Wildfire Mitigation and Fire Safety Report

City of Laguna Beach 505 Forest Ave Laguna Beach, CA 92651 (949) 497-3311

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Transmittal Letter

Dear Community Members:

We live in an extraordinarily beautiful location with an extraordinarily high risk of wildfire. Given this reality, the Wildfire Mitigation and Safety Subcommittee was formed by the City Council in December 2018 with instructions to analyze the wildfire risk in our community and to identify possible actions to be taken to mitigate this risk.

The attached report is the product of six months of intense study and analysis which has led the Subcommittee to two conclusions: (1) it is not possible to reduce the risk of wildfire in the City to the point of insignificance, and (2) there are many tangible steps that we can take to make our community more resistant to wildfire and better able to respond in case disaster strikes and we need to alert and evacuate the City.

The report contains 47 possible actions to be taken to mitigate the risk of a wildfire occurring in the City and to minimize the impact should one occur. These possible actions fall into several primary categories: (1) emergency alert systems, (2) evacuation plans and improvements, (3) fuel modification zones, (4) public infrastructure improvements, and (5) undergrounding utilities. The possible steps are further categorized as short, medium and long-term for implementation.

The final section of the report analyzes the estimated cost of each potential mitigation measure and existing and potential sources of funding for implementation. The estimated cost of the possible actions are: (1) $22.9 million short-term, (2) $9.4 million medium-term, and (3) $135.8 million long-term. Broken down by category the possible the estimated costs are: (1) $1.3 million for emergency alert systems, (2) $0.7 million for evacuation plans and improvements, (3) $15.6 million for fuel modification zones, (4) $68.3 million for public infrastructure and $82.2 million for undergrounding utilities.

There are substantial existing local funding sources that can be applied to implement some of the possible actions. The Subcommittee has identified existing funding sources sufficient to fund all of the short-term possible mitigation measures and portions of the medium-term measures. The implementation of the balance of the medium term and substantially all of the long-term actions will be dependent largely upon receiving grant funding and identifying other sources of local, State or utility company contributions.

The biggest cost item in the report is undergrounding Laguna Canyon Road at an approximate estimated cost of $120 million. The Subcommittee considers the undergrounding of utilities and

related road improvements to Laguna Canyon Road to be among the highest priority actions items. With only three ways in and out of the City, it is critical that improvements be made to Laguna Canyon Road to mitigate fire risk from the utility lines and to provide a safe route of ingress and egress. The Subcommittee strongly urges the community to come together to support a local financing plan to complete these improvements.

While the report focuses primarily on possible actions that the City and the Water Districts can implement, the Subcommittee believes that an essential step to wildfire safety in the City is for the owners of private property to reduce fire risks by properly maintaining vegetation and trees on their property and by taking steps to make older structures more fire resistant through renovations using current building standards and techniques. We also encourage residents to form assessment districts to facilitate utility undergrounding in their respective neighborhoods. The maximum level of wildfire safety can only be achieved through a joint public and private effort.

The Subcommittee wishes to thank the staff members who worked extremely hard to analyze the wildfire risks in the City and to develop the list of possible action items to mitigate the risks. We thank John Pietig, City Manager, Shohreh Dupuis, Assistant City Manager and Director of Public Works, Gavin Curran, Director of Administrative Services, Wade Brown, Undergrounding Program Manager, Mike Garcia, Fire Chief, Jeff Calvert, Police Captain, Jordan Villwock, Emergency Operations Coordinator and Mike Rohde, Wildland Fire Defense Program Manager for their valuable contributions to the report. We would also like to thank Renae Hinchey, General Manager of the Laguna Beach County Water District and Rick Shintaku, General Manager of the South Coast Water District and their staffs for their cooperation in preparing the portions of the report dealing with water systems.

Finally, we thank the City Council for creating the Subcommittee and providing us both with the opportunity to oversee the preparation of this report. We believe that all of the possible action items will benefit our residents and visitors by reducing the risk of a wildfire and improving our response capabilities in the event a wildfire reaches the City. We urge the City Council to implement as many of the possible action items as funding permits.

Very truly yours,

Bob Whalen
Mayor

Sue Kempf
City Councilmember

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Executive Summary

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Summary of Risk Factors

Nearly all of the City of Laguna Beach and its surrounding 16,000 acres of open space are designated by CalFire as a Very High Fire Hazard Severity Zone. This designation underscores the significant wildfire risk in the City. The City has a hilly terrain, significant vegetation that is fuel for wildfires and is subject to hot, dry summer and fall seasons and high-speed Santa Ana winds. These conditions are frequently involved in the most destructive fires in the region. Due to these conditions in the natural environment, the City has a history of wildfires, the most devastating of which occurred on October 27, 1993, when Laguna Beach was struck by a Santa Ana wind-driven fire that consumed over 14,000 acres, caused the evacuation of over 23,000 people, and destroyed 441 homes and structures in less than a day. More recently, the City experienced wildfires in 2015 and 2018 which started in the open space.

The risk created by the natural environment is compounded by certain physical constraints and limitations in the City including:

1993 - City Hall and Fire Station 1

1. Limited Evacuation Routes. There are only three emergency evacuation routes out of town--North Coast Highway, South Coast Highway, and Laguna Canyon Road.

2. Overhead Utilities. Dangerous overhead utility lines and equipment line many of the key evacuation routes and present a potential ignition source for a wildfire.

3. Impaired Access Areas. Many streets are narrow, others are dead-end, and certain areas of the City have only one two-lane egress route which will hamper access by first responders and evacuation by residents.

4. Older Buildings. A substantial percentage of the structures in Laguna Beach were built before the evolution of current wildland-urban interface building and fire safety standards which took effect in 2008, creating a predominance of structures lacking fire resistive characteristics.

5. Impact of Visitors. Laguna Beach receives approximately six million visitors per year, which will complicate evacuation efforts and require planning to consider a much larger volume of evacuees than just the 24,000 residents.

Existing Programs and Resources to Mitigate Risks

To mitigate certain of these wildfire risks and challenges, in recent years the City and other local agencies have taken a number of steps and devoted substantial resources to this effort including the following:

1. Vegetation Management: The City has a well-established vegetation management system in place to create a defensible space perimeter to help protect structures, lives and property known as a fuel modification zone. Approximately 300 acres of fuel modification zones adjoin two-thirds of the City boundary adjacent to the open space. These fuel modification zones were completed over the last 25 years at a cost of approximately $4.5 million and are maintained annually at the cost of $470,000.

Goat Grazing for Fuel Modification

2. Alert and Warning Plan: The City also has a robust alert and warning plan that includes multiple different emergency alerting platforms: Wireless Emergency Alerts, AlertOC, Nixle, Downtown Outdoor Warning System, and Emergency Alert System, that work with evacuation plans to provide guidance for the evacuation of a neighborhood or the entire city. The plans include references and for multiple evacuation scenarios, including wildfire.

3. Public Safety Resources: The City maintains its own Police, Fire, and Public Works Departments and a full-time Emergency Operations Coordinator that are valuable assets during a wildfire emergency. These local resources are augmented by mutual aid agreements with surrounding cities, agencies, counties, and the state. These mutual aid agreements provide access to specialty equipment such as fire-fighting aircraft and heavy equipment that would not be feasible for a small town to own and maintain. The City maintains contracts with specialty contractors for tree removal and heavy equipment which can provide additional resources in an emergency.

4. Improved Water Infrastructure: The City is served by the Laguna Beach County Water District and the South Coast Water District. Since the 1993 Laguna Beach Fire, both water districts have made substantial improvements to their systems that are beneficial for fighting a wildfire such as additional reservoirs, larger piping to increase water flow to fire

hydrants, replacement and additional pump stations to fill reservoirs, and emergency generators to keep pumps operational during a power outage.

Additional Mitigation Measures to be Considered

While the City and other local agencies have been proactive in developing wildfire mitigation measures and plans as described above, recent events demonstrate more must be done. Over the past several years, wildfires have destroyed large parts of the State with unprecedented force due to the effects of drought, changing climate and other conditions, including overhead utilities which caused the most destructive of the wildfires.

In 2017 and 2018, wildfires throughout the State were especially numerous culminating on November 8, 2018, when the City of Paradise was destroyed by the most deadly and destructive fire in California history. In a News Release on May 15, 2019, CalFire announced its conclusion that the Paradise Fire was caused by PG&E overhead utility lines and that the wind-driven fire killed 85 people, destroyed 18,804 homes and structures and burned over 150,000 acres. According to CalFire News Releases on May 25, June 8 and October 9, 2018, in addition to Paradise, there were 17 major wildfires in 2017 which were caused by overhead utility lines and equipment that burned over 190,000 acres, destroyed over 3,200 structures and claimed 22 lives. Ten of the top twenty most destructive fires in California history have been caused by powerline or electrical sources according to Cal Fire's March 14, 2019 listing of the "Top 20 Most Destructive California Wildfires."

In response to the unprecedented destruction from these wildfires and concern about the wildfire risks posed by overhead utilities and other conditions in the City, in December 2018, Mayor Bob Whalen recommended that the City Council approve the formation of a Subcommittee on Wildfire Mitigation and Fire Safety comprised of Mayor Whalen and Councilmember Sue Kempf to work with the City Manager and other staff members to undertake the following tasks:

1. Assess the City's current level of risk and exposure to wildfires;
2. Research and document the programs, rules and regulations currently in place to mitigate wildfire risk and promote fire safety in the City;
3. Identify the current annual cost to the City for its wildfire mitigation measures and fire safety programs;
4. Identify and prioritize additional programs, mitigation measures, staffing and equipment needed to further reduce the risk of loss of life and property damage from wildfires and the cost to implement them;
5. Develop an action plan to implement as many of the items identified in item four above as possible, along with any necessary changes to the City's ordinances, rules and regulations or state law; and
6. Develop a plan to fund the recommended improvements.

To complete these tasks, the Subcommittee has been meeting twice a month since January 2019. As summarized below, the Subcommittee gathered information from other wildfires and was briefed by experts regarding wildfire risks and responses in the State.

On January 23, 2019, Mayor Whalen and City staff toured the City of Paradise. This tour, led by representatives of the Governor's Office of Emergency Services and a CalFire incident commander, provided valuable insight as to how similar Paradise and Laguna Beach are in certain respects and how vulnerable Laguna Beach is to a similar devastating event.

Paradise Fire 2018

Like Laguna Beach, Paradise experiences high wind conditions, has heavy vegetation and has limited evacuation routes and impaired access areas. The Paradise first responders recounted to Laguna Beach representatives that the high winds created a fast-moving fire that jumped miles at a time due to embers traveling ahead of the main fire line. These embers created spot fires all over town, confusing the evacuees as to where the main fire was located. The fire also damaged key communications facilities in the first hours of the fire. These events severely hampered the evacuation efforts. Due to the speed and strength of the fire, first responders stated that all their efforts were focused on evacuation and rescue and not on attacking the fire. Most of the casualties occurred and structures were destroyed before the majority of mutual aid response arrived in town. Paradise had well-prepared evacuation plans and the citizens had even practiced implementing those evacuation plans. It is unclear how or whether these plans or practices affected the evacuation effort on the day of the fire.

It is clear to the Subcommittee and City staff that the events that occurred during the wildfire that destroyed Paradise, could have occurred in Laguna Beach.

In addition to the Paradise trip, certain staff members and the Subcommittee members were briefed on the Woolsey Fire that occurred in Malibu and surrounding areas in November 2018, which burned approximately 97,000 acres and destroyed 1,643 structures. Again, there are parallels to Laguna Beach with Malibu being a coastal community with limited ingress and egress and similar vegetation issues and climate conditions. A key factor there was the unavailability of mutual aid resources early on in a wind driven fire that spread rapidly due to flying embers. Evacuation was hampered due to a delays in having Caltrans open all lanes in an outbound direction on Pacific Coast Highway, a loss of all internet and cell communications, a loss of use of

the City Emergency Operations center which had to be relocated to an adjacent city, and approximately 2,000 downed Southern California utility poles and lines.

The Subcommittee has incorporated certain lessons from the Woolsey Fire in Malibu and the Camp Fire in Paradise into several possible action items outlined in this report.

Finally, the Fire Chief and the City's Emergency Operations Coordinator attended the Governor's Emergency Management Summit in Sacramento on June 3 to learn more about statewide efforts and possible grant funding for wildfire mitigation measures which helped frame certain of the analysis and possible recommendations in this report.

The attached report includes sections regarding fire risk, vegetation management, emergency alert systems, evacuation, resources, infrastructure and funding and provides a series of possible action items to be implemented in three phases based on funding availability. The possible action items are summarized below.

Short Term (1-2 years) (Estimated cost $22.9 million)

Improve the City's public evacuation process and emergency notification by:

- Conducting a neighborhood outreach program
- Installing a City-wide outdoor warning system
- Conducting outreach to community art venues for evacuation procedures
- Developing an interactive evacuation map using global positioning system location
- Preparing an evacuation modeling study
- Installing evacuation route signage
- Installing a traffic signal priority system
- Permanently staging evacuation traffic control devices
- Placing traffic control officers in Dana Point and Newport Beach during evacuation

Continue to expand and maintain the City's defensible space by:

- Streamlining the Coastal Development Permit process
- Streamlining the California Environmental Quality Act process
- Maintaining existing fuel modification zones
- Completing the fuel modification zones at Laguna Canyon and Canyon Acres
- Developing a program of residential fuel modification including: (a) inspection of permit requirements, and (b) enforcement of City codes
- Installing two fire detection cameras
- Installing two helicopter fire hydrant filling stations

Continue to eliminate the risks associated with overhead utilities and equipment and continue to improve fire resistive infrastructure and emergency communication system by:

- Undergrounding Coast Highway between Agate Street and Arch Street
- Undergrounding remaining overhead facilities on Coast Highway
- Undergrounding Bluebird Canyon Drive from Cress/Bluebird to Rancho Laguna Road
- Undergrounding Park Avenue Between Wendt Terrace to 500 feet easterly of St. Anns Drive
- Planning a temporary safe refuge and egress route for Bluebird Canyon and investigate widening of Bluebird Canyon Drive from the reservoir to Rancho Laguna Road
- Adopting and considering enhancements to the 2019 California Building Code
- Improving the fire resistivity of water pump and generator enclosures
- Installing an emergency generator at Pump Station 3 in South Coast Water District
- Creating fuel modification zones around telecommunications/radio facilities at the Moorhead and Ridge Reservoir sites
- Improving emergency radio reception at Moorhead Reservoir site
- Investigating fire resistive improvements to other emergency radio facilities
- Identifying an alternate emergency operations center location

Medium Term (3-5 years) (Estimated cost $9.4 million)

- Completing the fuel modification zones at Park Avenue
- Completing the fuel modification zones in the remaining one-third of the City
- Maintaining any new completed fuel modification zones
- Considering alternative staffing models to reduce fuel modification zone construction/maintenance costs
- Investigating incentives to improve the wildfire resistance of existing residences
- Developing a plan to augment current procedures for non-safety resources on Red Flag Days

Long Term (+5 years) (Estimated cost $135.8 million)

- Undergrounding Laguna Canyon Road between the electrical substation westerly of Canyon Acres to El Toro Road
- Undergrounding Glenneyre Street between Laguna Avenue and Thalia Street, and between Calliope Street and Arch Street
- Creating a fuel modification zone to improve the survivability of communications cables along Laguna Canyon Road
- Maintaining the fuel modification zones after 2030
- Increasing the capacity of reservoirs 2B and 3B in South Coast Water District
- Maintaining or improving water system inter-connections with other agencies
- Developing plans and incentives to underground utilities through assessment districts

Funding

To implement the above possible action items, significant funding is required. Table 1 of the report summarizes the possible action items listed above which are further described in the report. The possible action items are grouped into Short-Term, Medium-Term, and Long-Term. The placement in these categories considers both the time necessary to plan and prepare for each action item and the time necessary to develop and implement a financial strategy for funding. In addition, Table 1 summarizes the available funding and identifies potential revenue sources for consideration by the City Council and in certain cases the voters.

Tables A and B below summarize the funding need and a conceptual financial plan to fund the possible action items listed in the Short grouping of Table 1. Conceptual funding strategies for all possible action items are detailed in the Funding section of the report.

TABLE A: FUNDING NEED FOR ITEMS CATEGORIZED AS SHORT-TERM AND EXISTING FUNDING SOURCES

		New Requests	
		One-Time	Ongoing
A	Short-Term Category Requests: New One-Time Cost	$ (6,650,000)	
B	Short-Term Category Requests: New Ongoing Annual Cost		(285,000)
C	Short-Term Category Requests: Funded	(14,760,000)	
D	Short-Term Category Requests: Grant Eligible	(14,000)	
E	Short-Term Category Requests: Water Districts	(1,250,000)	
	Total Short-Term Category Requests	($22,674,000)	($285,000)

		Approved Funding Sources	
F	Use of existing Rule 20A credits for undergrounding Projects	$10,000,000	
G	Fuel Modification Grant and City Matching Contribution for ongoing maintenance	4,675,000	
H	Potential Water District Funding	1,250,000	
I	Existing Capital Improvement Program	85,000	
	Total approved funding sources for Short-Term Category	$16,010,000	$0
	Funding Gap (New Requests less Existing Funding Sources)	($6,664,000)	($285,000)

TABLE B: CONCEPTUAL FINANCIAL PLAN TO CLOSE FUNDING GAP FOR ITEMS CATEGORIZED AS SHORT-TERM

		Possible Funding Sources	
		One-Time	Ongoing
	Funding Gap for Short-Term Category Requests	**($6,664,000)**	**($285,000)**
1	Grant Funding for Neighborhood Outreach Program	14,000	
2	Available General Fund Available One-Time Funding in FY 2020-21	137,000	
3A	Measure LL FY 2019-20	1,000,000	
3B	Measure LL FY 2020-21	1,000,000	
4A	Reprogram FY 2019-20 Additional Pension Contribution	1,000,000	
4B	Reprogram FY 2020-21 Additional Pension Contribution	1,000,000	
5	Available Fund Balance Measure LL Fund	320,000	200,000
6	Restructure Side Fund Loan Repayment to repay Street Lighting and Utility Fund in FY 2019-20, and FY 2020-21	1,500,000	
7	Contribution from the Parking Fund repaid from mid-year savings if available	693,000	85,000
	Total Available Funds	6,664,000	285,000
	Short-Term (Shortfall)	$0	$0

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Table 1 – Possible Action Items

The following table of possible action items is sorted into three groups, “Short,” “Medium,” and “Long” based on the anticipated duration of the funding effort.

- ✓ **Short:** Existing one-time and ongoing revenues and re-prioritization of current appropriations.
- ✓ **Medium:** Increases in existing revenues sources, such as parking fees; speculative grants programs with matching funds from exiting Capital Improvement Funds, Street Lighting Funds or other existing City Funds; and considering other external sources if available.
- ✓ **Long:** Tax increases; speculative grants program; the creation of new districts; and other external sources.

Each item in the Short grouping is believed to be important enough that the items were not prioritized. The items in Medium and Long have been assigned a priority number and are listed in numerical order.

Each item is identified by a Row Number which is coordinated with the possible action item descriptions in the body of the report.

The rows are color coded by the descriptor in the Category column.

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Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
1	A	Notification	Conduct a neighborhood outreach program	Establish an outreach program which holds pop-up events in each neighborhood with neighborhood specific information/flyers that provide evacuation information, alert and warning systems, and disaster preparedness. The program will require annual follow-up.	Short		$20,000		$14,000			Police
2	A	Notification	Install a City-wide outdoor warning system	A city-wide outdoor warning system could be activated locally or remotely to pass along emergency notifications as an additional layer of notification, in the absence of functioning cell towers, or to those who do not have a mobile phone or have self-registered in AlertOC/Nixle.	Short	$1,200,000	$50,000					Police
3	A	Notification	Conduct outreach to community art venues for evacuation procedures	Conduct outreach to community art venues to communicate and enhance planning for emergency evacuation during a wildfire. The program will require annual follow-up.	Short		$5,000					Police
4	A	Notification	Develop an interactive evacuation map using global positioning system location	Develop an emergency planning website with an interactive evacuation map that would show the location of the device by global positioning system location and communicate the evacuation orders for that location.	Short	$50,000						Police
5	A	Evacuation	Prepare an evacuation modeling study	Prepare an Evacuation Time Estimate study through a consultant with specialty computer modeling that will identify potential bottlenecks in traffic, a reasonable capacity of our roadways, areas where two-way traffic must be maintained, and if a staged evacuation could be possible. Also, the study will identify areas with impaired access and investigate options for creating additional egress routes. Parameters could include, but not be limited to: areas with multiple streets but only one egress route, dead-end streets, the number of parcels served by the egress route, adjacency to the wildland urban interface, feasibility of construction, use during a wildfire evacuation and feasibility for routine use. In addition, the study will identify areas where temporary safe refuge areas may need to be considered.	Short	$200,000						Police
6	A	Evacuation	Install an evacuation route signage	Simple evacuation signage could be installed quickly and could speed evacuation for visitors and residents unfamiliar with certain parts of town.	Short	$20,000						Public Works
7	A	Evacuation	Install a traffic signal priority system	Install a remote controlled traffic signal system that would allow all outbound traffic signals on Coast Highway and Laguna Canyon Road to be green to expedite evacuation. The system is typically used for Fire and Police Code 3 responses, and has the capability to use a low priority mode for transit vehicles. Permitting, coordination, and cooperation must be obtained through Caltrans. Dana Point and Newport already have a compatible system, but it is not set up for evacuation.	Short	$300,000						Public Works
8	A	Evacuation	Permanently stage evacuation traffic control devices	Having barricades and signage permanently stored at key evacuation points will allow limited staff to immediately implement the first phases of evacuation plans. Potential locations could include Coast Highway at Crown Valley Parkway, Coast Highway at Newport Coast Drive in the parking lot for the park, and Laguna Canyon Road at El Toro Road.	Short	$150,000						Public Works

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Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
9	A	Evacuation	Place traffic control officers in Dana Point and Newport Beach during evacuation	Work with Newport Beach, Dana Point and OC Sherriff to agree on a plan to place traffic control officers in Dana Point and Newport Beach could improve evacuation efforts by keeping evacuees moving through intersections by following the directions of a traffic control officer instead of the programmed traffic signal. Possibly annual stand-by costs.	Short	Mutual Aid	Mutual Aid					Police
10	A	Fuel Mod	Streamline the Coastal Development Permit process	Obtain a multi-year, multi-phase, "blanket" permit for the creation of fuel modification zones.	Short	$30,000						Fire
11	A	Fuel Mod	Streamline the California Environmental Quality Act process	Streamlined California Environmental Quality Act permitting would allow for faster expansion of fuel modification zones and ease the maintenance requirements.	Short	$60,000						Fire
12	A	Fuel Mod	Maintain existing fuel modification zones	Maintain all existing or grant funded fuel modification zones until 2023	Short			$475,000				Fire
13	A	Fuel Mod	Complete the fuel modification zones at Laguna Canyon and Canyon Acres.	In 2018, the City received a State Grant for 55 acres creating fuel modification zones in Laguna Canyon and Canyon Acres. Work to be completed over a 3 year period with City funding 25% of the projects at a total cost of $4.2 million. Annual maintenance cost is accounted for in other items in the matrix	Short			$4,200,000				Fire
14	A	Fuel Mod	Develop a program of residential fuel modification including: (a) inspection of permit requirements, and (b) enforcement of City codes	The city does not currently inspect for fuel modification maintenance compliance with conditions of approved developments or enforce all of the City codes that would improve residential fuel modification maintenance. A program could have two functions (a) an inspection process would require that fuel modification requirements that were in place at the time of granting the permit for construction are maintained throughout the life of the structure; and (b) an enforcement process to improve residential fuel modification efforts throughout town. On-going cost for new employee as a Defensible Space Inspector to enforce existing codes and permits. In addition the inspector could review conditions on all properties in town and assist with outreach and citzen disaster preparations.	Short	$40,000	$200,000					Fire
15	A	Fuel Mod	Vegetation management in Bluebird Canyon	Bluebird Canyon contains over 400 residences with dense vegetation and large trees surrounding the area which creates a significant fire risk. Investigate an aggressive plan to trim or remove 49 large eucalyptus trees and thin vegetation along roads and homes appropriately.	Short			$85,000				Fire
16	A	Infrastructure	Install two fire detection cameras	Install two fire detection cameras in the Laguna Beach area: one on the Ridge Trail Reservoir and one at Signal Peak as a part of the High-Performance Wireless Research and Education Network system. The cameras will provide visual access to the wildland surrounding Laguna Beach and be operational in 2019. The installation will be funded by Southern California Edison with cooperation from the water district and telecommunications companies. The City will incur a small annual cost for power and connectivity.	Short		$10,000					Fire
17	A	Infrastructure	Install two helicopter fire hydrant filling stations	Install two RASS (Remotely Activated Snorkel Site) helicopter filling stations; one in the northerly end and one in the southerly end of town. Exact locations to be determined.	Short	$150,000						SCWD and LBCWD

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Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
18	A	Infrastructure	Undergrounding - Coast Highway between Agate Street and Arch Street	Coast Highway is a primary evacuation route. Coast Highway Utility Underground District 2019-1 was formed on April 16, 2019 as a Rule 20A project using Rule 20A credits for funding. Estimated completion – 2023	Short			$5,000,000				Public Works
19	A	Infrastructure	Plan a temporary safe refuge and egress route for Bluebird Canyon	Prepare a plan for creating temporary safe refuge area for the Bluebird Canyon area and examining routes for creating an additional egress route from the area using the results from the evacuation study.	Short	$50,000						Police
20	A	Infrastructure	Underground- Coast Highway remaining overhead facilities	Coast Highway is a primary evacuation route. This project is intended to remove all remaining overhead facilities along Coast Highway outside of District 2019-1 . A new underground utility district is being designed to be funded by Rule 20A credits and presented to the City Council for consideration within the year. Projected completion in 2024. The overhead street light system wiring needs to be addressed in a future street lighting project in the Capital Improvement Program.	Short			$5,000,000				Public Works
21	A	Infrastructure	Adopt the Revised 2019 California Building Code Section 7A	The City has previously adopted the California Building Code 7A regarding wildfire protection. New Code standards for increased fire resistiveness of structures are being proposed by the state this year. Direct staff to review the proposed codes changes and revisions regarding wildfire protection and propose amendments to the changes if needed to better protect Laguna Beach before the new codes are adopted in January 2020.	Short	No new cost, currently a Community Development function.						Community Development
22	A	Infrastructure	Improve the fire resistivity of water pump and generator enclosures	Harden all water pump and generator enclosures with non-combustible roof, ember resistant vents, underground electric service, and fire resistant alarm notification installations.	Short					$1,000,000		SCWD and LBCWD
23	A	Infrastructure	Install an emergency generator at Pump Station 3 in South Coast Water District	Water storage capacity is maintained through a series of pumps lifting water up to the reservoirs. To help ensure that sufficient water is available during a wildfire emergency, which could cause, or be associated with a power outage, it is recommended to install a standby emergency generator with automatic transfer switch that serves Pump Station 3 in the South Coast Water District.	Short					$250,000		SCWD
24	A	Infrastructure	Create fuel modification zones around telecommunications/radio facilities at the Moorhead and Ridge Reservoir sites	Telecommunication facilities are a vital link in notification, and coordination efforts during a wildfire. The telecommunications facilities at the Moorhead Reservoir and the Ridge Reservoir have exposed antennas and wiring that are subject to heat and fire damage. Even if the radio equipment and the power supply are housed in fire resistive enclosures, the antennas and their wiring could fail from the huge flame lengths of a wind driven fire. Therefore, it is recommended to rely on a fuel modification zone of approximately 100 feet in width to protect this equipment.	Short	$350,000						Fire
25	A	Infrastructure	Improve emergency radio reception at Moorhead Reservoir site	Develop a plan with Orange County Communications who operates the radio system to improve radio coverage and emergency communications from the radio repeater antenna at the Moorhead Reservoir site. Cost is for the plan only; radio or structural improvements are unknown at this time.	Short	$50,000						Police
26	A	Infrastructure	Investigate fire resistive improvements to emergency radio facilities	Conduct an analysis of fire hardening/structural improvements to the Moorhead Radio Repeater to improve the survivability of the radio equipment and a similar study for the radio equipment at Fire Station #3	Short	In-House Hours TBD						Fire

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Table 1 - Possible Action Items

Wildfire Mitigation and Fire Safety Report

Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
27	A	Infrastructure	Identify an alternate emergency operations center loocation	It is possible that the Emergency Operations Center (EOC) at City Hall cannot be used due to fire and evacuation. Begin a process to identify a suitable off-site location, possibly out of town, to serve as an alternative EOC. Lease agreements, duplicate equipment, communications connections, and materials may be needed.	Short	In-Kind Agreement	In-Kind Agreement					Police
28	A	Infrastructure	Undergrounding - Bluebird Canyon Drive from Cress/Bluebird to Rancho Laguna Road	This section of Bluebird Canyon Drive is the only access to approximately 400 parcels easterly of this area. Poles and wires blocking the road could significantly delay emergency access or evacuation. This relatively short distance of undergrounding could be a low cost and high benefit project.	Short	$2,300,000						Public Works
29	A	Infrastructure	Undergrounding - Park Avenue Between Wendt Terrace to 500 feet easterly of St. Anns Drive	This short section of Park Avenue is a primary, but not the only, access to approximately 600 parcels easterly of this area. Poles and wires blocking the road could significantly delay emergency access or evacuation of the neighborhood which includes schools and school related traffic. This relatively short distance of undergrounding could be a low cost and high benefit project.	Short	$1,700,000						Public Works
30	** Costs in 2019 Dollars, estimates are based on available information at the time of the report and do not represent a commitment of funds*			**Column Totals**		**$6,650,000**	**$285,000**	**$14,760,000**	**$14,000**	**$1,250,000**	**$0**	
31				**Total of "Short" Possible Action Items**								**$22,959,000**
32	1	Fuel Mod	Complete the fuel modification zones at Park Avenue	In 2018, the City applied for a State Grant for 15 acres for creating fuel modification zones near Park Avenue. Work to be completed over a 3 year period with City funding 25% of the project total cost of $1,000,000. Annual maintenance cost is accounted for in other items in the matrix	Medium	$250,000			$750,000			Fire
33	2	Fuel Mod	Maintain the fuel management zones completed between 2023 and 2030	Assumes that additional Fuel Modification Zones (FMZ) have been completed by 2023 and accounts for the increase in maintenance to maintain the FMZs until 2030	Medium		$425,000					Fire
34	3	Fuel Mod	Complete the fuel modification zones in the remainder of the City	Wildfire defensive fuel breaks have been established around 2/3 of the City, the remaining 1/3 should be completed. Permitting and construction costs are included in the estimate. Once the Fuel Modification Zones (FMZ) completely surround the City, expand the FMZ to the full scope of the FMZ program. This study is in progress and estimated to be completed in June 2019. Estimated cost of $8 million with 75% grant funded	Medium	$2,000,000			$6,000,000			Fire
35	4	Infrastructure	Investigate incentives to improve the wildfire resistance of existing residences	Bringing existing residences into conformance with modern building codes related to wildfire would significantly improve the residences resistance to wildfire. Investigate incentives that will encourage improvements to be made at a future date, such as reduced permit fees or certain types of improvements may be exempt from the design review process.	Medium	Cost TBD						Community Development

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Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
36	5	Resources	Develop a plan to augment current proceedures for non-safety resources on Red Flag Days	Develop a plan to have additional non-safety resources available during a red flag warning. Evaluate the cost/benefit of paying for additional resources for use just in case there is a wildfire as there are approximately 3 to 4 Red Flag Events per year totaling 10 to 14 Red Flag Warning days per year and additional staffing would need to be in place 24 hours per day. The plan would include an escalation schedule for staff, contractors, and equipment to be on-call, or on-site and based on the severity and duration of the warning and events in surrounding areas. Revise the Red Flag Warning Plan and Checklist appropriately and identify the funding needed to support any recommendations made in the investigation.	Medium	In-House Hours TBD	Event Specific Cost TBD					Police
37	6	Fuel Mod	Consider alternative staffing models to reduce fuel management zone construction/maintenance costs	Conduct a study of alternate staffing for hand clearance of fuel management zones. Consider establishment of a City funded fire and fuels hand crew if costs can be reduced and services increased.	Medium		Annual Cost/Savings TBD					Fire
38	** Costs in 2019 Dollars, estimates are based on available information at the time of the report and do not represent a commitment of funds*			**Column Totals**		**$2,250,000**	**$425,000**	**$0**	**$6,750,000**	**$0**	**$0**	
39				**Total of "Medium" Possible Action Items**								**$9,425,000**
40	1	Infrastructure	Undergrounding - Laguna Canyon Road between the electrical substation westerly of Canyon Acres to El Toro Road	Laguna Canyon Road is a primary route for evacuation and emergency/mutual aid resources to access the City. The poles and wires are adjacent to 16,000 acres of open space creating a fire risk from failures due to wind or vehicle impact. Pole or wire failures from a wildfire could also block emergency access. In addition, the failure of communication wires could disrupt emergency communications through loss of fiber optic cable damage. The costs to underground the utilities may require significant road improvements to allow for the underground facilities. The costs represent approximately $60 million for undergrounding and $60 million for roadway improvements that may need to be grant funded. Develop a cost/benefit analysis regarding potential City acquisition of Laguna Canyon Road from Caltrans to facilitate undergrounding and resolve ongoing debates with Caltrans about how to manage the road.	Long				$60,000,000		$60,000,000	Public Works
41	2	Fuel Mod	Maintain the fuel management zones completed after 2030	Assumes that all Fuel Modification Zones (FMZ) have been completed and accounts for the increase in maintenance to maintain the FMZs in perpetuity	Long		$1,100,000					Fire
42	3	Infrastructure	Increase the capacity of reservoirs 2B and 3B in South Coast Water District	Increase the storage capacity of each reservoir by approximately one million gallons for a total of two million gallons. This increase will reduce the reliance on pumps and increase the quantity of water provided by the gravity pressurized system during a wildfire emergency.	Long					$4,000,000		SCWD
43	4	Infrastructure	Maintain or improve water system inter-connections	LBCWD and SCWD should consider improving the water system inter-connections between themselves and the adjacent water districts such as Irvine Ranch Water District and Moulton Niguel Water District for efficient use during a wildfire emergency.	Long					Cost TBD		SCWD and LBCWD

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Row No.	Priority	Category	Opportunity	Action	Duration Based on Funding Efforts	New One Time Cost	New Ongoing Annual Cost	Funded	Grant Eligible	Water Districts *	Potential Local Funding	Responsible Party
44	5	Infrastructure	Undergrounding - Glenneyre Street between Laguna Avenue and Thalia Street, and between Calliope Street and Arch Street	Glenneyre Street is a high volume roadway that serves as a secondary emergency access and evacuation route parallelling Coast Highway and serving a significant portion of the City. Poles and wires blocking the road could significantly delay emergency access or evacuation.	Long						$8,200,000	Public Works
45	6	Infrastructure	Create a fuel modification zone to improve the survivability of communications cables along Laguna Canyon Road	The majority of wireless sites for telecommunications and data access, and direct wired data access (such as City Hall) are provided through fiber optic connections that are suspened between utility poles along Laguna Canyon Road. These fiber optic cables could be destroyed by the first impacts of a wildfire resulting in a significant loss of communication abilities. It is recommended to consider options to improve the survivability of the communications cables during a wildfire. This option recommends providing a sufficient fuel modification zone to protect the cables. Another option not presented could be undergrounding the cables. A cost estimate for fuel modification is provided.	Long	$600,000			$1,900,000			Fire
46	7	Infrastructure	Undergrounding - Neighborhoods	Work with the participative neighborhoods to develop plans and incentives to underground utilities through assessment districts and other methods. Continue to pursue the acquisition of Rule 20A credits from other citys and counties to expedite undergrounding.	Long	Cost TBD						Public Works
47	** Costs in 2019 Dollars, estimates are based on available information at the time of the report and do not represent a commitment of funds*			**Column Totals**		**$600,000**	**$1,100,000**	**$0**	**$61,900,000**	**$4,000,000**	**$68,200,000**	
48				**Total of "Long" Possible Action Items**								**$135,800,000**
49				**Grand Totals (Short + Medium + Long)**		**$9,500,000**	**$1,810,000**	**$14,760,000**	**$68,664,000**	**$5,250,000**	**$68,200,000**	**$168,184,000**

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Section 1
Fire Risk

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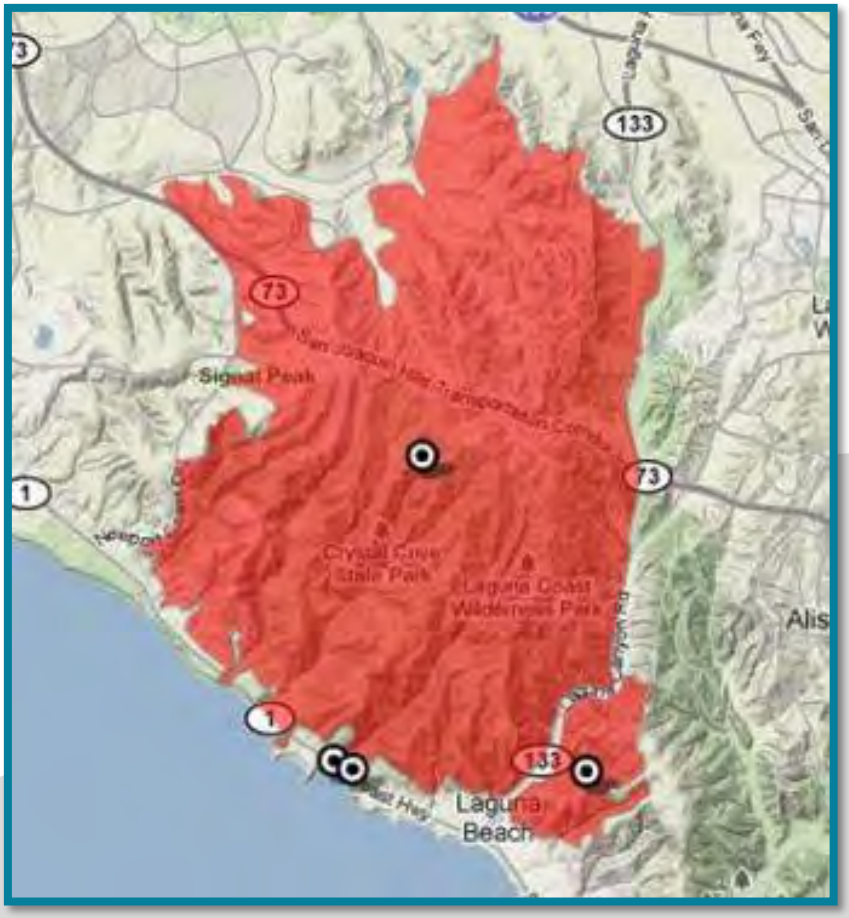
Significant Fire History

The worst wildfire in the history of the City of Laguna Beach occurred during strong Santa Ana winds on October 27, 1993. The fire started, just before noon, near the lakes in upper Laguna Canyon and moved rapidly towards the coast at a rate of over 6 miles per hour. Embers carried by the wind ignited spot fires well ahead of the main fire. Emerald Bay was the first area to be struck with over 40 homes ignited. The fire jumped Laguna Canyon Road at Big Bend and threatened areas that were still evacuating, blocking both civilian escape routes and firefighter access. The fire command post at Thurston School was burned over, as the fire ignited over 300 homes in the Skyline-Tahiti area. The fire began late in a siege of large wildfires that struck Southern California, which limited the mutual aid resources that were available to respond to the fire. By nightfall, over 14,437 acres and 441 structures had been burned and over 23,000 evacuated. The fire became one of the top 25 highest insured losses in United States history, a record this fire dubiously held for over 25 years.

The City has a history of significant wildfires, with other major fires occurring in 2018, 2016, 1983, 1979, 1968, 1955, and 1932. However, only minimal structural loss occurred in these fires.



Map of 1993 Laguna Fire

1993 Laguna Fire

Many of the elements that make Laguna Beach a desirable place to live, work, and visit also expose our residents and visitors to many different risk factors related to wildfire. These factors include environmental risks posed by the surrounding open space and weather conditions; risks involved in noticing and evacuating our residents and visitors of a developing event; risks from the lack of resources to deploy key firefighting or support functions; and infrastructure risks from the terrain and the layout of our streets to the materials that structures are constructed of. Some of these risks are summarized in this section and this report further examines these elements and proposes opportunities for improvement.

Environmental Risk Factors

The City is surrounded by approximately 16,000 acres of coastal sage scrub ecosystem that is protected by State, regional or local park, or conservancy programs. This creates a wide area of wildland-urban interface for the areas of the City that abut these wildlands. The entire region is subjected to hot dry summers, including occasional Santa Ana winds sometimes reaching hurricane strength. This combination of brush and high winds can lead to a recurrent opportunity for a high-intensity wildfire.

Defensive fuel breaks have been established around two-thirds of the City; however a need exists to address the remaining one-third of the City that has limited or no defensible space, including many neighborhoods in South Laguna.

Evacuation and Emergency Alert System

Evacuation may be necessary during a wildfire event and that evacuation may be complicated by erratic wildfire behavior that could block ingress and egress to some of the highly vulnerable areas in town. There are only three major escape routes from the City, and these routes have proven to become heavily congested during wildfire evacuation. Areas of safe-refuge are absent in much of the City, and this is of particular concern for ridge-line neighborhoods which may face congested evacuation routes or evacuation blocked by fire movement. These neighborhoods include Bluebird Canyon, upper Nyes Place, Arch Beach Heights, and Top of the World.

Heavy visitor populations, especially in the art venues, and access challenged or functional needs populations challenge wildfire evacuations and require directed effort to improve and communicate evacuation planning and communications. While the City has a robust emergency plan and notification system, it lacks ability to notify via outdoor warning systems in the majority of the City.

Pageant of the Masters

As seen in the Camp Fire that destroyed the town of Paradise, electronic means of emergency alert and communication can fail due to fire damage. Laguna Beach has a limited outdoor warning system that should be expanded to a citywide system.

Public safety radio systems have a single point of failure in the Moorhead Repeater Site. Coverage issues have been identified for the repeater located here, and study is needed to identify potential system engineering solutions to improve radio systems reliability, and fire defense improvements are needed for the physical site to harden this critical facility against loss.

Resources

During a wildfire event, it is likely that resources will be limited and that response efforts will rely on mutual aid from surrounding communities. Police/Fire Dispatch staffing should be increased during critical fire weather.

Infrastructure

Terrain and Infrastructure Factors

The terrain and the street layout in Laguna Beach leads to difficult street access, which can delay first responders or firefighting resources. Many streets are narrow, others are dead-end or one-way, and certain groups of streets have only one egress route. The location of many of these areas are adjacent to open space and considered a part of the wildland urban interface.

Staging and Temporary Safe Refuge

Major evacuation relocation facilities or mutual aid staging/command activities are frequently required to be located outside of the City due to the lack of space in town to stage hundreds of vehicles and thousands of people. Fire Department assessments also indicate that as a last resort measure, facilities suitable for use as a temporary safe refuge are very limited in the City.

Overhead Utilities

Approximately 45% of the electrical utilities in the City are provided by overhead poles and wires creating wildfire ignition hazards. Downed lines obstruct escape routes and hamper first responders when damaged during by wildfire or high winds. Loss of critical power supply during a wildfire can also hamper emergency alerting.

Structural Construction

Approximately 90% of the City's land area is designated under State law and local ordinance as Very High Fire Hazard Severity Zone, and by the California Public Utilities Commission as either Tier 2 or 3 moderate and extreme wildfire threat areas. While these designations are relatively recent, the significant majority of the structural development in Laguna Beach (94 %+) occurred

before evolution of current wildland-urban interface building and fire safety standards, creating a predominance of structures lacking fire resistive characteristics.

This condition suggests that many older structures, even blocks from the immediate wildland interface, may be subject to ignition from ember cast during major fires. The photo below shows the Coffee Park neighborhood of Santa Rosa that was destroyed in 2017 by the Tubbs Fire, even though it was blocks away from the fire front.

Coffee Park neighborhood after the Tubbs Fire
City of Santa Rosa, 2017

Structural loss to the Camp Fire
City of Paradise, 2018

Water System

Despite significant water system improvements following the 1993 wildfire, water system improvement needs persist and may affect the ability to maintain fire flows in some hillside neighborhoods of the South Laguna area of the City. Further investigation may be required to evaluate water storage capacity, pumping station adequacy, water piping delivery systems and systems redundancy.

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Section 2 Vegetation Management

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Vegetation Management

Vegetation management reduces the fuel that a wildfire consumes, thereby reducing the size and intensity of a fire in the area that has been treated. The City of Laguna Beach maintains 292 acres of vegetation management areas to reduce its high fire risk. In combination with 25 acres of privately maintained vegetation management areas, the total of 317 acres provides approximately two-thirds of the City with defensible space.

Two types of vegetation management are conducted by the City of Laguna Beach. The first type is "Fuel Modification Zones" (FMZs) which provides defensible space fuel breaks for structures and escape routes within the City's wildland-urban interface. These vegetation treatments reduce thermal output from wildfire, enabling active structural defense and public evacuation. FMZs protect large areas of structures through an area-wide mitigation treatment and reduce potential fire behavior near structures and escape routes up to 75%.

A second, but different type of fuel modification, uses fire resistive design and yard landscaping to prevent individual structural ignition during wildfire. This landscape procedure is required as part of new structural development within hazard areas. This program only applies currently to new construction.

Selection of Vegetation Management Treatment Methods

The City has conducted extensive analysis of the treatment options available for vegetation management. The methods evaluated were:

- Hand modification
- Mechanical removal
- Grazing
- Chemical and biological methods
- Controlled burn

The analysis included cost, suitability to habitat and terrain, risk and sustainability. Of the methods reviewed, only hand modification and grazing suit the City's needs. The analysis revealed:

1. Mechanical removal was not possible given the steepness of terrain. Equipment is limited to slopes less than 30%, and most slopes where treatment must be accomplished exceed that factor. Mechanical methods also remove more biomass by design than other methods and are unsuitable for use with the presence of sensitive species and environmental protections required within the City. Mechanical methods also were incompatible with geologic stability issues presented on many slopes within the City.

2. Chemical/biological methods of defoliation were deemed unsuitable for application within Laguna Beach watersheds and in proximity to both human populations and sensitive species. Minor herbicide use for spot control of invasive plants was however recognized as beneficial and is used.

3. Controlled burn applications were rejected due to risk for loss of control, smoke impacts, and resulting geologic instability. The old and dense vegetation on steep slopes creates dangerous burning conditions regardless of wind or humidity. An example of the danger is the 2018 fire in Aliso Canyon which burned aggressively despite high relative humidity, low winds and low temperatures destroying approximately 175 acres. A significant risk of loss of control would exist under many controlled burn conditions and threaten the very homes that need the protection provided by a defensible space. Smoke impacts to nearby neighborhoods cannot be managed. Controlled burning consumes all vegetation, including sensitive species, and leaves steep slopes subject to erosion and adverse geologic conditions.

These findings then limit the City's treatment methods to either hand modification or grazing, with the latter preferred when appropriate due to cost. Hand treatment expense is roughly $28,000 per acre, while grazing costs average $550 per acre.

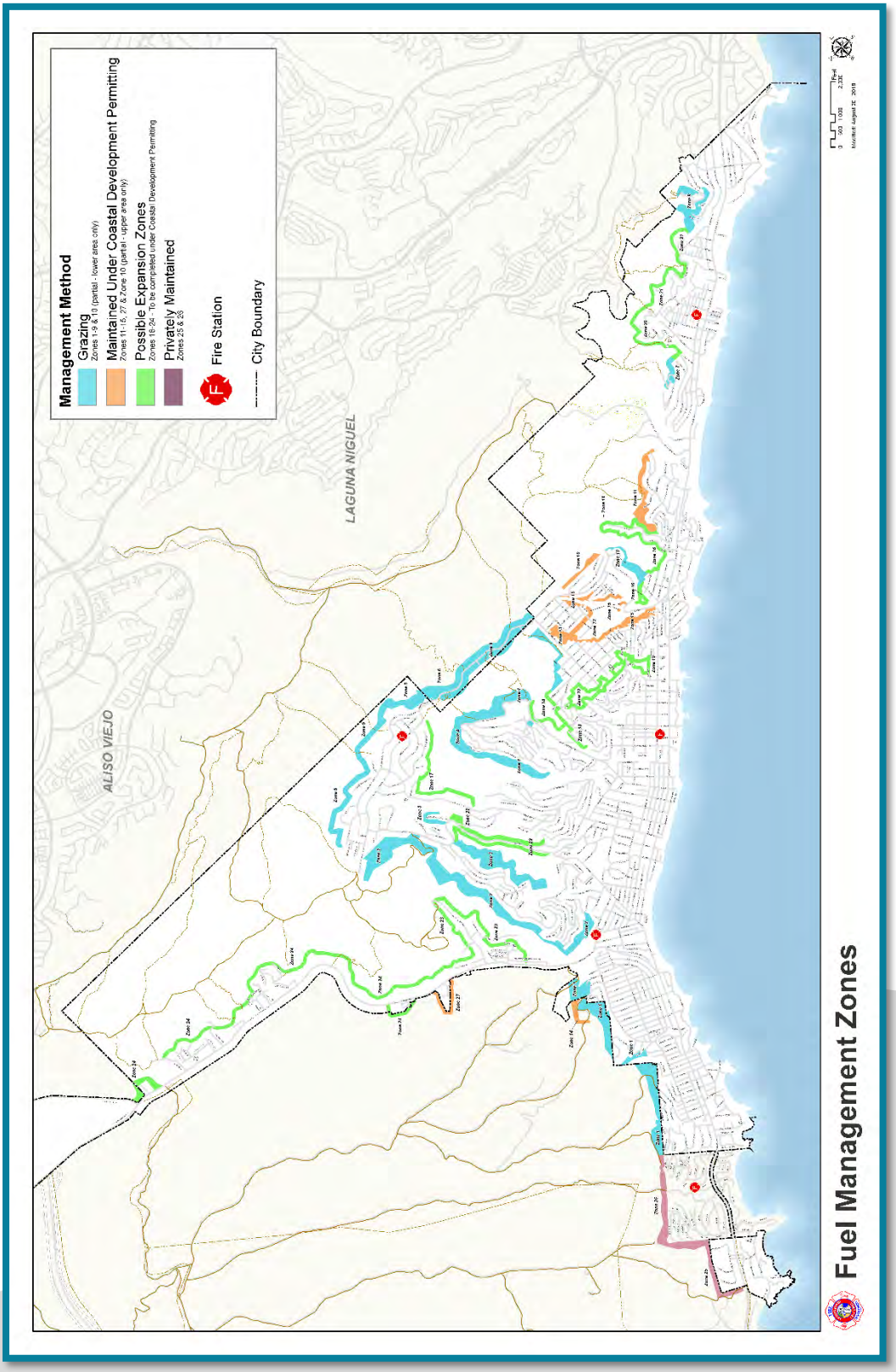
CDP Hand Crew Treatment

Nuisance Abatement Goat Grazing Treatment

Fire Mitigation Zone Program Essentials

FMZs are accomplished by three primary styles for 21 FMZs totaling 317 treated acres:

- Coastal Development Permit (CDP): This style is treated by strict environmental standards as identified by the CDP and the City's Fuel Modification Treatment Protocol. These areas are treated by either grazing or hand removal of hazardous fuels. 49 acres are treated by this method currently



Types of methods to create fuel management zones

- Public Nuisance Abatement law: This style includes areas which have a long history of treatment by goat grazing. These sites are typically less critical habitat, but still receive environmental review and oversight. 243 acres are currently treated by this method
- Two areas are privately maintained in the north portion of the City by HOA mowing (25 total acres)

Therefore, two-thirds of the City is currently provided a defensible space by the 317 treated acres at an annual maintenance cost of $473,716.

Fire resistant home survived 1993 Laguna Fire, Skyline-Tahiti neighborhoods

Laguna Canyon Cal Fire Grant area

Hobo Canyon Expansion Study area

Weed Abatement Program

The Laguna Beach Fire Department conducts an annual weed abatement program per the requirements of City Ordinance 12.12. The purpose of the program is to identify and eliminate public nuisances that can create a fire hazard or could be injurious to the health and welfare of residents in the vicinity. The Ordinance targets weeds and invasive plants and requires them to be removed from the property.

The term "weeds" includes any of the following: (1) weed which bear seeds of a downy or wingy nature; (2) sagebrush, chaparral, and other brush or weeds which attain such large growth as to become, when dry, a fire menace to adjacent improved property; (3) weeds which are otherwise noxious or dangerous; (4) poison oak and poison ivy when the conditions of growth are such as to constitute a menace to the public health; and (5) dry grass, stubble, brush, litter, or other flammable material which endangers the public safety by creating a fire hazard.

The term "invasive plants," all of which are non-native and are injurious to native vegetation and that may be a flood or fire hazard, shall include the following: (1) Artichoke thistle; (2) Arundo; (3) Pampas grass; (4) Fountain grass; and (5) Cape ivy.

The Fire Department maintains a list of private and city owned parcels that have historically been identified as requiring weed abatement. This list is updated annually with parcels removed that have been developed or parcels added that are identified as requiring weed abatement. This annual process begins in January with an updating of the previous year's list, and a resolution requiring abatement is then placed before the City Council. Notices are sent out to private property owners requiring abatement. The Fire Department follows up with inspections verifying compliance. For private properties that do not comply, the department abates the weeds and / or invasive plants with contract crews. The program concludes in August with the City Council passing a resolution to then charge the cost back to the property owners through an assessment on the tax bill.

Vegetation Management Challenges

One-third of the City is not protected by a fuel modification zone. The City receives a significant benefit from defensible space provided by the fuel modification zones already created. Approximately 25 years of obtaining permit approvals and $4.5 million in creation and maintenance costs still leave approximately one-third of the City without a defensible space. Completion of the fuel modifications zones around the City should be a priority.

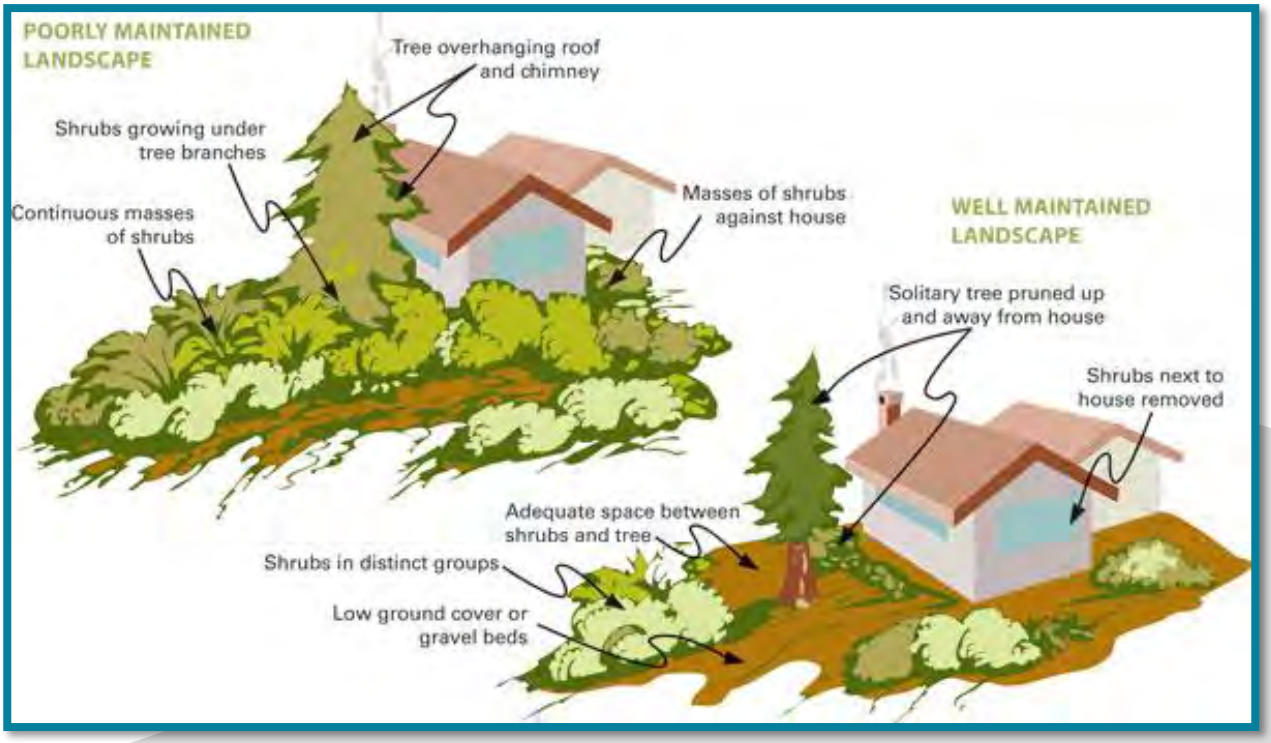
Under the City's Building and Fire Code, new construction must meet the current wildland-urban interface standard for construction in high-hazard areas. This standard was significantly upgraded in 2008 and requires the development to include private property landscape fuel modification

measures. While compliance is strong during construction, no inspection is currently conducted by the City to ensure enforcement of permit requirements over the longer term. Anecdotal information would suggest compliance is frequently not maintained with permit requirements.

Bluebird Canyon Vegetation and Tree Management

Bluebird Canyon is home to over 400 residences and is surrounded by dense coastal sage scrub vegetation. Large trees line Bluebird Canyon Drive, particularly in the narrowest section of the only road into and out of the canyon. This poses an ongoing risk of efficient ingress and egress. The dense vegetation makes Bluebird Canyon a beautiful area but creates a significant wildfire risk.

Specific areas of concern are the 29 large Blue gum eucalyptus trees in the area near the intersection of Bluebird Canyon Drive and Rancho Laguna Road, the 20 large Blue gum eucalyptus trees along Bluebird Canyon Drive. Some of these trees are very close to power lines. In addition, dense vegetation lines the roadways in the canyon. Many opinions exist regarding the proper methods of vegetation management necessary to mitigate this risk, including extensive trimming or removal of the trees.



Private Property Landscape Maintenance

Vegetation Management Possible Action Items

A table is provided on page 11 that lists the possible action items documented in this report. The table includes categorical and cost information in one location for easy reference. The title and description for the possible action items for vegetation management from that table are summarized below:

Streamline the Coastal Development Permit process - Row # 10
A Coastal Development Permit is required for the creation of a fuel modification zone. Obtaining individual permits consumes a lot of time and duplication of effort. It may be possible to obtain a multi-year, multi-phase, "blanket" permit for the creation of fuel modification zones to speed up the process.

Streamline the California Environmental Quality Act process - Row # 11
The City has been obtaining permit approvals for fuel modification zones for approximately 25 years. To allow for faster expansion of the fuel modification zones and ease the maintenance requirements a streamlined California Environmental Quality Act permitting process should be investigated.

Maintain the existing fuel modification zones - Row # 12
The City maintains the fuel modification zones that border approximately two-thirds of the City. This possible action item accounts for the maintenance of all existing fuel modification zones until 2023.

Complete the fuel modification zones at Laguna Canyon and Canyon Acres - Row # 13
In 2018, the City received a State Grant for creating fuel modification zones in Laguna Canyon and Canyon Acres covering 55 acres. The grant will provide approximately 75% of the cost with the City funding 25% at a total cost of $4 million. The work will be completed over a 3-year period with the annual maintenance cost accounted for in other possible action items in Table 1.

Develop a program of residential fuel modification including: (a) inspection of permit requirements, and (b) enforcement of City codes - Row # 14
The City does not currently inspect for fuel modification maintenance compliance with conditions of approved developments or enforce all of the City codes that would improve residential fuel modification maintenance. A program could have two functions (a) an inspection process would require that fuel modification requirements that were in place at the time of granting the permit for construction are maintained throughout the life of the structure; and (b) an enforcement process to improve residential fuel modification efforts throughout town. The program would require a new employee as a Defensible Space Inspector to enforce the existing codes and permits. In addition, the inspector could review conditions on all properties in town and assist with outreach and citizen disaster preparations.

Vegetation management in Bluebird Canyon – Row # 15
Bluebird Canyon contains over 400 residences with dense vegetation and large trees surrounding the area which creates a significant fire risk. Some of these trees are very near power lines. This possible action item is to investigate a plan to trim or remove approximately 49 large eucalyptus trees and thin vegetation along roads and homes appropriately.

Complete fuel modification zones at Park Avenue - Row # 32
In 2018, the City applied for a State Grant to create fuel modification zones near Park Avenue covering 15 acres. The grant will provide approximately 75% of the cost with the City funding 25% at a total cost of $1,000,000. The work will be completed over a 3-year period with the annual maintenance cost accounted for in other possible action items in Table 1.

Maintain the fuel modification zones completed between 2023 and 2030 - Row # 33
The table of possible action items include the creation of additional Fuel Modification Zones (FMZ) in the future. This item assumes that the FMZs have been completed by 2023 and accounts for the increase in maintenance to maintain the FMZs until 2030.

Complete the fuel modification zones in the remainder of the City - Row # 34
The City has wildfire defensive fuel breaks established around two-thirds of the City. It is recommended that the remaining one-third be completed. A study to complete this work is in process and should be completed in 2019. Completing the remaining Fuel Modification Zones is estimated to cost $8 million with approximately 75% of that cost being grant funded. Permitting and construction costs are included in the estimate.

Consider alternate staffing models to reduce fuel management zone construction and maintenance costs – Row # 37
Contract labor is typically used for the hand clearance of fuel management zones. It might be possible to save on labor costs if this work was conducted by City employees as a dual-purpose fire and fuels hand crew. Consider this type of alternative staffing if costs can be reduced and services increased.

Maintain the fuel modification zones after 2030 - Row # 41
This item is for the maintenance in perpetuity of all of the Fuel Modification Zones that have been created in the City as of 2030. The cost is represented as the increase in the maintenance costs beyond 2030.

Section 3
Emergency Alert System

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Emergency Alert System

During any emergency, alerting and informing the residents and visitors of the City is a high priority. The City of Laguna Beach has a robust alert and warning plan that includes multiple different emergency alerting platforms: Wireless Emergency Alerts (WEA), AlertOC, Nixle, Downtown Outdoor Warning System, and Emergency Alert System. See Table 2.

Each of the emergency alerting platforms has inherent strengths and weakness associated with the specific system which are presented below:

Sample Emergency Alert Message

Wireless Emergency Alerts (WEA)

Reaches people with mobile phones who are physically in the geographic radius of the warning.

Strengths:

- Currently 90% of Americans have a mobile phone[1]
- Reaches mobile phones in the geographic radius of the warning

Weaknesses:

- Only works if cell towers are operational and functioning
- Does not reach people without mobile phones
- Only communicates in English and Spanish
- City-wide test occurred March 6, 2019. While the overall outcome of the test was successful, challenges were discovered with data loading speed on the hyperlink contained in the WEA message

AlertOC

Reaches people who have self-registered and those with listed and unlisted phone numbers with home or business addresses in the geographic radius of the warning.

[1] https://www.statista.com/statistics/201184/percentage-of-mobile-phone-users-who-use-a-smartphone-in-the-us/

Strengths:

- Reaches listed and unlisted phone numbers in the geographic radius of the warning
- Currently 3,453 of the 17,560 unique numbers in AlertOC are self-registrants, equaling 19% of the overall data
- The City participated in the regional AlertOC test in September 2018 and plans to also participate in the upcoming test in September 2019

Weaknesses:

- Does not reach people who do not have a landline or have not self-registered their mobile phone
- Does not reach visitors in the target geographic radius

Nixle

The Nixle system is branded as our "Community Alert System" which is used for traffic alerts, road closures, community events, along with layered emergency messages. Nixle reaches people who have self-registered into the system and have a mobile phone or email address.

Strengths:

- Currently we have 11,376 unique numbers in Nixle. These could be individuals who live, work, or have an interest in Laguna Beach
- Used weekly to communicate traffic accidents, community events, or urgent emergency messages

Weaknesses:

- Doesn't reach people who have not registered or do not have a mobile phone or email address
- Nixle is a broad notification system that sends messages to zip codes, so neighborhood targeted messages are not possible

Outdoor Warning System

Reaches people within the range of the speakers/sirens and people without mobile phones or landlines.

Strengths:

- Use of sirens and loudspeakers to communicate the message
- Reaches people without the use of personal electronic devices

- Does not rely on smart phones, cellular antennas, electrical power from the grid, or communication lines
- Annual test conducted in March 2019
- Used during the Valentine's Day Storm in 2019 to instruct businesses to put their flood gates into place

Weaknesses:

- The current system is limited to the Downtown business area, Main Beach, and Heisler Park area. *See Table 2* for coverage area of existing system
- Doesn't reach people who are outside of the range of the Outdoor Warning System or who are hearing impaired

Images from 1993 Laguna Beach Fire

Emergency Alert System (EAS)

Reaches people watching television or listening to AM/FM radio in the geographic area (County-wide only) of the warning.

Strengths:

- Reaches people watching television or listening to the radio
- EAS on television is captioned per Federal Communications Commission (FCC) rules
- Tested monthly by the County of Orange

Weaknesses:

- Does not reach people who are not watching television or listening to AM/FM radio
- Does not reach those who do not understand English

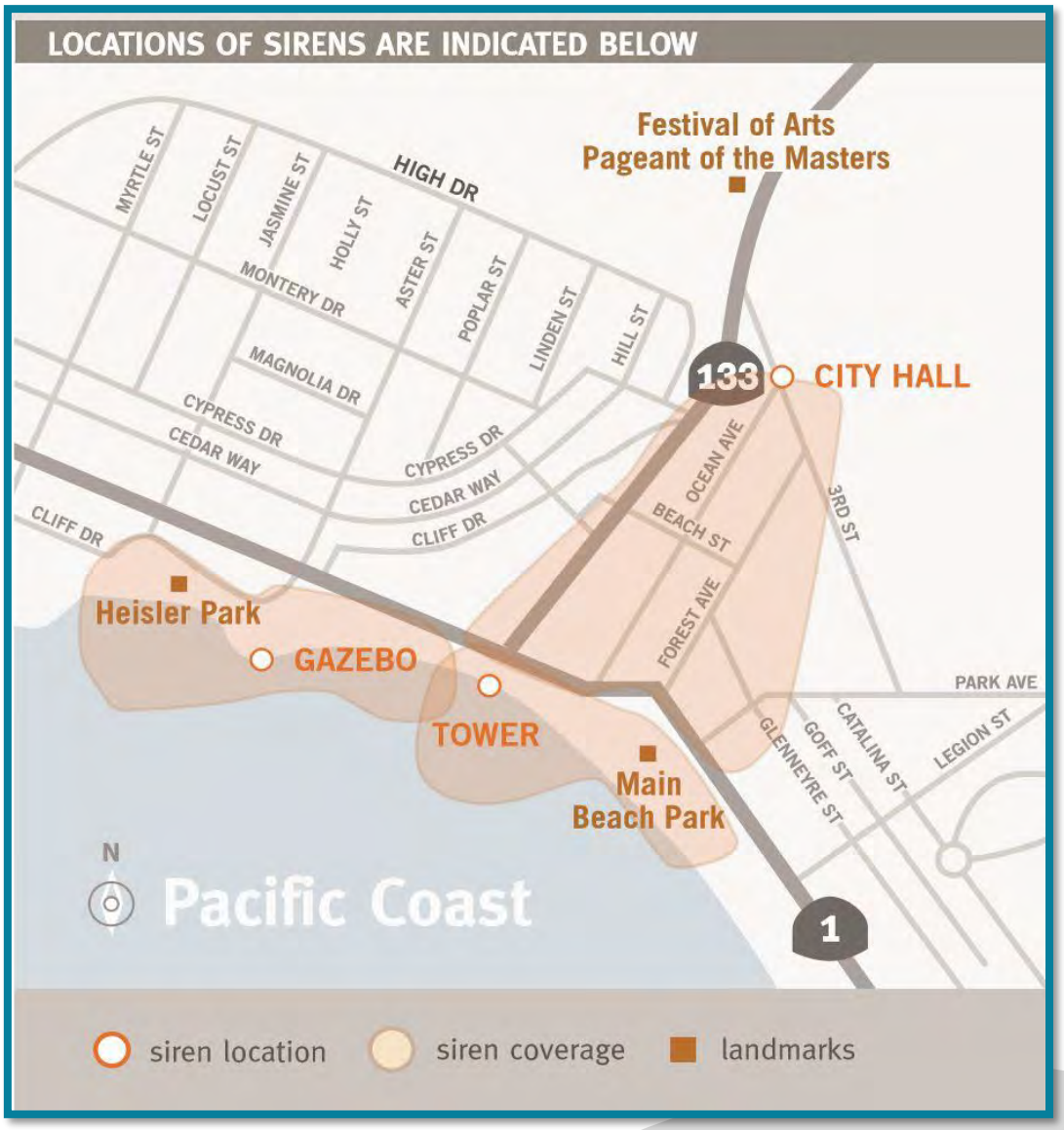
Table 2 – Alert & Warning Tools

The following table provides information on when each alert and warning system might be used, who controls the activation, the methods used to communicate the message, and who the system does and does not reach.

System	When to use	Activation contact	Methods	Who it reaches	Who it does not reach
Emergency Alert System (EAS)	• The situation is imminent or occurring now • The situation is life threatening to the public • The public must be provided with safety instructions • Other warning methods would be ineffective	• OCSD Control One • National Weather Service (NWS)	• Television • AM/FM Radio • NOAA Weather Radio	• People watching TV or listening to AM/FM radio in the geographic area of the warning (EAS on TV is captioned per FCC rules)	• People who are not watching TV or listening to AM/FM radio • People who do not understand English
Wireless Emergency Alert (WEA)	• The situation is imminent or occurring now • The situation is life threatening to the public • The public must be provided with safety instructions • Other warning methods would be ineffective	• Emergency Coordinator • Acting Emergency Coordinator • Support Services Supervisor • OCSD Control One	• Text message on WEA enabled mobile phones	• People with a mobile phone who are physically in the geographic radius of the warning	• People who do not have a mobile phone • People who do not understand English

System	When to use	Activation contact	Methods	Who it reaches	Who it does not reach
AlertOC	• The situation is imminent or occurring now • The situation has the potential to be life threatening to the public • The public must be provided with safety instructions	• Emergency Coordinator • Acting Emergency Coordinator • Support Services Supervisor • Public Safety Dispatch • OCSD Control One	• Text message • Phone Call • E-mail	• Listed and unlisted numbers with a home or business address in the geographic area of the warning • Those who have self-registered additional contact information: Text, mobile phone, and email address	• People that do not have a landline phone and have not registered a mobile phone or email in AlertOC • People who do not understanding English well and have not registered another language preference • Visitors in the warning area who do not have a landline or have not registered their contact information
Nixle	• There is public interest in the situation • Can be injunction with other communication tools	• Police Records • Public Safety Dispatch • Emergency Coordinator • Acting Emergency Coordinator	• Text message • E-mail	• People who have self-registered into the system	• People who have not self-registered in the system

Table 3 – Outdoor Warning System Coverage



Existing Outdoor Warning System Coverage

Emergency Alert System Challenges

Information on these systems is available on the city website, printed materials, and social media. All systems are tested annually. *See Table 4*. In the event of a disaster, every tool will be used to alert and warn all members of the public in the affected area[2].

[2] CA Senate Bill 833 Section 1 (m) – Guidelines Alert and Warning Systems

Table 4 – Alert and Warning Explained

Sample Emergency Alert Flyer

However, the alert and warning systems are only effective if the public is aware of them. Modern technology provides efficient ways of sending out alert information. To make certain that everyone is aware of these alert opportunities, some additional outreach is required.

During the visit to the City of Paradise, California, the first responders recounted problems communicating emergency messages to residents due to cell phone towers being compromised by the wildfire. In total, 17 cell towers were burned over and became inoperable. The ability to send emergency messages is so critical that even when cell towers are not functioning it is necessary to have redundant systems to ensure proper notifications are made.

Emergency Alert System Possible Action Items

A table is provided on page 11 that lists the possible action items raised in this report. The table includes categorical and cost information in one location for easy reference. The title and description for the emergency alert system possible action items from that table are summarized below:

Conduct a neighborhood outreach program - Row # 1
The City of Laguna Beach needs to create and maintain a public awareness program regarding wildfire risks and appropriate actions in case of a wildfire. This would include establishing an outreach program which holds pop-up events in each neighborhood with neighborhood specific information and flyers that provide information on evacuation information, alert and warning systems, and disaster preparedness. The awareness program will need to be repeated annually as a reminder for existing residents and provide the information to new residents.

Install a City-wide outdoor warning system - Row # 2
The City has numerous electronic means to distribute emergency notifications. However, most notification systems rely on electric power, cellular telephone facilities and communication lines that could fail due to fire damage. An additional redundant method to communicate emergency notifications is a city-wide outdoor warning system. The system could be activated locally or remotely by satellite to provide an additional layer of notification, in the absence of functioning cell towers, or to those who do not have a mobile phone or have not self-registered in AlertOC/Nixle.

Conduct outreach to community art venues for evacuation procedures - Row # 3
During the summer, thousands of visitors each day are enjoying the art festivals. Many of the visitors are unfamiliar with town and would be completely unaware of what to do if a wildfire occurred. The City could create and conduct an outreach program to community art venues so that they can appropriately plan and communicate emergency evacuation procedures during a wildfire. The program will require annual follow-up to ensure the information is current and festival staff is aware of the procedures.

Develop an interactive evacuation map using global positioning location - Row # 4
Residents and visitors may benefit from addition evacuation information provided to them. This possible action item develops an emergency planning website with an interactive evacuation map that would show the location of each user's device by global positioning system location. The evacuation orders and maps delivered to that device would be tailored specifically to the location of that device.

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Section 4
Evacuation

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Evacuation

The City of Laguna Beach currently has an evacuation plan that provides guidance for the evacuation and relocation of an affected population, typically involving 50 or more individuals. The plan includes references and checklists that would be used for multiple evacuation scenarios for all hazard conditions.

The plan identifies the roles and responsibilities of each department, evacuation terminology, public information, and twenty-two Evacuation Management Zones (EMZ) – which would allow us to tier evacuations (Immediate and Potential) to those impacted. Each EMZ has an individual map which includes how many properties are in the zone, critical infrastructure, and evacuation routes. These maps worked well during the 2018 Aliso Fire as the City was able to quickly send emergency alerts and upload the map immediately to social media and Nixle painting a clear picture to the community of what zone(s) which were impacted and the appropriate evacuation routes.

Woolsey Fire, Malibu, California, 2018

Additionally, the plan includes pre-planned Traffic Control Points (TCP) at main intersections within the city to assist with expediting evacuations. Although the plan for the TCPs are detailed (e.g. staffing, number of cones and barricades) it is likely that delays would exist as additional staff and volunteers would have to be called in to set up the TCPs as well as staff the locations.

Recently, the City, in collaboration with the Community Emergency Response Team (CERT), launched a disaster preparedness campaign – “Prepare Laguna Beach”. With this campaign we have increased our public outreach at local events including the farmers market, parades, and city gatherings. At these events, we have provided the community outreach flyers (Attachment II) which include evacuation maps and instructions on alert and warning systems. Since March 2018, over 700 households, approximately 6% of the community, have signed the promise to “be prepared” by putting together a kit, making a plan, and signing up for AlertOC.

In November 2018, the City launched its Preparedness Backpack program which provides residents the ability to purchase a Laguna Beach specific emergency kit backpack. The backpack includes basic emergency tools and emergency plan templates. During the first seven months, we have sold over 750.

Prepare Laguna Beach

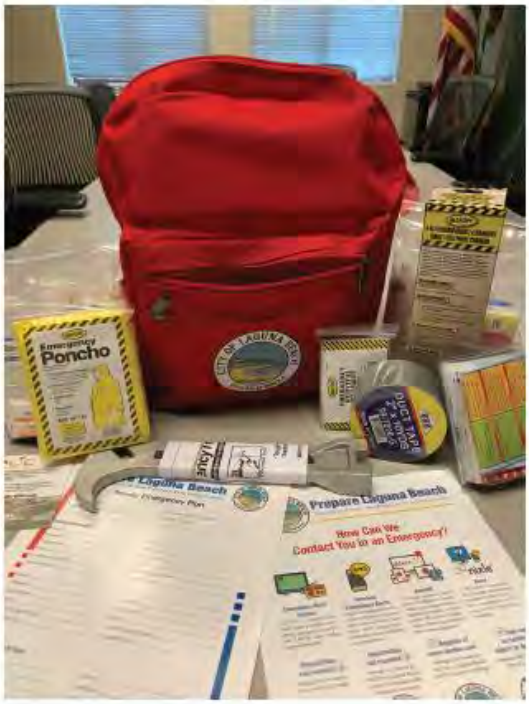
Taking Steps to be the Most Prepared City in Orange County

Getting prepared for emergencies has never been easier!

The Laguna Beach specific Emergency Kit Backpack is now available for purchase and includes the following items:

Customized red backpack with the City of Laguna Beach seal, hand crank AM/FM radio with flashlight and cell phone charger, 4-in-1 utility shut off tool, light sticks, bio hazard bags, 54-piece first aid kit, N95 mask, duct tape, emergency poncho, solar blanket, and personal hygiene kit. Additionally, it will include a family emergency plan guide and other disaster specific information.

Cost: $50.00
No profits are being made by the City of Laguna Beach



Purchase your kit today: https://bit.ly/2DInFGy

Sample Preparedness Flyer

Evacuation Challenges

In January 2019, City representatives visited Paradise, California and met with some of the first responders to the fire. The Paradise staff recounted problems with evacuations due to delayed notifications, roadway bottlenecking, roadway obstructions, and the sheer volume of vehicles. The quickly moving fire jumped miles at a time due to the high winds causing multiple fires throughout town. This behavior created confusion to evacuees when known evacuation routes were blocked. The terrain and layout of Laguna Beach has many similarities with Paradise.

During the evacuation of Paradise, evacuees filled the few roadways out of town. When they reached Highway 99 approximately eight miles out of town, drivers started obeying the traffic signals at the freeway onramps to Highway 99. This led to extreme congestion of the roads and this congestion quickly extended into Paradise blocking further evacuation.

Evacuation Near Paradise

Evacuation Near Paradise

Laguna Beach evacuees could face a similar situation as the evacuation reaches Dana Point and Newport Beach, causing an unintentional bottleneck. Therefore, it is recommended that immediately after evacuation is ordered, traffic control officers be placed in Dana Point and Newport Beach to keep the traffic flowing all the way out of town.

During an evacuation, placing traffic signals into a pre-defined sequence giving priority to certain directions and turning movements could aid traffic control efforts. If a traffic signal priority system is considered, it could also be used for prioritizing emergency vehicles during routine emergency response throughout the year improving emergency response times.

Closing a road takes time and often keeps police officers from performing other more important duties. To close a road under current practices, police block the road with their vehicle and then

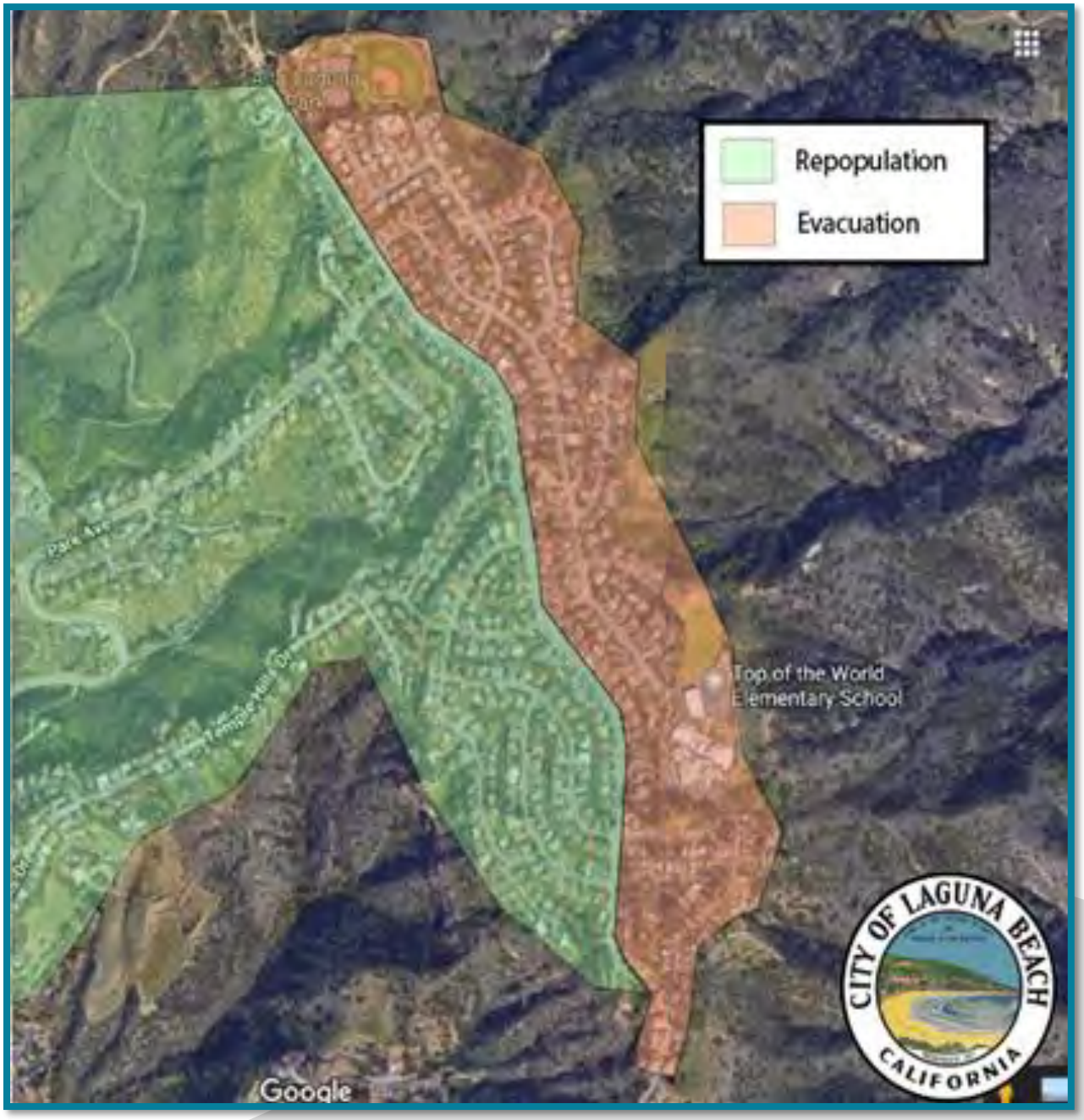
request Public Works to deploy appropriate traffic control devices. The road closure is then typically staffed by traffic control officers.

Resources may not be available to deliver traffic control devices in an emergency. Constructing permanent storage structures at key intersections could allow any authorized personnel to access the traffic control devices and close the road, ultimately speeding up the road closure process would free up police resources for other duties. If Laguna Canyon Road is to be used as an evacuation route, the pedestrian crossing signal near the Laguna College of Art and Design will likely cause congestion in an evacuation. Consideration should be given to placing traffic control officers at that location.

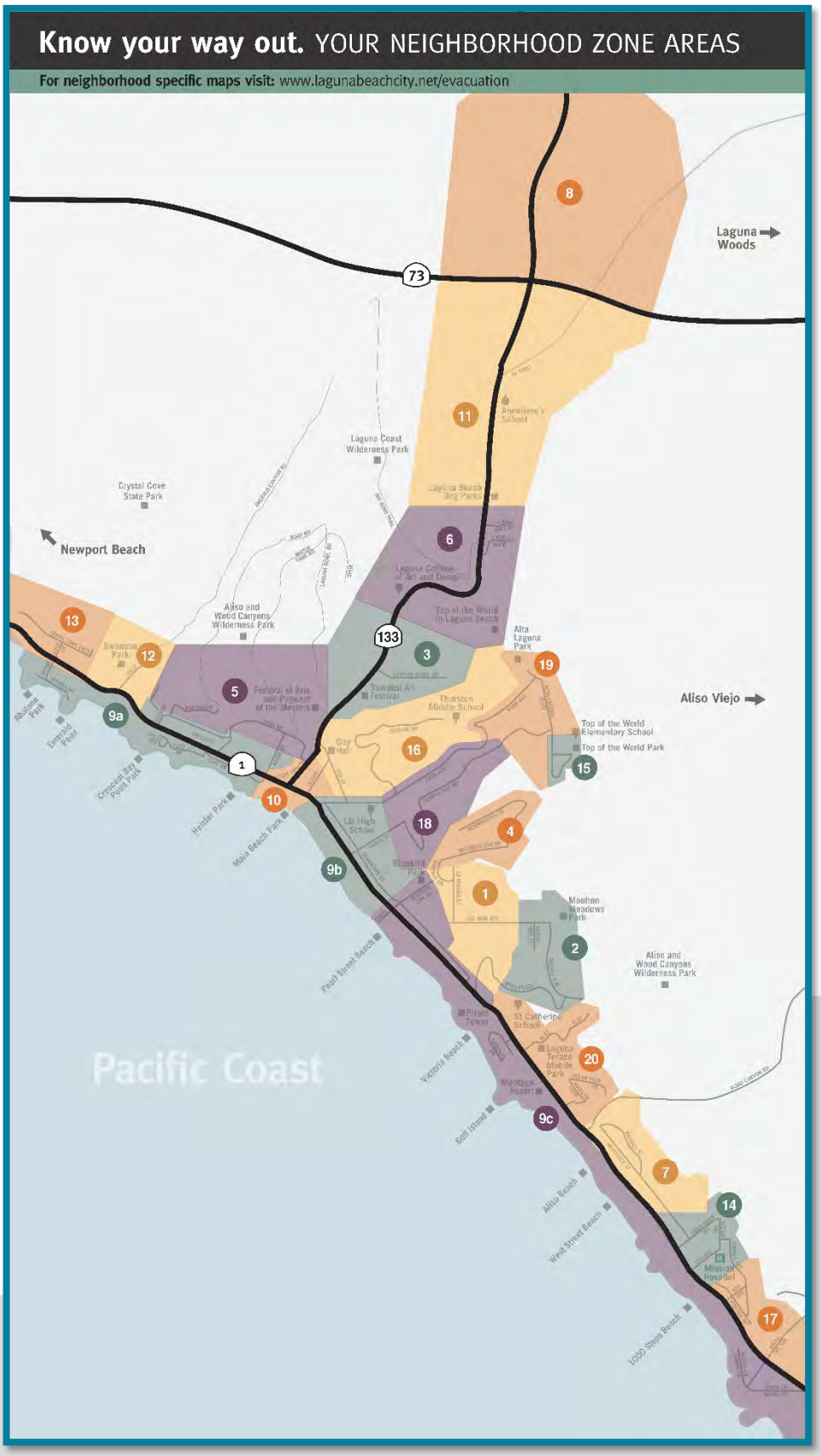
Consideration should be given to placing permanent evacuation route signage at key intersections throughout town, intended to speed evacuation for visitors and residents unfamiliar with certain parts of town.

Another challenge is communicating the evacuation orders. The City utilizes many electronic means to communicate emergency information. If an evacuation order is given, visitors and residents may need additional information to find a safe route out of town. Consideration should be given to having a consultant develop an emergency planning website with an interactive evacuation map utilizing global positioning system (GPS) location. The evacuation website would be an interactive tool in which the link would be communicated to the public via alert and warning systems such as WEA, Nixle, and AlertOC. The website would have a geo-targeted map and would show a person's internet protocol (IP) location or their GPS location in addition to the areas which need to be evacuated and what routes to take. It would also provide a format to register people with disabilities, access and functional needs for evacuation.

Examples of geo-targeted maps and routes that could be distributed and communicated through a website application are shown below.



Evacuation map during 2018 Aliso Fire in Laguna Beach



Evacuation Zone Map

Sample: Arch Beach Heights Neighborhood Evacuation Zone from the Laguna Beach Evacuation Plan

Samples of Evacuation Outreach Flyers

Your Neighborhood Fire Information

City of Laguna Beach

www.lagunabeachcity.net/cityhall/police

PLEASE KEEP FOR YOUR REFERENCE

MOBILE PHONES AND THE INTERNET MAY BE OVERWHELMED DURING AN EVACUATION.

Don't wait. Plan now.

Quick facts about fire

Fire is fast: In less than 30 seconds a small flame can turn into a major fire. It only takes minutes for thick black smoke to fill a house or for it to be engulfed in flames.

Fire is hot: Heat is more threatening than flames. Room temperatures in a fire can be 100 degrees at floor level and rise to 600 degrees at eye level. Inhaling this super-hot air will scorch your lungs and melt clothes to your skin.

Fire is dark: Fire starts bright, but quickly produces black smoke and complete darkness.

Fire is deadly: Smoke and toxic gases kill more people than flames do. Fire produces poisonous gases that make you disoriented and drowsy. Asphyxiation is the leading cause of fire deaths, exceeding burns by a three-to-one ratio.

NOTIFICATIONS

Notifications from **AlertOC** are targeted to areas with an imminent threat to life and safety rather than the entire city. Notifications from **Nixle** are sent to anyone registered regardless of where the incident is in the city. Visit www.AlertOC.com and text "92651" to 888-777.

Ready, Set, Go.

MANY RESIDENTS DO NOT FULLY UNDERSTAND THE IMPACT THAT COULD RESULT FROM WILDFIRE. THERE MAY NOT BE A LOT OF TIME TO FIGURE OUT WHO IS HOME, WHAT TO TAKE, WHERE OR WHEN TO GO. TAKE PERSONAL RESPONSIBILITY AND LEARN WHAT YOU CAN DO TODAY.

READY...

Ember awareness
Embers are burning pieces of vegetation or other flammable material that strong winds can carry up to a mile ahead of an actual fire. Flying embers are the leading cause of structural damage and home loss in a wildfire.

Vegetation management
is the controlling of plant materials to prevent wildfire spread. Follow guidelines to help protect your home and wind-driven embers.

Home hardening gives a home the best chance to survive a wildfire by its construction materials and the quality of defensible space. Home hardening will reduce the chance of ignition from direct flame, firebrand showers and radiant heat coming from outside of the defensible zone.

SET...

Pack your vehicle with your emergency items. Stay aware of the latest news from local media and your local public safety officials for updated information.

A family plan is only useful if it's completed well before a wildfire occurs. Your plan should address the needs of every member of your family or household, including pets. An escape route is a preplanned route designed to help your family get to a safe area during a wildfire. It's important to map out several in case roads are blocked or unsafe for travel.

Emergency kits should contain enough supplies and belongings for every member of your household for at least 3 days. Your to-go bag holds items needed to help you evacuate quickly and safely.

GO...

Leave early!
Knowing when to leave, what to take, where to go, and how to get there will prevent you and your family from being caught in smoke, fire, or road congestion while evacuating during a wildfire.

Don't wait to be told by authorities. If you are advised to leave, don't hesitate. Leave to a predetermined location. Have several travel routes in case one route is blocked by the fire or by emergency vehicles and equipment. Choose the route away from the fire.

Take your emergency kit containing your family and pets' necessary items.

Shelter in place
If trapped by a wildfire, know when and how to shelter in place. Shelter away from outside walls. Retreat inside your home for spot fires and extinguish them. Wear long sleeves and long pants made of natural fibers such as cotton. Stay hydrated. Ensure you can exit the home if it catches fire (remember that if it's hot inside the house it is four to five times hotter outside) Check your roof and extinguish any fires, sparks, or embers. Check inside the attic for hidden embers. Patrol your property and extinguish small fires.

Laguna Beach Emergency Management
(949) 497-0701 // www.lagunabeachcity.net/cityhall/police

Be prepared.

Know if you are in the fire zone. Take personal responsibility and prepare long before the threat of a wildland fire so your home and family are ready.

Why should you evacuate?

Emergency management officials use Immediate Evacuation Order as a protective action in certain emergencies to help save lives of residents and first responders. Upon receiving an Immediate Evacuation Order, you should leave immediately. Evacuation routes become severely congested during evacuations.

TYPES OF EVACUATION ORDERS

Immediate Evacuation Order

- The Laguna Beach Police Department orders all persons and their animals in designated evacuation areas to relocate to safer locations for their own safety immediately, without delay.
- Extreme risk for loss of life and property exists.
- An immediate evacuation order will apply to the public in general.
- Persons who refuse to comply with an immediate evacuation order will not be forcibly removed from their homes. However, they should not expect rescue or other lifesaving assistance after the onset of the emergency event.

Potential Evacuation Order

- Laguna Beach Police Department strongly urges and recommends persons and their animals in designated evacuation areas relocate to safer locations for their to own safety.
- High risk for loss of life and property exists.
- Personal discretion is allowed, but not advised. People with access and functional needs and those with large animals should leave now.
- If at any time the public feels threatened, take immediate action. Do not wait for notification.

RE-ENTRY PLAN

In order to allow residents back into the evacuated area, it must be thoroughly inspected to ensure essential infrastructure services have been restored and it is safe for residents to return to their homes. The City will create a re-entry plan, which may be phased based on the number of residents and businesses evacuated. In some cases, re-entry may be temporary and restricted based on safety and security.

Know your way out.

FAMILIARIZE YOURSELF WITH MAJOR ROUTES AND, IF POSSIBLE, MULTIPLE WAYS OUT OF YOUR NEIGHBORHOOD IN CASE OF AN EVACUATION.

Evacuation Possible Action Items

A table is provided on page 11 that lists the possible action items raised in this report. The table includes categorical and cost information in one location for easy reference. The title and description for the possible action items regarding evacuation from that table are summarized below:

Prepare an evacuation modeling study - Row # 5
Understanding the issues involved in a citywide evacuation is a complex problem. It is recommended to have a consultant prepare an Evacuation Time Estimate study using specialty computer modeling that will identify potential bottlenecks in traffic, reasonable capacity of our roadways, areas where two-way traffic must be maintained, and determine if a staged evacuation could be possible. As a part of the study, areas with impaired access could be identified and preliminary investigation of additional egress routes that may be recommended for further investigation. The parameters for the study could include, but not be limited to: areas with multiple streets but only one egress route, dead-end streets, one-way streets, number of parcels served by the egress route, adjacency to the wildland-urban interface, feasibility of construction, use during a wildfire evacuation and feasibility for routine use. In addition, the study could identify areas where temporary safe refuge areas may need to be considered.

Install evacuation signage - Row # 6
During an evacuation, residents and visitors may find that the only escape route they are familiar with is blocked. To lead people to alternate routes, simple evacuation signage could be installed at key locations to speed evacuation for visitors and residents unfamiliar with certain parts of town. The signs could be designed and installed relatively quickly.

Install a traffic signal priority system - Row # 7
Many cities include a traffic signal priority system that is typically used for Police and Fire emergency responses; Laguna Beach does not have such a system. These systems turn the signals green in the direction of travel of the emergency vehicle, thereby improving their travel time. It is possible to configure that system to be used during an evacuation by controlling all traffic signals to expedite evacuation. The system could also have the capability to use a low priority mode for transit vehicles. Since Caltrans owns and maintains all of the traffic signals in town, cooperation, coordination, and permitting must be obtained through Caltrans. Dana Point and Newport Beach already have compatible systems, but they are not set up for evacuation.

Permanently stage evacuation traffic control devices - Row # 8
During the early stages of an evacuation, delivering and setting up traffic control devices at key locations is a labor and time intensive task. Depending on the time of day, personnel may not be available to do this work. A possible action item is to have barricades and signage permanently stored at key evacuation points, allowing limited staff to immediately implement the first phases of evacuation plans. Potential locations could include Coast Highway at Crown Valley Parkway,

Coast Highway at Newport Coast Drive in the parking lot for the park, and Laguna Canyon Road at El Toro Road.

Place traffic control officers in Dana Point and Newport Beach during an evacuation - Row # 9
During the evacuation of Paradise, it was apparent that when evacuees reached a point approximately eight miles out of town where the roads merged with Highway 99, people started following the traffic signals, which created gridlock extending into Paradise and blocking further evacuation. A possible action is to work with Newport Beach, Dana Point and OC Sherriff to agree on a plan to place traffic control officers in Dana Point and Newport Beach that could keep evacuees moving through intersections by following the directions of a traffic control officer instead of the programmed traffic signal.

Section 5 Resources

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Resources

The City of Laguna Beach maintains its own Police, Fire and Public Works Departments. These locally controlled resources can be scheduled appropriately for seasonal demands or special events. Although Laguna Beach is a relatively small town of approximately 23,000 residents, it serves a visitor population of approximately six million each year. As a result, the City maintains a higher staffing level than a typical city of similar population.

The local resources are augmented by mutual aid agreements with similar resources from surrounding cities, agencies, counties and the State. Most importantly, the mutual aid agreements provide access to specialty equipment such as fire-fighting aircraft and heavy equipment that would not otherwise be feasible for a small town to own. Recently, the mutual aid system has begun pre-staging a five-engine fire team within a few miles of Laguna Beach when a significant wind event occurs. The City contributes occasionally to such regional pre-positioning efforts by providing an engine company or Chief Officer. In the event of a fire, these pre-positioned resources and additional mutual aid are immediately available to the City and other local jurisdictions.

Specialty contractors for tree removal or heavy equipment contractors can provide additional resources in an emergency. The City maintains contracts for routine specialty work and these resources are available during an emergency.

Since additional resources are likely to be needed during a fire emergency, the City increases staffing during a “Red Flag Warning”. Red Flag conditions of high heat, high winds, and low humidity are identified by the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service. A “Red Flag Warning” is declared by the Fire Chief during these weather conditions. Based on the warning, additional resources are made available by the Fire and Police Departments and the efforts are shown in the Red Flag Warning Plan & Checklist dated February 2018. The typical additional staffing depends on what resources are already committed on mutual aid assignments, but might include:

- **Fire Department -** One or two additional fire engines, and an additional Battalion Chief
- **Police Department -** One additional fire watch patrol, one or two additional officers, and one additional public safety dispatcher

Resource Challenges

Resources consist of personnel and heavy equipment that are available for assignments associated with a wildfire event. Police and Fire typically use shifts to schedule their resources throughout a 24-hour day, seven day per week format. In contrast, Public Works, utility companies, and specialty contractors generally utilize a typical 8-hour workday and a 5-day work-week format. Therefore, the availability of locally controlled resources could vary if an extreme wildfire event occurs, requiring additional resources to be called in.

The response time for the arrival of these resources is critical as most resources will need to travel into town. The Camp Fire that destroyed the town of Paradise (pop. 26,000) on November 8, 2018 claimed 85 lives and destroyed 19,000 structures including 11,200 residences. The timing of events surrounding this fire are eye-opening. The fire started at 6:30 a.m. approximately 6 miles from Paradise. Due to the weather conditions, the fire jumped miles at a time. Within 2 hours, the fire reached Paradise; within 4 hours of the start of the fire dozens of people had died and the majority of the town was destroyed. The majority of on-call resources and mutual aid resources had not arrived in Paradise by that time.

Also, as the devastating fires of 2017 and 2018 proved, it is likely that more than one large fire would be burning in California at the same time. Multiple fires strain the availability of mutual aid resources and could increase their response time.

Therefore, when developing wildfire mitigation strategies, it should be recognized that additional outside resources may not be quickly available for wildfire event assignments.

Relocating Mutual Aid Resources Closer to Laguna Beach

As a potential opportunity for the City to provide a faster initial response to a wildfire event, the Subcommittee investigated relocating key mutual aid resources closer to Laguna Beach. Key resources might include: relocation of helicopter, or fixed wing aircraft to a nearby airfield, bulldozers or other heavy equipment staged in town, water tanker trucks to supply additional water to first responder Fire Engines, and, additional resources for fire patrol or first response.

2012 Transformer/Pole Fire between Coast Hwy. and Nyes Place

When considering relocating mutual aid resources closer to town, significant considerations are:

- Mutual aid resources are part of a regional system and are deployed throughout the State as part of a regional public safety system
- Deployment of such resources is typically accomplished at significant expense to the mutual aid system and most often involves resources outside of City ownership or financial responsibility. Some of the City's resources are a part of the mutual aid system
- The availability of mutual aid resources is dependent on other wildfires that might occur prior to an event in Laguna Beach. Even if resources are temporarily relocated to Laguna Beach, there is no guarantee the resources will be there when needed by Laguna Beach
- As mutual aid resources are often distributed throughout the region for a faster response in the region, the longer travel distance from Laguna Beach to other regional areas may not be acceptable to the mutual aid system
- Lack of a suitable site or space in the City to stage various types of resources could be a limiting factor on the types of resources available

The Subcommittee determined that the assignment and pre-staging of mutual aid resources are based upon risk management decisions by regional fire officials, which consider the needs of the larger region in addition to those of the City. The City's Fire Chief is consulted during these pre-staging assignments, typically by conference call, and contributes to the regional risk analysis with a needs assessment for Laguna Beach.

The Subcommittee concluded that given the operational structure of the mutual aid system, relocating key mutual aid resources closer to Laguna Beach is a decision that will be made at the regional level.

Resources during Red Flag Warning

Considering that resources will be needed during a wildfire event and that response times could hamper the effectiveness of the resources, an opportunity for improvement is to investigate the staging of additional of resources beyond what is included in the Red Flag Warning Plan & Checklist and the additional public safety personnel staffing.

To avoid the time delay of having additional resources report to work, the opportunities for early staging of additional resources could include:

- **Public Works** - consider staffing a team capable of implementing road closures, traffic control and tree clearing and heavy equipment and driving buses for evacuation
- **Security and Event Contractors** - consider staffing a team capable of traffic control, intersection control, checking on house-bound and/or special needs residents, or conducting fire watch patrols along key roads and trails

- **Caltrans** - consider requesting Caltrans to staff a team to immediately implement road closures and traffic control at major highways outside of town
- **Water Districts** - consider requesting the Water Districts to staff a team capable of controlling water flow, staging emergency equipment, and emergency pump or generator repairs
- **Specialty Contractors** - consider staffing a team capable of emergency tree removal, emergency generator repair, or providing on-call assistance with heavy equipment, water tankers, or bulldozers
- **Resources from other Cities** - consider staffing fire-fighting resources that are available for hire that are not included in the mutual aid system

Increasing the availability of resources could occur in stages, or levels, based on the severity and duration of the Red Flag Warning. The levels of activation presented below are for example only:

- **Level 1** - Implement the Red Flag Warning Plan & Checklist
  - Water Districts to fill reservoirs to maximum capacity
- **Level 2** - At the direction of the City Manager, in consultation with the executive team, key resources could be placed on call. Prior agreements with the resources would reimburse them for stand-by time to respond with a set amount of time at a moment's notice
- **Level 3** - At the direction of the City Manager, in consultation with the executive team, key resources could be mobilized and located within the City. Some resources might only require a mobilization fee. Others might require hourly rates, if so, these resources could perform beneficial preparatory tasks if possible
- **Level 4** - In the event of a fire in a neighboring community, and at the direction of the City Manager, in consultation with the executive team, all identified resources could be mobilized and located with the City

The annual cost for the pre-staging of resources will be significant and will need to be determined as mitigation and deployment strategies are developed in the future. There are approximately 3 to 4 Red Flag Events per year totaling 10 to 14 Red Flag Warning days per year.

Resource Possible Action Items

A table is provided on page 11 that lists the possible action items raised in this report. The table includes categorical and cost information in one location for easy reference. The title and description for the possible action items regarding resource from that table are summarized below:

Develop a plan to augment current procedures for non-safety resources on Red Flag Days - Row #36

Limited personnel and equipment could be an issue if a wildfire occurs and evacuation is necessary. Since strong Santa Ana winds are associated with most of the recent deadly fires, Police and Fire typically increase their staffing during "Red Flag Warning Days." A possible action item is to develop a plan to have additional non-safety resources available during a red flag warning. It would be necessary to evaluate the cost/benefit of paying for additional resources just in case there is a wildfire. There are approximately 3 to 4 Red Flag Events per year totaling 10 to 14 Red Flag Warning days per year. The additional staffing would need to be in place 24 hours per day. The plan would include an escalation schedule for staff, contractors, and equipment to be on-call, or on-site and based on the severity and duration of the warning and events in surrounding areas.

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Section 6
Infrastructure

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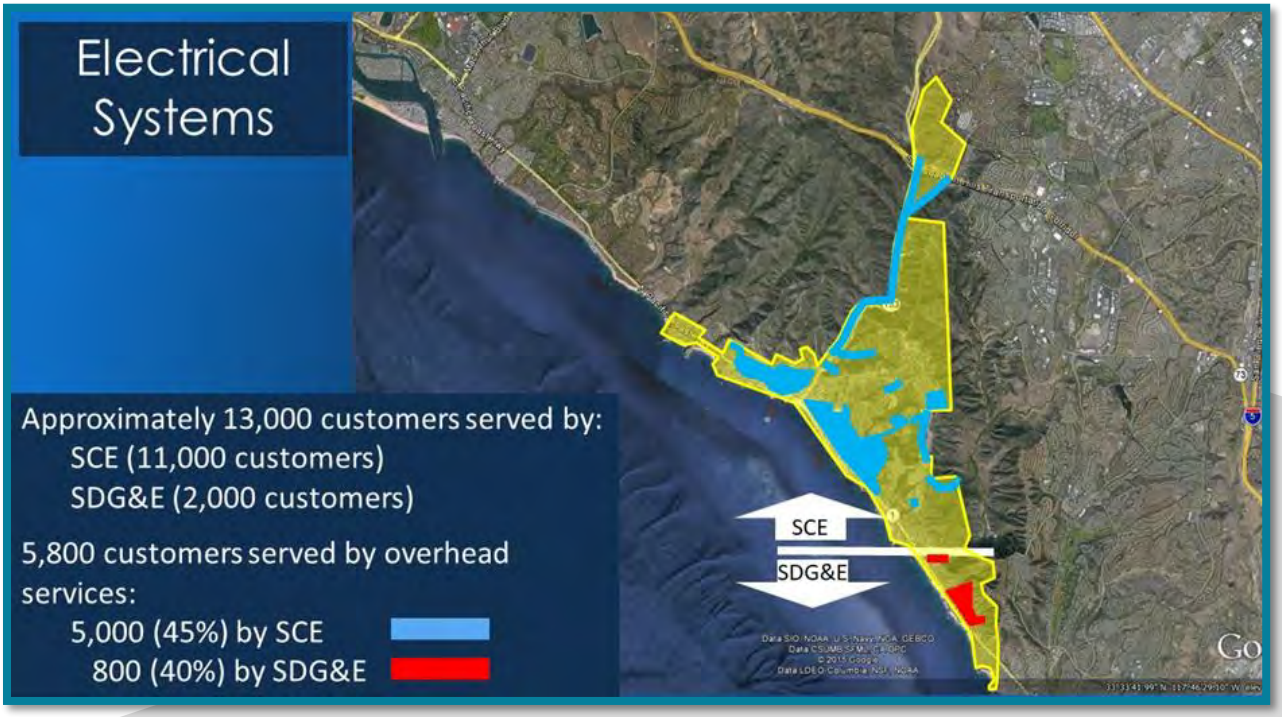
Existing Infrastructure

This section provides an overview and assessment of some of the existing infrastructure in the City of Laguna Beach including the electrical system, water system, roads and circulation, facilities suitable for use as a temporary safe refuge, buildings and structures, emergency radio systems, and telecommunications systems. Each of these systems could play a significant role if a wildfire strikes Laguna Beach. The systems are presented as sub-sections, each providing some background information, challenges, and opportunities for improvement to be considered. The opportunities listed in each sub-section are also incorporated into the Table 1 – Possible Action Items on page 11 of this report.

Electrical System

Laguna Beach is served by Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). Approximately, 11,000 properties northerly of Aliso Beach are served by SCE and 2,000 properties southerly of Aliso Beach are served by SDG&E. Of those services, approximately 5,000 (45%) of the SCE services, and 800 (40%) of the SDG&E services, are provided by overhead poles and wires as shown on the map below.



Graphic of Existing Overhead Electric Services

Electrical System Challenges

Failures of overhead utilities can be an ignition source for wildfire. Ten of the top twenty most destructive fires in California history were caused by powerline or electrical sources according to Cal Fire's listing of the "Top 20 Most Destructive California Wildfires," and a Cal Fire News Release on May 15, 2019. One of the fires on the Top 20 List, the Woolsey Fire is still under investigation.

Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP FIRE** *(Under Investigation)*	November 2018	Butte County	153,336	**18,804**	85
2	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	**5,636**	22
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	**2,900**	25
4	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	**2,820**	15
5	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
6	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
7	**WOOLSEY** (Under Investigation)	November 2018	Ventura	96,949	**1,643**	3
8	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity County	229,651	**1,614**	8
9	**NUNS** *(Powerline)*	October 2017	Sonoma	54,382	**1,355**	3
10	**THOMAS** *(Powerline)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	2
11	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
12	**JONES** *(Undetermined)*	October 1999	Shasta	26,200	**954**	1
13	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2
14	**ATLAS** *(Powerline)*	October 2017	Napa & Solano	51,624	**783**	6
15	**PAINT** *(Arson)*	June 1990	Santa Barbara	4,900	**641**	1
16	**FOUNTAIN** *(Arson)*	August 1992	Shasta	63,960	**636**	0
17	**SAYRE** *(Misc.)*	November 2008	Los Angeles	11,262	**604**	0
18	**CITY OF BERKELEY** *(Powerlines)*	September 1923	Alameda	130	**584**	0
19	**HARRIS** *(Undetermined)*	October 2007	San Diego	90,440	**548**	8
20	**REDWOOD VALLEY** *(Powerline)*	October 2017	Mendocino	36,523	**546**	9

***"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

3/14/2019

Cal Fire Listing of Top 20 Most Destructive Fires

CAL FIRE NEWS RELEASE

California Department of Forestry and Fire Protection

CONTACT: Michael Mohler
Deputy Director
(619) 933-2357

RELEASE DATE: May 15, 2019

CAL FIRE Investigators Determine Cause of the Camp Fire

Sacramento – The Camp Fire in Butte County, started the morning of November 8, 2018, and burned a total of 153,336 acres, destroying 18,804 structures and resulting in 85 civilian fatalities and several firefighter injuries. The Camp Fire is the deadliest and most destructive fire in California history.

CAL FIRE investigators were immediately dispatched to the Camp Fire and began working to determine the origin and cause of the fire. After a very meticulous and thorough investigation, CAL FIRE has determined that the Camp Fire was caused by electrical transmission lines owned and operated by Pacific Gas and Electricity (PG&E) located in the Pulga area.

The fire started in the early morning hours near the community of Pulga in Butte County. The tinder dry vegetation and Red Flag conditions consisting of strong winds, low humidity and warm temperatures promoted this fire and caused extreme rates of spread, rapidly burning into Pulga to the east and west into Concow, Paradise, Magalia and the outskirts of east Chico.

The investigation identified a second ignition sight near the intersection of Concow Rd. and Rim Rd. The cause of the second fire was determined to be vegetation into electrical distribution lines owned and operated by PG&E. This fire was consumed by the original fire which started earlier near Pulga.

During 2018 there were more than 7,571 wildfires that burned over 1.8 million acres within the state of California.

The Camp Fire investigative report has been forwarded to the Butte County District Attorney Mike Ramsey. For any questions related to the Camp Fire investigation, contact Mike Ramsey at (530) 538-7411 or at mramsey@buttecounty.net or mnoel@buttecounty.net .

Californians must remain vigilant and be prepared for wildfire. For more information on how to be prepared, visit www.readyforwildfire.org or www.fire.ca.gov. CAL FIRE also offers a free Ready for Wildfire app for IPhones and Android phones.

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Cal Fire News Release regarding the fire that destroyed Paradise

Public Safety Power Shut-off (PSPS)

The service territories of Southern California Edison and San Diego Gas & Electric cover tens of thousands of square miles including the lower half of California from approximately Santa Barbara on the coast to Mono Lake on the eastern border. This large area is subject to severe weather events such as strong winds from the northeast known as Santa Ana Winds that can reach hurricane force. Due to the large area, these severe weather events can be somewhat localized in occurrence. During severe weather events the utility companies are implementing a Public Safety Power Shut-off (PSPS) to reduce the chance that an electrical facility may cause a wildfire.

A PSPS event could be a preventive measure during a strong Santa Ana wind event. The shut-off could affect just a single circuit possibly affecting thousands of utility customers in an especially windy area, or multiple circuits that could affect tens of thousands of customers over a larger area. Considerations for the implementation of a PSPS include:

- National Weather Service Warnings
- In-house assessments by meteorologists
- Fire Potential Index
- Real-time information from utility field personnel, local or State Fire, Law and Emergency Management

Due to improved situational awareness through the use of hundreds of weather stations, in-house weather modeling, and regional fire monitoring cameras the conditions that lead up to a potential PSPS event should not catch the utility companies by surprise. Customers should receive notifications that a PSPS is possible up to two days prior to the occurrence. The variables involved in making the decision to implement a PSPS are fluid and change with the weather forecasts and the actual field conditions. Due to this fluidity, only the utility companies make the final decision for the implementation of a PSPS.

If the power has been shut off and before it can be restored, some, or all, of the following must occur to the satisfaction of the utility companies:

1. Extreme fire weather has abated or diminished;
2. High winds have decreased below thresholds; and
3. All circuits that were shut off have been patrolled, and any repairs made, before restoring the power.

PSPS could be a valuable tool to reduce the chance of a utility caused wildfire, but at a significant cost of time, money, and inconvenience to the customers.

Undergrounding

2007 Laguna Canyon Road Transmission Pole / Fire

Placing the electric utilities underground can significantly reduce the risk of an electric utility caused fire. Underground utilities are less likely to be damaged during a wildfire which could improve the likelihood that electric power remains on during evacuation and fire-fighting efforts. In addition, overhead poles and wires can fall and block access for emergency services or evacuation.

Undergrounding the remaining portions of Laguna Beach would be a significant cost. Special funding efforts will be required to complete the undergrounding throughout town. If funding is obtained, the design and construction of the underground facilities could take many years to complete. Nonetheless, undergrounding, especially along key evacuation routes, is a critical step to improving public safety. In a recent announcement Pacific Gas & Electric said that they will rebuild the electrical system in Paradise with an underground system.

Electrical System Prioritization Strategies

Strategies for prioritizing future undergrounding projects could include, but are not limited to, (1) undergrounding utilities along key evacuation routes; (2) undergrounding utilities adjacent to open space; or (3) undergrounding utilities in areas with impaired egress and access. This report combines the high priority projects from each of these categories and presents the highest priority projects to be included in Table 1 – Possible Action Items to be considered for funding from City revenues.

Undergrounding Evacuation Routes

As part of the development of Measure P, a 2018 ballot measure to fund undergrounding costs, key evacuation routes were identified and listed in the proposed ordinance. This listing was used for this report as a starting point for evaluating undergrounding priorities for consideration to receive City funding.

2007 Pole Down on Laguna Canyon Road

The key evacuation routes that were identified in the proposed Measure P ordinance are:

1. Laguna Canyon Road, road frontage to El Toro Road;
2. Monterey Drive, Hawthorne Road to Linden Street;
3. Thalia Street, Temple Terrace to 350 feet southwest of Glenneyre Street;
4. Glenneyre Street, Laguna Avenue to Thalia Street;
5. Glenneyre Street, Calliope Street to Arch Street;
6. Bluebird Canyon Drive, Eastman Way to Cress Street;
7. Coast Highway, Agate Street to 200 feet southeast of Upland Road;
8. Monterey Street/Virginia Way, West Street to 5th Avenue;
9. Temple Hills Drive, northeast and southwest of San Remo Drive;
10. Park Avenue, Wendt Terrace to 500 free east of St. Anns Drive;
11. Virginia Way, 7th Avenue to 9th Avenue; and
12. San Joaquin Street, Hillcrest Drive to alley 100 feet northeast of N. Coast Highway.

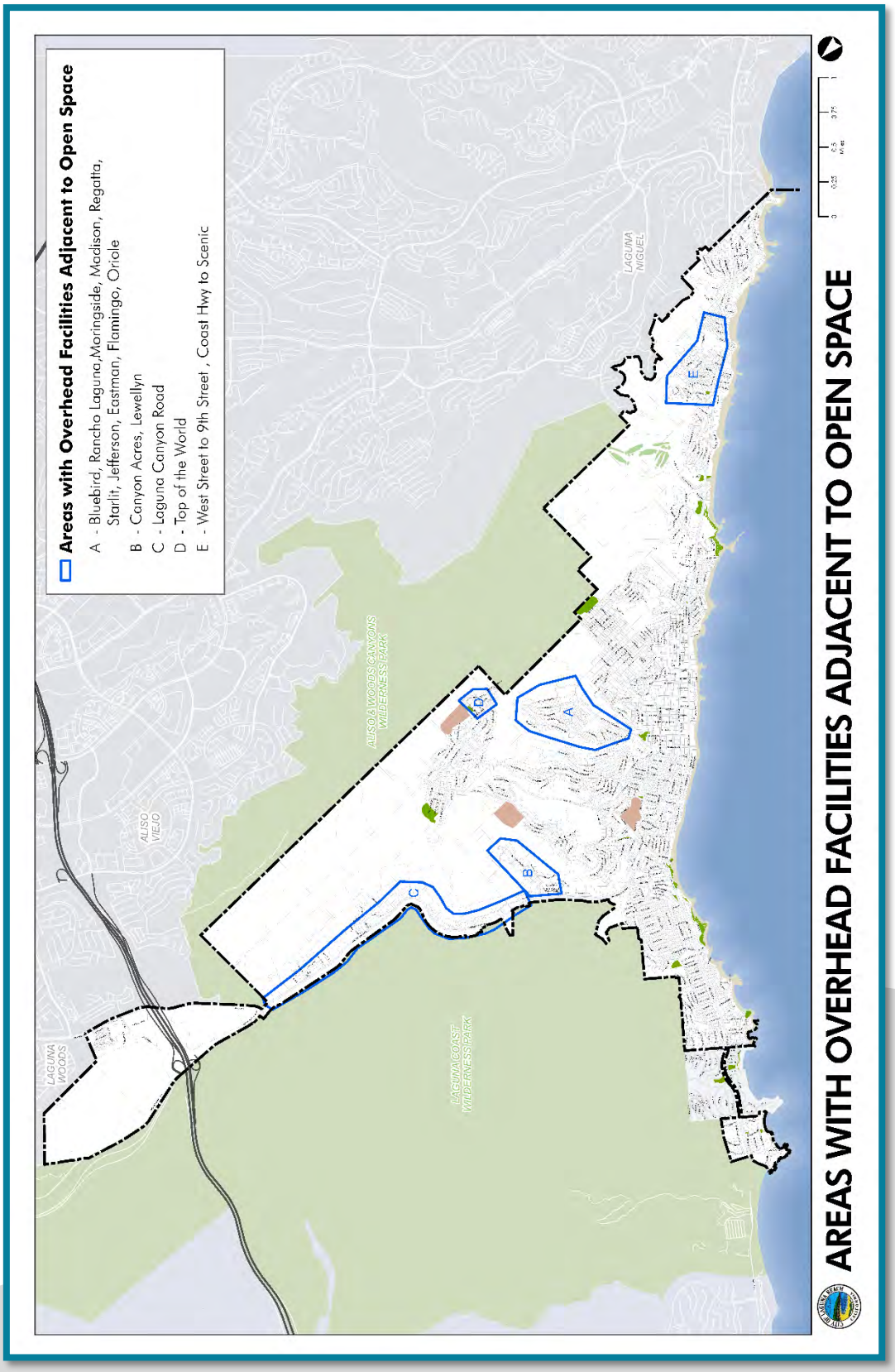
A map of some of the routes is shown below.

Graphic of Key Evacuation Routes and Overhead Electric Wires

Undergrounding Near Open Space

Investigating the undergrounding of utilities in areas adjacent to open space, often referred to as the wildland-urban interface, was also used in this report to prioritize future undergrounding projects for consideration of City funding. Electrical failures in the wildland-urban interface could quickly spread to thousands of acres and threaten thousands of homes depending on weather conditions. Some of the potential areas for prioritization are shown on the map below.

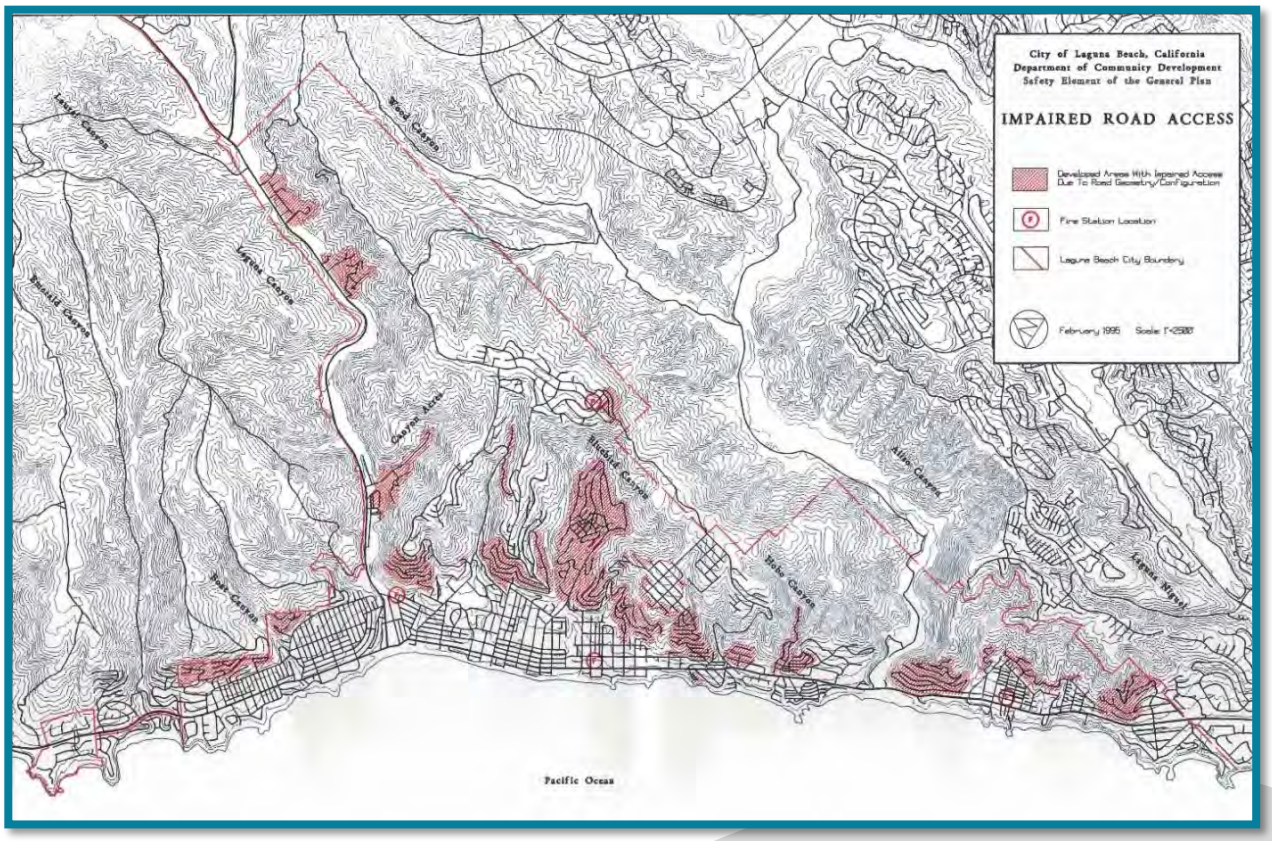
2012 Transformer / Pole Fire between Coast Hwy. and Nyes Place



Areas of Overhead Electric Facilities Adjacent to Open Space

Undergrounding in Areas with Impaired Access

Investigating the undergrounding of utilities in areas with impaired egress and access was also used to prioritize future undergrounding projects for consideration of City funding. Downed poles and wires along the roads serving as the only access to a box canyon, such as Bluebird Canyon Drive, could stop emergency services from accessing the area at any time of the year, or during a wildfire emergency block the evacuation of the area. The map below from the 1995 General Plan Safety Element shows some of the areas with impaired egress and access that was used for prioritization.



1995 Exhibit of Areas with Impaired Road Access

The three categories of potential prioritization for undergrounding described above are (1) undergrounding utilities along key evacuation routes; (2) undergrounding utilities adjacent to open space; or (3) undergrounding utilities in areas with impaired egress and access. Many possible projects could be envisioned from the numerous combinations of priorities. The subcommittee has determined that most utility undergrounding projects are best suited for being funded and constructed through the neighborhood assessment district process.

Assessment District Process

Assessment districts create a funding mechanism for neighborhoods to place their overhead utilities underground. These projects are championed by the proponents of the project in their neighborhood with assistance from City staff. Proponents create a boundary for their project in coordination with staff and the utility companies. A petition is circulated to verify that there is substantial support for the project; the law requires a minimum of 60% of the parcels by land area sign the petition. If the petition is successful, the City Council may determine to provide up-front funding for the design and assessment engineering costs of the project; this funding will be reimbursed by the district if the project is successful. Once the plans and engineering are completed and bids obtained for the construction, the assessment engineer will provide a report with the projected assessments for each property within the district. Then the property owners within the district will vote, weighted by the dollar amounts of their assessments, to determine if the project can move forward through the issuance of bonds for the costs of construction and the actual construction of the underground facilities. The property owners within the district pay off the bonds over a typical 15 to 20-year term through an annual assessment collection on their property tax bill.

Electrical System Possible Action Items

Completing utility undergrounding projects in key areas could reduce fire risks for the City. Some of the projects that ranked high in one or more of the prioritization categories could lead the list of undergrounding assessment district projects. However, not all projects are ideal candidates for the assessment district process, due to various reasons:

- Some projects have a high cost of construction but involve relatively few parcels that would be included in the district which would create a cost prohibitive assessment per parcel.
- Other projects are too small to generate the necessary neighborhood support for an assessment district but provide a substantial benefit to the public by improving emergency ingress and egress to a large number of properties during a wildfire or other emergency.

Therefore, the Sub-committee has identified some electrical undergrounding projects that provide significant safety benefits to the general public and recommend that these projects be funded by, or in part, by existing and future City revenues. These projects are listed here and are included in Table 1 – Possible Action Items on page 11.

	Row #	Location	Qualifying Elements for High Priority
1	18	Coast Highway between Agate Street and Arch Street	High priority as a primary evacuation route. Coast Highway Utility Underground District 2019-1 was formed on April 16, 2019 as a Rule 20A project. Estimated completion – May 2023.

2	20	Coast Highway remaining overhead facilities	High priority as a primary evacuation route. This project is intended to remove all remaining overhead facilities along Coast Highway.
3	40	Laguna Canyon Road between the electrical substation westerly of Canyon Acres to El Toro Road	High priority for emergency access/mutual aid resources into the City. The poles and wires are adjacent to 16,000 acres of open space creating a fire risk from failures due to wind or vehicle impact. Pole or wire failures from a wildfire could also block emergency access. In addition, the failure of communication wires could disrupt emergency communications through loss of fiber optic cable.
4	28	Bluebird Canyon Drive from Cress/Bluebird to Rancho Laguna Road	High priority as over 400 parcels have only one exit from this canyon. Failure of power lines could block emergency access into, or evacuation out of, the Bluebird Canyon area if they block Bluebird Canyon Drive between the intersection of Cress/Bluebird and Rancho Laguna Road. An electrical system caused fire in this canyon could quickly travel uphill through the steep open space to the surrounding areas.
5	29	Park Avenue between Wendt Terrace to 500 feet easterly of St. Anns Drive	High priority as a primary access to approximately 600 parcels easterly of this area. Poles and wires blocking the road could significantly delay emergency access or evacuation. This relatively short distance of undergrounding could be a low cost and high benefit project.
6	44	Glenneyre Street, Laguna Avenue to Thalia Street, and Calliope Street to Arch Street	High priority as a secondary emergency access and evacuation route serving a significant portion of the City.

Water System

The City of Laguna Beach is served by two water districts, Laguna Beach County Water District (LBCWD) and South Coast Water District (SCWD). The division between the two districts is located at approximately Nyes Place. Both districts obtain water from Local and/or County groundwater, the Owens Valley, the Colorado River, and the State Water Project. In addition, both districts maintain inter-connections with adjoining water districts to increase flow in an emergency. The total quantity of water available to be imported to the water districts during a wildfire event is not an issue; therefore, this report focuses on the water distribution systems.
Both districts rely on pumping water to reservoirs located on hills where gravity provides the water pressure to distribute water to the various zones throughout town. In addition, both districts have small zones where water pressure is provided by pumps.

General information regarding the facilities of the water districts is provided below. The facilities listed in the tables are only the facilities located within the Laguna Beach City limits. South Coast Water District's total service area also includes Dana Point and portions of San Juan Capistrano and San Clemente.

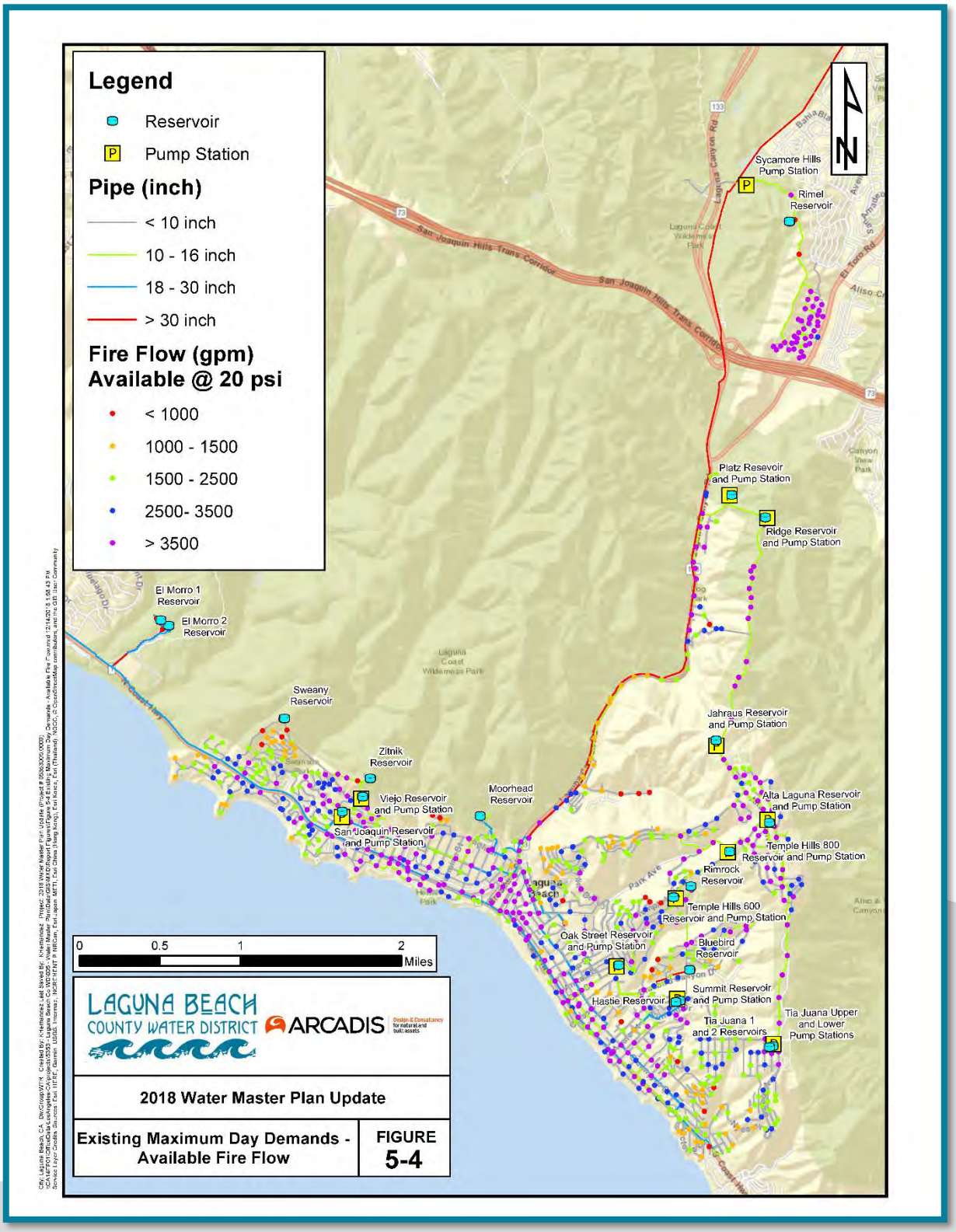
District	Reservoirs	Pump Stations	Capacity in Millions of Gallons	Water Meters	Fire Hydrants
LBCWD	20	12	35 MG	8,800	877
SCWD *	4	3	2.8 MG**	1,942	220

District	Capacity	Water Meters	Capacity / Meters	Fire Hydrants	Capacity / Hydrants
LBCWD	35 MG	8,800	4,000 gallons per meter	877	40,000 gallons per hydrant
SCWD *	2.8 MG**	1,942	1,400 gallons per meter	220	13,000 gallons per hydrant

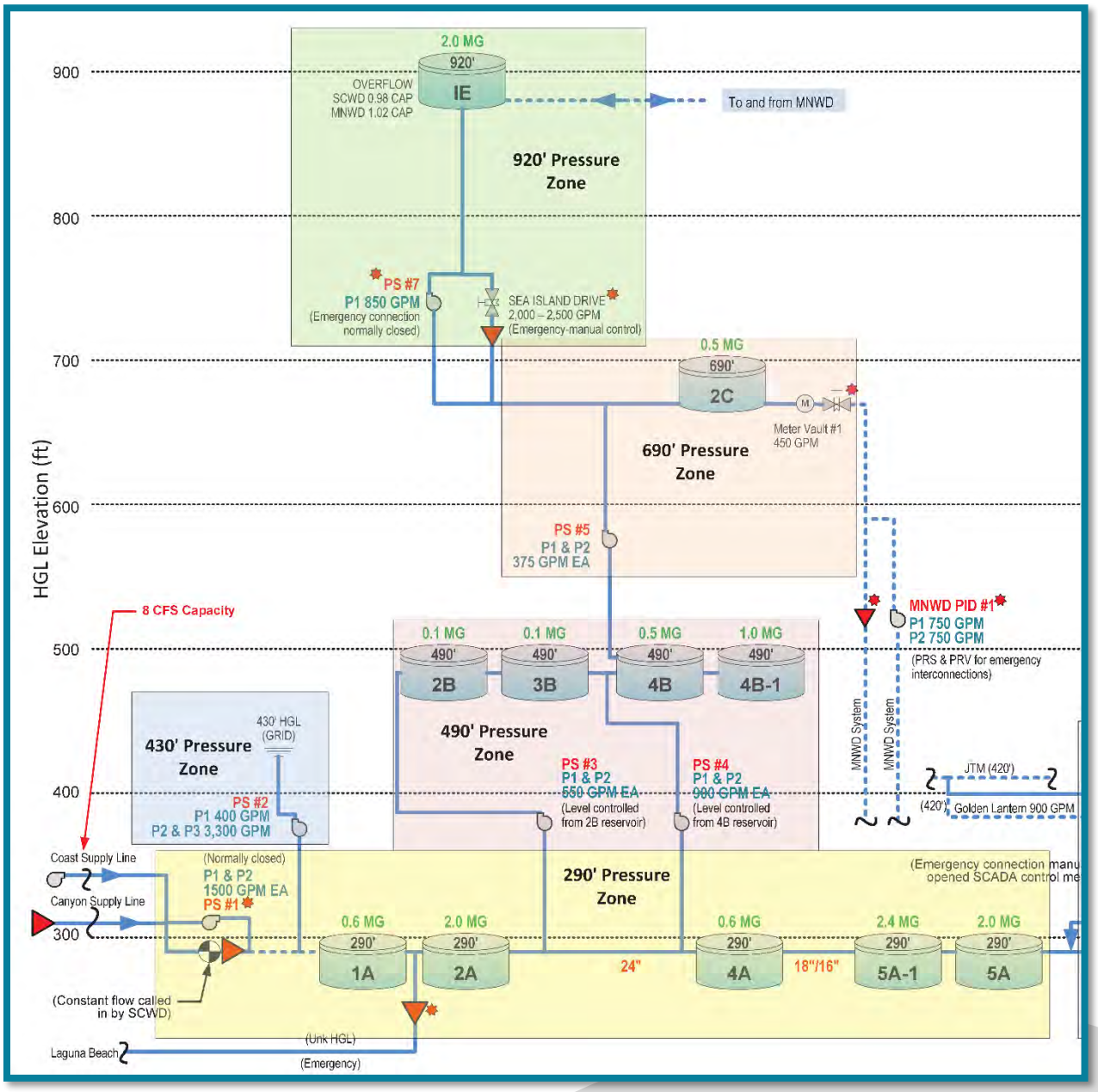
District	Capacity	Average Daily Consumption	Capacity / ADC	Maximum Daily Consumption	Capacity/MDC
LBCWD	35 MG	3.2 MG per day	10.9 days	4.9 MG per day	7.1 days
SCWD *	2.8 MG**	0.9 MG per day	3.1 days	1.8 MG per day	1.5 days

** SCWD's total service area storage is approximately 22 million gallons (MG) and emergency storage supplies are over 29 MG. For the pressure zones located within the Laguna Beach City limits, SCWD has a surplus storage of 6 MG; surplus storage is defined as the required storage per the District's design criteria minus the existing storage within the pressure zone*
*** While SCWD only has 2.8 MG of storage located within the Laguna Beach City limits, the SCWD water system has access to over 29 MG of emergency storage*

Both water districts have provided detailed maps and water system information suitable for more in-depth study in the future. Samples are shown below.



Laguna Beach County Water District Map of Available Fire Flow



South Coast Water District Schematic of Water System

For this report, the water districts have provided information detailing improvements made to their systems since the 1993 Laguna Beach Fire and describing types of improvements might be considered beneficial for their systems to support fighting a wildfire.

Since the 1993 fire the following improvements to the water systems have been made:

LBCWD

- Updated Master Plan to include a goal of fire hydrants capable of 1,500 gallons per minute at the wildland-urban interface
- Built two reservoirs totaling 8 million gallons
- Purchased additional fixed and portable emergency generators for pump stations
- Purchased additional portable, large capacity, pumps
- Installed parallel pipelines in strategic areas for fire flow improvement
- Developed the ability to supply groundwater from Newport Beach and Irvine Ranch water districts in the event of an outage on the Metropolitan Water District delivery system
- Identified low pressure areas, some of which (but not all) have been improved
- Installed a demonstration garden that shows that landscaping can be fire safe, water efficient, and beautiful

SCWD

- Relocation and replacement of pump station #2, located near Ocean Vista Drive, which increased capacity, added emergency generator, underground electric service and two dedicated fire pumps
- Constructed fire flow improvements in West Street including new fire hydrant installations and larger piping
- Replacement of small diameter main in South Laguna Village area
- Replaced pumps and increased capacity at pump station #3 located on West Street
- Replaced all sub-standard fire hydrants along Coast Highway
- Added new high-capacity water mains and fire hydrants on Driftwood, Ocean Vista, Wesley, and Marilyn sized expressly for fire flow
- Installed emergency power connections at all pump stations
- Purchased new and additional portable emergency generators

Water System Challenges

When discussing wildfire mitigation and fire safety, it is important to note that the water systems of both districts are designed and constructed to provide potable water to the citizens and adequate water flow to combat structure fires but not to combat major wildfires. Fighting a wildfire event can require large volumes of water storage and large diameter distribution piping to obtain the significant water flows necessary to fight a wildfire. These volumes could be orders of magnitude above the volumes currently available.

There are three standards that could be considered when evaluating the systems of both water districts.

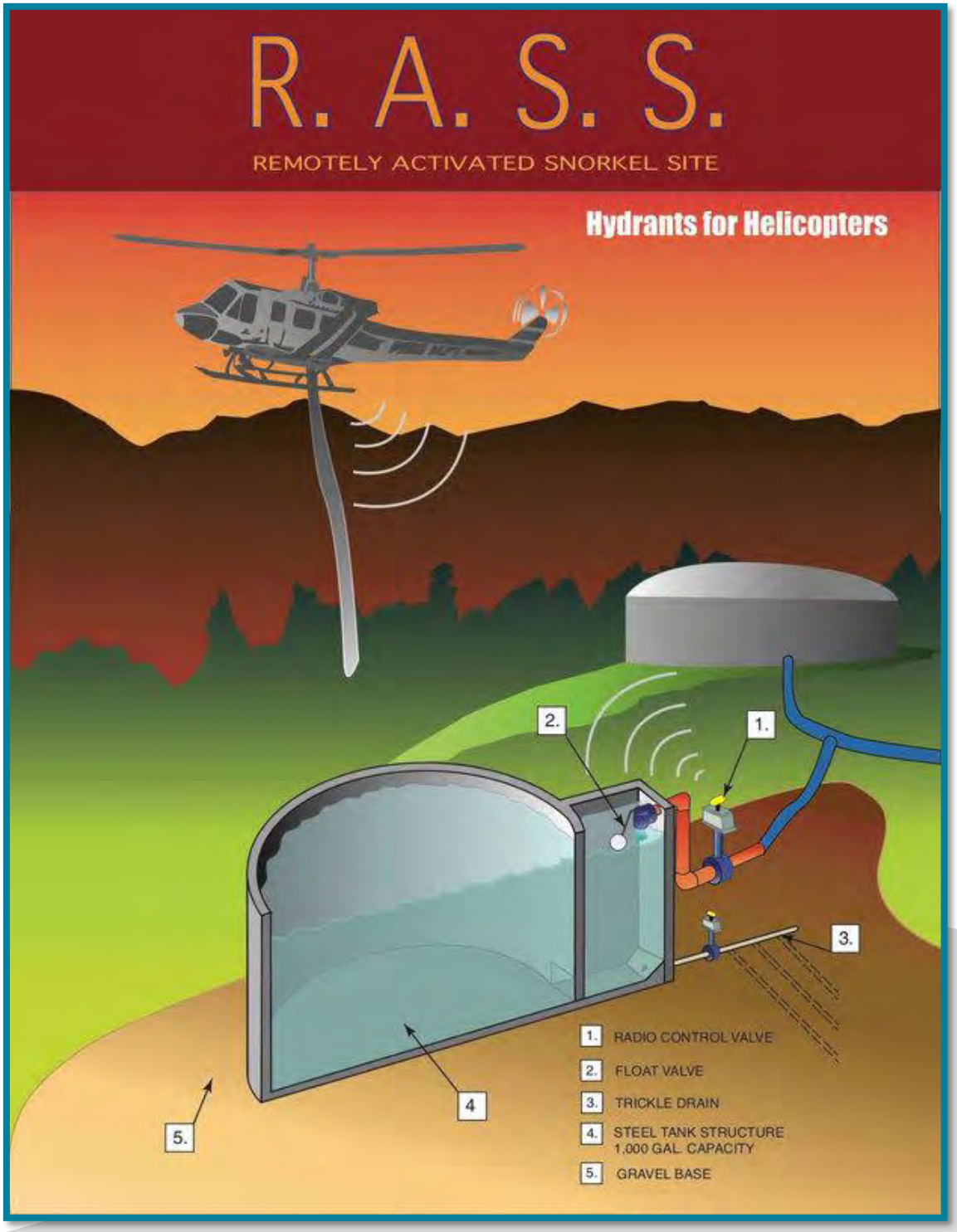
1. National Fire Protection Association, Standard 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting;

2. American Water Works Association, Manual M31, Distribution System Requirements for Fire Protection; and
3. Insurance Service Office: Water Supply Rating.

Determining what additional upgrades to the water systems are necessary and beneficial for fighting a wildfire requires further study by the water districts. However, system improvements that might be beneficial to fighting a wildfire could include:

- Emergency generators to maintain power to pumps that fill the reservoirs
- Redundant pumps to fill the reservoirs
- Increased capacity of reservoirs
- Larger piping to increase water flow to key areas of the systems such as piping along the wildland-urban interface
- Increasing the fire resistiveness of key infrastructure such as the generator and pump enclosures
- Installation of remote-controlled filling tanks for helicopter access. These special fire hydrants are known as RASS (Remotely Activated Snorkel Site) hydrants
- Harden the Supervisory Control and Data Acquisition (SCADA) systems to allow full control of the water facilities during a wildfire

Helicopter refilling its tanks from a RASS fire hydrant without assistance



RASS Fire Hydrant Schematic

Water System Possible Action Items

List of Potential Improvements Provided by Water Districts

Both districts have provided lists of potential improvements to their water systems that might be beneficial to fighting a wildfire. The key items are:

LBCWD

- Continue fire hydrant replacements with current standards
- Continue improving remote control operation of facilities
- Consider vegetation management and/or water cannons for protecting key infrastructure
- Increase capacity at Platz Pump Station and install a stationary emergency generator with automatic transfer switch
- Increase capacity at San Juaquin Pump Station and install a stationary generator with automatic transfer switch
- Construct a pipeline from San Juaquin Reservoir to Zitnik Reservoir
- Consider trail/access road improvements to reservoirs
- Maintain and analyze upgrading the inter-connections with the Irvine Ranch, El Toro, and Moulton Niguel water districts in the future

SCWD

- Add 4,200 feet of new high-capacity water mains and fire hydrants to serve the areas of Coast Royal, Upper and Lower Three Arch Bay, and Mission Hospital (included in 2017 Master Plan)
- Additional connections between South Laguna Beach distribution system and transmission system
- Replace Reservoirs 2B and 3B to increase capacity from 100,000 gallons to over a million gallons each
- Retrofit Pump Stations 1 and 3 with noncombustible roofs and ember resistant vents
- Underground the electric service at Pump Station 3
- Install a standby generator with automatic transfer switch at Pump Station 3
- Improve or extend fire/access roads to reservoirs
- Add to the transmission system redundancy capabilities

Recommended City Support of Possible Action Items

The City Council Subcommittee appreciates and supports the long-term goals and improvement programs provided by both water districts. For the purposes of providing an improved water supply for fighting a wildfire, the Subcommittee specifically supports exploring the following recommendations with the Water Districts in priority order.

Increase the capacity of Reservoirs 2B and 3B in South Coast Water District - Row # 42
Increasing the storage capacity of reservoirs 2B and 3B will reduce the reliance on pumps and increase the quantity of water provided by the gravity pressurized system during a wildfire emergency in the South Coast Water District. It has been discussed to increase the storage capacity of each reservoir by approximately one million gallons for a total of two million gallons.

Improve the fire resistivity of water pump and generator enclosures - Row # 22
Some of the water pump and generator enclosures within both water districts are constructed of combustible materials. During a wildfire the systems could be subject to failure. It is recommended to harden all water pump and generator enclosures with non-combustible roof, ember resistant vents, underground electric service, and fire-resistant alarm notification installations.

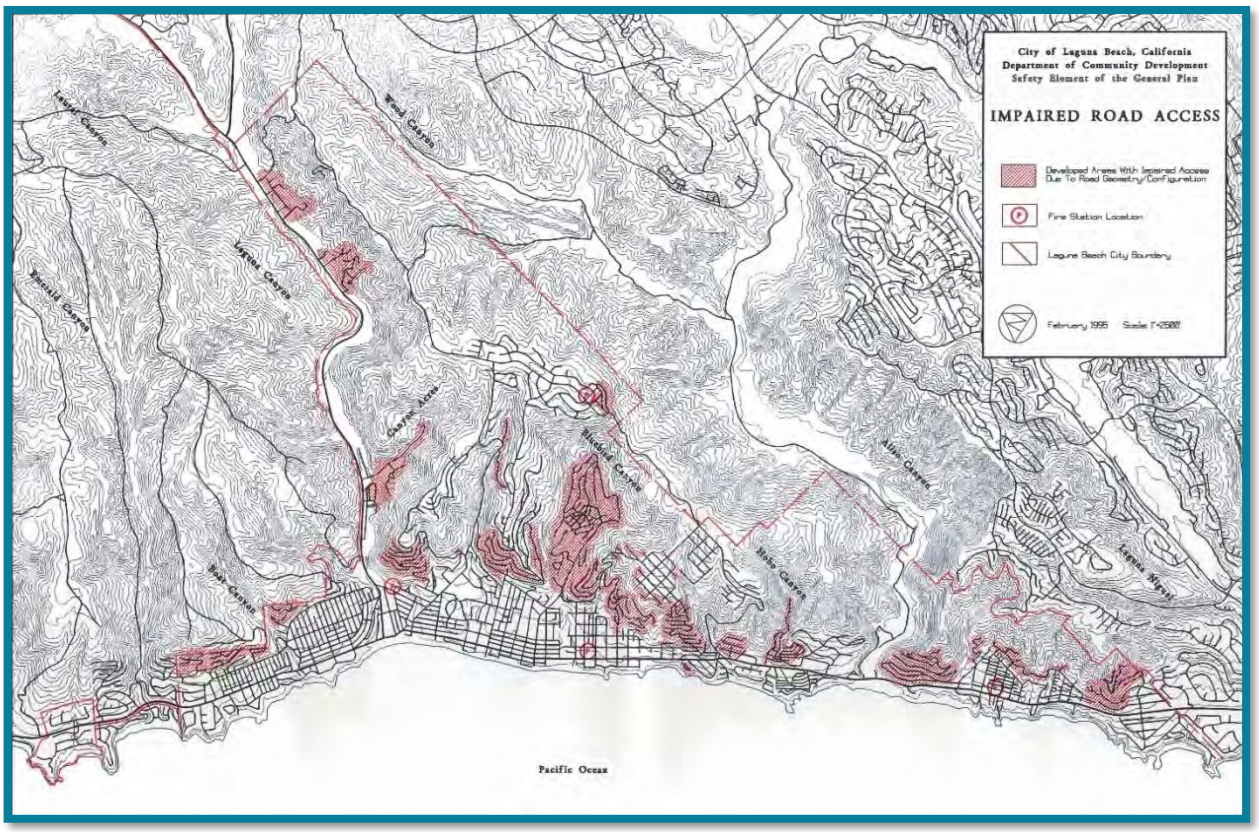
Install an emergency generator at Pump Station 3 in South Coast Water District - Row # 23
Water storage capacity is maintained through a series of pumps lifting water up to the reservoirs. Wildfires sometimes cause, or are associated with, a power outage. To help ensure that sufficient water is available during a wildfire emergency, it is recommended to install a standby emergency generator with automatic transfer switch that serves Pump Station 3.

Maintain or improve water system inter-connections - Row # 43
Laguna Beach County Water District and South Coast Water District have connections to the adjacent water districts such as Irvine Ranch Water District and Moulton Niguel Water District for emergency use. Both districts should consider improving the water system inter-connections for improving the connections for more efficient use during a wildfire emergency.

Install two helicopter fire hydrant filling stations - Row # 17
Helicopters that are used for firefighting usually fill their water tanks at a lake or are filled by a fire engine crew. A Remotely Activated Snorkel Site (RASS) fire hydrant is a tank where a helicopter can fill its water tank without any assistance. Installing two RASS fire hydrants, one in the northerly end and one in the southerly end of town would greatly improve the refilling and travel time of the helicopters which means more water on the fire. Exact locations will need to be determined.

Roads and Circulation

The roadway widths and configurations in Laguna Beach are highly variable. Many streets are narrow, others are dead-end, and certain groups of streets have only one egress route. The location of many of these streets are adjacent to open space and considered a part of the wildland-urban interface. Evacuation may be necessary during a wildfire event and that evacuation may be complicated by erratic wildfire behavior that could block ingress and egress to some of the highly vulnerable areas in town. A map of areas with impaired access was developed in 1995 with the General Plan Safety Element and is shown below:



1995 Exhibit of Roads with Impaired Access

Roads and Circulation Challenges

A step to alleviating ingress and egress concerns is in current practice in the Diamond/Crestview area. The procedures are documented in the Red Flag Warning Plan and Checklist. Special parking restrictions are enforced on designated on-street parking spaces (marked with a "red flag" painted on the pavement) in the Diamond/Crestview area during a red flag event. Once a red flag event has been posted, vehicles parked in the designated spaces may be cited or towed. The reduced parking on those streets reduces congestion and improves ingress for emergency vehicles and egress for the residents.

Other areas of town might benefit from similar safety-oriented enforcement or the creation of additional egress roadways. It might be possible to create additional roadways that reduce dead end streets or provide additional egress routes from certain areas. However, identifying and recommending potential solutions for those issues needs further investigation in the future.

Roads and Circulation Possible Action Items

A possible action item to investigate improvements to the roads and circulation in Laguna Beach has been identified and was listed previously in the section on Evacuation. For convenience, the item summarized here again.

Prepare an evacuation modeling study - Row #5
Understanding the issues involved in a citywide evacuation is a complex problem. It is recommended to have a consultant prepare an Evacuation Time Estimate study using specialty computer modeling that will identify potential bottlenecks in traffic, a reasonable capacity of our roadways, areas where two-way traffic must be maintained, and if a staged evacuation could be possible. As a part of the study, areas with impaired access could be identified and preliminary investigation of where additional egress routes may be recommended for further investigation. The parameters for the study could include, but not be limited to: areas with multiple streets but only one egress route, dead-end streets, the number of parcels served by the egress route, adjacency to the wildland-urban interface, feasibility of construction, use during a wildfire evacuation and feasibility for routine use. In addition, the study could identify areas where temporary safe refuge areas may need to be considered.

Temporary Refuge Areas

The Fire Department has prepared detailed assessments for fighting a wildfire along the Laguna Coast. The assessments are divided into South, Central and North and are a part of the Fire Department's routine training.

Temporary safe refuge locations may be needed during a wildfire event and were utilized in the devastating Camp Fire that killed 85 people and destroyed the City of Paradise (18,000 structures destroyed) in November 2018. The fast-moving fire forced people evacuating the town to use buildings, parking lots and open space areas as temporary safe refuge while the flames surrounded them. These were last minute decisions made by desperate people and fire crews. While it is important that buildings and areas with certain fire resistive qualities be listed and known to emergency personnel to use as a last resort, a temporary safe refuge is not a substitute for evacuation from the area. The map below identifies some of the areas or buildings that are listed in the Fire Department assessments as consideration for use as a temporary safe refuge. The map also shows some of the areas of town with impaired access ranked in order of the number of properties within each area and only includes areas containing more than 75 parcels.

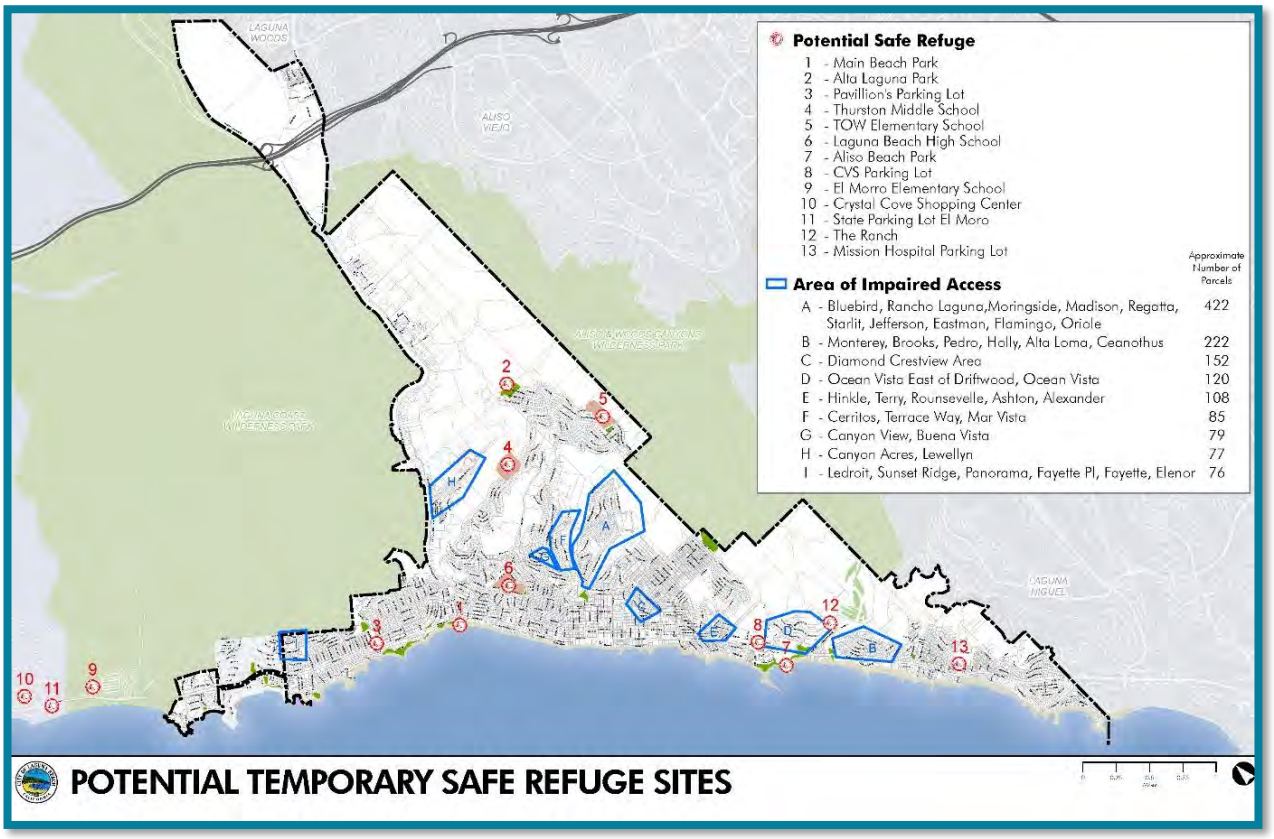


Exhibit of Potential Temporary Safe Refuge Sites

Temporary Safe Refuge and Staging Challenges

A review of the Fire Department assessments shows a lack of locations suitable for use as fire-fighting staging and a lack of locations suitable as a temporary safe refuge in many portions of town. It is apparent from the map, that there are many locations in Laguna Beach where there are no suitable buildings, or open areas, to use as a temporary safe refuge areas in an extreme emergency. As an example, the Bluebird Canyon area (A on the map) is not near a suitable temporary safe refuge area and also contains the highest number of properties, approximately 422, with impaired access.

The Fire Department analysis shows that the majority of suitable staging areas for a command center are located out of town. The photograph below shows Main Beach being used as a staging area during the 1993 Fire which blocked the highway and restricted emergency access during the firefighting efforts.

1993 Laguna Beach Fire- Staging Area at Main Beach

Temporary Refuge Areas and Staging Possible Action Item

Plan a temporary safe refuge and egress route for Bluebird Canyon - Row # 19
Prepare a plan for creating temporary safe refuge area for the Bluebird Canyon area and examining routes for creating an additional egress route from the area using the results from the evacuation study.

Emergency Operations Center

Emergency Operations Center at City Hall

A critical function during a wildfire emergency is the Emergency Operations Center (EOC) which is located in City Hall. The majority of the coordination and communication decisions are made through the EOC. It is possible that the EOC could become unusable either by evacuation efforts, fire damage to the structure, or through loss of power and/or communications connections. Recently, during the evacuation of Malibu in 2018, the Malibu EOC had to be relocated to Santa Monica which proved to be very difficult task due to the lack of planning for such an event. It is recommended to have staff identify an off-site location, possibly out of town, to serve as an alternative EOC. Lease agreements, duplicate equipment and materials may be needed.

Emergency Operations Center Possible Action Item

Identify an alternate emergency operations center location - Row # 27
It is possible that the Emergency Operations Center (EOC) at City Hall cannot be used due to fire and evacuation. Begin a process to identify a suitable off-site location, possibly out of town, to serve as an alternative EOC. Lease agreements, duplicate equipment, communications connections, and materials may be needed.

Structures

1993 Laguna Beach Fire

Protecting residential and commercial structures from fire is partly achieved during construction through the appropriate building and fire codes. The City of Laguna Beach has adopted the California Building Code (CBC) including Section 7A which applies to the building materials, systems and assemblies used in the exterior design and construction of new buildings, alterations and repairs for structures within a Fire Hazard Severity Zone. The City has amended sections to strengthen the requirements even further for the protection against wildfire.

The City always has the opportunity to review the proposed changes to the CBC and adopt or make amendments before adoption. The CBC for 2019 is expected to be approved by the State in July 2019 and then the City has until January 2020 to adopt it and/or modify it.

The CBC is written on an assumption that the building is surrounded by a compliant fuel modification zone of approximately 300 feet in width. Even structures built in conformance with the most stringent codes may not perform as expected without a fuel break to slow the advance of a fire. This is especially important when considering other sections of this report regarding fuel modification zones and landscaping on private property.

1993 Skyline Area

1993 Laguna Beach Fire - Skyline Area

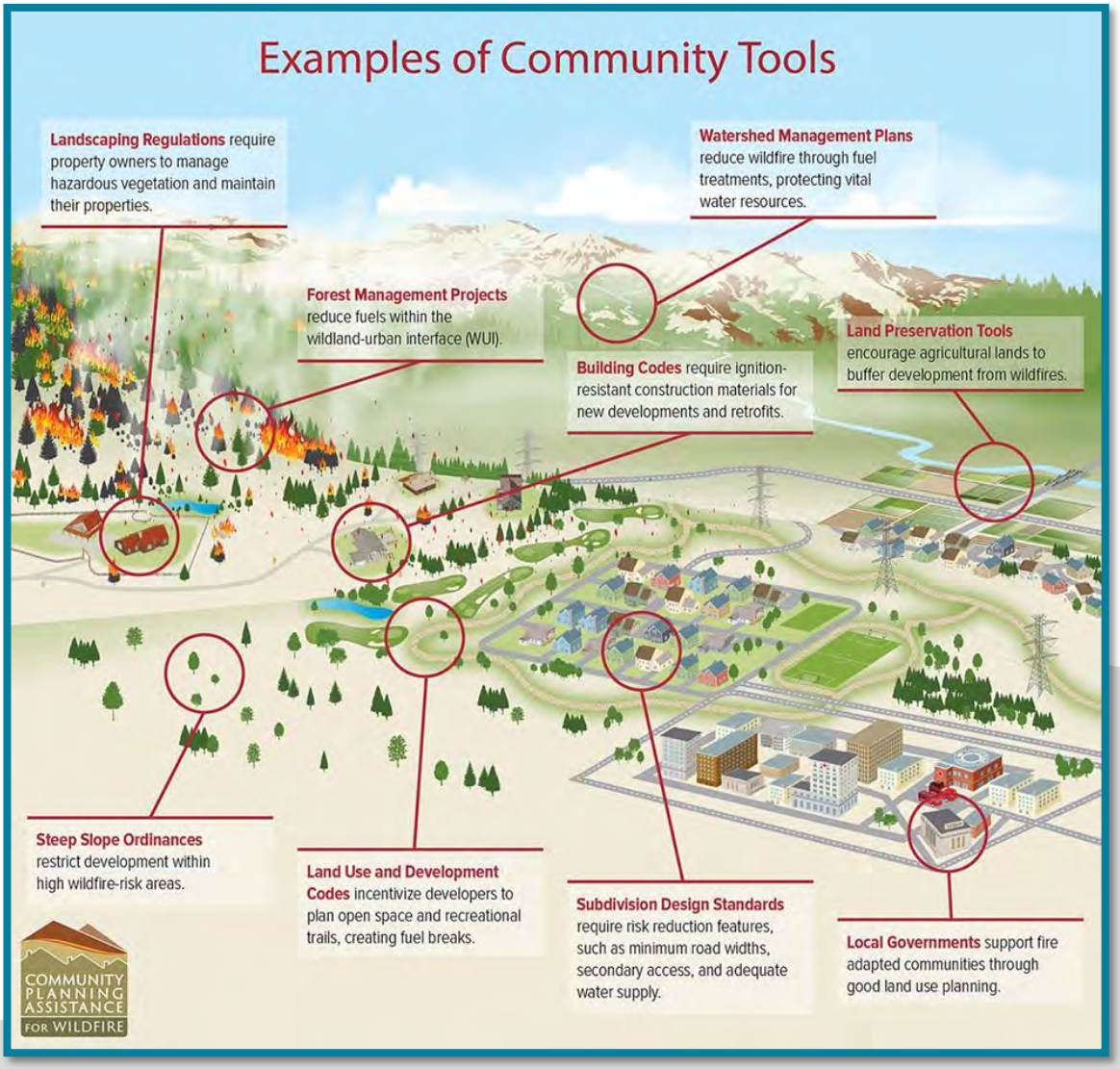
Recent studies of the structural loss in Paradise, CA from the 2018 Camp Fire demonstrated that 51% of the 350 homes built since the adoption of Chapter 7A wildland-urban interface fire and building code improvements in 2008 survived this catastrophic wildfire, while only 18% of 12,100 homes built prior survived (McClatchy/AP Study, 2019).

A retrofit program to make exisiting structures more fire resistive could be considered. Incentives for homeowners to make those improvements could also be considered. The fire resistive improvements could focus on the following areas:

- Fire and ember resistive attic vents
- Non-combustible roofing and siding
- Fire resistive roof eaves
- Fire resistive doors and windows
- Fire resistive balconies, decks, and structural overheads/cantilevers
- Fire resistive yard landscaping
- Structural separation

Some California State Legislators are considering legislation that could require fire resistive upgrades upon the sale or transfer of a property and propose incentives for making such improvements. Considering that fire resistive upgrades could be very expensive, it is recommended that the City consider incentives that would increase the voluntary participation in upgrading existing structures to a more fire resistive status such as reduced permit fees or certain exemptions from the design review process.

There are other tools that a community can use to increase the fire resistiveness of their town. In 2016, an independent, non-partisan group, Headwaters Economics, published a landmark study titled *Communities Utilize Land Use Planning to reduce Wildfire Risks and Costs* (See examples of Community Tools, below). This study identifies many of the best practices associated with community wildfire preparedness and resiliency.



Headwaters Economics Institute Study 2016

Using the examples of community tools described above, the City has successfully addressed many of the areas and a summary is provided below:

Landscape Regulation
The City has a strong landscaping requirement for new construction within the wildland-urban interface but lacks inspection or consistent enforcement to maintain permit required conditions over time. Evidence suggests that many properties may not be maintaining their properties as prescribed in their development permits resulting in a degraded condition.

Forest Management Projects
The City actively engages in fuel modification projects within the wildland-urban interface, but needs to expand the program City-wide. Some areas of the City lack any defensible space.

Building Codes
The City maintains stringent requirements for new construction within the wildland-urban interface, and has adopted California Building Code, Chapter 7A wildland-urban interface building standards. While this standard offers strong protection for structures developed since 2008, most of the community was built before adoption, and lack these fire defenses.

Land Preservation Tools
16,000 acres of wildland open space has been preserved around the City, the land is in a natural condition which presents wildfire risks and challenges.

Watershed Management Plans
The City aggressively manages watershed lands and promotes environmentally sensitive fuel modification practices, but additional work may be possible to achieve working with park agencies and other landowners.

Steep Slope Ordinance
Some homes within the City are located on steep slopes which increases exposure to fire behavior and risk. Consideration for additional slope controls or expanded landscape fuel modification may be necessary to increase fire protection of these sites.

Land Use and Development Code
The City maintains strict land use development standards. New development is also subject to Coastal Act review.

Subdivision Design Standards
While no new subdivisions are planned for the City, existing infrastructure has opportunities for improvement as outlined in this report.

Local Government Support

The City is wholly committed to wildfire preparedness, and the Mayor's designation of the Wildfire Preparedness and Fire Safety Committee is but one example. The City maintains a robust focus on fire safety in its Fire, Police, Building, Community Development, Public Works, and Water Quality Departments, maintains citizen oversight through citizen committees like the Emergency and Disaster Preparedness Committee, and works with other public and private partners such as OC Parks, Orange County Fire Authority, Laguna Canyon Foundation, Greater Laguna Firesafe Council, and similar organizations in fire safety efforts. The City has been successful in partnering with the State of California in acquiring grants to address fire safety needs, including fuels management.

Structure Challenges

Laguna Beach's stringent building and fire codes only affect new construction or renovations completed after the codes are in effect. A significant majority of structures in Laguna Beach do not meet the current CBC and Fire Code requirements. It is certainly possible that many existing structures may never be brought into compliance with the current codes.

Laguna Beach Fire Engine

A research paper prepared by Headwater Economics "Building a Wildfire-Resistant Home: Codes and Costs" compares existing codes and standards for wildfire-resistant construction and estimates the cost differences for constructing a wildfire-resistant home compared to a typical home. Key findings include:

- A new home built to wildfire-resistant codes can be constructed for roughly the same cost as a typical home
- Costs vary significantly for retrofitting an existing home to be wildfire resistant
- Many wildfire-resistant home features have additional benefits, such as longer lifecycle and reduced maintenance

Therefore, this report offers two general statements regarding the cost of compliance with the CBC Section 7A.

1. Obtaining compliance with CBC Section 7A should not be a limiting factor when constructing new structures or extensive renovations; and
2. Upgrading an existing structure with fire resistive materials for the sole purpose of obtaining compliance with CBC Section 7A could be cost prohibitive in certain cases.

Structure Possible Action Items

Adopt the 2019 California Building Code Section 7A - Row # 21
The City routinely adopts new California Building Code when they are revised by the State and has previously adopted Section 7A regarding wildfire resistance. New code revisions will be introduced by the state in 2019. The City's adoption of the new California Building Code Section 7A will confirm the importance of adopting new Code standards for increased fire resistiveness of structures. Direct staff to review the proposed codes changes and propose amendments to the changes if needed to better protect Laguna Beach before the new codes are adopted in January 2020.

Investigate incentives to improve wildfire resistance of existing residences - Row # 35
The majority of the wildland urban interface involves residential property. There are improvements that individual property owners can do to reduce their risk to wildfire such as bringing existing residences into conformance with modern building codes related to wildfire. This retrofitting can be effective but expensive. It is recommended to investigate incentives that will encourage improvements to be made at a future date, such as reduced permit fees or certain types of improvements being exempted from the design review process.

Radio Facilities

Radio communication facilities are used by our Police, Fire and Public Works Departments and is a vital link for notification and coordination efforts during a wildfire. Due to the terrain of Laguna Beach, there are areas with poor emergency radio coverage. Almost all of the radio transmissions relay through the radio repeater at the Moorhead Reservoir on the hill northwesterly of the Festival of the Arts. This location is surrounded by open space and subject to a wildfire event.

There is a back-up system running from City Hall to Fire Station #3 at Top of the World. From there, radio signals are transmitted to Loma Ridge and the County-wide system which does not provide coverage for Laguna Beach. In addition, Fire Station #3 is not a fire resistive structure and could be vulnerable in a wildfire event.

Radio Facilities Possible Action Items

Improve the emergency radio reception at Moorhead Reservoir site - Row # 25
Due to the terrain in Laguna Beach the emergency radio coverage could use improvement. It is recommended to work in cooperation with Orange County Communications, who operates the radio system, to develop a plan to improve radio coverage and emergency communications from the radio repeater antenna at the Moorhead Reservoir site.

Investigate fire resistive improvements to emergency radio facilities - Row # 26
The emergency radio equipment and antennas at the Moorhead Reservoir site are subject to damage during a wildfire. It is recommended to conduct an analysis of fire hardening or structural improvements to the Moorhead Radio Repeater to improve the survivability of the radio equipment and a similar study for the radio equipment at Fire Station #3.

Telecommunications Facilities

Wireless telephone communications were one of the first systems that failed during the Camp Fire that destroyed the City of Paradise in November 2018. The failed systems severely hampered the evacuation and coordination efforts.

The telecommunication companies maintain telecommunications antennas within the open space surrounding Laguna Beach that are subject to damage from a wildfire event. In general, the antennas and the exposed wiring of a wireless site could be damaged by wildfire. The electronic radio equipment is typically housed in masonry or metal enclosures often without any additional fire resistive features to protect the exposed antennas and wiring.

These sites are referred to as “Macro” sites which are capable of transmitting several miles and service a large area as compared to small cell sites which have a much shorter transmitting distance and cover a very localized area. The macro sites provide a significant portion of the service coverage to Laguna Beach.

Key macro facilities are located on the Laguna Beach County Water District “Ridge Reservoir” which is located on the West Ridge Trail east of Laguna Canyon Road and Sun Valley Drive. The facility is not surrounded by any fuel modification zone and the antennas are exposed on the side of the reservoir.

Ridge Reservoir

Antennas on Ridge Reservoir

Moorhead Reservoir Site

Antenna Tower at Moorhead Reservoir

Most of the telecommunications companies have small cell site installations along Laguna Canyon Road which fill the gaps in coverage caused by the terrain of the canyon and provide additional capacity for the higher demand for service along main roadways. These sites are typically attached to existing utility poles and could be subject to damage from the first impacts of a wildfire. If damaged, the result might only affect very localized areas in the canyon.

There are numerous other antenna sites within Laguna Beach, but most are on buildings along Coast Highway and would not be subject to the first impacts of a wildfire.

Telecommunication Facilities Challenges

The telecommunications macro sites involve exposed antennas and wiring that are subject to heat and fire damage. Even if the radio equipment and the power supply are housed in fire resistive enclosures the antenna and its wiring would fail from the huge flame lengths of a wind driven fire. Therefore, it is recommended to rely on a fuel modification zone of approximately 100 feet in width to protect this equipment.

If fuel modification is not feasible, other possibilities could include:

- Taller antenna towers with protected conduits leading up the towers
- Fire proofing measures such as fire-stop materials coating the exposed conduits to reduce damage during a fire
- Since the macro sites are located on water reservoirs it might be possible to provide a fire pump and water cannon system to protect the equipment during a fire

All antenna sites rely on electric power and a fiber optic line for operation. A significant portion of the electricity provided to Laguna Beach travels on the overhead lines that parallel Laguna Canyon Road. Also, the fiber optic lines that provide the telecommunications connections and the data connections for the majority of Laguna Beach are connected to the communication utility poles that parallel the western side (open space side) of Laguna Canyon Road. Both the power and fiber optic lines along Laguna Canyon Road could be subject to the first impacts of a wildfire. If fiber optic lines along Laguna Canyon Road are damaged, it would create a significant impact to all communications and data access for a majority of Laguna Beach.

Telecommunications Facilities Possible Action Items

Create fuel modification zones around telecommunications/radio facilities at the Moorhead and Ridge Reservoir sites - Row # 24
Telecommunication facilities are a vital link in notification, and coordination efforts during a wildfire. The telecommunications facilities at the Moorhead Reservoir and the Ridge Reservoir have exposed antennas and wiring that are subject to heat and fire damage. Even if the radio equipment and the power supply are housed in fire resistive enclosures, the antennas and their wiring could fail from the huge flame lengths of a wind driven fire. Therefore, it is recommended to rely on a fuel modification zone of approximately 100 feet in width to protect this equipment.

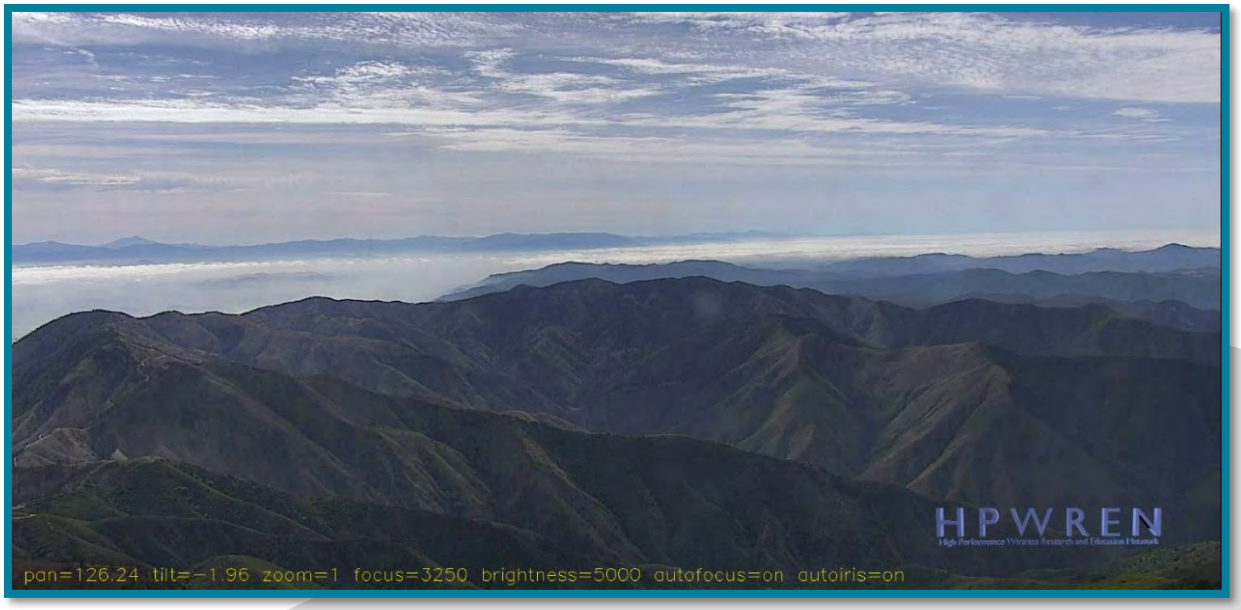
Create a fuel modification zone to improve the survivability of communication cables along Laguna Canyon Road - Row # 45
The majority of wireless sites for telecommunications and data access, and direct wired data access (such as City Hall) are provided through fiber optic connections that are suspended between utility poles along Laguna Canyon Road. These fiber optic cables could be destroyed by the first impacts of a wildfire resulting in a significant loss of communication abilities. It is

recommended to consider options to improve the survivability of the communications cables during a wildfire. This option recommends providing a sufficient fuel modification zone to protect the cables. Another option not presented could be undergrounding the cables, which would be achieved with the undergrounding of utilities on Laguna Canyon Road as recommended in the possible action item in Row #40.

Fire Detection Camera System

In 2000, the National Science Foundation funded a multi-institutional research and education project through the University of California at San Diego to collect data from a wide range of astronomical, environmental and geologic sensors through a wireless network. Over the years the system has greatly expanded and is now known as the High-Performance Wireless Research and Education Network (HPWREN). The network spans from San Clemente Island to nearly the Arizona border and now includes numerous cameras that are used for fire detection and public safety uses.

The County of San Diego, San Diego Gas & Electric and fire-fighting agencies have provided further resources for additional cameras and weather stations in strategic locations overlooking vast areas of mountainous brush and chaparral that are often used by firefighters to confirm the location or status of an active wild fire. These cameras have become a very significant public safety component of the HPWREN system.



View from HPWREN camera on Santiago Peak

Fire Detection Cameras Possible Action Item

Install two fire detection cameras - Row # 16

Early detection of a wildfire is key to a successful fire-fighting attack on the fire and these cameras are an excellent resource for early detection. Two cameras will be placed in the area of the City of Laguna Beach during the next year; one on the Ridge Reservoir and one at Signal Peak as a part of the High-Performance Wireless Research and Education Network system. The cameras will provide visual access to the wildland surrounding Laguna Beach and be operational in 2019. The installation will be funded by Southern California Edison with cooperation from the water district and telecommunications companies. The City will incur a small annual cost for power and connectivity.

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Section 7
Funding

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Funding Strategies

This section provides the financial plan and funding strategies needed to address the costs associated with the possible action items identified for the Short, Medium, and Long-Term categories.

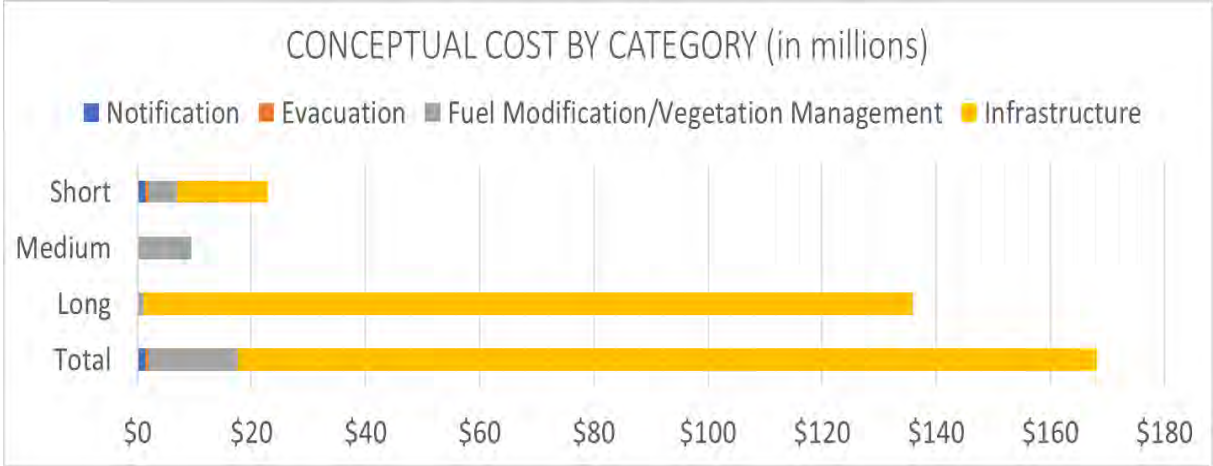
The placement in these categories considers both the time necessary to plan and prepare for each opportunity and the time necessary to develop and implement a financial strategy to fund them. Descriptions of the proposed or potential funding sources are:

- ✓ **Short-Term (1-2 years):** Existing one-time and ongoing revenues and re-prioritization of current appropriations
- ✓ **Medium-Term (3-5 years):** Increases in existing revenues sources, such as parking fees; grant programs with matching funds from existing Capital Improvement Funds; available funding from Street Lighting and Utility Funds, Measure LL Fund, or other existing City Funds; and other external sources
- ✓ **Long-Term (+5 years):** Tax increases; grant programs; the creation of new assessment districts; and other internal or external sources

Each improvement has been assigned a funding category that includes:

- **New One-Time Costs:** Programs or project costs that include one-time construction or purchase costs
- **New Ongoing Costs:** Programs or projects that require annual funding
- **Funded:** Programs or projects that are already accounted for or in the upcoming two-year budget
- **Grant-Eligible:** Programs or projects could meet eligibility requirements to be funded by a future grant program. This is speculative and depends on the future availability of grant funds
- **Water Districts:** Programs or projects that may be included in the future capital improvement program of the water districts
- **Local Funding:** Programs or projects that may be funded through the formation of a special tax or assessment district or other tax funding mechanism

The estimated total cost for action items identified in Table 1 is $168 million. Of that amount, $22.9 million is included in the Short-Term category, $9.4 million in the Medium-Term category, and $135.8 million in the Long-Term category as shown in the chart below:



Funding Strategies for Possible Action Items Categorized as "Short-Term"

Table A summarizes the possible action items grouped in the Short-Term category with a total funding need of $22.9 million. It also shows that the City Council has already appropriated $14.7 million towards those action items that includes $10 million from existing Rule 20A credits and $4.7 million related to the California Department of Forestry and Fire Protection (Cal-Fire) grant. This leaves a funding gap of approximately $6.7 million.

TABLE A: FUNDING NEED FOR ITEMS CATEGORIZED AS SHORT-TERM AND EXISTING FUNDING SOURCES

		New Requests	
		One-Time	Ongoing
A	Short-Term Category Requests: New One-Time Cost	$ (6,650,000)	
B	Short-Term Category Requests: New Ongoing Annual Cost		(285,000)
C	Short-Term Category Requests: Funded	(14,760,000)	
D	Short-Term Category Requests: Grant Eligible	(14,000)	
E	Short-Term Category Requests: Water Districts	(1,250,000)	
	Total Short-Term Category Requests	($22,674,000)	($285,000)

		Approved Funding Sources	
F	Use of existing Rule 20A credits for undergrounding Projects	$10,000,000	
G	Fuel Modification Grant and City Matching Contribution for ongoing maintenance	4,675,000	
H	Potential Water District Funding	1,250,000	
I	Existing Capital Improvement Program	85,000	
	Total approved funding sources for Short-Term Category	$16,010,000	$0
	Funding Gap (New Requests less Existing Funding Sources)	($6,664,000)	($285,000)

This funding gap for these action items can be provided by:

- $14,000 outreach grant to be funded directly by the Fire Safety Council
- $137,000 in available one-time funding from the General Fund in FY 2020-21
- $2 million in existing Measure LL appropriations programmed for utility undergrounding and fire safety

- Reprogramming $2 million in one-time pension contributions
- Restructuring the "Side Fund" loan so that the Street Lighting and Utility Fund is repaid over the next two years and use the repayment amount toward the Short-Term items
- Utilizing a contribution from the Parking Fund for the remaining balance

This funding strategy is summarized in Table B below:

TABLE B: CONCEPTUAL FINANCIAL PLAN TO CLOSE FUNDING GAP FOR ITEMS CATEGORIZED AS SHORT-TERM

		Possible Funding Sources	
		One-Time	Ongoing
	Funding Gap for Short-Term Category Requests	($6,664,000)	($285,000)
1	Grant Funding for Neighborhood Outreach Program	14,000	
2	Available General Fund Available One-Time Funding in FY 2020-21	137,000	
3A	Measure LL FY 2019-20	1,000,000	
3B	Measure LL FY 2020-21	1,000,000	
4A	Reprogram FY 2019-20 Additional Pension Contribution	1,000,000	
4B	Reprogram FY 2020-21 Additional Pension Contribution	1,000,000	
5	Available Fund Balance Measure LL Fund	320,000	200,000
6	Restructure Side Fund Loan Repayment to repay Street Lighting and Utility Fund in FY 2019-20, and FY 2020-21	1,500,000	
7	Contribution from the Parking Fund repaid from mid-year savings if available	693,000	85,000
	Total Available Funds	6,664,000	285,000
	Short-Term (Shortfall)	$0	$0

Conceptual Funding Strategies for Possible Action Items Categorized as "Medium-Term"

Table C summarizes the possible action items grouped in the Medium category with a total funding need of approximately $9.4 million.

TABLE C: FUNDING NEED FOR ITEMS CATEGORIZED AS MEDIUM-TERM AND EXISTING FUNDING SOURCES

		Financial Need	
		One-Time	Ongoing
A	Medium Category Requests: New One-Time Cost	(2,250,000)	
B	Medium Category Requests: New Ongoing Cost	-	(425,000)
C	Medium Category Requests: Grant Eligible	(6,750,000)	
	Funding Gap	($9,000,000)	($425,000)

The funding for these action items can be provided by:

- Increasing parking rates
- Using Measure LL Funds programmed for utility undergrounding and fire safety
- Using available funding in Street Lighting and Utility Fund
- Applying for fuel modification grants, which is still speculative at this time

This financial strategy is summarized in Table D below:

TABLE D: CONCEPTUAL FINANCIAL PLAN TO CLOSE FUNDING GAP FOR ITEMS CATEGORIZED AS MEDIUM-TERM

		Possible Funding Sources	
		One-Time	Ongoing
	Funding Gap for Medium-Term Projects	($9,000,000)	($425,000)
1	Increase in Parking Rates ($1 increase in parking rates generates $1.2 million)(*)	3,175,000	425,000
2	Measure LL Funding over three-year period (years 3-5) **	3,000,000	
3	Street Lighting and Utility Fund estimated available fund balance	2,000,000	
	Total Available Funds	8,175,000	425,000
	Medium-Term (Shortfall)	(825,000)	0
		Speculative Funding Sources	
4	Fuel Modification Grant or contribution from other agency (Speculative)	6,750,000	
	Medium-Term Surplus***	5,925,000	0

* Ongoing parking revenue increase is estimated to be $1.2M, generated outside of the downtown area, the total for three years is $3.6M

** Ongoing appropriation for undergrounding and fire safety in the Measure LL Fund is $1M, the total for three years is $3M

*** To the extent grant monies are received, any contributions from the Parking, Measure LL or Street Lighting and Utility Fund could be reduced or reprogrammed to items categorized as Long-Term

Conceptual Funding Strategies for Possible Action Items Categorized as "Long-Term"

Table E summarizes the possible action items listed in Table 1 in the Long-Term category with a total funding need of approximately $135.8 million.

TABLE E: FUNDING NEED FOR ITEMS CATEGORIZED AS LONG-TERM AND EXISTING FUNDING SOURCES

		New Requests	
		One-Time	Ongoing
A	Long-Term Category Requests: New One-Time Cost	(600,000)	
B	Long-Term Category Requests: New Ongoing Annual Cost		(1,100,000)
C	Long-Term Category Requests: Grant Eligible - Caltrans, OCTA, State and Federal Grants	(61,900,000)	
D	Long-Term Category Requests: Potential Local Funding	(68,200,000)	
E	Long-Term Category Requests: Potential Water District Funding	(4,000,000)	
	Total Long-Term Category	($134,700,000)	($1,100,000)

Funding Strategies for Long-Term Category Possible Action Items

Due to the substantial funding necessary to complete the items listed in the Long-Term category and the long-term time frame for planning and implementation, this report does not provide any specific financial recommendations for this category. However, Table F below shows potential new revenue sources that could be considered. These items are described in the following pages:

TABLE F: POSSIBLE NEW REVENUE SOURCES (IN MILLIONS)

	Description	Required Approval	Possible Revenue Amount
a	Grant or contribution from other agency for Laguna Canyon Road (Speculative)	Other Agencies	$60 (one-time)
b	Debt Service for $60,000,000 at 2.15% 20 year bonds (Debt Service = $3.7 million) City or Assessment District Debt	City Council and/or voter approval	$60 (one-time)
c	Fuel Modification Grant (Speculative)	Other Agencies	$1.9 (one-time)
d	Local Funding: Parcel Tax ($100 parcel tax generates $1.3 million)	Voter Approval	$1-$3 (ongoing)
e	Local Funding: Increase Local Sales Tax by 0.5% or 1% (Currently 7.75%)	Voter Approval	$2.75-$5.5 (ongoing)
f	Local Funding: Increase Transient Occupancy Tax (Hotel Tax) by 1%	Voter Approval	$1.3 (ongoing)
g	Local Funding: Increase in Parking Rates outside of the downtown area by additional $1	City Council	$1.2 (ongoing)
h	Local Funding: Remove CAP on City Business License Gross Receipts	Voter Approval	$0.5 - $1 (ongoing)
i	Local Funding: Measure LL Fund	City Council	$1 (ongoing)
j	Local Funding: Street Lighting and Utility Fund	City Council	$1 (ongoing)
k	Available Cash in the Parking Fund	City Council	$5 (one-time)
		Total Possible New Revenue	$130 - $150

a) **Grants and Contributions from other Agencies**: Infrastructure and undergrounding grants or contributions toward the improvements along Laguna Canyon Road from other agencies.

b) **Issue Debt:** Generally, there are three kinds of municipal debt financing:

   a. General obligation (GO) bonds, bonds that are secured by a promise to levy property taxes in an amount necessary to cover the debt service and require voter approval;
   b. Revenue bonds that are long-term debt instruments with debt service paid by specific dedicated revenues and a simple majority of the Council is required to issue debt (examples include lease revenue bonds or certificates of participation); and
   c. Special tax or assessment debt, bonds that are repaid from those who benefit from the project.

c) **Fuel Modification Grants:** Fuel modification grants.

d) **Parcel Tax:** A parcel tax is a particular type of excise tax that is based on either a flat per-parcel rate or a rate that varies depending upon use, size and several units on each parcel. Parcel taxes may be levied for general purposes or restricted to a particular purpose. Regardless of use, parcel taxes require two-thirds voter approval. A $100 flat per parcel tax could generate an estimated $1.3 million annually.

e) **Increase the Hotel Tax by 1%:** Increasing the hotel tax by 1% would generate approximately $1.3 million in new revenue annually. The current Hotel Tax rate is 14%; 12% for transient occupancy tax (TOT), and 2% for the self-imposed Business Improvement District Tax. To increase the TOT rate would require majority voter approval or two-thirds voter approval depending upon how the initiative is drafted.

f) **Increase Sales Tax by ½% from 7.75% to 8.25%**: A ½ cent district sales tax would generate approximately $2.75 million annually. To increase the sales tax rate would require majority voter approval or two-thirds voter approval depending upon how the initiative is drafted.

g) **Increase in Parking Fees:** A $1 increase system-wide (parking meters and parking lots) would generate $2.4 million in new revenue annually. A $1 increase in parking meters and parking lots outside of the downtown would generate $1.2 million annually.

h) **Remove Cap from Business License Tax:** The City's business license gross receipts tax has a maximum annual tax of $1,650. By removing this cap, this could generate approximately $0.5-$1.0 million annually. To increase the business license tax rate would require majority voter approval or two-thirds voter approval depending upon how the initiative is drafted.

i) **Measure LL Fund:** $1 million in ongoing funding currently designated for undergrounding and fire safety.

j) **Street Lighting and Utility Fund:** Up to $1 million in available ongoing funding.

k) **Available Cash in the Parking Fund:** At the end of FY 2020-21, the available fund balance in the Parking Fund is estimated to be approximately $5 million. All, or a portion of, this balance could be applied to projects and programs identified in this report.

Financial Impacts from Previous Disasters

Disasters have a substantial adverse impact on local governments. Being financially prepared and proactive in identifying opportunities to prevent or limit the impacts of a disaster will help restore the short and long-term financial position of the City when a disaster occurs.

Below are some financial statistics from previous disasters that impacted Laguna Beach.

- October 1993 fire destroyed 441 structures. According to an LA Times article at the time, in the aftermath of the October 1993 Fire, insurance claims for Laguna Beach were expected to reach $435 million in damages. This total did not include damage to public property or the cost of fighting the fire

- On June 1, 2005, the Bluebird Canyon Landslide destroyed a 500-foot section of Flamingo Road, two large water mains and numerous sewer mains and storm drains. The repairs took three years to complete with a final cost of $36 million. During this time, residents of Laguna Beach approved a ½ sales tax increase that contributed funding to the repair

and to the Disaster Contingency Fund. The Disaster Contingency Fund has a balance of over $6 million set aside for future emergencies

- On December 22, 2010, the City experienced torrential rains damaging public and private properties throughout the City forcing the temporary closure of numerous streets. Laguna Canyon Road was closed for several days during the clean-up effort, the channel at Beach Street overflowed and many downtown businesses and City facilities were flooded. The City's cost related to the cleanup and recovery was approximately $6.7 million

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