traveled (VMT), including induced demand analysis, as a new metric for transportation analysis under the California Environmental Quality Act (CEQA). Caltrans is developing guidance on VMT analysis and associated safety analysis for both SHS projects and local land use projects through CEQA. In order to increase positive safety outcomes: <ul style="list-style-type: none"> • Through the Local Development-Intergovernmental Review (LD-IGR) process, minimize using or requesting LOS analysis as a measurement of safety for local land use projects with potential impacts to the SHS, particularly in low VMT areas (as defined by the SB 743 Technical Advisory). • Develop LD-IGR guidance, to be used by Caltrans and local agencies as part of SB 743 implementation, that is based on the latest safety research. • Sufficiently train Caltrans and local agency staff to implement SB 743 including the safety analysis component. • Update state-aid local assistance project selection criteria to reflect SB 743 requirements. • Coordinate and collaborate with the federal government so that federal-aid programs allow VMT analysis and mitigation instead of LOS analysis.

9.3 Enforcement (EF) – Findings and Recommendations for Policy Consideration

F-EF1: International and U.S. studies have shown that automated speed enforcement is an effective countermeasure to speeding that can have meaningful safety impacts.

Automated speed enforcement systems work by capturing data about a speed violation, including images and license plate information, which is then reviewed and processed at a later time to determine if a violation occurred. Currently, automated speed enforcement is used extensively internationally and in 142 communities in the U.S. Numerous studies and several federal entities, including the National Transportation Safety Board, have concluded that automated speed enforcement is an effective countermeasure to reduce speeding-related crashes, fatalities, and injuries.

F-EF2: Automated speed enforcement should supplement, not replace, traditional enforcement operations.

According to the Federal Highway Administration’s *Speed Enforcement Camera Systems Operational Guidelines*, automated speed enforcement is a supplement to, not a replacement for, traditional traffic law enforcement operations. Automated speed enforcement systems can effectively augment and support traditional enforcement operations in multiple ways. Automated speed enforcement systems serve as a “force multiplier” that allows limited law enforcement resources to focus on other public safety priorities. ASE can be operated in areas where in-person traffic stops would be impractical as well as on higher speed roadways where traffic calming devices may not be appropriate. While ASE does not provide an educational opportunity nor afford the exercise of judgment in issuing a citation that an officer would have from an in-person stop, it may also provide for more consistent and impartial enforcement. Examples of cities that have deployed automated speed enforcement programs without reducing law enforcement staffing levels include Seattle, Portland, and Washington, D.C.

Number	Recommendation for Policy Consideration
C-EF1	Use of automated speed enforcement should supplement, not supplant, existing law enforcement personnel.

F-EF3: Many complex public policy considerations must be taken into account to develop and implement an automated speed enforcement program.

When developing an automated speed enforcement program, policy makers confront a number of key decisions. The many complicated and sensitive issues that must be addressed prior to implementation include citation amount, citation type, equity, camera locations, privacy and data use, public noticing, and speed tolerance level. In evaluating and making decisions regarding automated speed enforcement programs, policies and proposed practices need to be fully and transparently vetted through meaningful public awareness, education, and engagement.

Number	Recommendations for Policy Consideration
C-EF2	<p>Automated speed enforcement (ASE) guidelines could take into consideration the following relevant policy issues, which would need to be fully and transparently vetted within the impacted communities to ensure equitable outcomes:</p> <ul style="list-style-type: none"> • Citation Amount – The citation amount needs to deter speeders but should not be so large that it criminalizes those who cannot afford to pay the penalty. • Citation Type – In addition to considering the merits of either a civil and criminal citations, contemplate adding a warning phase” with the initial program launch where only warnings (not citations) would be issued. • Locations – The location(s) any automated speed enforcement system may be determined based on a data-driven safety analysis. • Privacy – ASE programs may incorporate best practices in surveillance technology. • Public Noticing – Determine the method(s) used to notify the community of the automated speed enforcement program, including advance hearings, signage, and ongoing electronic notification systems. Noticing should include education that articulates the relationship between crash severity and individual vehicle speed. • Speed tolerance level – For consistency, explore establishing Statewide minimum speed tolerance levels, based on either a percentage or absolute amount of the posted speed limit. Some Task Force members observed that if speed tolerances are too low communities grow frustrated due to minor speedometer variances; if the tolerance is too high then law enforcement is communicating that the posted speed is too low for the conditions. The IHHS states that most automated speed enforcement tickets are triggered going at least 10 to 11 MPH over the posted speeds, although the tolerance is lower in certain locations such as school and work zones. • Incorporate Lessons Learned – ASE guidelines should take into consideration existing State regulations for red light cameras as well as on Community Control Over Police Surveillance (CCOPS) practices whenever possible.
C-EF3	<p>Develop strategies to eliminate any incentive that could turn an automated speed enforcement program into a revenue generation technique. Ideas raised by the Task Force included:</p> <ul style="list-style-type: none"> • Earmark all automated speed enforcement revenue to solely administer the program and for traffic safety road investments. • Do not allow the entities that establish the speed tolerances, the penalty amount, enforcement locations, and other decisions that impact the automated speed enforcement revenue to financially benefit from their policy decisions.

Number	Recommendations for Policy Consideration
	<ul style="list-style-type: none"> • Pay the automated speed enforcement vendor a fixed price for competitively-procured equipment and services, rather than the amount of revenue collected.

F-EF4: Traffic safety enforcement is not prioritized amongst all law enforcement agencies Statewide.

Traffic safety enforcement is not prioritized amongst all law enforcement agencies Statewide. Following the recession of 2008, law enforcement agencies severely cut back their resources for traffic safety enforcement activities. Traffic fatalities have been on an upward trend since 2010 and many local law enforcement agencies have not returned to pre-recession staffing. Without funding from the OTS, some areas of the state would not have dedicated traffic safety enforcement. Economists are now predicting another economic downturn soon and many of these agencies are still not operating at full staff.

Number	Recommendation for Policy Consideration
C-EF4	<p>Convene a forum where law enforcement agencies Statewide can discuss issues and barriers to consistent and continual traffic safety enforcement.</p> <ul style="list-style-type: none"> • The goal of the forum would be to share best practices and develop recommendations to overcome the lack of prioritization of traffic safety enforcement across the State. • This event would keep local law enforcement engaged in traffic enforcement operations and reinforce the need for traffic safety enforcement. • This event should include a focus on data-driven, evidence-based strategies to provide for consistent and continual traffic safety enforcement.

9.4. Education (ED) – Findings and Recommendations for Policy Consideration

F-ED1: Traffic safety education is an important countermeasure to speeding but California lacks sufficient mechanisms for coordinated traffic safety campaigns.

Education countermeasures can change public knowledge, attitudes, and behavior related to speeding, but California lacks a coordinated traffic safety campaign. As the state leader in behavioral traffic safety, the OTS can create safety campaigns that can change roadway user’s behavior and decrease fatalities throughout the State. The California Department of Public Health can also be consulted in the design, evaluation, and dissemination of evidenced-based campaigns. Furthermore, there are opportunities for both the California Highway Patrol and the Department of Motor Vehicles to reinforce traffic safety education as well as opportunities to coordinate with current ongoing traffic safety campaigns being implemented at the regional and local levels. California has the opportunity to provide comprehensive, multi-agency, coordinated outreach on the dangers of speeding to the diverse population of 39 million Californians.

<i>Number</i>	<i>Recommendation for Policy Consideration</i>
C-ED1	Develop a statewide coordinated traffic safety campaign to: <ul style="list-style-type: none"> • Inform and educate the California population at large on how they can travel safely and abide by the laws of the road. • Prioritize public awareness, outreach, and education on traffic safety and the dangers of excessive speed. • Expand the reach of individual campaigns being implemented at regional and local levels, and leverage investment through coordinated messaging, visuals, and branding.

10.0 Appendices

A. AB 2363 – Zero Traffic Fatalities Task Force

CHAPTER 8. Zero Traffic Fatalities Task Force

CVC Section 3095.

- (a) On or before July 1, 2019, the Secretary of Transportation shall establish and convene the Zero Traffic Fatalities Task Force.
- (b) The task force shall include, but is not limited to, representatives from the Department of the California Highway Patrol, the University of California and other academic institutions, the Department of Transportation, the State Department of Public Health, local governments, bicycle safety organizations, statewide motorist service membership organizations, transportation advocacy organizations, and labor organizations.
- (c) The task force shall develop a structured, coordinated process for early engagement of all parties to develop policies to reduce traffic fatalities to zero.

CVC Section 3096.

- (a) The Secretary of Transportation shall prepare and submit a report of findings based on the Zero Traffic Fatalities Task Force's efforts to the appropriate policy and fiscal committees of the Legislature on or before January 1, 2020.
- (b) The report shall include, but is not limited to, a detailed analysis of the following issues:
 - (1) The existing process for establishing speed limits, including a detailed discussion on where speed limits are allowed to deviate from the 85th percentile.
 - (2) Existing policies on how to reduce speeds on local streets and roads.
 - (3) A recommendation as to whether an alternative to the use of the 85th percentile as a method for determining speed limits should be considered, and if so, what alternatives should be looked at.
 - (4) Engineering recommendations on how to increase vehicular, pedestrian, and bicycle safety.
 - (5) Additional steps that can be taken to eliminate vehicular, pedestrian, and bicycle fatalities on the road.
 - (6) Existing reports and analyses on calculating the 85th percentile at the local, state, national, and international levels.
 - (7) Usage of the 85th percentile in urban and rural settings.
 - (8) How local bicycle and pedestrian plans affect the 85th percentile.

CVC Section 3097.

This chapter shall remain in effect only until January 1, 2023, and as of that date is repealed.

B. University of California, Institute of Transportation Studies, Research Synthesis

See attached document.

C. List of Abbreviations

ASE – Automated Speed Enforcement
Caltrans – California Department of Transportation
CA MUTCD – California Manual on Uniform Traffic Control Devices
CDPH – California Department of Public Health
CHP – California Highway Patrol
CMF – Crash Modification Factors
CMOD – California Crash Medical Outcomes Data Project
CODES – Crash Outcome Data Evaluation Systems
CVC – California Vehicle Code
E&TS – Engineering and traffic survey
FHWA – Federal Highway Administration
HIN – High Injury Network
HVE – High Visibility Enforcement
LOS – Level of Service
NACTO – National Association of City Transportation Professionals
NCHRP – National Cooperative Highway Research Program
NHTSA – National Highway Traffic Safety Administration
NTSB – National Transportation Safety Board
OTS – California Office of Traffic Safety
SFDPH – San Francisco Department of Public Health
SFMTA – San Francisco Municipal Transportation Agency
SFPD – San Francisco Police Department
SDOT – Seattle Department of Transportation
SHSP – California Strategic Highway Safety Plan
SWITRS – Statewide Integrated Traffic Records System
TISS – Transportation-related Injury Surveillance System
UC ITS – University of California Institute for Transportation Studies