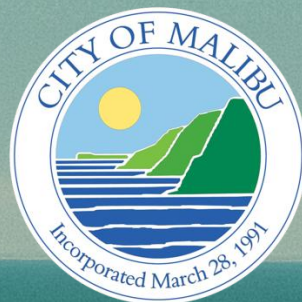


Institute Of Transportation Engineers (ITE) Western District Conference



Signal Synchronization and Safety Adaptive: Enhancing Traffic Safety on PCH

July 1, 2026



Team Introduction



Sri Chakravarthy
Kimley-Horn
Project Manager



Seth Searle
Kimley-Horn
Systems Engineer



Matt Stewart
Kimley-Horn
Project Engineer

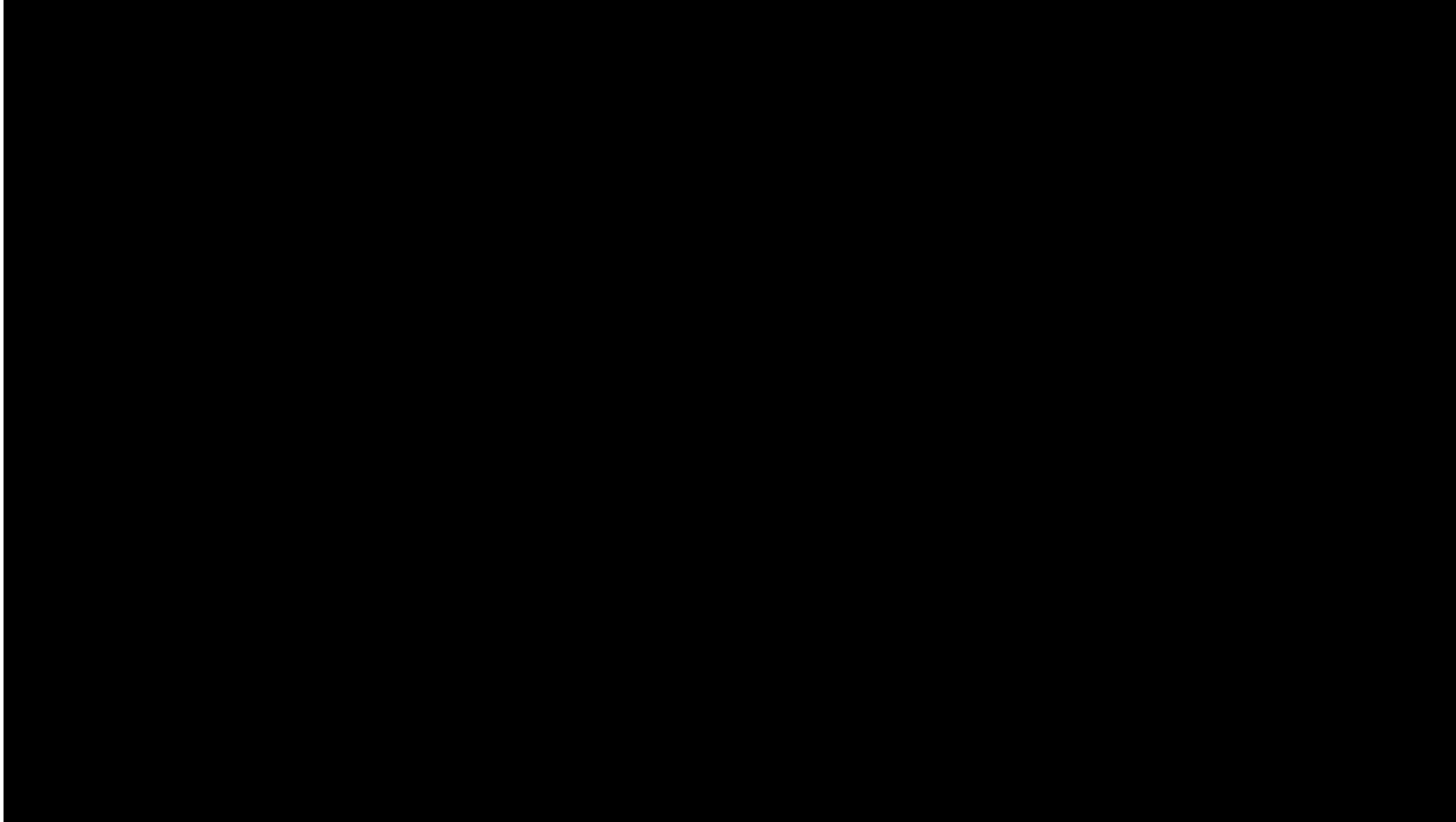


Malibu: What You Think You Know





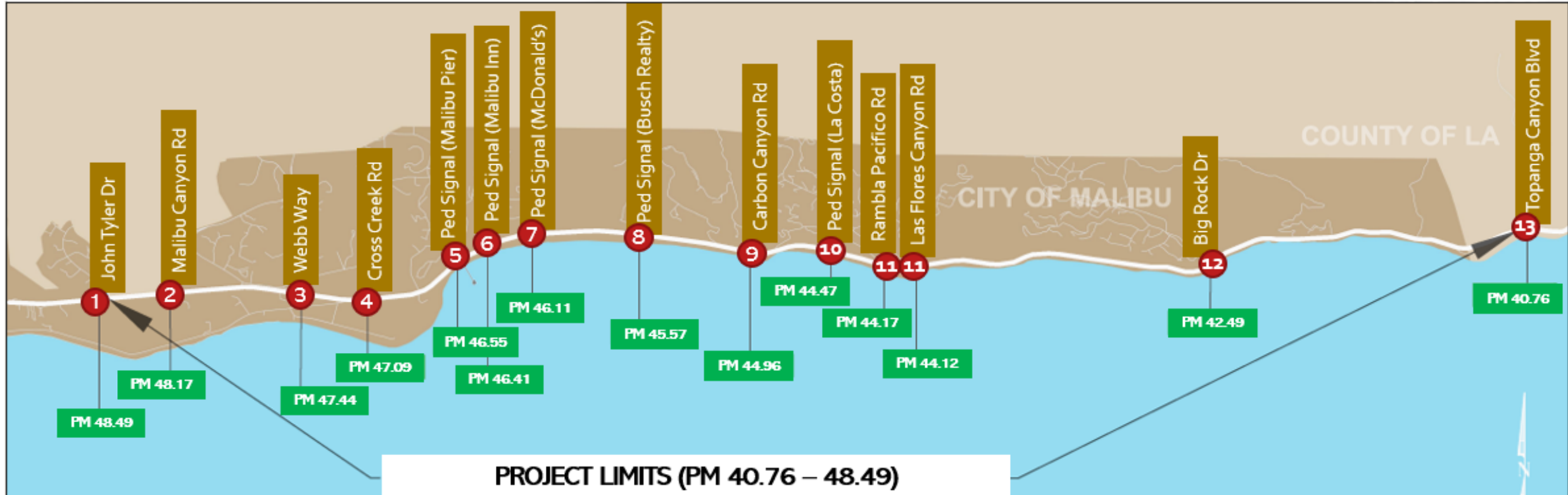
Malibu: The Reality





PROJECT OVERVIEW

- SR-1/PCH from John Tyler Dr to Topanga Canyon Blvd
- Approximately 8 miles with 13 signalized intersections



SAFETY ADAPTIVE SIGNAL SYSTEM: *Enhancing Traffic Safety on PCH*



Pacific Coast Highway

Signal System Improvement Project



SIGNAL SYSTEM IMPROVEMENT PROJECT FEATURES:



Adaptive/Responsive Signal System



Automated Speed Enforcement Camera



Closed Circuit Television Camera (CCTV) System



Refreshed Roadway Striping



Emergency Vehicle Preemption



Fiber/Wireless Signal Interconnect



Vehicle Loop Detection



Upgraded controller cabinets and battery back-up system



ADA Curb Ramps and Truncated Domes



Upgraded Signal Poles

Implementing Agency:

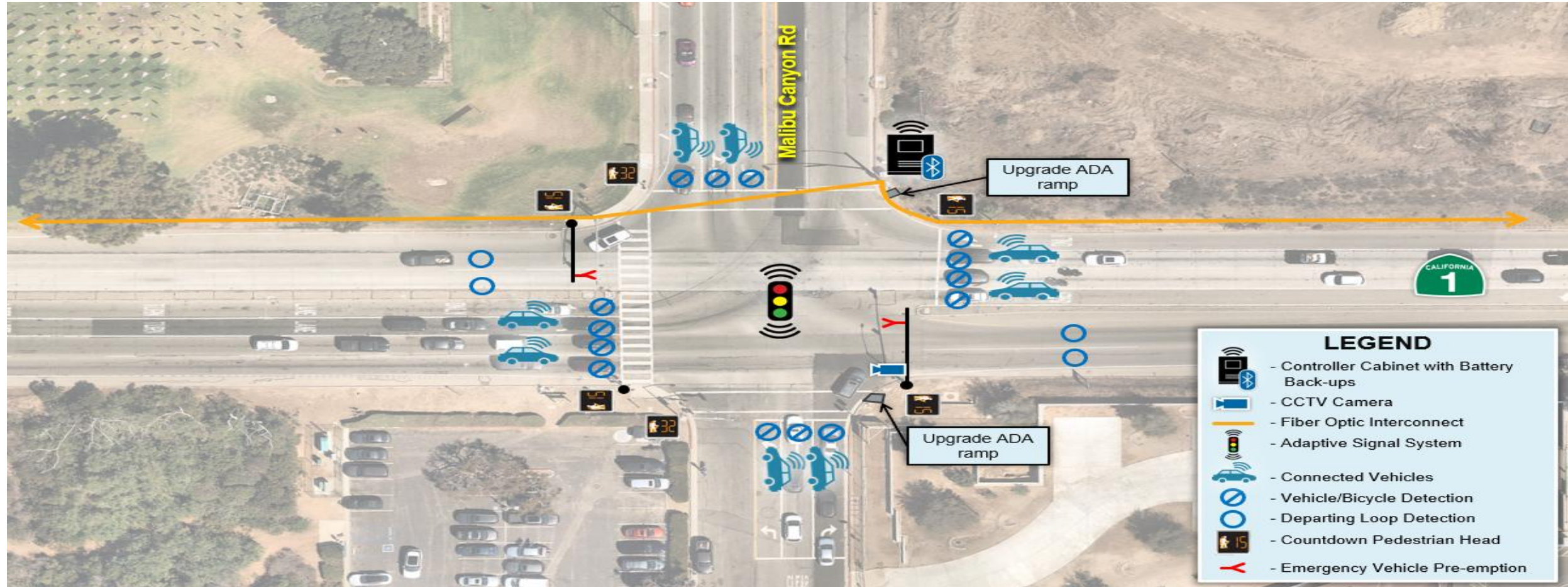


Design Consultant: **Kimley»Horn**

Contractor: **GMZ Engineering, Inc.**



PROJECT OVERVIEW – INTERSECTION ENHANCEMENTS



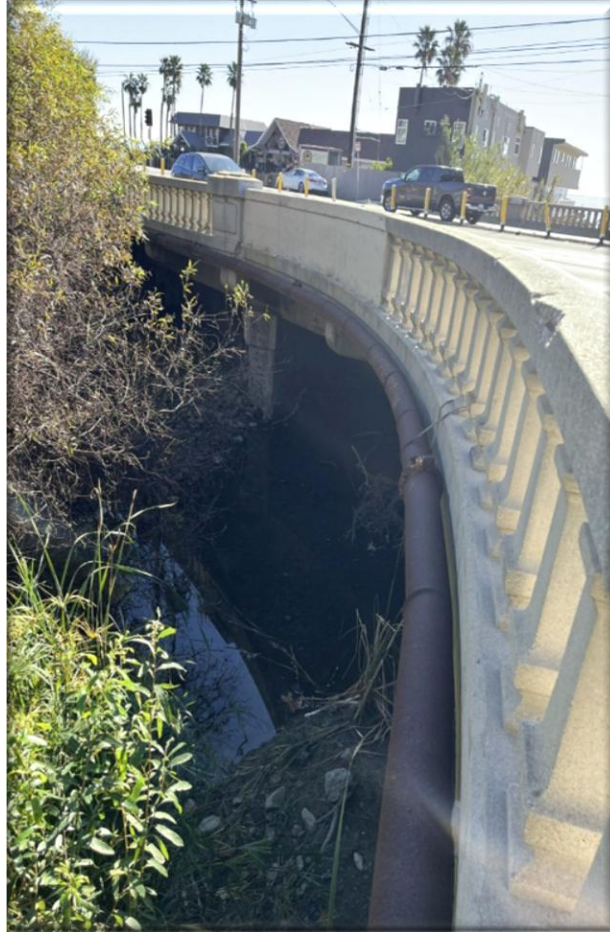


CONSTRUCTION OVERVIEW – INTERSECTION ENHANCEMENTS



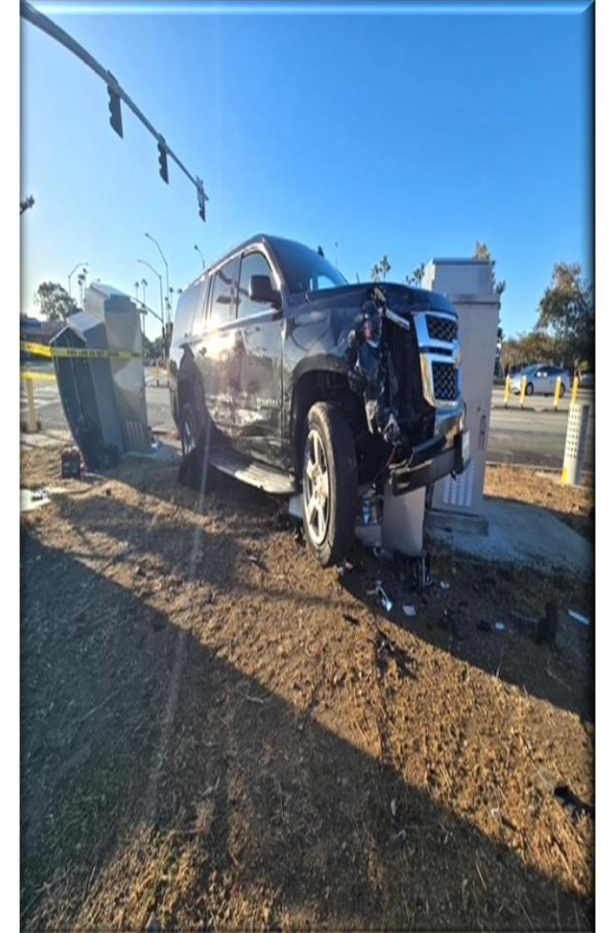
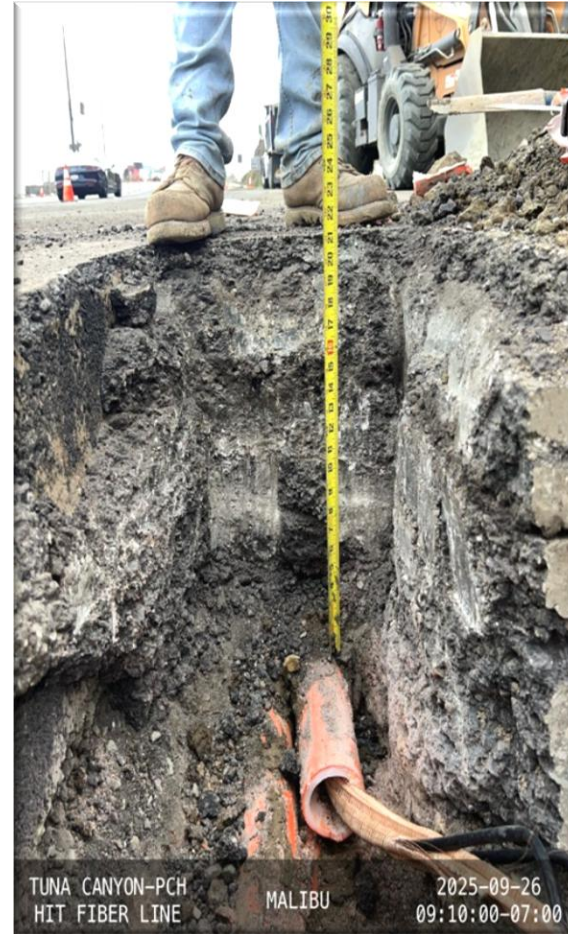


CONSTRUCTION OVERVIEW - DIFFICULTIES





CONSTRUCTION OVERVIEW – RECOVERY

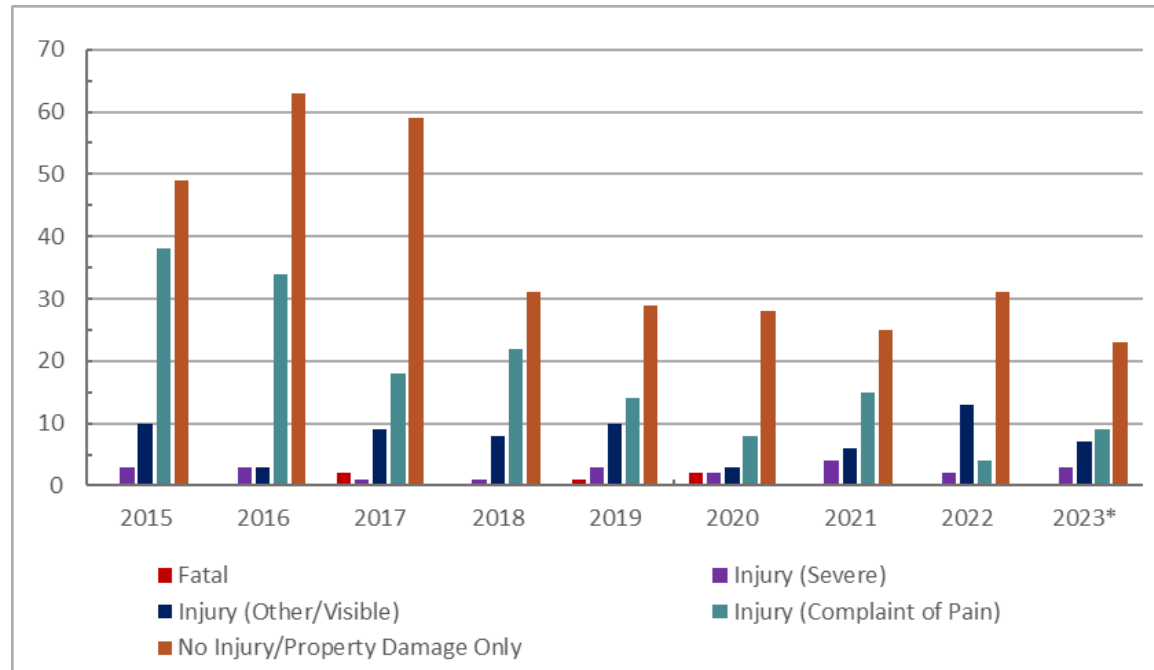




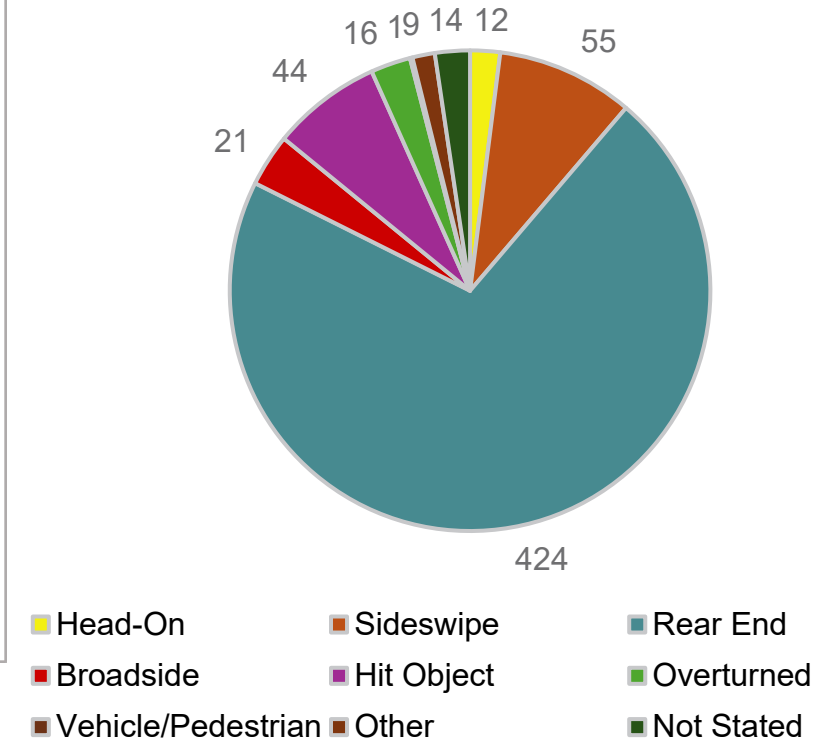
THE CITY OF MALIBU – SAFETY ASSESSMENT

Year	Number of Collisions
2015	100
2016	103
2017	89
2018	62
2019	57
2020	43
2021	50
2022	50
2023*	42
Total	596

PCH 2015-2023 Speed-Related Collisions by Type



PCH 2015-2023 Speed-Related Collisions by Cause





THE CITY OF MALIBU – SAFETY ASSESSMENT





SAFETY ADAPTIVE APPROACH

What factors contribute to an unsafe corridor?

1. Driver behavior:

1. Distracted drivers
2. Impaired drivers

2. Corridor characteristics:

1. Conditions that facilitate excessive speeding – wide roadways, high speed limits, light traffic, sparsely spaced intersections, good signal timing
2. Visibility – most pedestrian fatalities occur at night
3. Proximity to high-volume pedestrian areas (e.g. schools, malls, venues, etc.)



SAFETY ADAPTIVE APPROACH

How much does excessive speeding contribute to an unsafe corridor?

(Source: Portland.gov - Top Contributing Factors to Traffic Deaths).




10% LIKELIHOOD OF
FATALITY OR
SEVERE INJURY




40% LIKELIHOOD OF
FATALITY OR
SEVERE INJURY




80% LIKELIHOOD OF
FATALITY OR
SEVERE INJURY



SAFETY ADAPTIVE APPROACH

What is “*Safety Adaptive*”?

Technology designed to take real-time vehicle speeds as an input and, when unsafe driving conditions (i.e. motorists speeding) are detected, adjust the signal timings to stop motorists at more red lights until the unsafe condition is no longer detected.

This allows you to effectively have a “dynamic speed bump” on major roadways that only activates when you need it.





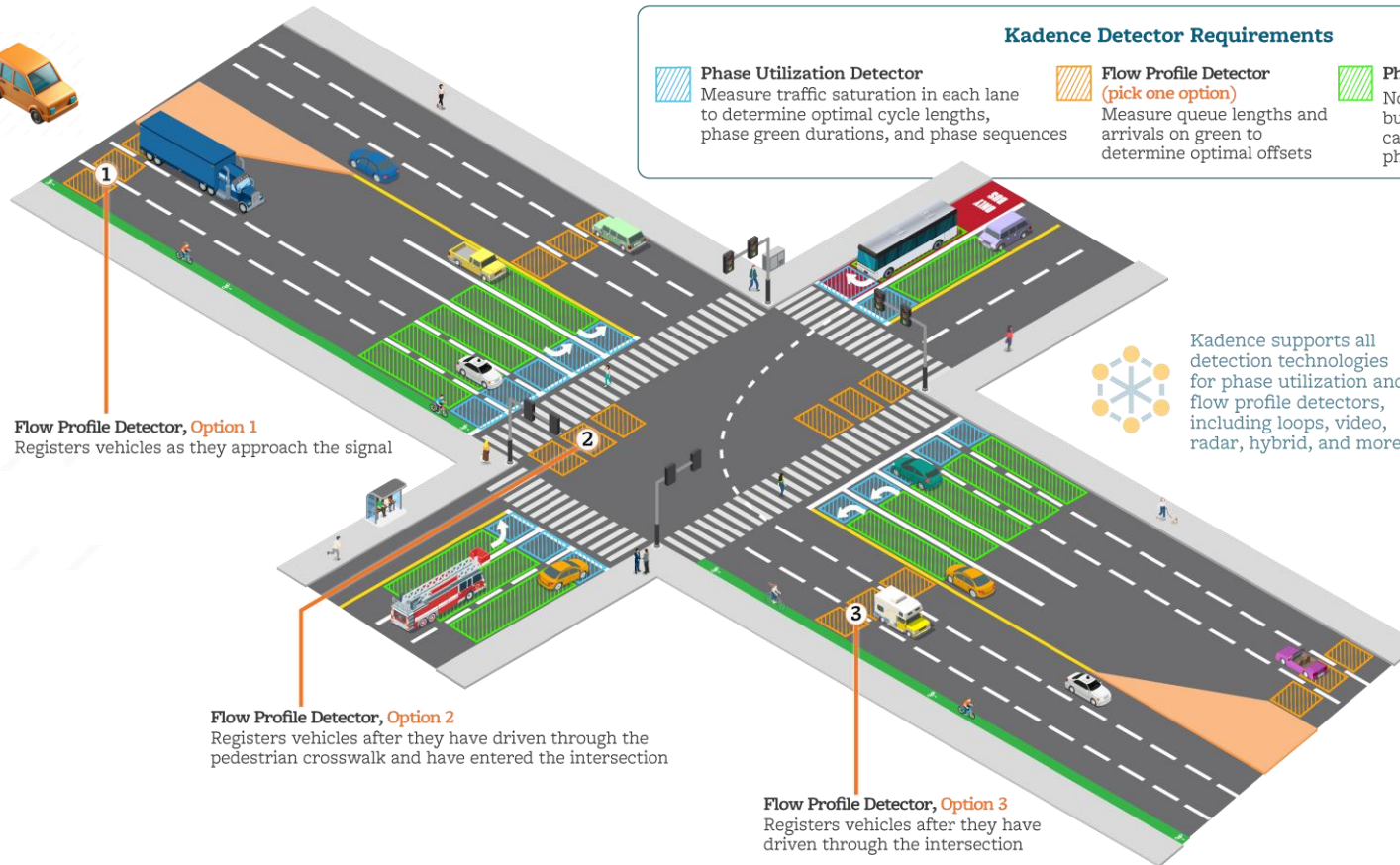
TRADITIONAL ADAPTIVE APPROACH

Kadence Detector Requirements

 **Phase Utilization Detector**
Measure traffic saturation in each lane to determine optimal cycle lengths, phase green durations, and phase sequences

 **Flow Profile Detector (pick one option)**
Measure queue lengths and arrivals on green to determine optimal offsets

 **Phase Call Detector**
Not used in Kadence calculations but necessary for ensuring vehicle calls/extensions are placed for each phase. May cover multiple lanes.



 Kadence supports all detection technologies for phase utilization and flow profile detectors, including loops, video, radar, hybrid, and more.



TRADITIONAL ADAPTIVE APPROACH

Kadence Detector Requirements

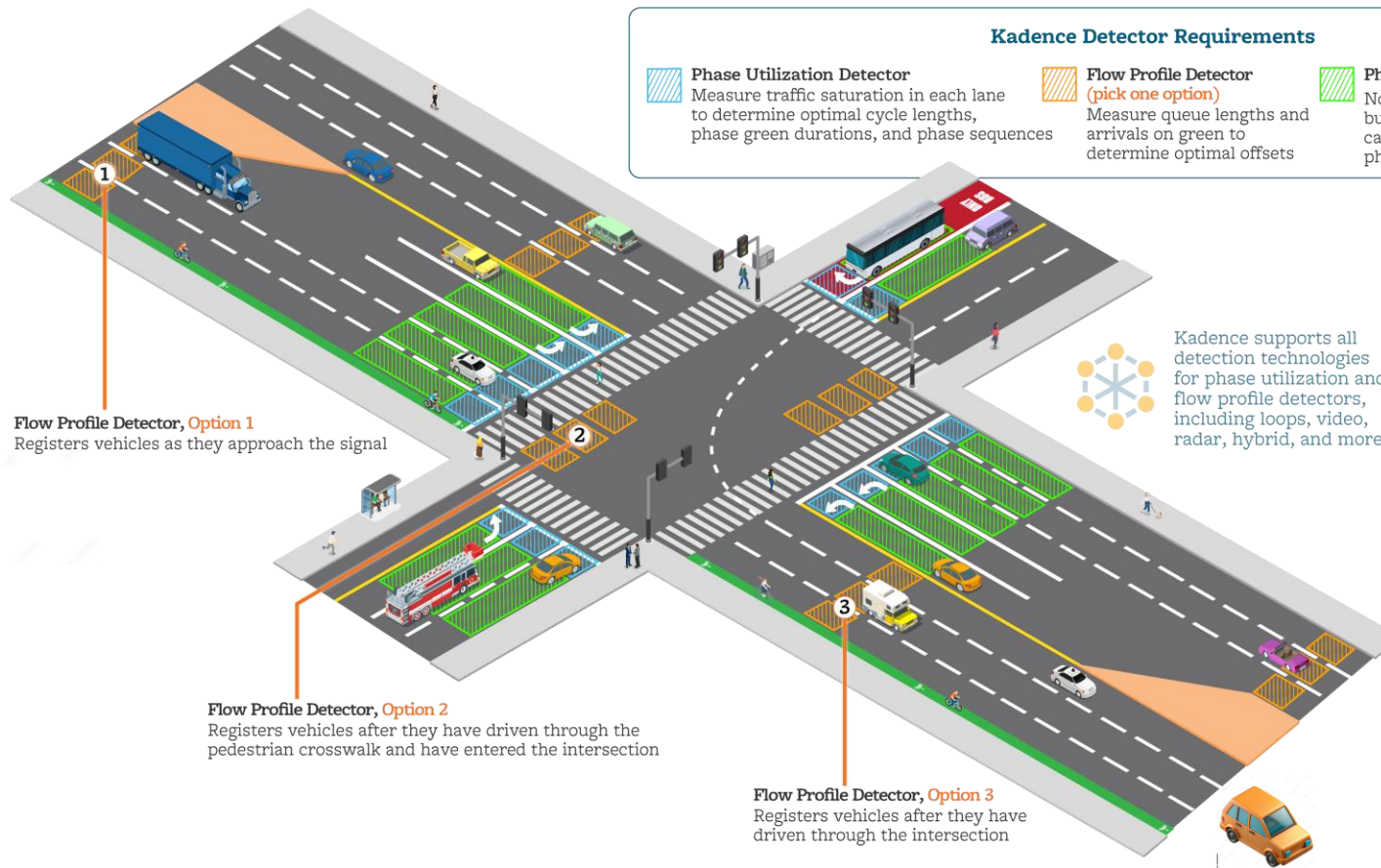
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SAFETY ADAPTIVE APPROACH

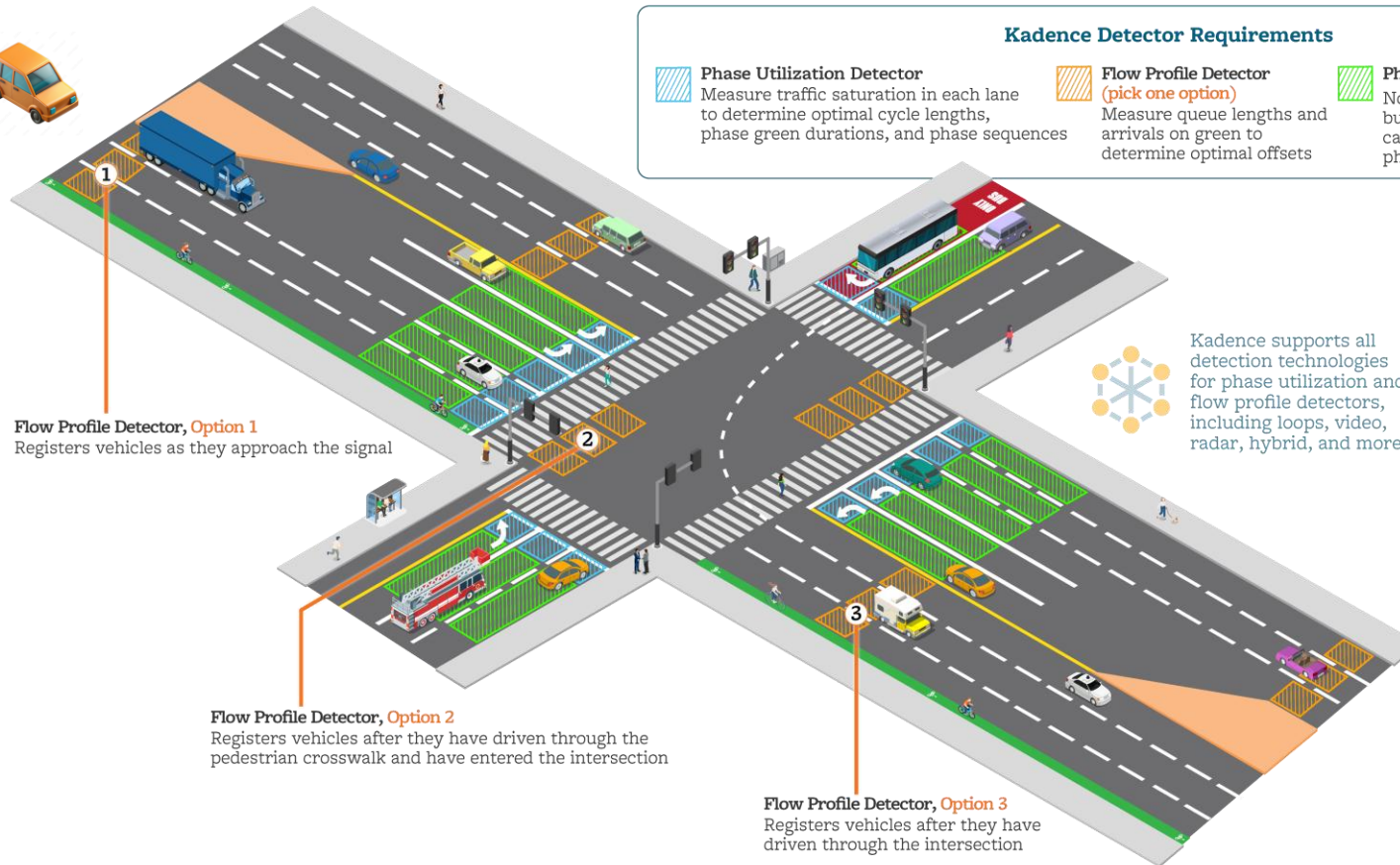
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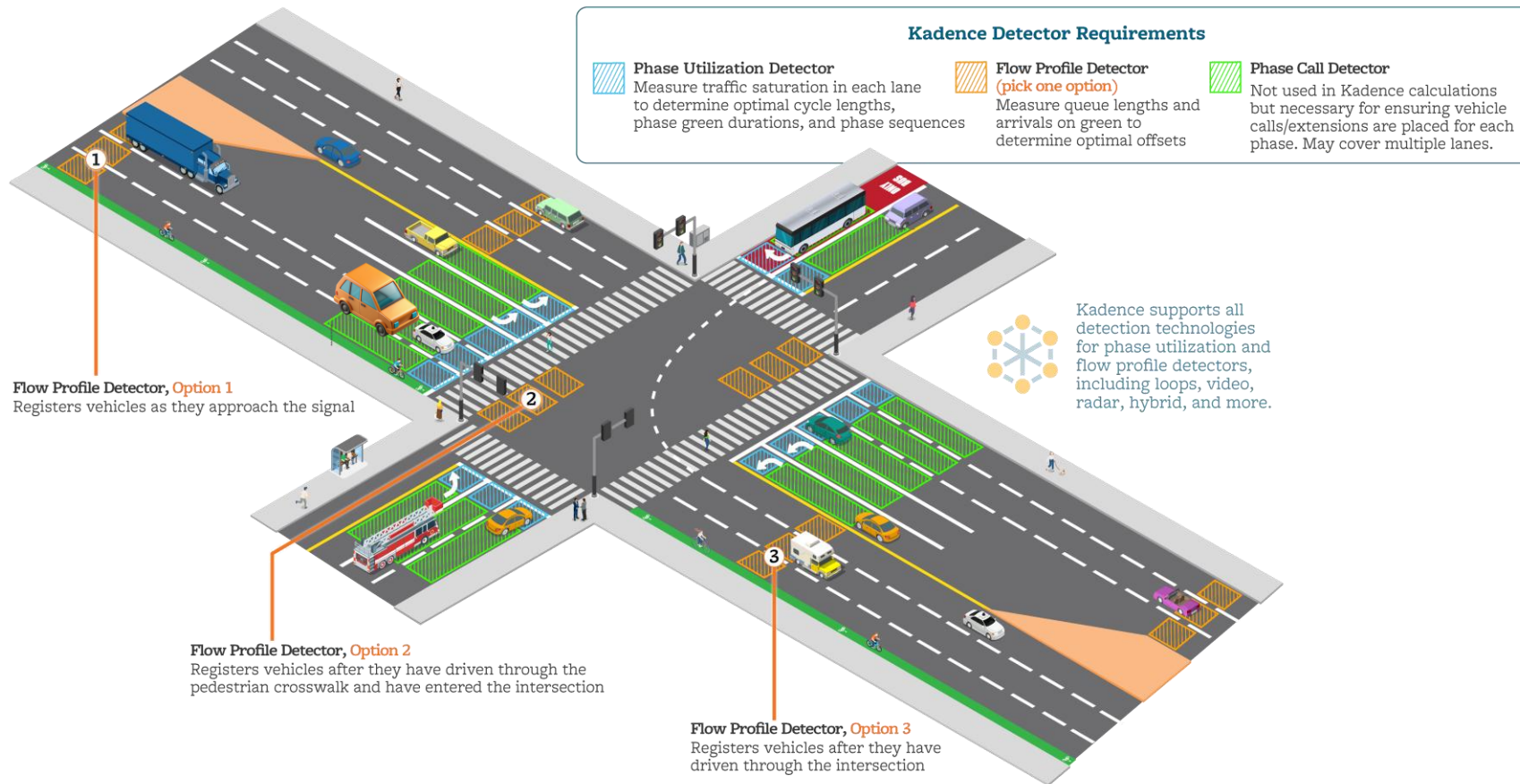
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SPEED
LIMIT
40



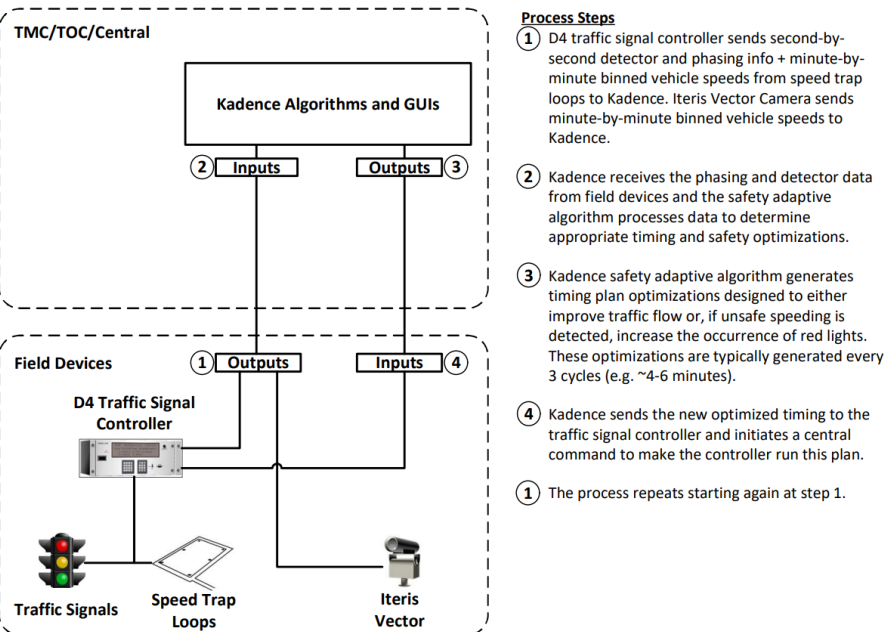
SAFETY ADAPTIVE APPROACH





Kadence Safety Adaptive Process Flow

Malibu PCH



Prepared by:
Kimley»Horn
Aug 2025

Kadence Safety Adaptive Network Diagram

Caltrans Network

Kadence Server



Kadence
Workstation



Field Device Network



Traffic Signals (D4)
Kadence - UDP : City defined port



Iteris
Vector
Kadence - HTTPS : REST API

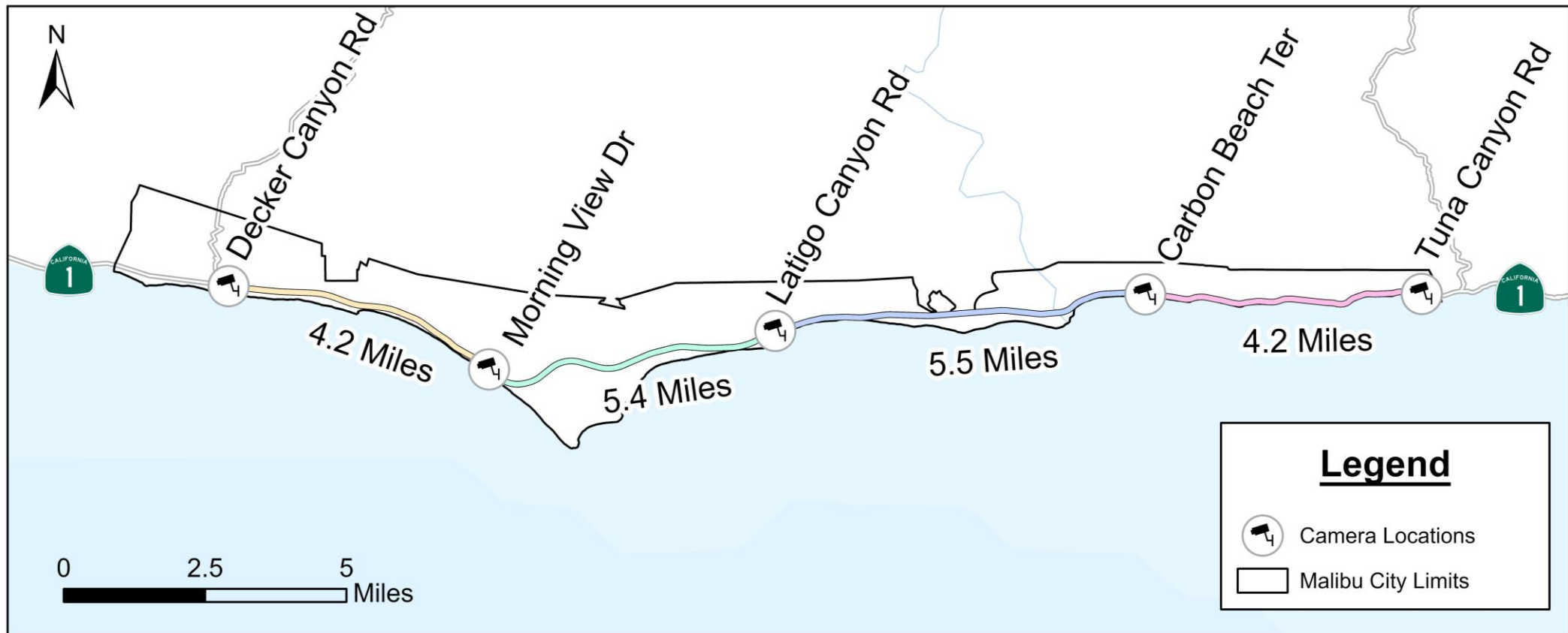
Prepared by:
Kimley»Horn
Aug 2025



PCH SAFETY - WHAT'S NEXT?



AUTOMATED SPEED ENFORCEMENT CAMERAS





QUICK BUILD ROUNDABOUTS





LAS FLORES INTERSECTION SAFETY IMPROVEMENTS





*THANK YOU,
QUESTIONS?*