Fehr & Peers

City of Dana Point Evacuation Assessment

Prepared for:
City of Dana Point

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Introduction

Fehr & Peers completed an assessment of roadway capacity and evacuation time estimates under the described evacuation scenarios in the City of Dana Point. Consistent with AB 747 and the Governor's Office of Land Use and Climate Innovation (LUCI) Evacuation Planning Technical Advisory (April 2023), cities are required to review and update evacuation routes and their capacity, safety, and viability under a range of emergency scenarios when the Safety Element or Local Hazard Mitigation Plan (LHMP) is updated.

Disclaimer

This document provides an assessment of roadway capacity and time needed to evacuate under the described evacuation scenarios. Please note that emergency evacuations can occur due to any number of events (fire, flood, earthquakes, etc.). These events can also have micro-level challenges that can alter the movement of cars and people, such as debris in the roadway or abandoned vehicles. Additionally, it is impossible to predict individual behavior related to personal risk assessment for each hazard event as the associated evacuation instructions are provided. As such, this assessment is intended to provide the City with a broad understanding of the capacity of the transportation system during an evacuation scenario; it does not provide a guarantee that evacuations will follow modeling that is used for analysis purposes, nor does it guarantee that the findings are applicable to any or all situations.

Moreover, as emergency evacuation assessment is an emerging field, there is no established standard methodology. Fehr & Peers has adopted existing methodologies in transportation planning that, in our knowledge and experience, we believe are the most appropriate within the limits presented by the tools and data available and the budgetary and time constraints in the scope of work, and by current knowledge and state of the practice.

While this assessment should help the City better prepare for hazard related events and associated evacuations, the City should take care in planning and implementing any potential evacuation scenario. Fehr & Peers cannot and does not guarantee the efficacy of any of the information used in this assessment as such would be beyond our professional duty and capability.

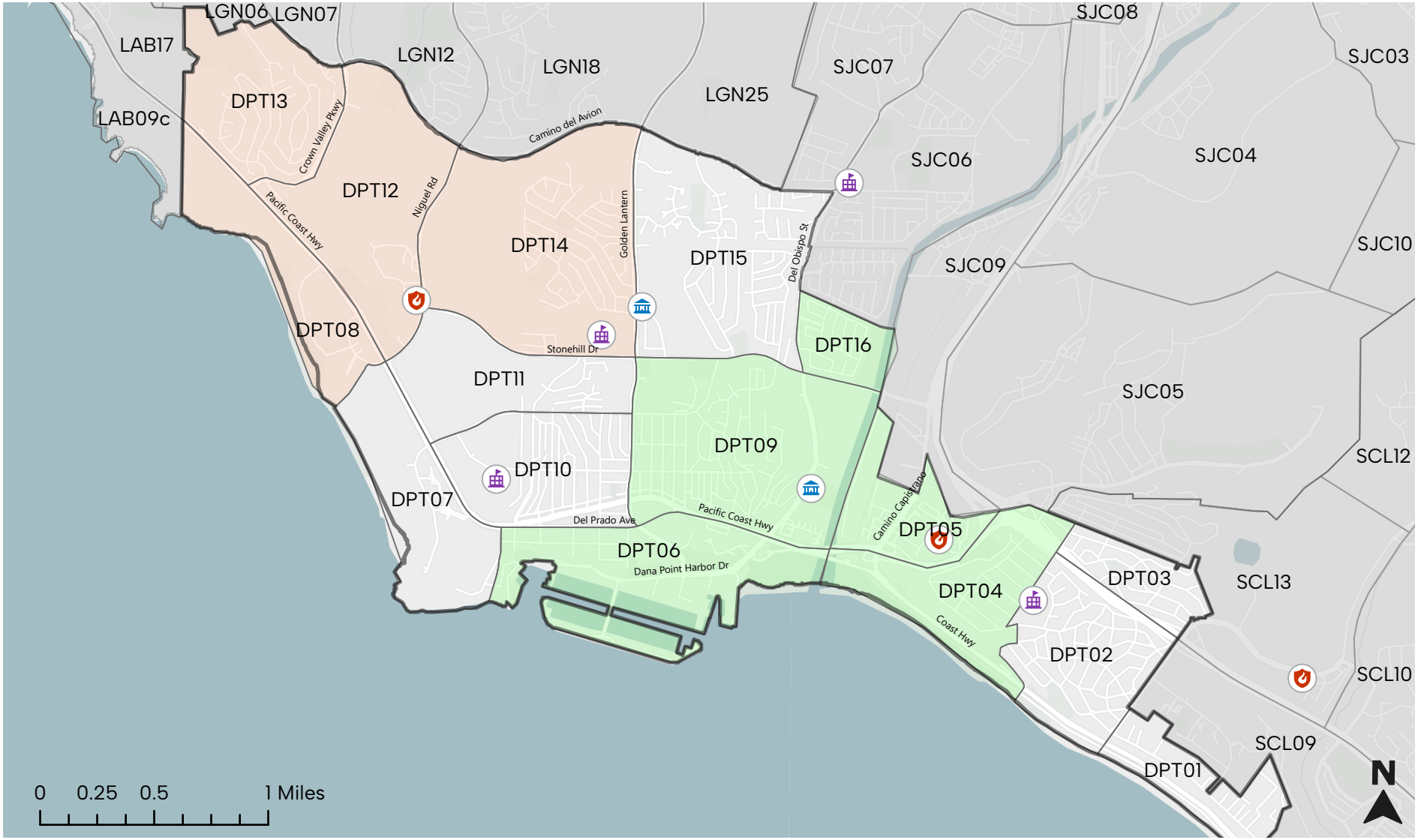
Hazards and Evacuation Planning

The City completed the most recent update of its Local Hazard Mitigation Plan (LHMP) in February 2025 which identified the following hazard zones (hazard maps are shown in the **Public Safety Element**):

- **Liquefaction Zones** are areas of water-saturated soil that are prone to disruption following an earthquake. This includes the San Jaun Creek watershed.
- **Flood Hazard Areas** were identified by the Federal Emergency Management Agency (FEMA) based on the likelihood of an area experiencing a high intensity flood event (specifically a 100-year of 500-year event). This includes the Dana Point Harbor area, the southeastern coast, the San Juan Creek, and the Peppertree Bend area.
- **Tsunami Inundation Zones** are low-lying areas that are prone to potential flooding following an earthquake. This includes the Dana Point Harbor area and the southeastern coast.
- **Fire Hazard Severity Zones (FHSZ)** were identified by the California Department of Forestry and Fire Protection (CALFIRE) based on an assessment of significant wildfire hazards. FHSZ's are located in the northwestern and southeastern portions of Dana Point.
- **Hazardous Materials Release and Radiological Release Events** are hazard events where harmful concentrations of hazardous or toxic substances are released into the environment due to industrial accidents, vehicle crashes, deliberate act, or as a result of another disaster (e.g. earthquake). This could also include nuclear waste release from the decommissioned San Onofre Nuclear Generating Station (SONGS) located to the southeast of the City. Hazardous material and radiological release events may trigger an evacuation in the southeastern portion of the City (e.g. due to a train derailment). City-wide materials release may prompt a shelter-in-place order which would not prompt an evacuation.

The City's Office of Emergency Services, the Orange County Fire Authority (OCFA), and the Orange County Sheriff's Department (OC Sherriff) regularly review evacuation plans and procedures. These plans identify evacuation zones, routes, and procedures used during emergencies. Responsibilities, preplanned response actions, and emergency communication procedures are also summarized. During emergencies, the City and County utilize a wireless emergency alert (WEA) system to send mass alert messages via cell phones to residents, employees, and visitors in a designated area.

Evacuation zones within the City are shown in **Figure 1.**



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Source: City of Dana Point Office of Emergency Services, OC Sheriffs Office, OC Fire Authority

Figure 1

City of Dana Point Evacuation Zones

The City, OCFA, and OC Sheriff have identified the following evacuation routes, which are shown in **Figure 2**:

- Crown Valley Parkway
- Niguel Road
- Street of the Golden Lantern
- Del Obispo Street
- Camino Capistrano
- Coast Highway
- Stonehill Drive
- Pacific Coast Highway

Regionally, the City has evacuation access to two state highways: Interstate 5 (I-5), which connects to San Diego and Northern Orange County, and the Pacific Coast Highway (PCH) (SR-1), which connects to I-5, Laguna Beach, and other northern coastal cities. Adjacent city evacuation routes are also shown in **Figure 2,** which directly connect to the Dana Point evacuation routes**.**

While it is possible that some people, depending upon the nature and scale of the event, may choose to evacuate via walking, bicycling, or other forms of transportation, these are likely to be a small percentage. The analysis in this report evaluates a worst-case condition whereby all persons evacuate via private autos.

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Source: City of Dana Point Office of Emergency Services, OC Sheriffs Office, OC Fire Authority

Figure 2

City of Dana Point Evacuation Routes

Evacuation Scenarios

Three scenarios were selected for analysis in consultation with the City. These scenarios are intended to reflect the varying factors related to type of hazard, location in the City, and available evacuation routes. They do not represent the only possible scenarios. The scenarios represent a hazard that either starts in the identified location in the City or bleeds-over into the City. The scenarios are described below and summarized in **Table 1.**

- **Scenario 1 –** Localized Evacuation due to an incident in the **Southeast Quadrant** of the City **without Road Closures:** This scenario evaluates an event that requires the evacuation of the residents and employees located in the evacuation zones within the FEMA's 100-year flood plain. This scenario represents a potential forecasted flooding event. This scenario assumes all roadways would remain open and that people in the evacuation area will receive an evacuation notification at least 24 hours before the flood.
- **Scenario 2 –**Localized Evacuation due to an incident in the **Southeast Quadrant** of the City **with Road Closures:** This scenario involves the same evacuation zones as Scenario 1; however, it represents a reactive scenario where multiple roads are closed, and remaining roadways are experiencing PM peak hour congestion. This could be triggered by an earthquake or tsunami warning where the risk of low-lying flooding and liquefaction is imminent or by a hazardous materials release event. Roadways may be closed due to damage caused by the hazard or to prevent further catastrophe. This scenario would also require the evacuation of beach visitors as it is assumed this could occur during the peak summer tourism season.
- **Scenario 3 –** Localized Evacuation due to Incident in the **Northwest Quadrant** of the City **with Road Closures:** This scenario evaluates an event that requires the evacuation of residents, employees, and beach visitors located adjacent to the high fire severity zone in the northwest quadrant of the City. This scenario could potentially be triggered by a wildfire event near the Laguna Niguel-Dana Point border that closes northbound Crown Valley Parkway, Niguel Road, and Golden Lantern. The potential path of travel of the wildfire was assumed from the northeast to the southwest. To assess worst-case conditions, we assumed the evacuation would begin during the PM peak hour.

The evacuation routes for the three scenarios are identified in **Figures 3 through 5.**

Table 1: Evacuation Scenarios

Criteria	Scenario 1	Scenario 2	Scenario 3
Description	Incident impacting the SE quadrant of the City with advance notification (e.g. flood)	Incident impacting the SE quadrant of the City without advance notification (e.g. liquefaction, tsunami, hazardous materials)	Incident iimpacting the NW quadrant of the City without advance notification (e.g. wildfire from the NE to the SW)
Evacuation Zones	DPT04, DPT05, DPT06, DPT09, DPT16	DPT04, DPT05, DPT06, DPT09, DPT16	DPT08, DPT12, DPT13, DPT14
Evacuating Groups	Residents Employees[1]	Residents Employees Beach Visitors	Residents Employees Beach Visitors
Major Routes Available	PCH South (towards I-5) PCH North (towards Laguna Beach) Camino Capistrano North Camino Capistrano South Coast Highway South Del Obispo Street North Golden Lantern North Stonehill Drive West NB I-5 On-Ramp at Stonehill Drive	PCH North (towards Laguna Beach) Del Obispo Street North Golden Lantern North Stonehill Drive West	PCH North (towards Laguna Beach) PCH South (towards I-5) Camino Del Avion East Stonehill Drive East Golden Lantern South
Major Routes Not Available	N/A	PCH South (towards I-5) Camino Capistrano North Camino Capistrano South Coast Highway South NB I-5 On-Ramp at Stonehill Drive	Crown Valley Parkway North Niguel Road North Golden Lantern North
Evacuation Time Window	24 hours	PM Peak Hour (4pm-5pm)	PM Peak Hour (4pm-5pm)
Evacuation Destination	Outside the evacuation area	Outside the evacuation area	Outside the evacuation area

Source: Fehr & Peers, 2025.

[1] It is assumed that beach access would be closed when a flooding event is forecasted.

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Figure 3

Scenario 1 Evacuation Zones and Routes

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Figure 4

Scenario 2 Evacuation Zones and Routes

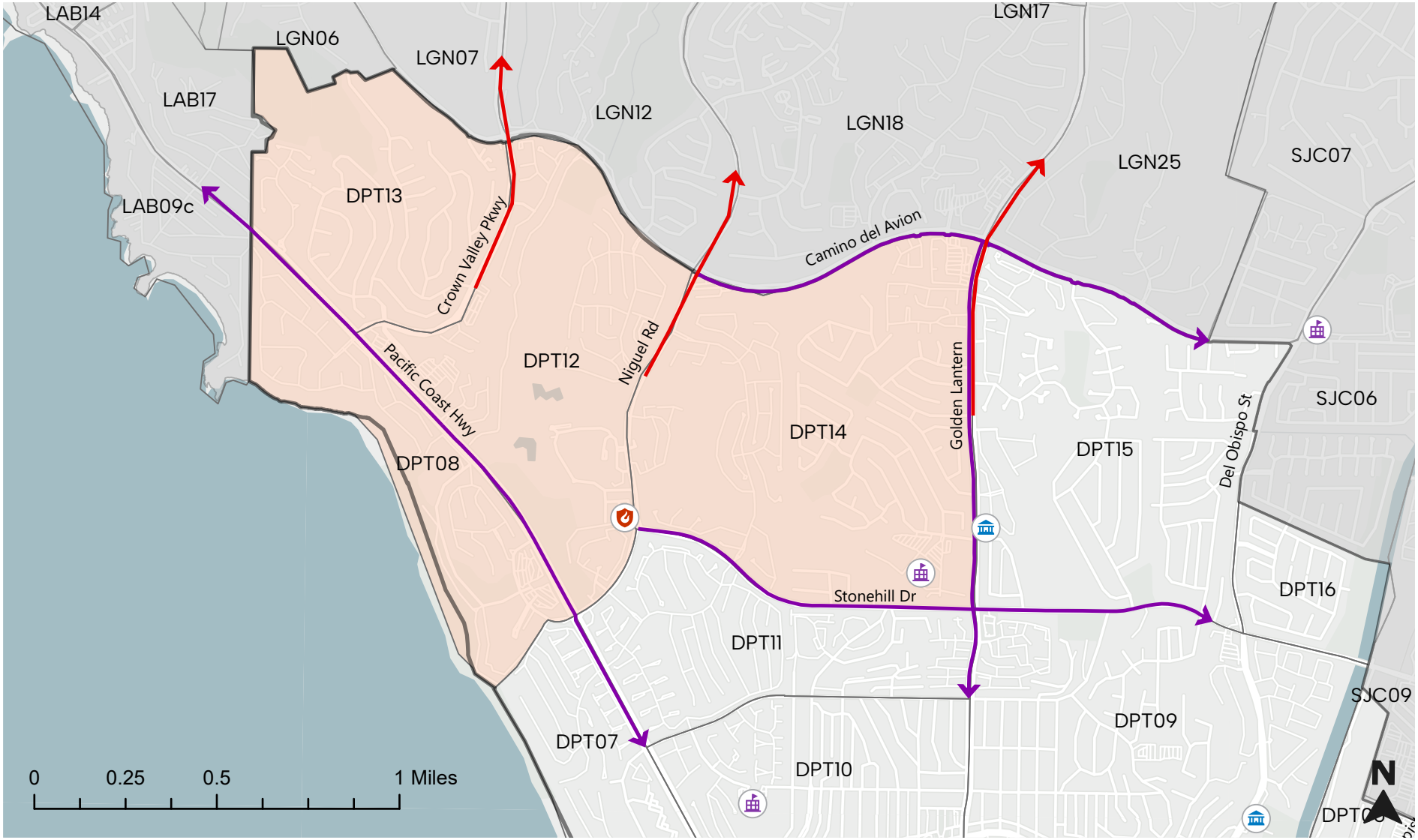

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Figure 5

Scenario 3 Evacuation Zones and Routes

Evacuation Capacity Assessment

Forecasting Methodology

The number of residents, anticipated vehicle ownership per household, and employees in the area were referenced to estimate the number of people and vehicles that would need to evacuate (the evacuation demand). **Table 2** summarizes land use information for the evacuation areas that were extracted from the Orange County Transportation Analysis Model (OCTAM). The OCTAM model has been calibrated to align with the SCAG 2024 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

Table 2: Evacuation Population

Land Use	Existing (2024) Conditions			Future Year (2050) Conditions		
	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Households	4,192	4,192	3,872	4,675	4,675	3,999
Residents	9,539	9,539	8,149	9,506	9,506	7,626
Employees	5,049	5,049	3,637	5,605	5,605	3,617
Visitors (vehicles)	--	1,079	500	--	1,079	500
% of City Service Population Evacuating	27%	27%	22%	26%	26%	19%

Source: OCTAM, 2025. Fehr & Peers, 2025.

Vehicle accessibility was also reviewed using U.S. Census Bureau data to identify the number of households in the area that would potentially have issues during an evacuation event due to limited mobility options. This estimate assumes that the zero vehicle households would require outside assistance. Note: although outside the scope of this assessment, the City may want to consider a program that ensures evacuation of these households is achievable via public transit, emergency responders, or other neighborhood programs. For example, the City can update and communicate specific assembly points across the City for persons without vehicle access, as noted in the City's Emergency Plan. Additionally, it was assumed that some households with more than two vehicles likely would not be able to utilize all of their vehicles during an evacuation event (e.g. homes with three or four vehicles but with only two licensed drivers).

When evaluating employees that would require evacuation, this assessment estimated one vehicle per employee. Visitor vehicle usage was estimated by reviewing parking lot capacity at major parking facilities including the Dana Point Harbor, Doheny State Beach, and Salt Creek Beach.

Scenarios 2 and 3 assume a sudden evacuation during the PM peak hour, unlike Scenario 1 which assumes a 24-hour evacuation notice time. Therefore, a baseline background traffic forecast was

estimated to already be on the roadway network during Scenarios 2 and 3 that would be part of the evacuation demand. Traffic counts from the Existing (2024) PM peak hour and traffic forecasts for the Future Year (2050) Summer PM peak hour were used to reflect background traffic conditions.

There are also evacuation populations that will require special attention and specific emergency operations plans, such as local K-12 schools, congregate care facilities, senior living facilities, and hotels. Visitor vehicles and background traffic account for these additional groups. It is assumed that each of these facilities would require special transit assistance to evacuate safely.

Table 3 and **Table 4** summarize the evacuation demand and evacuation vehicle estimates.

Table 3: Existing (2024) Evacuation Demand

Evacuee Type	Scenario 1 Evac Area	Scenario 2 Evac Area	Scenario 3 Evac Area	Avg Evac Veh/HH	Scenario 1 Evac Veh	Scenario 2 Evac Veh	Scenario 3 Evac Veh
Zero Veh HH	108	108	101	0	0	0	0
One Veh HH	1,219	1,219	1,126	1	1,219	1,219	1,126
Two Veh HH	1,927	1,927	1,777	2	3,854	3,854	3,554
Three Veh HH	696	696	643	2.5	1,740	1,740	1,608
Four+ Veh HH	242	242	225	3	726	726	675
Employees	5,049	5,049	3,637	1	5,049	5,049	3,637
Visitors (Vehicles)	0	1,079	500	1	0	1,079	500
Background Traffic Within the Evacuation Area:					N/A	3,314	4,334
Total Evacuation Vehicles:					12,590	16,983	15,435
Total People Without Access To Vehicles:					246	246	213

Notes:
1. All employees are assumed to drive alone for evacuation as a conservative approach.
2. Visitor vehicle demand was estimated assuming all public parking would be in use during the evacuation scenario.
3. The background traffic within the evacuation areas for Scenario 2 and Scenario 3 represent the vehicles traveling within the evacuation areas when the emergency occurs.
4. Evac = Evacuation, Veh = Vehicles, HHs = Households, Emp = Employees
5. Note: Numbers may not add due to rounding.

Source: Fehr & Peers, 2025

Table 4: Future Year (2050) Evacuation Demand

Evacuee Type	Scenario 1 Evac Area	Scenario 2 Evac Area	Scenario 3 Evac Area	Avg Evac Veh/HH	Scenario 1 Evac Veh	Scenario 2 Evac Veh	Scenario 3 Evac Veh
Zero Veh HH	121	121	104	0	0	0	0
One Veh HH	1,360	1,360	1,163	1	1,360	1,360	1,163
Two Veh HH	2,148	2,148	1,836	2	4,296	4,296	3,672
Three Veh HH	775	775	664	2.5	1,938	1,938	1,660
Four+ Veh HH	271	271	232	3	813	813	696
Employees	5,605	5,605	3,617	1	5,605	5,605	3,617
Visitors (Vehicles)	0	1,079	500	1	0	1,079	500
Background Traffic Within the Evacuation Area:					N/A	3,900	5,180
Total Evacuation Vehicles:					14,012	18,991	16,488
Total People Without Access To Vehicles:					246	246	198

Notes:
1. All employees are assumed to drive alone for evacuation as a conservative approach.
2. Visitor vehicle demand was estimated assuming all public parking would be in use during the evacuation scenario.
3. The background traffic within the evacuation areas for Scenario 2 and Scenario 3 represent the vehicles traveling within the evacuation areas when the emergency occurs.
4. Evac = Evacuation, Veh = Vehicles, HHs = Households, Emp = Employees
5. Note: Numbers may not add due to rounding.

Source: Fehr & Peers, 2025

Evacuation Capacity Methodology

Capacity assessments were performed for the emergency evacuations scenarios, with capacity referring to the maximum traffic flow that can be on a roadway. The *Highway Capacity Manual, 7th Edition* (HCM), was used as a reference to estimate roadway capacity during an evacuation event. Under ideal conditions, a roadway lane can accommodate up to 1,900 vehicles per hour (saturation flow[2]). However, this assessment recognizes that traffic signals along the evacuation routes allocate approximately 50% of their green time to evacuating traffic, and that ideal saturation flow would not be achieved in an evacuation event. As a result, the effective through capacity for evacuation was estimated to be 950 vehicles per lane per hour.

The theoretical total evacuation time is estimated as the total vehicle trips divided by the total outbound capacity. Not all evacuation routes are available to all evacuation zones as some routes may require out-of-direction travel and/or experience congestion from other evacuating vehicles. To identify potential bottlenecks, evacuating vehicles from each evacuation zone were assigned to available routes based on the proximity of the evacuation zone to the route.

Tables 5 through 10 present the evacuation capacity estimates. Given the identified evacuation routes could be partially obstructed, a reduced capacity condition is also analyzed to estimate evacuation time when only half of the outbound capacity is available (475 vehicles per lane per hour).

[2] The saturation flow is the flow rate per lane at which vehicles can pass through a signalized intersection (typically expressed in vehicles per hour), as defined by the Highway Capacity Manual.

Table 5: Existing (2024) Scenario 1 Evacuation Capacity and Time

Route	Evacuation Zone					Background Traffic[1]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[3]
	DPT04	DPT05	DPT06	DPT09	DPT16						
PCH South (to I-5)	98	115				-	213	2	1,900	0.11	0.22
PCH North (to Laguna)	98	116	934	565		-	1,713	2	1,900	0.90	1.80
Camino Capistrano North	196	922				-	1,118	1	950	1.18	2.35
Camino Capistrano South	980					-	980	1	950	1.03	2.06
Coast Hwy South	588					-	588	1	950	0.62	1.24
Del Obispo			1,244	1,129	576	-	2,949	2	1,900	1.55[5]	3.10[5]
Golden Lantern			933	1,411		-	2,344	3[2]	2,850	0.82	1.64
I-5 On-Ramp at Stonehill				1,976	72	-	2,048	2	1,900	1.08	2.16
Stonehill West				565	72	-	637	2	1,900	0.34	0.67
Total	**1,960**	**1,153**	**3,111**	**5,646**	**720**	**-**	**12,590**	**16**	**15,200**	**0.83**	**1.66**

Notes:
1. This scenario does not include background traffic as evacuation is anticipated to take place over a 24-hour period.
2. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
3. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
4. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
5. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Table 6: Future Year (2050) Scenario 1 Evacuation Capacity and Time

Route	Evacuation Zone					Background Traffic[1]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[3]
	DPT04	DPT05	DPT06	DPT09	DPT16						
PCH South (to I-5)	105	155				-	260	2	1,900	0.14	0.27
PCH North (to Laguna)	105	155	1,138	582		-	1,980	2	1,900	1.04	2.08
Camino Capistrano North	211	1,240				-	1,451	1	950	1.53	3.05
Camino Capistrano South	1,053					-	1,053	1	950	1.11	2.22
Coast Hwy South	632					-	632	1	950	0.67	1.33
Del Obispo			1,518	1,164	597	-	3,279	2	1,900	1.73[5]	3.45[5]
Golden Lantern			1,138	1,454		-	2,592	3[2]	2,850	0.91	1.82
I-5 On-Ramp at Stonehill				2,036	75	-	2,111	2	1,900	1.11	2.22
Stonehill West				582	74	-	656	2	1,900	0.35	0.69
Total	**2,106**	**1,550**	**3,794**	**5,818**	**746**	**-**	**14,014**	**16**	**15,200**	**0.92**	**1.84**

Notes:
1. This scenario does not include background traffic as evacuation is anticipated to take place over a 24-hour period.
2. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
3. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
4. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
5. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Table 7: Existing (2024) Scenario 2 Evacuation Capacity and Time

Route	Evacuation Zone					Background Traffic[2]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[4]
	DPT04	DPT05	DPT06[1]	DPT09	DPT16						
PCH North (to Laguna)	1,960	576	838	565		1,038	4,977	2	1,900	2.62	5.24
Del Obispo			1,676	2,258	612	812	5,358	2	1,900	2.82[6]	5.64[6]
Golden Lantern			1,676	1,976		720	4,372	3[3]	2,850	1.53	3.07
Stonehill West		577		847	108	744	2,276	2	1,900	1.20	2.40
Total	**1,960**	**1,153**	**4,190**	**5,646**	**720**	**3,314**	**16,983**	**9**	**8,550**	**1.99**	**3.97**

Notes:
1. DPT06 zone includes visitor vehicles at Doheny State Beach and Dana Point Harbor.
2. The background traffic within the evacuation area for Scenario 2 represents the vehicles traveling within the evacuation area when the emergency occurs. The number of vehicles were estimated based on collected traffic counts in 2024.
3. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
4. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
5. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
6. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Table 8: Future Year (2050) Scenario 2 Evacuation Capacity and Time

Route	Evacuation Zone					Background Traffic[2]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[4]
	DPT04	DPT05	DPT06[1]	DPT09	DPT16						
PCH North (to Laguna)	2,106	775	975	582		1,190	5,628	2	1,900	2.96	5.92
Del Obispo			1,949	2,327	634	930	5,840	2	1,900	3.07[6]	6.15[6]
Golden Lantern			1,949	2,036		970	4,955	3[3]	2,850	1.74	3.48
Stonehill West		775		873	112	810	2,570	2	1,900	1.35	2.71
Total	**2,106**	**1,550**	**4,873**	**5,818**	**746**	**3,900**	**18,993**	**9**	**8,550**	**2.22**	**4.44**

Notes:
1. DPT06 zone includes visitor vehicles at Doheny State Beach and Dana Point Harbor.
2. The background traffic within the evacuation area for Scenario 2 represents the vehicles traveling within the evacuation area when the emergency occurs. The number of vehicles were estimated based on 2050 traffic forecasts.
3. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
4. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
5. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
6. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Table 9: Existing (2024) Scenario 3 Evacuation Capacity and Time

Route	Zone				Background Traffic[2]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[4]
	DPT08[1]	DPT12	DPT13	DPT14						
PCH North (to Laguna)	309	728	2,072		1,169	4,278	3[3]	2,850	1.50	3.00
PCH South (to Dana Point)	1,234	970	366		1,140	3,710	2	1,900	1.95[6]	3.91[6]
Camino Del Avion East		364		469	446	1,279	2	1,900	0.67	1.35
Stonehill Drive East		364		1,878	736	2,978	2	1,900	1.57	3.13
Golden Lantern South				2,347	843	3,190	3[3]	2,850	1.12	2.24
Total	**1,543**	**2,426**	**2,438**	**4,694**	**4,334**	**15,435**	**12**	**11,400**	**1.35**	**2.71**

Notes:
1. DPT08 zone includes visitor vehicles at Salt Creek Beach.
2. The background traffic within the evacuation area for Scenario 3 represents the vehicles traveling within the evacuation area when the emergency occurs. The number of vehicles were estimated based on collected traffic counts in 2024.
3. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
4. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
5. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
6. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Table 10: Future Year (2050) Scenario 3 Evacuation Capacity and Time

Route	Zone				Background Traffic[2]	Total	Outbound Lanes	Outbound Capacity	Evacuation Time (hrs)	Evacuation Time at 50% (hrs)[4]
	DPT08[1]	DPT12	DPT13	DPT14						
PCH North (to Laguna)	337	749	2,102		1,320	4,508	3[3]	2,850	1.58	3.16
PCH South (to Dana Point)	1,347	998	371		1,320	4,036	2	1,900	2.12[6]	4.25[6]
Camino Del Avion East		374		466	560	1,400	2	1,900	0.74	1.47
Stonehill Drive East		375		1,862	840	3,077	2	1,900	1.62	3.24
Golden Lantern South				2,328	1,140	3,468	3[3]	2,850	1.22	2.43
Total	**1,684**	**2,496**	**2,473**	**4,656**	**5,180**	**16,489**	**12**	**11,400**	**1.45**	**2.89**

Notes:
1. DPT08 zone includes visitor vehicles at Salt Creek Beach.
2. The background traffic within the evacuation area for Scenario 3 represents the vehicles traveling within the evacuation area when the emergency occurs. The number of vehicles were estimated based on 2050 traffic forecasts.
3. Evacuation capacity assumes conversion of buffered bike lane into third outbound vehicle travel lane.
4. Reduced capacity evacuation scenario assumes 50% of roadway capacity is available.
5. Travel time = vehicle trips/outbound capacity. Total travel time is a weighted average across all evacuation routes.
6. Values underlined represent the longest travel time associated with a specific route within the scenario.
Source: Fehr & Peers, 2025.

Scenario 1

The estimated average evacuation time in Scenario 1 is approximately 50-55 minutes when the evacuation routes have full outbound capacity under both existing and future conditions. The average evacuation time could increase to one hour and 50 minutes if only half of the outbound capacity is available (due to physical blockages or other hazards). However, based on the distribution of land uses and availability of evacuation routes, Del Obispo Street is assumed to be the primary evacuation routes, extending the maximum evacuation time to approximately 90 to 105 minutes (or three hours to three and a half hours under the half-capacity scenario).

The evacuation assessment assumes that all the vehicles begin their evacuation at the same time. As described in **Table 1**, it is assumed that the evacuation area will be notified 24 hours in advance of a forecasted event (e.g. flood, severe weather). Therefore, the more probable evacuation profile is likely to occur over a longer period due to individual choices regarding evacuations. This scenario does not include the evacuation of visitors, as it is expected that major visitor locations (e.g. Doheny State Beach) would be closed in preparation for the forecasted event.

Scenario 2

The estimated average evacuation time in Scenario 2 under existing conditions is approximately two hours when the evacuation routes have full outbound capacity. The average evacuation time could increase to four hours if only half of the outbound capacity is available. Under future conditions, the average evacuation time increases to approximately two hours and 15 minutes (four and a half hours under the half-capacity scenario). The number of evacuating vehicles includes residents, employees, visitors at Doheny State Beach and the Dana Point Harbor, and vehicles on the roadway when the evacuation order is issued.

Similar to Scenario 1, Del Obispo Street is assumed as the primary evacuation route due to the distribution of land uses within the evacuation zone. Congestion along this route can extend the maximum estimated evacuation time to approximately three hours (or six hours under the half-capacity scenario).

The evacuation assessment assumes that all the vehicles begin their evacuation at the same time. It is likely that evacuation orders will be issued at different times for each zone, facilitating the orderly movement of evacuees. Additionally, the roadways within the evacuation area are assumed to be closed. Inbound traffic is not allowed to enter the area except for emergency vehicles.

Evacuation of visitors requires special consideration as visitors may be staying at hotels where they are unfamiliar with evacuation routes and will be utilizing specific parking lots that may experience additional delay when vehicles need to exit (e.g. Doheny State Beach parking lot, Dana Point Harbor parking structure). Additionally, visitors that utilize the City trolley service may not be able to access their private vehicles for an evacuation. The City should work with lodging operators, the California State Parks, and local businesses to increase awareness of evacuation procedures and provide alternative travel options for visitors including emergency trolley operations.

Scenario 3

The estimated average evacuation time in Scenario 3 is approximately one hour and 30 minutes when the evacuation routes have full outbound capacity. The average evacuation time could increase to nearly three hours if only half of the outbound capacity is available. The number of evacuating

vehicles includes residents, employees, visitors at Salt Creek Beach, and vehicles on the roadway when the evacuation order is issued.

Southbound PCH (towards I-5 and the Lantern District) is assumed as the primary evacuation route, given the distribution of land uses. Congestion along this route would extend the maximum evacuation time to approximately two hours (four hours under the half-capacity scenario).

The evacuation assessment assumes that all the vehicles begin their evacuation at the same time. It is likely that evacuation orders will be issued at different times for each zone, facilitating the orderly movement of evacuees. Additionally, the roadways within the evacuation area are assumed to be closed, except for PCH. Inbound traffic is not allowed to enter the area except for emergency vehicles.

This zone includes multiple hotels and the Dana Hills High School, which will require additional coordination in the event of an evacuation. The City's Office of Emergency Management should work with hotel operators and the Capistrano Unified School District to regularly review evacuation procedures. Potential strategies include:

- Deploying school buses during emergency evacuations and limiting parent/guardian access to the schools, instead reuniting at a designated evacuation center
- Providing evacuation information and route information for visitors in hotel rooms
- Additional training for employees regarding emergency evacuation procedures

Zero-Vehicle Households and Vulnerable Populations

For the remaining residents without access to vehicles or requiring additional assistance, the City should consider the following options to ensure complete evacuation:

- Establish a neighborhood program to link people needing assistance with people willing to assist
- Coordinate with OCTA to provide transit assistance
- Coordinate with Capistrano Unified School District to provide school bus access
- Increased coordination with emergency services personnel to assist with accessibility

Adjacent City Evacuation Considerations

This evacuation assessment focuses on evacuation time estimates for populations residing, working, or visiting within the Dana Point city limits. Real-world evacuation scenarios are not confined to jurisdictional boundaries. In the event of a large-scale emergency (e.g. wildfire in the northwest quadrant of the City also impacting Laguna Beach and Laguna Niguel), adjacent communities may also initiate their own evacuations, leading to additional evacuation vehicle demand on roadways within Dana Point. Depending on the scale of the emergency, this could significantly extend evacuation times due to increased congestion and and/or reduced roadway capacity. The estimates presented here should be viewed as the baseline evacuation timeframe and interpreted with this broader context in mind.

The City shall work with adjacent jurisdictions and county agencies to coordinate evacuation planning and emergency operations. Specific coordination strategies are noted in the Recommendations section.

Additional Considerations

The estimated evacuation times above are based on the theoretical capacity of the system during an event, which assumes roadways operate at 50% lower capacity than non-event conditions due to increased congestion, weather conditions, and potential roadway obstructions. They also only represent the time it takes to evacuate and do not account for other critical phases of the evacuation process, such as hazard detection (when the threat is first identified), official notification, public receipt of the order, and preparation time (the time it takes evacuees to gather their belongings). These phases can extend the total evacuation time; thus, real evacuation time is expected to occur over a longer period than just the above evacuation time.

It should also be noted that the actual evacuation time could be affected by the time-of-the-day, weather, and unexpected roadway incidents during hazard events (i.e. debris, vehicle breakdowns, or power outages) and that could further reduce capacity and increase evacuation time.

Recommendations

Based on the findings of the evacuation assessment and general evacuation best practices, the following policies and actions are recommended for inclusion (where appropriate) in the City's Capital Improvements Program, Safety Element, Local Hazard Mitigation Plan, and/or Emergency Operations Plan to improve emergency evacuation operations. New policies and actions are underlined and denoted in blue text.

Preparation

- Prioritize maintenance along evacuation roadways and improve them as necessary and appropriate to ensure ongoing serviceability.
- Regularly review evacuation procedures, plans, and routes in coordination with adjacent cities, county agencies, and state agencies.
- Partner with the American Red Cross, the County, neighboring cities, public and private schools, and HOAs to provide evacuation and reunification locations and shelters in an emergency
- Identify critical facilities with unique evacuation needs (e.g. care homes, assisted living facilities, childcare centers). Review evacuation procedures with facility operators and incorporate coordination efforts into the City's Emergency Plan.
- Enhance communication with hotels and other locations with higher levels of tourism to inform visitors of evacuation routes and procedures.
- Continue education efforts to the community regarding evacuation routes, evacuation centers, and methods of communication.
- Designate safety zones or shelter-in-place locations as potential places of refuge when evacuation routes become blocked.
- Regularly evaluate the availability and anticipated demand for community facilities to serve as evacuation centers. Designate such facilities and regularly maintain them to comply with industry standards. Establish solar photovoltaic systems and battery storage for evacuation centers and other critical facilities in the event of power outages.
- Maintain and enhance wayfinding, signs, and barriers to direct traffic.
- Coordinate with Caltrans and nearby jurisdictions on developing strategies to address freeway and state highway congestion on I-5 and SR-1 (PCH) which serve as key evacuation routes.
- Coordinate and identify key essentials for a "go bag" to help reduce delays and promote public preparedness.

Evacuation Traffic Management

Traffic management strategies focus on increasing roadway capacity and efficiency to handle high evacuation traffic volumes. A summary of evacuation traffic management strategies is provided in **Table 11.**

Table 11: Evacuation Traffic Management Strategies

Strategy	Description
Emergency Lane Reassignment/ Contraflow Operation	During an emergency event, outbound traffic flow can be prioritized by repurposing inbound lanes for outbound traffic. Additionally, buffered bike lanes and/or parking lanes can be repurposed as an additional travel lane. This can be done with the use of temporary signage, cones, or other barriers. At least one inbound lane should be maintained for emergency vehicles. The use of this strategy may be difficult to employ during a dynamic emergency event and will typically require on-site traffic control at intersections. Potential locations where this could be easily deployed include: • Stonehill Drive (use of striped median between Interna Way and Del Obispo Street) • Street of the Golden Lantern (use of buffered bike lane and parking lane) • Pacific Coast Highway (use of buffered bike lane north of Shoreline Drive)
Intersection Turn Lane Reassignment	At intersections with on-site traffic control, turn lanes can be reassigned with the use of temporary signage or traffic control personnel directing vehicles. This could include restricting turns, closing freeway off-ramps, or converting through lanes to left/right turn lanes. This strategy is especially effective along evacuation routes where most vehicles need to complete a turn.
On-Site Traffic Control	On-site traffic control at key high-volume intersections during evacuation hours can help facilitate continuous outbound traffic and directly manage road/ramp closures or turn restrictions. Emergency personnel can adjust these points in response to traffic build-up and real-time incidents such as unexpected hazards on the roadway. Traffic control also reduces confusion by directing evacuees to the proper evacuation routes.
Evacuation Signal Timing	The City should consider developing evacuation signal timing plans at key intersections to prioritize green time for vehicles leaving the evacuation zone, increasing outbound capacity. This strategy requires a connection to a traffic management center.
Parking Management	Effective street parking management on high hazard days, such as during red flag warnings (increased fire hazard) or other extreme weather events can help maintain clear and unobstructed evacuation routes. Temporary parking restrictions along major evacuation routes prevent parked vehicles from reducing roadway capacity. Advance notifications through alerts, signage, and public announcements, along with strict enforcement by the City's Code Enforcement Division and the Orange County Sheriff's Department can be used to ensure compliance on anticipated hazard days.

Source: Fehr & Peers, 2025.

Fehr & Peers reviewed evacuation routing for the three scenarios and identified key locations where on-site traffic control is recommended during evacuation events, which are listed in **Table 12**. Major evacuation movements are noted which should be prioritized. These recommendations should inform emergency planning; however, they should not substitute on-the-ground decision making during actual emergencies.

Table 12: Intersection Evacuation Traffic Management Recommendations

Scenario	Intersection	Priority Movements	Additional Traffic Control
Scenarios 1 and 2	Del Obispo Street and Stonehill Drive	NB Movements WB Movements	
	Pacific Coast Highway (PCH) and Doheny Park Road Ramps	SB Right Turn NB Right Turn to PCH WB	Close WB PCH Off-Ramp and disable traffic signal (NB/SB through only)
	PCH and Del Obispo Street	NB Movements WB Movements	Close EB and SB movements. Operate signal with NB and WB split phase only
Scenario 3	Niguel Road and PCH	SB PCH Through Movement All Niguel Road Turns	Restrict through movements on Niguel Road. Convert through lanes to turn lanes for added capacity
	Stonehill Drive and Golden Lantern	EB Movements	Restrict WB Left Turn and reallocate time to EB Through
	Camino Del Avion and Golden Lantern	EB Movements	Restrict WB Left Turn and reallocate time to EB Through

Source: Fehr & Peers, 2025.

Evacuation Procedures

- Continue to utilize the wireless emergency alert (WEA) system to communicate emergency conditions and evacuation orders to residents, employees, and visitors within designated hazard areas.
- Issue mandatory evacuation orders and release evacuees by pre-designated zones to manage roadway congestion. Issue mandatory evacuation orders based on characteristics of the hazard, such as flood spread characteristics.
- Coordinate release/timed evacuation with adjacent jurisdictions. In a short-term evacuation event, evacuate the residents that are in the highest amount of danger first.
- Coordinate with Caltrans to manage freeway lanes, restricting vehicles already on the freeway to travel on the inner lanes and reserving the outer lanes for vehicles entering the freeway. Close off-ramps to reduce weaving activity on the freeway during evacuation.
- Use high-capacity public transit vehicles to reduce the use of single occupancy vehicles and increase the number of evacuees.
- Provide evacuees with guidance on safe and efficient routes along with dynamic rerouting information to decrease travel times and reduce congestion on highly traveled roads (for example, GPS-routing systems).
- Monitor traffic using intelligent transportation system (ITS) technology to identify accidents and problem areas, determine the effectiveness of responses, and change responses as

needed.
- Improve coordination between frontline emergency personnel, disaster preparedness teams, emergency communications teams, media sources, and the school district to ensure accurate and clear information is being disseminated.

Education and Training

- Coordinate with the Capistrano Unified School District to build awareness regarding school evacuation protocols which include sheltering in place or evacuating off-site using school buses.
- Provide multilingual public health, emergency preparedness, and evacuation information and signage to residents and visitors through libraries, the City website, radio, schools, hotels, and other social media platforms.
- Develop and distribute educational materials to residents and businesses on evacuation planning and routes and the standards and requirements for vegetation clearance and maintenance of defensible space. Focus outreach on vulnerable populations, such as senior, young children, and individuals with physical disabilities.
- Continue to utilize the Community Emergency Response Training (CERT) program to increase disaster preparedness training to the community at the neighborhood level.
- Conduct regular evacuation training and recommend residents to maintain emergency supplies for at least 3 – 10 days.
- Continue to provide education to city employees through the City's Office of Emergency Management.

Unique Strategies by Evacuation Type

- Populations with Vehicle Access:
    - Ask residents to take one or two cars (based on household size) to reduce the number of evacuating vehicles.
    - Encourage carpooling with neighbors and co-workers.
    - Offer offsite parking facilities to safely store secondary vehicles in advance of an emergency event.
- Children and Unaccompanied Minors:
    - Require schools or childcare centers to develop their own emergency plans, including how to efficiently contact parents and identifying shelter locations.
    - Utilize school buses for time-sensitive evacuation.
- Individuals with Access and Functional Needs
    - Individuals with access and functional needs may include, but are not limited to, individuals with disabilities, older adults or patients in hospital and medical facilities. This group is considered to have no vehicle access for self-evacuation and needs health or medical service.
    - In the planning process, senior and assisted living facilities should work with the City to coordinate evacuation with partner facilities that provide similar services and are located outside of the impact zone to transfer patients to those partner facilities. In addition to ambulances, the City could consider coordinating with the Orange County Sheriff's Department and OCTA to provide vehicle services.
    - For home-stayed individuals with access and functional needs, it is first

recommended to work with neighbors or nearby friends or family for a ride. If not able to get neighborhood assistance, those individuals are recommended to request government assistance by calling 211 or the local police department.

- For aging/disabled residents and or persons with limited financial support may not have a phone (landline and/ or cell phone) to call 211 or 911, or TV and radio, the City should work with the Orange County Sheriffs Department to plan for door-to-door physical attempt with residents and determine if a resident requires immediate assistance to evacuate.
- Encourage and help educate residents on having a "go-bag" ready for unexpected hazards.