City Council Meeting
08-10-26
Item 6.A.

Council Agenda Report

To: Mayor Silverstein and the Honorable Members of the City Council

Prepared by: Nadia Fahoum, Associate Engineer

Reviewed by: Tatiana Holden, Assistant Public Works Director/Assistant City Engineer

Approved by: Joseph D. Irvin, City Manager

Date prepared: June 24, 2026 Meeting date: August 10, 2026

Subject: Pacific Coast Highway Quick Build Roundabouts Project Update

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RECOMMENDED ACTION: 1) Receive an update on the Pacific Coast Highway Quick Build Roundabouts project and 2) Provide direction to staff on whether to proceed with this project.

FISCAL IMPACT: No additional appropriation is required. Funding for this project is included in the Adopted Budget for Fiscal Year 2026-2027 in Account No. 310-9078-5100 (Pacific Coast Highway Quick Build Roundabouts Project).

This project is funded through the Los Angeles County Metro Measure M Subregional Highway Funds in the amount of $2,000,000, which was the original project cost estimate outlined below. However, this cost estimate assumes a temporary installation of the Quick Build Roundabouts renders the project ineligible for Metro funding for construction costs. Staff have identified different alternatives that would allow the City to leverage the Metro funding provided by Los Angeles County Supervisor Lindsey Horvath. However, depending on Council's direction, additional funding may be required to complete the project. This is discussed below with the options forward in the staff report.

Project Funding	
Metro Measure M	$2,000,000
Project Total Funding	**$2,000,000**
Project Estimate	
Design	$464,356

Construction	$1,535,644
Project Total Costs	**$2,000,000**

STRATEGIC PLAN IMPLEMENTATION: This item supports the City's 2025-2028 Strategic Plan Goal 4: Improve Public Safety.

Goal 4: Improve Public Safety
Objective 4.1: Reduce injury and fatal collisions on Pacific Coast Highway
Strategy: Commit to setting speed limits based on crash risk, street type, and presence of vulnerable users, in addition to the 85th percentile speed, and using legislative advocacy.

DISCUSSION:
The Pacific Coast Highway Quick Build Roundabouts project (Project) has the objective of improving safety, operations, and accessibility of the highway through strategically placing and constructing "quick build" modular roundabouts at the intersections of Encinal Canyon Road and El Matador Beach along Pacific Coast Highway (PCH); providing continuous traffic flow, speed control, and improved accessibility for pedestrians and cyclists.

Project Background
Below is a timeline of key project dates

- On June 22, 2015, the Malibu's City Council adopted the Pacific Coast Highway Safety Study, developed in partnership with the California Department of Transportation (Caltrans), which authorized recommendations for measures to improve safety along the PCH corridor to reduce vehicle, bicycle, and pedestrian conflicts.

- On October 17, 2023, four Pepperdine University students were fatally struck by a motorist traveling 104-mph in a 45 zone.

- On November 13, 2023, the Malibu City Council declared a Local Emergency aimed at addressing the risks to public safety of dangerous, illegal, reckless, and/or distracted driving on Pacific Coast Highway in the City. The City of Malibu hosted a special public meeting of the PCH Taskforce with City, County and State elected officials, Caltrans and the LA County Sheriff's Department (LASD) to discuss efforts to make PCH safer.

- On January 22, 2024, City staff presented the new 2024 Pacific Coast Highway Safety Report meant to track and update City's and Caltrans' public safety

improvement projects on Pacific Coast Highway. The Council directed staff to perform a feasibility study of all potential calming measures on PCH that could be implemented immediately.

Following direction by the Council, Caltrans, Supervisor's Lindsey Horvath's Office and City staff evaluated potential improvements and identified the segment of Pacific Coast Highway in Western Malibu as experiencing high speeds and in need of an improvement that could be implemented more quickly than a traditional capital project, otherwise as rapidly deployable solution. This segment was selected for a "quick-build" project to address the ongoing safety concerns. Roundabouts were identified as the preferred "quick-build" solution. Roundabouts could be delivered using readily available and quick to construct materials, allowing traffic-calming measures to be installed rapidly while reducing vehicle speeds and improving safety. To support the project development and rapid implementation, Supervisor Horvath's Office allocated $2,000,000 in Measure M funds to the City for the purpose of designing and constructing "quick-build" roundabouts.

- On November 1, 2024, Funding Scoping & Allocation for these identified roundabouts began its processing with Metro.

- On November 25, 2024, a presentation was given to Council with updates on new and ongoing initiatives to make PCH safer, addressing critical concerns of the community which included: 1) Timeline to Implement Speed Cameras on PCH, 2) Caltrans to Install Temporary Roundabouts for Safety in Western Malibu, 3) Progress on the PCH Master Plan.

- On February 27, 2025, the Los Angeles Metropolitan Transportation Authority Board of Directors approved funding in the amount of $2 million for the design and installation of "quick-build" roundabouts at two locations on PCH, El Matador State Beach and Encinal Canyon Road.

- On March 24, 2025, the City Council added the Pacific Coast Highway Quick Build Roundabouts Project to the City's Capital Improvement Program (CIP) for Fiscal Year (FY) 2024-25; and authorized the execution of a Professional Services Agreements with Kimley-Horn for engineering design services for the PCH Quick Build Roundabouts Project.

- On April 9, 2025, a kickoff meeting was held to begin the design of the Pacific Coast Highway Quick Build Roundabouts Project.

- On September 9, 2025, the City Public Works Department mailed project notification letters to nearby property owners and occupants regarding the upcoming project and Public Works Commission hearing.

- On September 15, 2025, the City Public Works Department held a virtual town hall meeting to gain community insight on the proposed project.

- On September 24, 2025, the City Public Works Department presented the proposed project to the City Public Works Commission.

- On October 22, 2025, the City Public Works Department held a virtual town hall meeting to gain community insight on the proposed project.

- On December 2, 2025, the City Public Works Department held a second town hall meeting in person to gain community insight on the proposed project.

- On December 16, 2025, the City Planning Commission approved the project with added conditions under Resolution No. 25-78.

- On January 6, 2026, Appeal No. 26-001 was filed by a resident group.

- On March 18, 2026, the City Council denied the appeal and approved CDP No. 25-041, subject to added conditions.

- On April 28, 2026, Appeal No. A-4-MAL-26-0011 was filed by a resident group to the California Coastal Commission.

- On June 11, 2026, the California Coastal Commission unanimously denied the appeal and approved the project.

Responding to Council Direction

On March 18, 2026, staff presented the Project application before City Council in which the staff report, written reports, public testimony, and all other information in the record was reviewed and considered. Council directed staff to return with more information at a future public meeting date for determination on whether the project is to proceed forward.

Within the last several weeks, staff and Kimley Horn worked to perform the following Council-directed items:

- **Conduct an evaluation of roadway performance in the context of wildfire evacuation scenarios in Malibu, California, specifically testing performance**

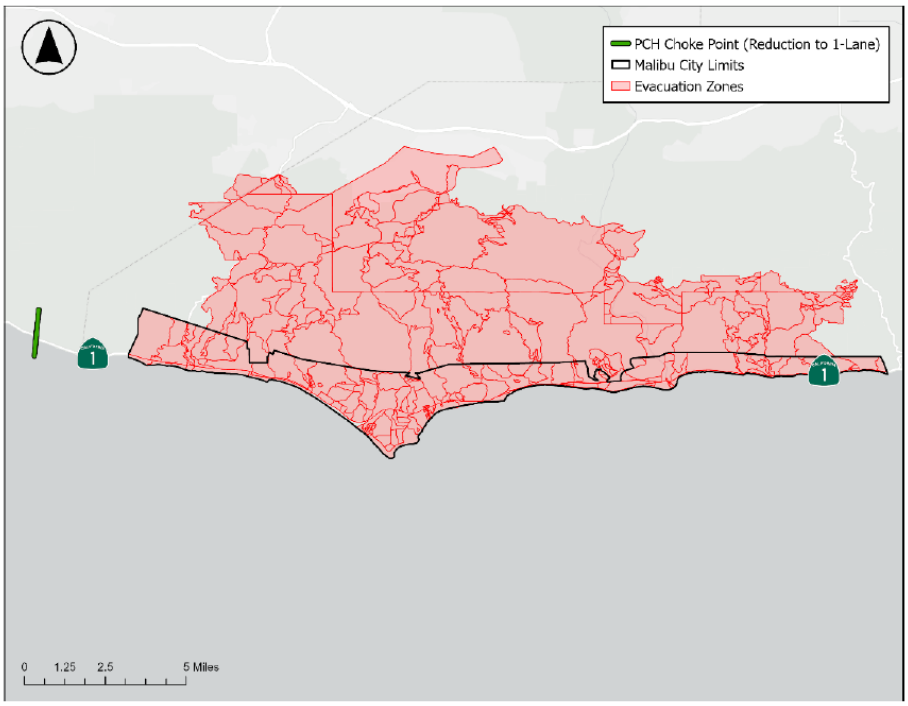
impacts with inclusion of the proposed pilot quick-build roundabout improvements on PCH at El Matador Beach Road and at Encinal Road.

The Wildfire Evacuation Assessment Report (Attachment 1) indicates that evacuation performance is influenced far more by regional roadway constraints than by the proposed roundabouts. It concludes that the proposed quick build roundabouts would have minimal impact on overall wildfire evacuation performance and clearance. Under conservative PSPS conditions, the amount of time it would take residents to evacuate the evacuation zone under the proposed project sees a marginal increase of 1.4% in comparison to the existing (No Project) evacuation conditions.

Table 1 – Modeling Scenarios

Modeling Scenarios	
No Project without PSPS[5]	Existing El Matador Beach Rd and Encinal Rd intersections, with existing roadway conditions throughout Malibu.
Plus Project without PSPS	Proposed Roundabouts at El Matador Beach Rd and Encinal Rd intersections, with existing roadway conditions throughout Malibu.
No Project with PSPS	Existing El Matador Beach Rd and Encinal Rd intersections, with PSPS conditions between Malibu Canyon Rd and Trancas.
Plus Project with PSP	Proposed Roundabouts at El Matador Beach Rd and Encinal Rd intersections, with PSPS conditions between Malibu Canyon Rd and Trancas.

[5] Public Safety Power Shutoff (PSPS), during which signalized intersections operate as all-way stop controlled intersections



Clearance Time	Without PSPS	With PSPS
No Project	11:13 PM	11:58 PM
Plus Project	11:21 PM	12:12 AM (Next Day)
Increase in Clearance Time	+8 Minutes (0.82%)	+14 Minutes (1.38%)

It is worth noting that Public Safety Power Shutoff (PSPS) events, in which all existing traffic signals operate as all-way stops, have a greater impact on evacuation than the proposed roundabouts themselves. The study demonstrates that under the existing conditions of the highway (otherwise "No Project"), the amount of time it would take residents to evacuate the evacuation zone under PSPS conditions is increased by approximately 45 minutes.

- **Develop a simulation for the following scenario under normal roundabout operations: groups of cyclist's movement through roundabout.**

  A multi-modal simulation was developed and will be shown to Council during the staff presentation at the scheduled August 10, 2026, City Council meeting. The simulation was developed to evaluate how groups of cyclists interact with typical vehicular traffic under standard operating conditions.

  The simulation provides a visual and analytical assessment of how groups of cyclists progress through the roundabout and illustrates the operational impacts on surrounding traffic.

  The roundabouts yield-controlled design and continuous flow characteristics allow traffic to recover quickly following each cyclist movement. The simulation demonstrates that the roundabout continues to operate successfully under normal conditions while accommodating groups of cyclists.

- **Develop a simulation for the following scenario under normal roundabout operations: navigation of all roadway users.**

  A multi-modal simulation was developed and will be shown to Council during the staff presentation at the scheduled August 10, 2026, City Council meeting. The simulation analyzed the movements and circulation through the roundabouts of various users such as cyclists, pedestrians, and motorists.

Motorists approaching the roundabout reduce speed, assess circulating traffic, yield as required, enter when an acceptable gap is available, travel through the circulatory roadway, and exit at their intended destination. Pedestrians use the designated crosswalks and splitter islands to cross each approach in two stages, while the drivers yield where required. Cyclists are shown navigating the roundabout in accordance with FHWA accepted operating practices, traveling as part of the traffic stream.

The simulation highlights safe gap acceptance, yielding behavior, lane discipline, and continuous traffic circulation. Demonstrating how the roundabout accommodates multiple modes of transportation while maintaining efficient traffic operations and minimizing delays.

- **Develop a simulation for the following scenario under normal roundabout operations: turn templates and access for vehicles (waste management, fire, ambulance, mail services, error) to the private driveways – mobility movement.**

  A vehicle-turning simulation was developed and will be shown to Council during the staff presentation at the scheduled August 10, 2026 City Council meeting. The simulation analyzed vehicle turning movements, circulation through the roundabouts, and access to adjacent private driveways to confirm that mobility would be maintained.

  The simulation included turn templates for a range of vehicle types, including passenger vehicles, waste collection trucks, fire apparatus, ambulances, mail delivery vehicles, and other large service vehicles. The simulation evaluated each vehicle's ability to safely navigate the roundabouts while maintaining access to private driveways and minimizing conflicts with opposing traffic.

  The simulation demonstrated that the proposed roundabout design accommodates the anticipated vehicle types and preserves access to properties along the corridor while providing the intended traffic-calming benefits, operational efficiency, emergency access, and roadway safety.

Options Forward

The following options are before Council for consideration, unless otherwise determined:

1. Proceed with the construction of the quick build roundabouts at the intersections of El Matador State Beach and Encinal Canyon Road along PCH.

Due to the constraints of LA County Metro Measure M funds, the funding source cannot support the construction of "temporary" or otherwise safety improvements intended to be removed. Should Council direct staff to proceed with this option, the roundabouts would remain indefinite unless replaced with permanent improvements.

The direction to staff under this option would also include revising the City's Coastal Development Permit, revising Caltrans documents and permits, and working with the design consultant Kimley-Horn to modify the plan set as necessary. The additional work required under this option would exceed the available fund of $2 million, and staff estimate it would require an additional six to eight months to complete pushing project completion to Summer 2027. Staff estimate the current project funding gap to be approximately $500,000. Should Council direct staff to proceed with this option, staff would return to request the funding when there is a more refined cost estimate and identified funding source. The additional funding could come from Measure M, speed camera revenues, or another source.

Project Estimate	
Design	$700,000
Construction	$1,800,000
Project Total Costs	**$2,500,000**

2. Proceed with the construction of one quick build roundabout at the intersection of El Matador State Beach along PCH.

   If Council wishes to proceed with some traffic calming measures in this area, Council could direct staff to pursue the implementation of one quick build roundabout at El Matador State Beach. This option would still require staff work to remove the "temporary" aspects of the current project permitting but would reduce the overall project costs and eliminate concerns regarding driveways entering and exiting at the Encinal Canyon location.

   The direction to staff under this option would also include revising the City's Coastal Development Permit, revising Caltrans documents and permits, and modifying the plan set as necessary. The additional work required under this option is supported by the available fund of $2 million and requires an additional 6 months to complete.

Project Estimate	
Design	$600,000
Construction	$1,000,000

Project Total Costs	**$1,600,000**

3. Place a hold on the project and remove it from the City's Capital Improvement Program at this time. With Council guidance, should there be future consideration for roundabouts at these locations, the following project may be reactivated.

   The direction to staff under this option would also include submitting reimbursement requests to Metro for the design costs incurred and withdrawing from the remainder of the approved project scope. It should be noted that if this is Council's direction, the funds provided by Los Angeles County Supervisor Lindsey Horvath's Office were applied to and approved solely for the design and construction of quick-build roundabouts. If this scope is no longer pursued, the remainder of funds are not approved for other use or allocation to other project scopes; and are required to be returned to Los Angeles County Supervisor Lindsey Horvath's Office to be considered against other regional transportation priorities.

Project Estimate	
Design	$464,356
Construction	$0
Project Total Costs	**$464,356**

Staff is seeking Council direction on how to proceed with the project. Should Council approve this project in either options 1 or 2, staff anticipates awarding a construction contract in Spring 2027 with a construction completion date of Summer 2027. However, seeking a modified or new Coastal Development Permit may subject the project to another round of appeals, which could further delay project implementation and increase project costs.

ATTACHMENTS:

1. PCH Quick Build Roundabouts - Wildfire Evacuation Assessment Report

Kimley»Horn

To:	Travis Hart, Deputy Public Works Director, Malibu, California
	Nadia Fahoum, Associate Engineer, Malibu, California
From:	Ayberk Kocatepe, Ph.D., PTP
	Asher Cipinko
	Sri Chakravarthy, P.E., T.E.
Subject:	Wildfire Evacuation Assessment – Pilot Quick-Build Roundabouts, Malibu, California
Date:	June 26, 2026

Kimley-Horn and Associates, Inc. ("Kimley-Horn" or the "Consultant") is tasked to conduct a wildfire evacuation assessment for the proposed Pilot Quick Build Roundabout project ("Project" or "proposed Project"). This memorandum provides an assessment under existing and with Project conditions and impacts to roadway capacity and clearance times under wildfire evacuation scenarios.

Introduction and Purpose

This document presents an evaluation of roadway performance in the context of wildfire evacuation scenarios in Malibu, California, specifically testing performance impacts with inclusion of the proposed pilot quick-build roundabout improvements on Pacific Coast Highway at El Matador Beach Road and at Encinal Road. The objective of this evaluation is to assess the immediate Project-level effects on evacuation performance. The proposed improvements are single lane roundabouts that maintain one entry travel lanes and one exit travel lanes per direction.

Methodology

This assessment applies evacuation modeling to evaluate the Project's impact on roadway performance during wildfire scenarios and impacts on the broader regional roadway network. To this end, Kimley-Horn has utilized AEGIS[1] (Adaptative Evacuation and Geographic Intelligence System), a tool specifically designed for comparative evacuation analysis using multiple national and localized datasets, geospatial analysis software, and advanced modeling algorithms to create dynamic assignment, agent-based models capable of capturing the detailed interactions between vehicles and operational statistics of the roadway network, second-by-second throughout the length of the evacuation. Analysis under AEGIS is conducted by collecting local data, developing hazard scenarios and modeling assumptions based on local conditions, modelling the selected scenarios within the AEGIS software, and analyzing results to assess operational impacts directly tied to the Project.

Scenario Description

This assessment analyzes an evacuation scenario based on the Woolsey Fire (2018) to stress test the roadway network in Malibu. The Woolsey Fire was a multi-day event which began south of Simi Valley and rapidly burned through Ventura and Los Angeles Counites. The fire event occurred concurrently with the Hill Fire, an earlier ignition in Ventura County. Impacts of the Hill Fire caused closures on PCH in the west and northbound direction, and evacuees were routed east and southbound. To assess performance on the

[1] Kimley-Horn's proprietary evacuation analysis tool designed to analyze custom evacuation scenarios

study intersections on PCH west of the City of Malibu, this study analyzes an alternative scenario considering the impacts of the Woolsey Fire in isolation without Hill Fire-related PCH closures, and evacuees are directed west and north on PCH toward Ventura County. This alternative scenario was selected to represent severe wildfire evacuation conditions, including rapid fire progression into Malibu, broad mandatory evacuation messaging, constrained evacuation routes, and significant westbound PCH delays to stress test the Project.

Evacuation events are inherently stochastic, influenced by many variables from human behavior to the sudden onset of the event making it impractical to evaluate every possible scenario. Given this complexity, it is essential to introduce assumptions to create a manageable framework to allow the model to run specific scenarios and derive meaningful insights and conclusions that can guide further detailed investigations and refinements of the models. This analysis reflects a single potential scenario developed based on assumptions informed by historical events, as well as input received from City Council and discussions with City staff, and considers worst-case evacuation demand conditions.

This methodological process is supported by recent court decisions upholding that evaluating a single evacuation scenario can be as valid as any other, given the countless variables that shape real-world outcomes. In *League to Save Lake Tahoe Mountain v. County of Placer (2022)*, the court recognized that with factors such as human behavior, timing, and fire dynamics, it is impossible to model every potential condition. Instead, selecting a representative scenario and metric such as total time to exit provides a manageable framework that provides meaningful analysis.

This analysis does not attempt to recreate the actual Woolsey Fire evacuation event or traffic-control strategy, but instead is a counterfactual scenario applying Woolsey-based evacuation demand and behavior to a westbound PCH routing scenario to evaluate the proposed project effects at El Matador Beach Road and at Encinal Road. Any analysis results are intended as a planning level guide to compare roadway configuration conditions and assess specific operations at the Project site, rather than inform general operational strategy utilized by law enforcement in the event of an evacuation.

Modeling Assumptions

When undertaking this review, reasonable assumptions were made to facilitate the analysis and allow for more streamlined and focused research. All modeling assumptions are described below, based on the Review of Woolsey Fire Response by Malibu City Management[2]. Modeling scenarios, reflecting one wildfire scenario across four different roadway condition scenarios are described in Table 1.

- The study area spans the City of Malibu jurisdiction limits to the "PCH lane reduction", the location where the PCH reduces from 2-lanes to 1-lane in each direction. The study area, proposed roundabout locations, and signalized intersections located on the PCH within the City limits are shown in Figure 1. For the purposes of this study, evacuees are considered "cleared" and evacuated once able to pass the PCH lane reduction. Detailed imagery of the Project site and signalized intersection locations are included in Appendix A.
- To calculate evacuee demand on PCH, US Census blocks[3] within the study area were assessed to determine overlap with the Woolsey Fire burn perimeter and regional highway access. All zones

[2] Review of Woolsey Fire Response by Malibu City Management, City of Malibu, July 26, 2019

[3] Table B08201: Household Size by Vehicles Available, 2024 ACS 5-Year Estimates, US Census Bureau

within the City of Malibu and zones intersecting the burn perimeter north of the City without direct access to US-101 were selected as evacuation zones within this study, shown in **Figure 2**.Under the evacuation scenario the number of vehicles on the roadway network during an evacuation was determined using household and vehicle ownership information obtained directly from socio-economic data in US Census estimates under the most recent 2024 American Community Survey 5-Year dataset.

- Based on observed evacuation behavior during the Woolsey Fire, evacuee departures are not assumed to be simultaneous but instead follow an S-curve pattern, with departures starting gradually, peaking shortly after notification, and tapering over time. For this analysis, the evacuation response was modeled using an S-curve beginning at approximately 7:00 AM, consistent with the initial evacuation alert, and extending over an estimated eight-hour period, reflecting input from observed conditions including evolving notifications, a citywide evacuation order, and documented delays, confusion, and staggered response behavior.
- The 2026 roadway network reflects existing conditions, with capacities and speed limit data derived from OpenStreetMaps[4] data.
- The modeling approach applied a 20 percent reduction to roadway capacity to account for evacuees departing before the explicit evacuation notice and disruptions to typical travel patterns during wildfire conditions. The Woolsey Fire evacuation did not occur under normal traffic operating conditions: the City's alert log documented traffic signal outages at PCH and Coastline by 7:25 AM, subsequent PCH closures and lane-control changes, and an urgent evacuation reinforcement at 12:29 PM. Reports began emerging in the early afternoon of traffic backups, instances of delayed or noncompliant evacuation response, and impacts associated with constrained route availability.
- Households without access to a personal vehicle would inherently depend on external support to evacuate. Additionally, it is presumed that employment centers will be unoccupied during the time of evacuation for both scenarios. Under occupied circumstances, it is assumed employment centers would undertake the responsibility of facilitating the evacuation of employees lacking personal vehicles, to the extent that employees would be at their place of work during an evacuation event.

[4] https://www.openstreetmap.org/

Figure 1 – Study Area

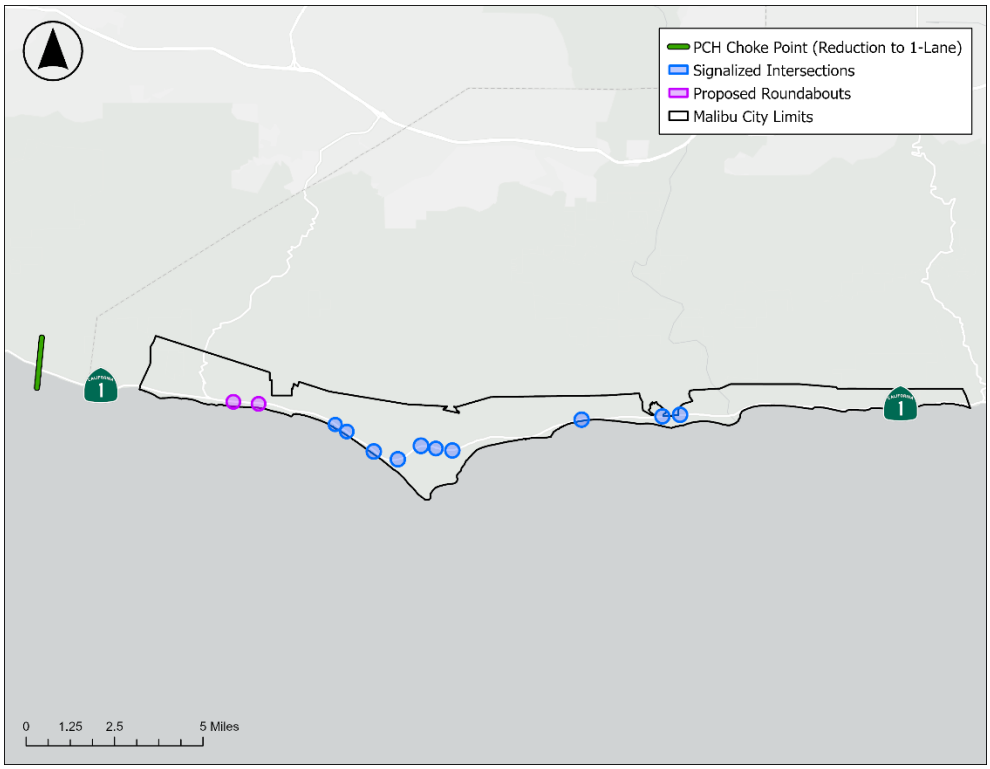


Figure 2 – Impacted Evacuation Zones

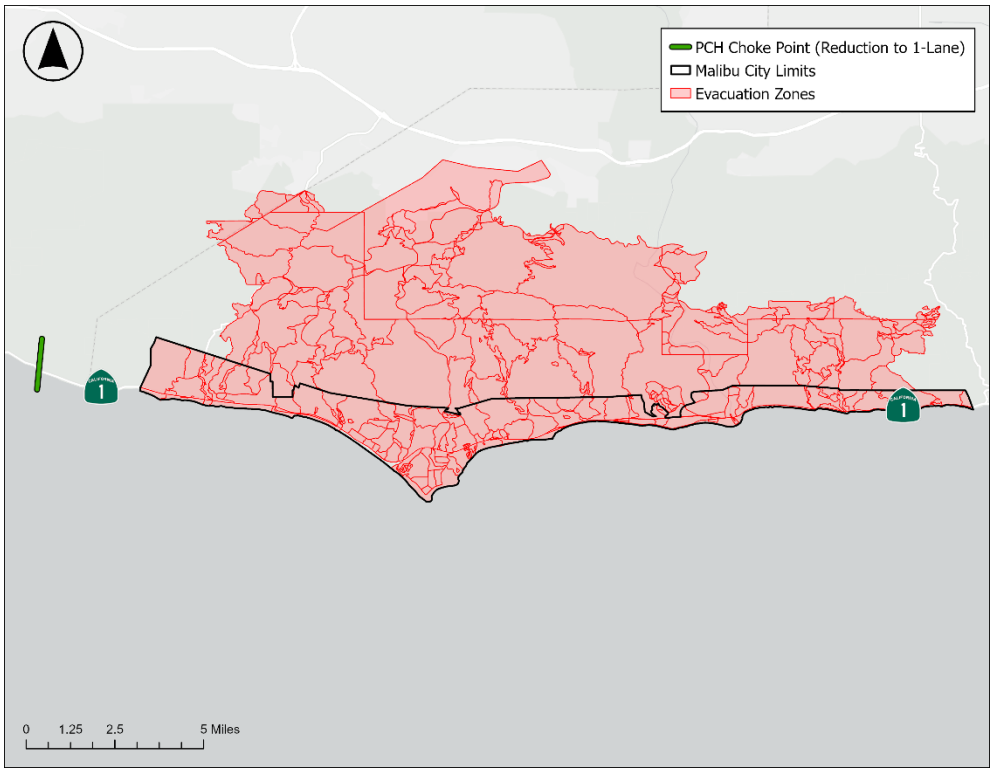


Table 1 – Modeling Scenarios

Modeling Scenarios	
No Project without PSPS[5]	Existing El Matador Beach Rd and Encinal Rd intersections, with existing roadway conditions throughout Malibu.
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No Project with PSPS	Existing El Matador Beach Rd and Encinal Rd intersections, with PSPS conditions between Malibu Canyon Rd and Trancas.
Plus Project with PSP	Proposed Roundabouts at El Matador Beach Rd and Encinal Rd intersections, with PSPS conditions between Malibu Canyon Rd and Trancas.

[5] Public Safety Power Shutoff (PSPS), during which signalized intersections operate as all-way stop controlled intersections

Evacuation Route Assessment

Model Analysis and Results

AEGIS, A Kimley-Horn platform, was used to develop an evacuation model to simulate the evacuation scenario. The modeling platform is capable of producing a range of metrics to assess network performance during an evacuation event. Several key metrics include roadway vehicle demand, queueing, experienced delay, and clearance or evacuation times. Key results are summarized below. A data dashboard with interactive maps and animations of model results are accessible here, and in Appendix A.

Average Vehicle Delay

Average delay during the peak hour of the evacuation, when vehicle demand is at its greatest, grew by 4.2 and 2.9 seconds at Encincal and El Matador Beach Roads respectively with the addition of the Project under no PSPS conditions. With PSPS active, the delay grew by 4.9 and 2.1 seconds respectively. It should be noted that the side-street delay decreased with the addition of the Project, while PCH delay increased. Delay in seconds per vehicle experienced at both El Matador Beach Rd and Encinal Rd are shown in **Table 2** below.

Table 2 – Average Delay per Vehicle (seconds) during Peak Hour

Intersection	Average Delay per Vehicle during Peak Hour			
	No Project without PSPS	Plus Project without PSPS	No Project with PSP	Plus Project with PSPS
El Matador Beach Rd	3.3 Seconds	6.2 Seconds	8.1 Seconds	10.2 Seconds
Encinal Rd	17.8 Seconds	22.0 Seconds	41.4 Seconds	46.3 Seconds

Delay increased under PSPS conditions at the 10 signalized intersections between Malibu Canyon Rd and Trancas Canyon Rd are shown in Table 3.

Table 3 – Average Delay per Vehicle (seconds) at Signalized Intersections with and without PSPS

Intersection	Without PSPS	With PSPS	Delta
Malibu Canyon Rd	8.51	2.36	-6.15
John Tyler Dr	11.51	3.19	-8.32
Corral Canyon Rd	11.93	3.18	-8.75
Zumirez Dr	14.74	3.44	-11.3
Kanan Dume Rd	14.55	2.59	-11.96
Heathercliff Rd	10.99	3.65	-7.34
Busch Dr	8.31	17.79	+9.48
Morning View Dr	14.33	9.45	-4.88
Guernsey Ave	25.00	51.12	+26.12
Trancas Canyon Rd	15.52	31.56	+16.04

Signalized intersections show varying degrees of delay increase and decrease. Decreases in delay at signalized intersections may be associated to lower side street vehicle utilization as a component of the model's rerouting behavior in response to travel time changes with the inclusion of PSPS conditions, reflected in larger overall increases in delay at downstream intersections such as Encinal as a result of vehicle rerouting. It is important to note that while the worst approach at an intersection may show improvements to delay under these conditions, the overall performance of the intersection may decrease, as reflected by increases to the overall time taken to evacuate (discussed below). However, the delay is shifted from primarily being experienced at the side street, to across all approaches.

Vehicle Queueing

The maximum queue length observed during the evacuation increased by approximately 25 feet at Encinal (about one vehicle), with no change at El Matador Beach under no-PSPS conditions. Under PSPS conditions, the queue at Encinal increased by approximately 118 feet (about 4–5 vehicles), while conditions at El Matador Beach remained unchanged.

The lack of change at El Matador Beach reflects minimal conflicting demand at that location, whereas increases at Encinal are attributable to existing local demand combined with downstream congestion near the convergence of canyon roadways with PCH. Maximum queue lengths at both locations are summarized in Table 4.

Table 4 – Maximum Vehicle Queue (feet) during Evacuation

Intersection	Maximum Vehicle Queue during Evacuation			
	No Project without PSPS	Plus Project without PSPS	No Project with PSP	Plus Project with PSPS
El Matador Beach Rd	132 ft	157 ft (+25 ft)	196 ft	314 ft (+118 ft)
Encinal Rd	25 ft	25 ft	25 ft	25 ft

Queue lengths at the 10 signalized intersections between Malibu Canyon Rd and Trancas Canyon Rd under PSPS conditions generally grew, with the highest increases between Trancas Canyon Rd and Guernsey Rd, where the dual signalized intersections converting to all-way stops introduces queues stretching the storage length of the roadways between them. Queue lengths did not increase with Project, as queues tied to the roundabouts did not extend beyond their localized impacts.

Systemwide Clearance Time and Average Time to Clear

The amount of time it takes residents to evacuate the evacuation zone is referred to as “clearance time”. This metric measures the time taken from the initial evacuation notice until the full evacuation impact zone is able to “clear”, or pass a selected boundary, including the departure period and travel time until the final evacuee is able to pass the boundary. For the purposes of this analysis, evacuees are considered cleared once reaching the PCH lane reduction, where westbound lanes are reduced from 2-lane to 1-lane. The addition of the Project under no PSPS conditions increases the system-wide clearance time by 8 minutes (0.8%). Under PSPS conditions with Project between Malibu Canyon Rd and Trancas Rd, system-wide clearance time increases by 14 minutes (1.4%). The amount of time it takes each scenario to completely evacuate and clear past the PCH lane reduction is presented in Table 6 below.

Table 5 – Systemwide Clearance Times by Scenario (Since 7 AM Notice)

Clearance Time	Without PSPS	With PSPS
No Project	11:13 PM	11:58 PM
Plus Project	11:21 PM	12:12 AM (Next Day)
Increase in Clearance Time	+8 Minutes (0.82%)	+14 Minutes (1.38%)

The average time per evacuee to clear measures the time on average that each individual evacuee takes to cross the clearance boundary (PCH lane reduction) from the moment they left their home location. The average time taken from departure to clearing the PCH lane reduction for a single vehicle increased by 19 seconds (0.12%) with the addition of the Project under no PSPS conditions. Under PSPS conditions, the Project increases individual vehicle evacuation time by 21 seconds (0.16%). The average time to clear for a single evacuee is shown in Table 7.

Table 6 – Average Time per Evacuee to Clear

Average Time per Evacuee to Clear	Without PSPS	With PSPS
No Project	4 Hours, 30 Minutes, 44 Seconds	4 Hours, 36 Minutes, 12 Seconds
Plus Project	4 Hours, 31 Minutes, 3 Seconds	4 Hours, 36 Minutes, 38 Seconds
Increase in Clearance Time	+19 Seconds (0.12%)	+26 Seconds (0.16%)

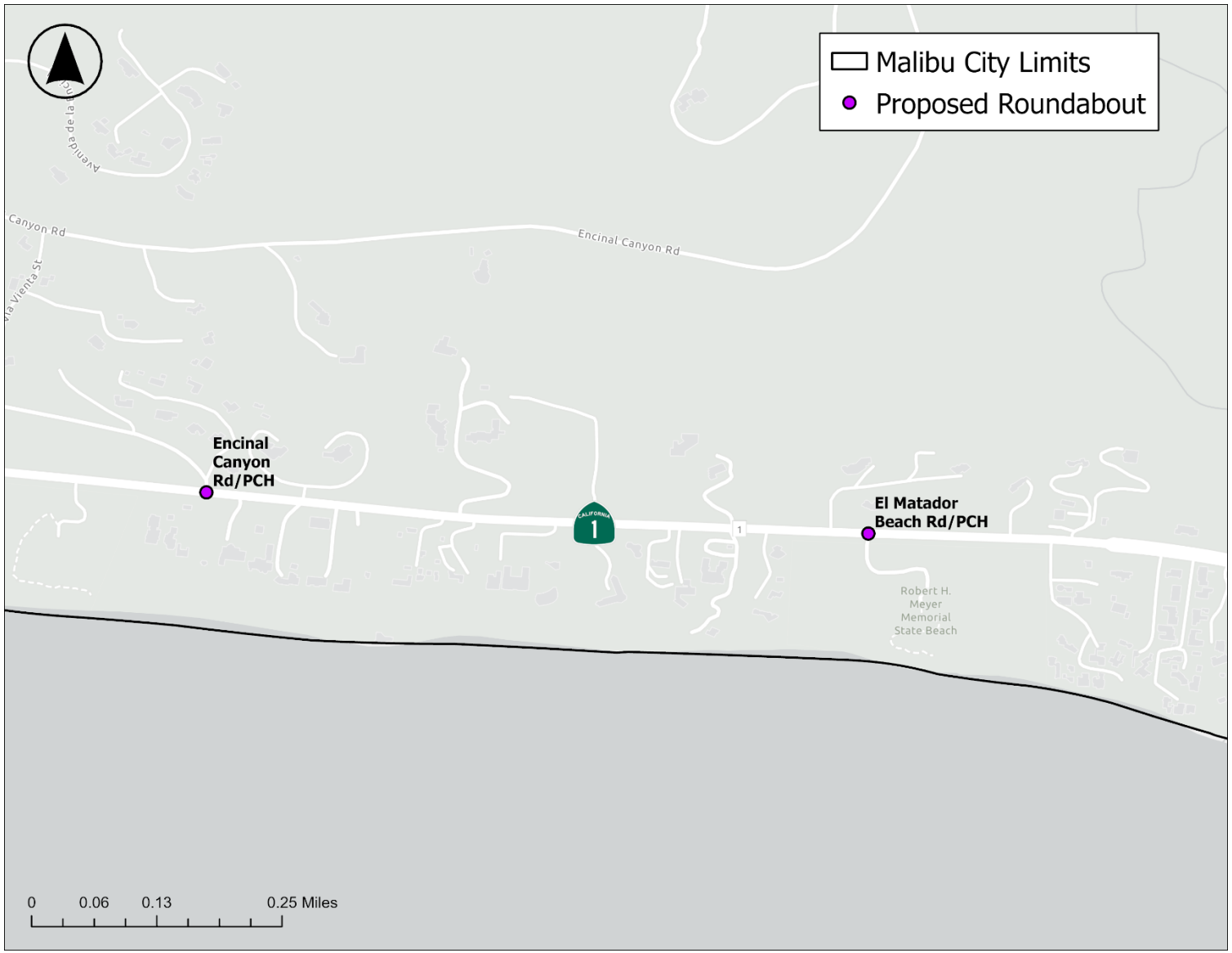
Appendix A

Kimley»Horn

Data dashboard accessible here, and at QR code below:

Kimley»Horn

Proposed Roundabout Locations



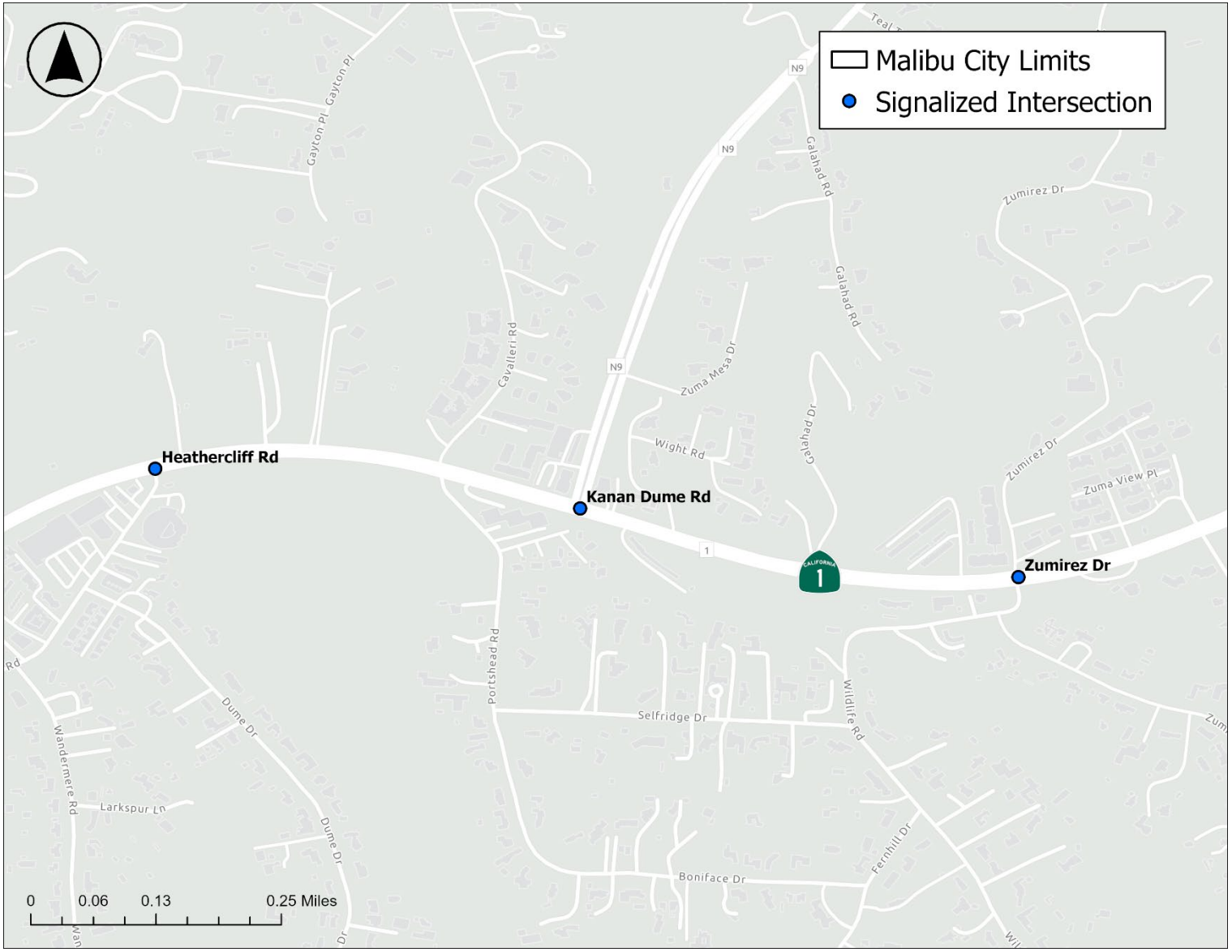
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Signalized Intersection Locations



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Signalized Intersection Locations



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Signalized Intersection Locations



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Signalized Intersection Locations

