

Wildfire Prevention and Protection Action Plan

DRAFTED MARCH 2019



SAN RAFAEL
THE CITY WITH A MISSION



San Rafael Wildfire Prevention and Protection Action Plan



Executive Summary:

At the direction of the San Rafael City Council, staff have produced the San Rafael Wildfire Prevention and Protection Action Plan. This document is intended as a master planning document to guide continual efforts to reduce the wildfire risk in San Rafael. It does not provide specific program details for every objective. All items that require additional detail will return to the City Council at a subsequent date for consideration either by Resolution or Ordinance, following a community engagement process. This master plan incorporates lessons learned from recent wildfires, ongoing local and County efforts, existing plans, and public input. This document is intended as a guide to overall approach and lays out the City of San Rafael's plans for Wildfire Prevention and Preparedness. The plan will be executed in partnership with other city, county and community efforts.



Background:

In 2007, the City of San Rafael adopted a model ordinance for vegetation management. As we experience continued fire risk and activity associated with climate change, the City of San Rafael has been actively evaluating methods to further reduce our community's susceptibility to devastating wildfires. Wildfire risks will persist under extreme conditions; however, we can significantly mitigate those risk factors through enhanced regulations, education and enforcement. Public policy and programs provide a framework for a more resilient San Rafael but will require public support, compliance, effective implementation, and individual effort.

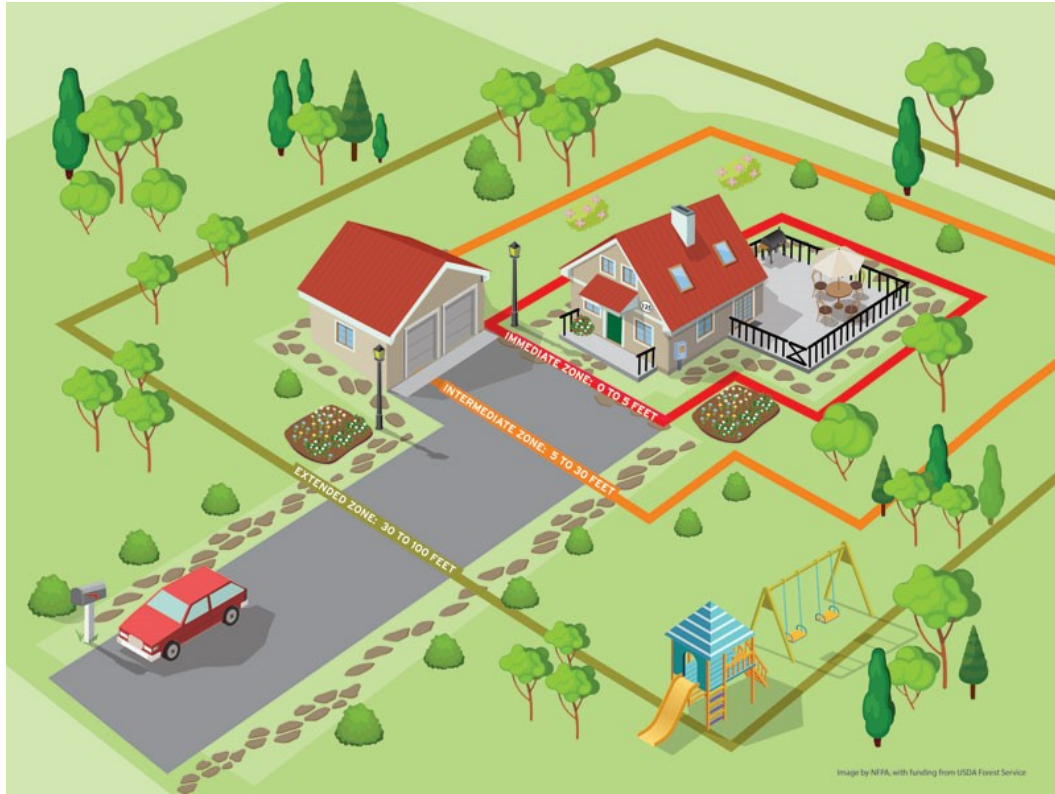
Currently, the City's wildfire prevention efforts focus on our Wildland Urban Interface (WUI) areas, which were established to identify areas thought to be most at risk for being impacted by a wildfire. Specific vegetation standards, including those adopted by San Rafael in 2007, apply only to property in the WUI. However, as climate change and increased fuel build-up contribute to more devastating fires, these boundaries no longer are sufficient or effective. Ember storms, explained in more detail below, can spread fire miles ahead of the flame front, regardless of WUI or jurisdictional boundaries. To adequately protect communities, more universal standards and approaches are necessary. Each structure burned in a fire is a risk to life, a personal and communal loss, and contributes to additional fire spread.

The Fire Department has one full-time, fixed-term Vegetation Management Specialist position and one part-time Vegetation Management Inspector. Together, the Department conducted more than 1,200 WUI home inspections in the first half of Fiscal Year 2018/19 and assisted the Department of Public Works with removal of flammable vegetation on approximately 125 acres of City-owned

public space. Monthly chipper days – providing residents with free juniper and bamboo chipping services – are also overseen by the Fire Department. Altogether, more than 1,500 tons of vegetation has been removed this fiscal year as a result of the Fire Department’s vegetation management efforts. The City also works closely with Marin County Fire, FIRESafe MARIN, and other local and regional agencies on wildfire prevention and fuel reduction strategies.

Additionally, the Police Department employs two part-time open-space rangers who patrol City open space for fire hazards and violations of City ordinances during the fire season (generally considered to be May through November). These rangers are empowered to remove dangerous items from encampments if they pose an immediate fire risk, and assist in removing abandoned campsites, garbage and other fire risks from the area. Note, enforcement of anti-camping ordinances is limited by the law and a recent U.S. 9th Circuit court ruling and the City is currently working to update its ordinances to be in compliance with the law.

Despite the City’s ongoing efforts, wildfire risk and community concern require more action. Continual and expanded efforts to address wildfire prevention and safety will protect lives, property, businesses, as well as our natural resources, including forests, watersheds, and endangered species habitats.



Fire Science:

A basic understanding of fire science and behavior is needed to best understand how the items proposed in this plan will reduce the wildfire risk in San Rafael. Fire requires heat, oxygen, and fuel to burn. Wildfire behavior is impacted by weather, topography, and fuel. Fuel is the consistent feature in fire ignition and behavior that we can do the most to control.

Wildfire prevention focuses on reducing ignition sources, such as heat and easily ignitable fuel. Wildfire mitigation focuses on reducing fuel to reduce the ability of a wildfire to spread and impact lives and property. Types of fuel are generally defined by the time it takes to respond to changing weather conditions or dry out. 1 hour, or flash fuels, like tall grass, ignite and burn very quickly. 10, 100, and 1,000-hour fuels take increasingly more heat and time to ignite but burn for longer. Similar to the way one would build a camp fire, fire mitigation work should start with the easily ignitable fuels and progressively remove the others from areas of protection.

When referring to fuel structures, or the way the fuels exist in the environment, the three common in San Rafael are surface, ladder, and aerial fuel. Surface fuel includes dead and dying vegetation material on the ground's surface. Fire that only impacts ground fuels is much easier to contain and extinguish. Ladder fuels connect separate fuel sources and contribute to fire spread. Reducing ladder fuels helps keep fire on the ground and reduces the rate of spread. Ladder fuels allow

ground fire to spread into canopies and aerial fuels. Aerial fuels exist above the ground, and include the tree canopy, branches and high brush. Fires consuming large amounts of aerial fuels are difficult to contain.

The three primary methods of wildfire spread are described below:

Embers: According to recent research, embers are the most prolific cause of home ignition at a rate of two out of every three homes destroyed. Embers are glowing or burning pieces of vegetation or construction debris that are lofted during the wildfire. Embers can move up to a mile ahead of a firestorm. These small embers or sparks may fall on the vegetation near your home – on dry leaves, needles or twigs on the roof– and then subsequently ignite and burn down the home. The concentration of embers that land on the roof and roll off makes the removal of all flammable materials close to the house critical. Ember storms place all structures without fire resistant landscaping and construction within miles of the fire at potential risk.

Direct flame contact: Direct flame impingement refers to the transfer of heat by direct flame exposure. Direct contact will heat the building materials of the home; if the time and intensity of exposure is severe enough, windows will break, and materials will ignite.

Radiant heat: A house can catch on fire from the heat that is transferred to it from nearby burning objects, even in the absence of direct flames or embers. By creating defensible space around homes, we can significantly reduce the risk from radiant heat. A home with 100 feet of clearance from forest or shrubs will usually have minimal impact from radiant heat or direct flame.

Establishing strong guidelines for defensible space and fire-resistant building materials helps prevent ignition from radiant heat and embers. Limiting fuel and available vegetation reduces the possibility of direct flame contact igniting structures or other vegetation. Conditions are increasingly making ember storms, created by winds and highly combustible vegetation, the primary method of wildfire spread.

NFPA and [Firewise USA](#) recognize three zones surrounding a structure:.

Immediate Zone (within 5 feet of a structure): This zone is most vulnerable to embers and should be clear of all dead and flammable vegetation.

Intermediate Zone (5 to 30 feet from a structure): This area should be carefully landscaped to act as a fire break.

Extended Zone (30 to 100 feet – or, in some cases, up to 200 feet – from a structure): This zone should act to interrupt the path of fire and keep embers from becoming airborne.



Methodology:

This document lists a series of prescriptions, programs, and ordinance changes needed to make San Rafael more fire and disaster-resistant. These action items reflect the need for a comprehensive approach to reducing wildfire risk. Removing dangerous vegetation, using fire-resistant building materials, and avoiding risky activities all are vital for protecting the community.

This plan is written with regards to the City and County of Marin Local Hazard Mitigation Plans (LHMP); Marin County Community Wildfire Protection Plan (CWPP); Marin County Lessons Learned 2017 North Bay Fire Siege, September 2018 (*2017 Lessons Learned report*); San Rafael Climate Change Action Plan, and the San Rafael General Plan.

The draft plan was presented to City Council on January 22, 2019. Feedback from the public, elected officials, and City staff has been incorporated into this version. Public input was gathered through public meetings, Homeowners Association and Neighborhood Association meetings, online feedback forms, social media, Nextdoor polls and direct contacts.

The final version of the plan has been re-organized and renumbered from the initial draft. A cross walk of the final draft numbers and draft numbering system is included at the end of this plan.



Intent:

The San Rafael Wildfire Prevention and Protection Action Plan is designed to serve as a master plan and framework to the ongoing work to reduce wildfire risk in San Rafael. This plan considers and incorporates local, county, regional, and national findings and best practices, including those incorporated into the Marin County Wildfire Prevention and Protection Plan and the 2017 Lesson’s Learned report.

The plan is designed to address all the phases of disaster response (mitigation, preparedness, response, and recovery) while engaging the whole community. Creative and innovative solutions are considered to help achieve these goals. As a community member summarized via the feedback form “if ever there was a situation where you should not let ‘the perfect be the enemy of the good’, this is it.” This plan is presented as a framework to move efforts forward, establish benchmarks, and provide opportunities for evaluation and improvement.

The following were the guiding principles and intent of this plan:

- Public safety and risk reduction
- Coordination and collaboration
- Environmental protection and sustainability
- Equity
- Cost effectiveness
- Incentivize voluntary compliance before fines and penalties

Structure:

The action items are organized into three categories in alignment with the Marin County 2017 *Lessons Learned* report: 1) Vegetation Management 2) Wildfire Prevention and Protection and 3) Emergency Notifications and Evacuation. Each action item includes the objective, rationale, required actions, concerns, costs, potential stakeholders, a proposed timeline, and anticipated outcomes in the following format:

OBJECTIVE

Action	This section includes a description of the proposed action.
<i>What this means</i>	This section should explain in more detail what this action would mean to those impacted by it.
<i>Rationale</i>	This section includes a discussion of why we recommend this, including the scale of impact we believe it will have.
<i>Concerns</i>	This section includes a discussion of political, legal, or cost feasibility concerns that we've identified. It lists any identified trade-offs, such as the dedication of existing staffing resources away from other projects to do this work.
<i>Costs</i>	This section includes estimated one-time and on-going costs to the City, as well as any costs the community may incur. The standards for evaluation are listed below. When possible, it concludes with the total estimated cost of implementing the item.
<i>Stakeholders</i>	This section includes a list of stakeholders.
<i>Timeline</i>	This section says if the action is underway and if not, why. For example, it is noted here if the action requires further or extensive legal review, future City Council action, community outreach, program design work, etc.
<i>Outcomes</i>	This section outlines the anticipated result of the item implementation.



Impacts on Budget and Staff Time:

A full, year-by-year budget estimating the cost to implement the plan is attached at the end of the plan. This includes contract work for open space fuel reduction projects, staff time to implement and maintain the plan, support for residents through cost share programs and chipper days, outreach and education, as well as supplies and funding for specific projects. As possible, the total estimated cost to implement the objective is included in the cost box. The cost ranges are based on current rates and do not account for inflation. Some projects will be ongoing, while others will have peak periods and then reduced costs as vegetation work shifts into maintenance.

Some cost recovery may be attained through enforcement fines which will be in alignment with the City master fee schedule. The City hopes to achieve voluntary compliance before implementing fines or fees for dangerous non-compliance.

The funding, required staff time, and proposed timelines for each objective have been individually evaluated. If action is requested on the entire action plan, timelines may need to be extended and additional staff may be required. Financial costs have been evaluated and are identified using the following standard:

- \$ Efforts are supported by current program budget
- \$\$ Efforts could be supported with reprogramming of current budget
- \$\$\$ Efforts require additional funding

Staff time required to achieve each objective has been estimated and identified using the following standard:

@ Efforts are supported with currently allocated staff time. No significant impact on other programming is anticipated.

@@ Efforts can be accomplished with existing staff reallocating time. Other projects will be deprioritized.

@@@ Efforts will require more staff time than is currently available. Requires additional staff or increasing hours of part-time staff.

Definitions:

For the purposes of this document, the following words are defined:

“Fuel” means any combustible vegetation, including grass, leaves, ground litter, plants, shrubs and trees, that can feed a fire.

“Prescription” means a set of standards, regulations, or recommendations that consider the unique aspects of a particular issue including vegetation, slope, aspect, nearby construction materials, and surrounding area.

“Vegetation Management Plan” means a site-specific written plan for a property to mitigate the risk of wildfire through strategic reduction of combustible vegetation.

“Wildfire” means a fire that originates in an area of combustible vegetation, as opposed to a structure fire, which originates in or adjacent to a building.

“Wildland-Urban Interface” is an area where human development (e.g., houses) abut or intermingle with undeveloped vegetation and where the risk of wildfire is high.

A table of acronyms is provided below:

Table 1 – Acronyms

ACRONYM	DESCRIPTION
AFN	Access and Functional Needs
CERT	Community Emergency Response Team
CSA	Community Service Agreement
CSD	Community Service District
CWPP	Community Wildfire Protection Plan
DPW	Department of Public Works
EOC	Emergency Operations Center
GETS	Government Emergency Telecommunications Service
HEAT	Homeless Emergency Action Team
LHMP	Local Hazard Mitigation Plan
MCSO	Marin County Sheriff's Office
MMWD	Marin Municipal Water District
NCCC	National Civilian Conservation Corps, An AmeriCorps Program
NFPA	National Fire Protection Association
NRG	Neighborhood Response Group
OES	Office of Emergency Services
PG&E	Pacific Gas and Electric
PRC	Public Resource Code
RLT	Resilient Landscape Template
SRA	State Responsibility Area
SRFD	San Rafael Fire Department
SRMC	San Rafael Municipal Code
SRPD	San Rafael Police Department
VMP	Vegetation Management Plan
WEA	Wireless Emergency Alerts
WPS	Wireless Priority Services
WUI	Wildland-Urban Interface

VEGETATION MANAGEMENT

1. Eliminate highly flammable vegetation near structures and roadways throughout San Rafael

ACTION	Propose revising the existing provisions that prohibit Juniper and Bamboo to include Acacia and Italian Cypress, and universally apply these regulations to all properties in San Rafael.
WHAT THIS MEANS	All property owners in San Rafael, both public and private, would be required to remove all Juniper (<i>Juniperus spp.</i>), Bamboo (<i>Bambusa spp.</i>), Acacia (<i>Acacia spp.</i>), and Italian Cypress (<i>Cupressis sempervirens</i>) within a set distance of a structure or roadway by July 1, 2020. Support for property owners to meet this deadline may include an enhanced Chipper Day program and the ability to apply for the City to fund additional green waste carts for a limited time. Outreach to nurseries and landscaping companies would be included to help prevent the sale and planting of highly flammable vegetation. Fire prone, non-native and invasive species would also be removed from public spaces as possible. Consider ordinance banning the sale of prohibited plants or requiring “high fire risk” warning labels within San Rafael.
RATIONALE	These species are known to propagate fire at a high rate of spread and create unnecessary risks to the property owners, first responders, and community at large. The ordinance update would help reduce fire ignition, the spread of wildfire, and improve responder safety throughout the entire community by eliminating highly combustible vegetation. Establishing and maintaining citywide vegetation standards simplify education and enforcement efforts. To address aesthetics and erosion, outreach and education efforts would include information about fire resistant plants recommended as replacements.
CONCERNS	Staff time would be required to proactively encourage voluntarily compliance and enforce as necessary. Costs to residents and City to remove and dispose of hazardous fuel loads. Cost to City to meet vegetation standards on City property. Ability to assure equitable wildfire protection with assistance programs. Need and want to replace the removed species for erosion protection, carbon sequestration, habitat, and beautification.
COSTS	\$ Ordinance change can be accomplished with current funding and staffing levels. @@@ Implementation and enforcement of the updated ordinance would require significant staff time. \$\$\$ Program support to help property owners meet the requirements would require additional funding. Implementation would include an increased number of ‘Free Chipper Days’ at a rate of roughly \$1,800 per day to support community efforts. The City would consider supporting residents requesting the \$2.20-per-month charge per parcel for an additional green waste cart for a set period. Grant applications have been submitted to help cover the cost of the increased ‘Chipper Days’. To encourage

compliance, an additional 40 chipper days would be offered prior to the July 1, 2020 deadline, for a total cost of \$64,000.

Property owners not in compliance by the July 1, 2020 deadline would incur costs to remove vegetation to meet updated vegetation standards.

Total: Staff time and equipment costs to implement are estimated between \$75,000-125,000 annually.

STAKEHOLDERS All property owners in San Rafael, both public and private. Fire Department. Public Works. Nurseries and Landscapers.

TIMELINE Ordinance changes would be internally drafted, reviewed and presented at public meetings in the future. Staff hopes to have an initial round of proposed draft ordinances ready for public and City Council input within 90 days. Education, outreach, and assistance with vegetation removal for property owners would begin within 30 days of the ordinance adoption.

OUTCOMES Voluntary compliance and enforcement would result in less highly flammable fuels in San Rafael resulting in reduced likelihood of ignition and less fire spread within the immediate and intermediate zones. The data reviewed to consider the success of implementation would include tons of vegetative debris removed, results of inspections.

2. Apply vegetation management and defensible space standards citywide

ACTION Propose revising the municipal code to apply vegetation standards, building codes and wildfire related ordinances citywide. No boundary would limit where these provisions are applied in the future.

WHAT THIS MEANS Requirements that are currently applied only to parcels in the WUI would be applicable to all parcels within the City of San Rafael. Proposed ordinances would outline new citywide vegetation, building, and ground covering standards. A set of revised ordinances would establish citywide vegetation standards. A section unique to WUI ordinances would be maintained for any unique standards. Outreach and education would provide property owners with suggestions for species to plant with consideration to fire resistance, drought tolerance, and carbon sequestration. Application of vegetation standards may include considerations for building material, topography, surrounding fuel and infrastructure, or other impacts to fire behavior. An internal policy would guide the interpretation and enforcement of the ordinances. A permit process allowing homeowners to remove specific vegetation on public land to achieve defensible space for their home would be considered in coordination with City efforts to reduce hazardous fuels in open space. Guidelines would also include standards for planting, maintaining and removing Eucalyptus (*Eucalyptus globulus*)

	trees.
RATIONALE	Wildfires do not respect WUI boundaries, and can easily spread to urban areas, outside the WUI as painfully demonstrated in the 2017 Wine County fires. This improvement is included in the <i>2017 Lessons Learned</i> report. Uniform application of all vegetation management and fire prevention related codes and ordinances would improve wildfire resilience throughout the community. Uniform standards would provide clarity and simplify enforcement. The removal of highly flammable and dense vegetation stands would also promote healthy vegetation growth.
CONCERNS	Public would have varying costs to meet new vegetation management standards. Would require staff training on updated Municipal Code. High cost burden for properties not currently up to the new code. High cost to obtain compliance with new code; could trigger substantial rehab/ or tax reassessment, and possible new insurance costs. Could disincentivize development. The City hillside ordinance would need reviewed and updated to allow new construction to alter landscaping to achieve defensible space. Replacement of removed species for erosion protection and carbon sequestration. Challenges educating property owners not residing in San Rafael of new ordinances.
COSTS	<p>\$\$\$ Costs to support residents meeting updated standards and assuring City property meets standards would require additional funding.</p> <p>@ Ordinance updates can be updated with existing staff</p> <p>@@@ Outreach, education, and enforcement would require additional staffing.</p> <p>Total cost to City: Initial staff time and equipment costs to implement are estimated between \$100,000-150,000 annually.</p>
STAKEHOLDERS	Fire Department, Building Department, residents, businesses, landowners, Marin Builders Association.
TIMELINE	Ordinance changes would be internally drafted, reviewed and presented at public meetings in the future. Staff hopes to have an initial round of ordinance updates ready for public and City Council input within 90 days. Building Code updates would be incorporated into the reoccurring review cycle towards the end of 2019.
OUTCOMES	Reduces hazardous fuels and wildfire risk throughout the Immediate, Intermediate, and Extended zones. Reducing likelihood of ember storms to create new ignitions in or outside of the WUI boundaries. Community wide resilience.

3. Reduce ember ignitions within immediate zones to prevent structure ignitions through enhanced standards and support

ACTION

Propose revising the municipal code Title 4 (“Fire”) to include a series of standards to be selectively applied within the immediate zone, generally to mean five feet, of a structure with consideration to unique construction materials, slope, aspect, surrounding vegetation, and fire risk of each property. A policy would be drafted to define the approach to the enforcement.

The perimeter around a structure would need to meet a set of standards designed to reduce the likelihood of embers creating spot fires and igniting structures, on or before July 1, 2020. Individual prescriptions may be established considering unique attributes of the property, a VMP or RLT, and requiring approval of the Fire Chief or designee. These standards may include a selection of the proposed components:

- a) No vegetation in the immediate zone shall make direct contact with the structure.
- b) Hardwood trees are permitted within the zone provided they are well-irrigated, limbed five feet or one-third of the tree height, and have five feet between other tree canopies.
- c) Any vegetation within the immediate zone shall not grow under a window, stairs, decks, or combustible structures or encroach within two feet thereof.
- d) Vines and ivy shall be well-irrigated and maintained to eliminate any dead or dying material build-up.
- e) No ladder or continuous fuels posing a risk to a structure shall be present.
- f) Mulch or similar ground covering is only permitted when no contact is made with combustible exterior walls or plants.
- g) No vegetation except for 3-inch grass, blooming flowers, succulent plants, or established trees shall be present. Exemptions may be considered for erosion control.

WHAT THIS MEANS

All properties requesting an exemption from vegetation standards would be subject to a vegetation inspection and asked to complete a VMP or RLT, for approval by the Fire Chief or designee.

RATIONALE

Through voluntary compliance and proactive enforcement, a series of vegetation and other fuel standards should reduce structure ignitions during an active wildfire by reducing the combustible fuel needed to develop embers into flames. Recent case studies show that urban fire conflagrations are not spreading as a wall of fire, but rather as embers starting hundreds of new fires. Reducing structural ignitability reduces property loss and creates less fuel to continue spreading the fire. This requirement accounts for embers falling from roofs and eaves onto the ground. Focusing on the “house out” concept empowers all property owners, regardless of lot

	size to reduce wildfire risk for themselves and their neighbors. The public's responsibility to decrease structure ignitability and maintain defensible space was included as an area of improvement in the 2017 <i>Lessons Learned</i> report.
CONCERNS	Cost to private and public property owners. Ability to enforce. Erosion control. Ability to notify all property owners of updated regulations.
COSTS	<p>@ Ordinance change can be implemented with current staff.</p> <p>@@@ Increased inspections and enforcement could not be accomplished with current staffing levels. Increased public education and outreach.</p> <p>\$\$\$ Additional funding would be needed to support community vegetation removal, such as free chipper days and assistance to low income property owners.</p> <p>Total cost to City: Initial staff time and equipment costs to support homeowner implementation is estimated between \$50,000-100,000 annually.</p>
STAKEHOLDERS	All property owners in San Rafael, both public and private. Fire Department. Code Enforcement. Nurseries, Landscapers.
TIMELINE	The requirement, modeled in part after Mill Valley ordinance updates, can be incorporated into the new citywide vegetation standards and presented for public and Councilmember comment within 90 days. Staff propose July 1, 2020 as the date of compliance.
OUTCOMES	Reduced likelihood of structure ignitions. Removal of hazardous fuel near structures.

4. Expand goat grazing for vegetation maintenance

ACTION	SRFD program update. Increase the use of goat grazing through cooperative relationships with contractors, FIREsafe MARIN, Marin County and other land-owning agencies.
WHAT THIS MEANS	San Rafael currently leases goats from private industry for specific times throughout the year. The City is working to gain access to the County's new goat resources for open-space vegetation clearance. In addition, new contractors are being considered to help meet the demand and reduce per acre cost. Coordination would also occur between various public and private landowners. Staff would work with property owners to link project sites to create continuous fuel breaks and reduce transportation costs.
RATIONALE	Coordinated grazing reduces the costs associated with transporting the goats to new sites and creates more continuous fuel breaks. Goats are an effective way to manage reoccurring fuels, such as grasses and French Broom (<i>genista monspessulanus</i>). Reducing mechanical removal of fuels, such as mowers and weed eaters, also reducing carbon

	emissions.
CONCERNS	Goats and vegetation management contractors are in high demand. Goats are most cost effective on larger treatment areas. In 2018, over \$80,000 was spent on goat grazing. Moving and securing goats can be challenging. Coordinating the timing of grazing with rain, vegetation growth, and high fire danger is challenging.
COSTS	<p>\$\$\$ Additional funding is needed to expand the goat grazing program and maintain fuel reduction work. Cost saving associated with reduced transport would support increased acreage.</p> <p>@ Goat grazing coordination can be accomplished with current staff.</p> <p>A recent grazing estimate was \$900 an acre and \$2,500 per transport. At least 61.5 acres need annual treatment, which with transport costs could total close to \$80,000 annually in 2019 dollars.</p> <p>Initial Costs to the City are estimated at \$80,000 annually and would increase as more fuel reduction work transitions to goat maintenance.</p>
STAKEHOLDERS	Fire Department, Public Works, FIREsafe MARIN, Marin County Fire.
TIMELINE	In progress. Contract negotiations are underway. Goats would be available in late winter/early spring 2019. The majority of goat grazing is completed before July 1st and peak fire season. Grazing is needed annually. The timing of grazing is impacted by rainfall, plant growth and seeding, and extreme fire conditions.
OUTCOMES	Goat grazing serves as a low carbon emitting fuel reduction and maintenance tool throughout San Rafael.

5. Establish additional fuel interruption zones

ACTION	SRFD and DPW program. Remove hazardous fuels on public land within 100 feet of structures. Strategically remove hazardous fuels within 30-50 feet of private, improved property to create fuel interruption zones. Efforts would focus on shaded fuel breaks and removal of ground and ladder fuels.
WHAT THIS MEANS	San Rafael would take on the cost and burden of clearing vegetation on San Rafael owned and maintained land that abuts privately owned and developed land. Fuel interruption zones consist of low-cut grasses, removal of dead vegetation and ladder fuels, and shaded fuel breaks.
RATIONALE	San Rafael must do its part to reduce fuels, particularly in areas bordering other property to assure efforts of one parcel are not negated by another's. This would

	reduce fuels to limit fire ignition and spread in San Rafael Open Spaces and help reduce the potential for a fire to spread from undeveloped to developed land. Aligns with <i>Marin CWPP</i> transition zone strategy.
CONCERNS	Cooperation and coordination with other public agencies and landowners may be difficult. Costs.
COSTS	<p>\$\$\$ Efforts require extensive additional funding to achieve necessary results.</p> <p>Fire prevention and mitigation grants may help mitigate the cost. Measure A funding cannot cover all the necessary fuel reduction work. Measure A funding may be used to support maintenance work once the significant fuel reduction is completed. Additional funding is needed to fully fund maintenance and prevent additional fuel build ups.</p> <p>@@@ Substantial staff time is needed to strategically manage projects, contractors and conservation crews while continuing vegetation inspections and educational programming.</p> <p>Based on past costs, the current list of fuel reduction projects for 2019 is over \$500,000. The staff time to implement is included in the staffing request costs.</p>
STAKEHOLDERS	Fire, Public Works, landowners, Marin County, State Parks, MMWD
TIMELINE	In progress. Fuel reduction work is ongoing but reliant on available funding. A funding request to the Cal Fire, Fire Prevention Grant submitted December 19 th , 2018 requests \$922,000 to support fuel reduction in 2019 and 2020. Notifications of awards will be in April of 2019.
OUTCOMES	Reduction in hazardous fuels near structures and more pre-established fuel breaks to slow fire spread.

6. Improve public education regarding fire-safe landscaping and living with wildfire

ACTION	SRFD program. Outreach and education efforts, including information about areas of refuge, emergency alerts, defensible space, and reducing structure ignitability would be conducted citywide.
WHAT THIS MEANS	Additional outreach and online resources would be created to support firesafe landscaping and strategies to effectively harden homes. Outreach would target residents, nurseries, and community groups with an emphasis on gardening and landscaping. Current outreach is focused on WUI areas, but this expanded program would target all areas in San Rafael. This item includes an expansion of outreach and improved online resources, in collaboration and support of FIRESafe Marin efforts. In addition, education and outreach materials would be updated to reflect lessons learned from recent wildfires, including helping residents understand wildfire evacuations and

	<p>areas of refuge. Outreach and education would provide property owners with suggested ground coverings and species of plants with consideration to fire resistance, drought tolerance, and carbon sequestration. Efforts would also include point of sale locations such as nurseries and landscapers. Property owners would also be better informed on the best ways to dispose of different vegetative debris.</p>
RATIONALE	<p>Education and outreach efforts need to be expanded to adequately reach the entire community. Residents want to maintain a beautiful community while increasing fire safety. Additional education and outreach are needed to assure residents are landscaping with wildfire risks in mind. Residents are concerned about wildfire evacuations and need to be better informed to make quick decisions. San Rafael needs to incorporate lessons learned from other devastating fires in our wildfire prevention and preparedness efforts.</p>
CONCERNS	<p>Multiple outreach strategies are needed to reach various demographics. Volunteer coordination can be time consuming and unreliable. Mailers and outreach materials may not reach property owners, but rather occupants. Need additional strategies to make property owners aware of wildfire safety, new requirements, and actions they can take or empower their renters to take.</p>
COSTS	<p>@@ Updating online materials, developing new outreach materials, and contacts with residents can be completed with current staff reallocating time and the support of volunteers.</p> <p>\$\$\$ Additional funding is needed to expand outreach, including printing additional materials, citywide.</p> <p>Total Costs to the City include the request for additional staffing and outreach materials for an annual cost estimate between \$50,000 to \$100,000. Annual outreach material costs alone are estimated as being between \$20,000 and \$40,000.</p>
STAKEHOLDERS	<p>Fire Department, Community organizations, property owners, Open Government and Digital Services, nurseries and landscapers, FIREsafe Marin, Marin County</p>
TIMELINE	<p>Outreach and education regarding updated ordinances would begin immediately following adoption. Updates and lessons learned from recent wildfires would be incorporated into future community presentations. Extensive outreach campaign would occur in the Spring of 2019 to align with fire season and vegetation inspections pending available staff and resources.</p>
OUTCOMES	<p>Property owners, residents, and businesses would have a better understanding of how to achieve and maintain defensible landscaping, resulting in more voluntary compliance. Better community preparedness and resiliency.</p>

7. Establish more Firewise communities in San Rafael

ACTION	SRFD program. Conduct outreach to identify communities interested in becoming “Firewise” and support them throughout the process. Coordinate efforts with FIRESafe MARIN and NFPA.
WHAT THIS MEANS	SRFD would dedicate time and effort to help additional communities meet “Firewise” standards, earn and maintain Firewise recognition. This would include increased education, disaster preparedness, and fuel reduction. There are currently three Firewise communities within the SRFD response area. City staff would also communicate the benefits of Firewise communities with insurance companies and support FIRESafe MARIN’s efforts. Currently, only one insurance company offers discounts for policy holders in Firewise communities.
RATIONALE	Firewise is a National Fire Protection Association (NFPA) program that “teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.” The program provides valuable educational information and a roadmap to help make San Rafael neighborhoods more resilient. Reducing fire risk takes neighborhood coordination as hazardous fuels on nearby property can negatively impact a well mitigated property. Firewise provided a mechanism for a few motivated neighbors to help their neighborhood become more fire resistant. Increasing the number of Firewise communities is a priority of the 2017 <i>Lessons Learned</i> report.
CONCERNS	Staff time. Currently, only one insurance company offers discounts for policy holders in Firewise communities. Increasing insurance company support of the program would help encourage more neighborhoods to work together to achieve Firewise recognition.
COSTS	<p>\$ There is minimal additional cost associated with the Firewise program. Programs of cost, such as community chipper days, are aligned with the overall City fuel reduction initiative, therefore do not represent new costs.</p> <p>@@ Firewise communities can be supported with current staff reallocating time.</p> <p>Total Costs would include staff time and sponsored chipper days, costing about \$2,000-\$7,000 for each community becoming Firewise.</p>
STAKEHOLDERS	Fire Department, Homeowners Associations and Neighborhood groups, property owners, FIRESafe Marin
TIMELINE	In progress. Two new Firewise communities were recognized for the first time in 2018 and more are expected in 2019.
OUTCOMES	San Rafael would have more Firewise, and therefore more resilient neighborhoods.

8. Reduce hazardous fuels through an abatement process on privately owned unimproved lots and within 200 feet of a structure or 20 feet of roadway

ACTION	City Program. Develop program and policy to reduce hazardous fuels through increased vegetation removal mandates and abatement on property with noncompliant and unresponsive owners. City and County ordinance and policy changes may be required.
WHAT THIS MEANS	After establishing a vacant parcel list, parcels would be inspected and noticed if they do not comply with the updated vegetation management standards. The abatement process would also be used to enforce vegetation standards on improved lots with unresponsive owners. A public hearing would be conducted giving any property owner the opportunity to commit to compliance within a set period. If property owners do not mitigate the issue themselves, they would be fined and/or have the cost of the City clearing the hazardous fuels charged to the them. A policy would be developed to guide the abatement process.
RATIONALE	Many privately owned parcels do not comply with vegetation management standards and create safety risks for the entire community. Establishing a consistent notification process, timeline for compliance, and cost recovery process would help address these risks.
CONCERNS	Potential challenges with recouping costs of abatement. Fines would need to be substantial to encourage compliance.
COSTS	<p>\$\$\$ The City would have to cover the additional costs of clearing unimproved hazardous property. Until costs are recouped this would require additional funding.</p> <p>@@ Staff would need to establish a vacant parcel and noncompliant list, inspect, notice and re-inspect. Coordinating contractor work as necessary would require additional staff time.</p> <p>TOTAL: Temporary costs, to be repaid by property owners, are estimated between \$50,000-\$150,000 per year.</p>
STAKEHOLDERS	Fire Department, Public Works, Code Enforcement, Marin County, landowners
TIMELINE	Program can be developed and brought to the City Council for approval within 90 days. Coordination with the County may delay this process.
OUTCOMES	Reduce hazardous fuels and recover associated costs from absentee and noncompliant property owners.

9. Effectively coordinate the removal of vegetative debris from public and private property

ACTION	City program. Work with Marin Sanitary Service to develop a plan to support removal of increased vegetative debris. Consider identifying a City drop off site for removed hazardous fuels. Consider utilizing a scheduled bulk pick up day for vegetation.
WHAT THIS MEANS	Research and stakeholder input are needed to determine if a vegetation debris removal site is necessary or beneficial to helping reduce hazardous fuels. Additional discussions would help determine if a drop-off site should be always public, public on select days, or for City staff and contractors only. Other considerations include increasing green waste carts, chipper days, bulk removal days, large containers (BioBox) or a combination thereof. Responsible disposal would also take into consideration proper disposal and composting to reduce additional greenhouse gas releases. Encourage homeowners to fully utilize their green carts on a weekly basis, reducing the need for bulk removal.
RATIONALE	Stronger vegetation regulations would result in an increased amount of woody biomass and vegetative debris. A coordinated, multi-faceted approach would be needed to effectively and responsibly remove biomass from San Rafael. Goals would include reducing the costs associated with City sponsored chipper days, diverting woody biomass from landfills to biomass markets, and supporting property owners' fuel reduction efforts.
CONCERNS	Cost. Security. Assuring appropriate use of space. Large piles of vegetative debris could pose additional fire risk if not properly protected. Fuel reduction in areas around drop-off sites would be required.
COSTS	<p>\$\$\$ Unless an existing, unused site is identified, costs for implementation and maintenance would be extensive. Additional funding is also needed to support increased green waste carts and/or community chipper days.</p> <p>@@ Coordination can be accomplished with current staff reallocating time. @@@ If a full-time drop-off site is established, additional staff may be necessary.</p> <p>Total annual Costs to the City are estimated as between \$15,000 and \$30,000.</p>
STAKEHOLDERS	Fire Dept, Public Works, Sustainability Program, Residents, Marin Sanitary Service.
TIMELINE	Short and long-term recommendations would be drafted within 120 days. The timeline considers the vegetation removal requirement deadlines placed on residents. Implementation would be impacted by funding.
OUTCOMES	Hazardous fuel debris is removed from public and private property and diverted from landfills.

10. Engage Community Emergency Response Team (CERT) members, Neighborhood Response Groups (NRGs) and other volunteers in fire prevention

ACTION	SRFD program. Develop program and training to enable San Rafael CERT, NRGs and other disaster volunteer groups to support fuel reduction efforts through education, outreach, data gathering, and direct service.
WHAT THIS MEANS	Utilize existing volunteers and recruit additional volunteers to supplement the outreach, education, and hazard identification work of SRFD.
RATIONALE	San Rafael has almost 500 trained CERT members, many anxious for ways to be more involved in disaster preparedness. Training and engaging CERT and NRG volunteers would help increase public outreach and education and help inform SRFD's vegetation inspection priorities. CERT and NRG members would utilize local knowledge and willpower while building more resiliency through education and relationship building. Volunteer hours dedicated to fuel reduction may be used as match dollars for fire grants.
CONCERNS	Volunteer safety and assuring the accurate distribution of information and data collection.
COSTS	<p>\$ The program can be implemented with minimal cost and existing funds.</p> <p>@@ The program can be implemented with existing staff. Initially, some time would need to be reallocated, but once active, CERT members would help save inspectors time.</p>
STAKEHOLDERS	Fire Department, CERT members, NRGs, Marin County CERT
TIMELINE	In progress. San Rafael CERT steering committee is re-engaged and looking for ways to stay involved in disaster preparedness and response during 'blue skies. Training needs to be developed and presented by fire prevention staff. A pilot program in a limited geographic area can be rolled out within three months.
OUTCOMES	Increase capacity of volunteers to support mitigation efforts. Expanded reach and impact with minimal cost implications.

11. Reengage volunteer “Broom Pull Days”

ACTION	City program. Work with the volunteer program to reestablish an ongoing volunteer program to pull invasive Scotch and French broom (<i>Cytisus scoparius</i> and <i>Genista monspessulanus</i>) from public open space and high fire risk areas.
WHAT THIS MEANS	A previous program saw a great deal of success removing and eliminating French Broom in parts of San Rafael. Education and best practice materials exist and can be re-used to support a reinvigoration of this effort. City staff would be needed to support the effort and City staff may be required at the start of projects to assure work areas are clear of debris and threats. With approval, work may include areas in the hundred-foot easement onto state owned lands to establish an effective fuel break.
RATIONALE	The focus of this project would be to engage community will and volunteer labor to work on eliminating French and Scotch broom from high fire risk areas of San Rafael. Volunteer programs provide a path for residents to directly reduce wildfire risks. Volunteers would help reduce the need for contractors and support maintenance in previously cleared areas.
CONCERNS	Safety of volunteers. Time and effort needed to coordinate project sites, registration, and volunteer safety and technique training. Potential community conflicts over project areas.
COSTS	<p>\$\$ Reallocated or new funding is needed to purchase tools and safety equipment. Woody Biomass left on site would need to be removed.</p> <p>@@ The program can be implemented with current staff reallocating time. Additional staff time would help expand the project areas.</p> <p>Total Cost to the City includes equipment and staff time and is estimated at \$5,000-\$15,000.</p>
STAKEHOLDERS	Fire Department, Public Works, Police Department, Sustainability and Volunteer Program Coordinator, MMWD, State Parks, Marin County
TIMELINE	A volunteer project could be scheduled within 60 days of having the necessary approvals, tools, safety equipment, and strategy in place.
OUTCOMES	Increase of 20% in citywide volunteer hours dedicated to fuel reduction and wildfire mitigation. Decrease in hazardous fuels in public/private land borders.

12. Review and update WUI map

ACTION	SRFD project and resolution. Review and update the San Rafael WUI map for more practical application and consistency with County and other land management agencies' maps.
WHAT THIS MEANS	SRFD would review and update the WUI map for consistency between maps and application of WUI code. The map would be simplified and updated to apply current fire behavior expectations to WUI boundaries. The initial review of the map suggests updates may remove about 500 homes from the WUI and add 2,000.
RATIONALE	The current San Rafael WUI map has multiple variations used by different jurisdictions and does not accurately reflect the threat posed to many areas in or near the currently defined WUI. Updating the map would improve education, vegetation management, and fire prevention efforts. Maintaining a designated WUI can help with resource prioritization, grant funding, and State code application.
CONCERNS	Potential insurance and code compliance changes for property owners being added or removed from the WUI.
COSTS	\$ Review and updates can be completed with existing funds. @@ Review, coordination, and map development would require existing staff to reallocate time.
STAKEHOLDERS	Fire Department, property owners, land management agencies with current San Rafael WUI maps.
TIMELINE	160 days would be needed for internal review and coordination with partners. The updated map would be presented to the City Council within 60 days of completion to be adopted through a resolution.
OUTCOMES	San Rafael would have a consistent and logical Wildland Urban Interface map.

13. Consider adoption of Public Resource Code 4290 and 4291

ACTION	Consider adoption of Public Resources Code (PRC) sections 4290 and 4291, which serve as guidelines for defensible space and fuel management regulations.
What this means	At a minimum, San Rafael vegetation standards would meet the state minimum outlined in PRC sections 4290 and 4291. Proposed amendments to the language would apply the standards citywide.
Rationale	Adopting PRC sections 4290 and 4291 assures San Rafael complies with State vegetation management standards and simplifies the existing San Rafael vegetation management standards. PRC sections 4290 and 4291 do not relax our existing codes. Adopting PRC sections 4290 and 4291 would also allow for immediate enforcement of PRC changes. Adopting PRCs 4290 and 4291 would support uniform application of wildfire mitigation standards.
Concerns	If PRC sections 4290 or 4291 are revised in the future in ways that are deemed detrimental to the City, additional municipal code amendments would be necessary to clarify their application in San Rafael.
Costs	<p>\$ An ordinance change can be accomplished with current funding and staffing levels.</p> <p>\$\$\$ Providing support to homeowners meeting the updated vegetation standards, through chipper days and increased inspections, would require additional funding.</p> <p>@@@ Implementation and enforcement of an updated ordinance would require more staff time than currently available.</p> <p>Total Cost: Costs to the City are included in staff time and other vegetation management objectives, including property owner support.</p>
Stakeholders	Fire Department, property owners
Timeline	Ordinance changes proposing to adopt PRC 4290 and 4291 would be internally drafted, reviewed and presented at public meetings in the future. Staff hopes to have an initial round of draft ordinance updates ready for public and City Council input within 90 days. Enforcement would begin July 1, 2020.
Outcomes	Reduction in dead and dying vegetation within 100 feet of all San Rafael structures. Clear fuel standards within the immediate, intermediate, and extended ignition zones.

14. Develop new efforts, solutions, and resources dedicated to wildfire prevention and protection

ACTION	<p>City project. To support hazardous fuel removal, abatement, education and outreach, inspections, and other wildfire risk reduction efforts additional efforts, resources, and solutions are needed. This item seeks to establish new partnerships, funding avenues, and revenue opportunities, including but not limited to adjustments in existing City budget, grants, taxes, fees, donations, and use of conservation corps, inmate crews, volunteers, and on-duty engine crews. Efforts would work to reduce the financial impact on individual property owners, businesses, and the City's general fund. Available funding would support work on public property and be considered for homeowner assistance programs.</p>
WHAT THIS MEANS	<p>San Rafael is applying to numerous grant programs for funding to help reduce the fire risk. Grant funding may provide one-time funding sources to help reduce heavy fuel loading. However, grants do not provide a reoccurring funding source to address the ongoing needs associated with vegetation management. To accomplish this objective San Rafael would also seek and review project bids from non-traditional labor pools such as the Conservation Corps of the North Bay, AmeriCorps NCCC, Cal Fire Delta crews, and County fire crews. The City is also exploring an expanded partnership with Downtown Streets Team to help with fuel reduction work that would provide community members with income and job training. Collaboration with County efforts would be considered for cost efficiency and timeliness of outcomes. Staff would continue to seek mutual beneficial partnerships to support implementation of the plan.</p>
RATIONALE	<p>Heavy fuel loads create dangerous situations throughout the area. Aggressive strategies are needed to mitigate the current risk while implementing a long-term fuel maintenance program. Current funding and resources are not adequate to quickly reduce decades of fuel buildup. Finding additional funding sources and utilizing new crews would be necessary to address the wildfire risk in a timely manner. AmeriCorps NCCC members would be able to assist low-income, disabled, and elderly residents achieve defensible space. A program partnership with Downtown Streets Team may offer an opportunity for cost-effective fuel reduction, job training, and a reduction in individuals experiencing homelessness. Use of on-duty engine crews for inspection would be considered permitting effective emergency response times and staff health.</p>
CONCERNS	<p>Grant applications and management of projects require substantial staff time and effort. Some grant funds may not be available within the desired timeline. Effective use of various crews would require strategic management. Grants are one-time applications and do not provide an ongoing, predictable funding source for long term strategic fuel management. Some grants require match funds, which may limit other projects. Fuel maintenance would require additional funding to prevent new fuel buildups.</p>

COSTS	<p>\$\$ - Grant applications can be submitted with the current program budget. Some grants have matching fund requirements that may require reprioritizing of programming.</p> <p>@@ Grant applications can be submitted with existing staff reallocating time. Grant management and tracking would require additional time reallocations. Crew management would require reallocation or additional staff time.</p> <p>Total Cost to the City, including staff time and support resources, is estimated between \$20,000 and \$100,000</p>
STAKEHOLDERS	<p>Fire Department, Public Works, Finance, property owners, businesses, Marin County, Downtown Streets Team, AmeriCorps NCCC</p>
TIMELINE	<p>In progress. Various projects, grants, and labor options are currently being explored. CAL FIRE prevention grants award notices would be issued in April with funding available in September of 2019. Hazard Mitigation Grant applications are due in April of 2019. An application and onsite visit have been completed for the City to host a National Civilian Conservation Corps (NCCC) team this Spring and Summer. A final decision is expected in mid-March. If approved, crews would be available between April and July of 2019 for six to twelve weeks.</p>
OUTCOMES	<p>The City will dedicate staff time to finding, applying, and managing resources to support wildfire mitigation and education in San Rafael, ideally increasing the available resources with a minimal burden to residents.</p>

Wildfire Prevention and Protection

15. Immediately seize ignition sources at encampments and remove encampments in open space as quickly as possible.

ACTION	City program. Evaluate City ordinances for revision and compliance with <i>Martin v. Boise</i> regarding camping limitations and continue collaborative Homeless Emergency Action Team (HEAT) efforts to limit fire risk associated with encampment fire risk.
WHAT THIS MEANS	Continue immediate removal of flammable items and ignition sources posing a fire threat. Continue collaborative effort and improve coordination between Police Rangers, Public Works, Fire, and vegetation contractors to remove abandoned encampments in open spaces. Evaluate City ordinances for appropriate time, place, and manner restrictions on camping in certain areas due to health and safety risks. Consider redirecting individuals experiencing homelessness to identified fire safe areas. Consider efforts to remove abandoned encampments in shorter time intervals.
RATIONALE	Reduce health and safety threat by eliminating flammable items and potential ignition sources in open space.
CONCERNS	Legal constraints related to limitations on camping enforcement and notice prior to removal of encampments. Resources required to remove and dispose of fire risks, including refuse and other abandoned items in open space areas. Encampments removed from open space may relocate to other areas.
COSTS	<p>\$\$\$ The additional removal and storing of items would require additional funding.</p> <p>@@@ Additional staff time is needed to effectively monitor open spaces year-round.</p> <p>Storage, cleanup, and debris removal costs are estimated between \$25,000 and \$100,000 annually. Additional costs to the City are included in the staffing requests in Objective #27, estimated at \$250,000.</p>
STAKEHOLDERS	Fire, Police, Public Works, Homeless Planning and Outreach
TIMELINE	Ongoing. Continually update strategies based on new case law and best practices.
OUTCOMES	Reduced fire ignitions originating in open space encampments.

16. Reduce likelihood of ignition in undeveloped land

ACTION	Propose revision to the municipal code to remove any specific time period of fire season. Resulting in smoking being prohibited in City open space all year. Assure parking areas are clear of flash fuels (highly combustible, fine fuels such as grasses, leaves, pine needles, etc.). Work with other land-owning partners to limit smoking and ignition sources in open space.
WHAT THIS MEANS	Updates would deconflict existing code and remove any dates associated with fire season, expanding the ability of the Fire Chief to enforce fire safety regulations to prevent a wildfire in open spaces. Smoking would explicitly be prohibited year-round within City open spaces. Currently, SRMC has some conflicting information and dates associated with smoking prohibition and fire season. In addition to updating SRMC ordinances, staff would work with other public land-owning agencies to limit smoking in public open space with wildfire risk.
RATIONALE	Updates would provide increased safety, clarity, and consistency within municipal code. Reducing ignition sources helps protect the community and natural resources from a wildfire ignited in the open space.
CONCERNS	Enforcement is challenging; signage is not very effective. Additional staff is needed to enforce.
COSTS	<p>\$ Ordinance change can be accomplished with currently allocated funding.</p> <p>@ Ordinance change can be accomplished with current staff.</p> <p>@@@ Strong enforcement of open-space regulations requires additional staff.</p> <p>Total Cost: Cost of enforcement is included in the additional police ranger staffing requests, totally about \$250,000 annually.</p>
STAKEHOLDERS	Fire Department, Police Rangers, Public, Park and Open Space Commission, State Parks
TIMELINE	An update to SRMC 19.10.060(13) would be prepared and presented for community and Councilmember input within 90 days. Enforcement would begin immediately after adoption.
OUTCOMES	No smoking allowed in open space. Reduced ignition potential.

17. Explore opportunities in Fire and Building Code updates to increase use of fire-resistant materials and application of CA Fire Code Chapter 7A

ACTION	Ordinance change. Review and propose updates to SRMC to apply CA Fire Code Chapter 7A (fire resistant building material requirements) outside the WUI and to additional structures.
WHAT THIS MEANS	Chapter 7A outlines the materials and construction methods to reduce potential structure ignition during a wildfire for new construction and substantial remodels (50%) within the WUI. Proposed updates to the SRMC would suggest applying Chapter 7A to a broader list of improvement and all new construction, regardless of WUI proximity. Ordinance changes would require any new material used in remodels, updates, or new construction be fire rated. For example, a property owner replacing windows would be required to install windows complying with Chapter 7A.
RATIONALE	Increase compliance with known fire prevention methods, including fire resistant building materials. Include all structures to reduce likelihood of an urban fire conflagration. To reduce the impact of a wildfire, consideration for the toxicity of building materials when burned should be considered. The <i>2017 Lessons Learned</i> report calls on property owners to harden homes, including fire resistant materials.
CONCERNS	Potential to discourage otherwise positive improvements because of additional costs associated with Chapter 7A compliance. Potential to discourage compliance with permits and inspections for fear of additional costs to meet Chapter 7A requirements.
COSTS	<p>\$ Reviewing and updating the SRMC can be completed with available funds. Additional permits may increase revenue for the City.</p> <p>\$\$\$ Construction costs may increase for property owners. Additional permits may be required.</p> <p>@@ Research, review and drafting of proposed SRMC updates can be completed with current staff reallocating time.</p>
STAKEHOLDERS	Fire Department, Community Development, Marin Builders Association, property owners, Marin Association of Realtors
TIMELINE	Additional research, review, and stakeholder input can be completed within 120 days. Fire and Building Code adoptions would occur in concert with other agencies late in 2019.
OUTCOMES	San Rafael would have more hardened homes, with a reduced risk for wildfire ignition, property damage, and loss of life.

18. Eliminate fire hazard associated with shake and wooden roofs

ACTION	Ordinance change. Update building code to require all shake roofs be replaced by January 1, 2029 or at time of resale, whichever is first. Require no shake roof structures be eligible for resale.
WHAT THIS MEANS	Property owners and owners of commercial property with shake roofs would have 10 years to replace their roofs with a safer material and shake roofs would no longer be allowed in new construction. Based on area surveys, staff believe less than 200 shake roofs are in San Rafael. This would effectively result in the near-complete elimination of shake roofs from San Rafael by 2029.
RATIONALE	This ordinance would eliminate a known threat to structures and the public, decreasing potential ignition and the rate and intensity of the spread of fire. Roof material is a critical component to a wildfire-hardened home. Removing wood roofing materials would increase safety for firefighters and first responders, as well as the neighboring community. Per the 2016 Marin County Community Wildfire Protection Plan (CWPP), "homes with a non-combustible roof and defensible space at least 30 to 60 feet around the structure have an 85-95% chance of survival". Reducing the likelihood of ember ignition on a shake roof also protects neighboring homes from ignition.
CONCERNS	Roof replacement could be prohibitively expensive for some homeowners and businesses. An exemption for historical structures should be considered. Applicable fines for having a shake roof after the deadline would need to be substantial to encourage compliance. Implementing at time of sale may slow down process and create -increased burden on sellers and buyers.
COSTS	<p>\$\$\$ Property owners would incur large cost to replace roof. Assistance programs should be considered to encourage compliance. The City would also need to replace any wooden roofs on City-owned buildings. Property owners may see reduced insurance costs after roof replacement.</p> <p>@ Ordinance change, education, and enforcement can be supported with current staffing levels.</p> <p>Total Costs: This item is expected to cost the City between \$500,000-\$750,000, which includes the replacement of the wood roof on Falkirk and potential assistance to homeowners through mitigation grants and staff time. Please note, the Falkirk roof replacement would have substantial costs to the City regardless of this item.</p>
STAKEHOLDERS	Fire Department, Community Development, Property owners, Businesses, Marin Association of Realtors
TIMELINE	The updated building code can be prepared and presented for community and City Council input within 90 days. The re-sale requirement would become effective within 30 days, with an allowance for homes in escrow at time of adoption. There would be a

ten-year period of compliance to minimize financial hardships. Assistance programs, including hazard mitigation grants, should be considered over the implementation period.

OUTCOMES

Shake and wooden roofs and the associated fire hazard are eliminated in San Rafael by 2029.

19. Develop comprehensive San Rafael hazardous vegetation study and mitigation measures

ACTION

City project. Consider contracting with a vendor for parcel-level vegetation mapping. Identify areas of with high risk vegetation, including unmaintained Eucalyptus groves. Incorporate findings into mitigation and vegetation maintenance plans.

WHAT THIS MEANS

Studies would need to be conducted to gain a better understanding of high fuel density and risk areas. Specific attention would be paid to Eucalyptus grove locations, density and nearness to structures. This data and imagery would help inform strategic vegetation management and forest health moving forward. For example, an identified high-risk Eucalyptus grove may be scheduled for pruning or thinning over the course of a few years, with ground fuel maintenance (removing leaves, dead limbs, etc.) every three to five years thereafter.

RATIONALE

Baseline information and imagery would help establish a comprehensive fuel management strategy. Identifying high risk areas would prioritize projects and available funding. Reoccurring studies and aerial imagery would also help show trends in regrowth, successful management strategies and before and after comparisons. Break out mapping by fire agency is included in the *2017 Lessons Learned* report.

CONCERNS

No available funds to cover the cost. Balancing fire mitigation, erosion control, habitats, and forest health.

COSTS

\$\$\$ Imagery and plan development would require additional funding.

@@ Efforts can be supported with current staff reallocating time. Studies would help reduce staff drive and inspection time.

In depth mapping would cost the city \$30,000 with an annual reoccurring cost of about \$1,000.

STAKEHOLDERS

Fire Department, Public Works, Marin County Fire

TIMELINE

Funding for parcel level mapping was included in the Cal Fire Prevention Grant. If approved, work could begin in September of 2019 and incorporated into the fuel

management plan for 2020.

OUTCOMES Shift in fuel mitigation strategy from citizen-reported to data-driven and aerial imagery.

20. Complete an analysis of fire roads and strategic fuel breaks

ACTION

SRFD and DPW project. Develop a plan for a survey of all San Rafael fire roads to identify areas in need of strategic surface improvements, to be used as shaded fuel breaks, and that need vegetation clearance for safe access.

WHAT THIS MEANS

Identify high risk areas and assure the fire road surface and clearance would remain accessible. Increase fuel clearance along strategic fire roads (such as ridge lines) to create significant fuel breaks to stop or slow fire spread. These fuel breaks would include forest thinning and understory clearing to create shaded fuel breaks. Shaded fuel breaks reduce fire risk while supporting erosion control, carbon sequestration, and natural beauty. Coordination between other landowners, including private, MMWD, County, and State Parks would help assure continuity and effectiveness of efforts.

RATIONALE

Fire roads provide critical access for fire personnel to access and contain existing fires. Fire roads also serve as fuel breaks, means of access for fuel reduction work and enforcement in open space. Increasing fuel clearance along fire roads helps protect responders using the roads and creates existing fuel breaks to limit a fire's spread. Fire roads also serve as trails and provide recreational opportunities in open spaces.

CONCERNS

High costs and potential environmental impact to implement.

COSTS

\$\$\$ Additional funding, possibly via grants, is required to retain contracted labor to establish initial fuel breaks and fire road improvements.

\$\$\$ Reoccurring costs would include maintenance of fuel breaks and road surfaces. It is possible to support some maintenance with reprogramming of existing budget and renewal of Measure A funds; however, comprehensive efforts would require an additional funding source.

@@ Analysis of roads and potential fuel breaks can be completed by existing staff reallocating time.

@@@ Maintenance would require current staff to reduce time spent on inspections and other projects. Developing and implementing a comprehensive and strategic maintenance plan would require additional staffing.

The Total estimated cost to repair and clear vegetation along the 12 miles of San Rafael Fire roads is \$750,000-\$1,000,000 and should be completed every five years.

STAKEHOLDERS	Fire Department, Public Works, public using fire roads, agencies with connecting fire roads
TIMELINE	In progress. Road and fuel break analysis is underway. Fire road surface maintenance is an ongoing effort. Additional focus and funds are needed to develop and implement a more strategic and effective approach. The timeline for repairing fire roads and implementing strategic fuel breaks would be dependent on funding.
OUTCOMES	San Rafael fire roads would be well maintained for emergency access and serve as fuel breaks and recreational trails.

21. Increase the number of hardened homes in San Rafael

ACTION	Outreach and education to help property owners understand the various steps they can take to harden their homes. Consider support for property owners unable to implement on their own. Suggestions range from simple vent covers to building material recommendations and be aligned with FIRESafe MARIN and Marin County Fire suggestions.
WHAT THIS MEANS	In coordination with NFPA recommendations and FIRESafe Marin, the City would work to better inform and support property owners attempting to harden their homes and reduce the likelihood of ignition. Methods to harden homes would range from simple vent covers to building material recommendations. Outreach and education would be aligned with FIRESafe MARIN and Marin County Fire recommendations.
RATIONALE	Hardening homes is as necessary a step to protect homes from wildfires as vegetation management. Hardened homes with defensible space are most likely to survive a wildfire. Hardening homes includes fire resistant building materials, and design considerations, and limiting the possibility of an ember entering the home. Per FIRESafe Marin, two out of every three homes destroyed are ignited by wind-blown embers (Maranghides and Mell 2009). Encouraging residents to take steps to harden their homes is aligned with the <i>2017 Lessons Learned</i> report.
CONCERNS	Efforts would target residents, but almost 50% of San Rafael residents are renters. Additional efforts to encourage landlords to protect their investments would be needed.
COSTS	Costs include staff time and educational materials. Property owners' costs may vary from \$100's-\$10,000's depending on the steps they decide to take. Total cost to the City for educational materials is estimated to be \$20,000 annually.
STAKEHOLDERS	Fire Department, Property Owners, Fire Safe Marin, Marin County Fire, Code Enforcement

TIMELINE	Existing outreach and education materials would continue to be used. Increased public outreach, expos, and support for homeowners would depend on staff and funding levels.
OUTCOMES	Fewer structures in San Rafael would be susceptible to wildfire ignition

22. Improve development and implementation of Vegetation Management Plans (VMPs) and create new Resilient Landscape Templates (RLT)s.

ACTION	City program. Create Resilient Landscape Templates that offer suggestions for homeowners to achieve beautiful, fire resistant, drought tolerant, and carbon sequestering landscaping. Align VMP process with plan objectives and County VMP updates. Information will include information on fire resistant, drought resistant and carbon sequestering native plants.
WHAT THIS MEANS	SRFD will take the lead to streamline and automate the current Vegetation Management Plan (VMP) forms and review process. The VMPs will be reviewed for areas of improvement and consistency with County and other jurisdictions plans. The City will establish new Resilient Landscape Templates (RLT) designed for property owners rather than landscape architects. The RLTs will help property owners understand what species to remove and avoid and which to maintain and plant. VMPs and RLTs will serve as a resource for reoccurring seasonal work and enforcement with minimal maintenance effort.
RATIONALE	RLTs will serve as a resource to help residents achieve beautiful and fire resistant landscaping. An improved and more accessible VMP process will focus on new construction, remodels, and commercial space. Fire-resistant landscaping would help keep the whole community safe by reducing the chances of ignition and fire spread. An improved system would be necessary to support the additional VMPs submitted because of ordinance changes.
CONCERNS	Developing a comprehensive, but simple system would be a challenge and require input from multiple stakeholders and staff.
COSTS	<p>\$\$ Any costs associated with improvements can be funded by reallocating existing funds</p> <p>@@ Updates and improvements can be completed with existing fire staff reallocating time, and support from other departments.</p> <p>Total Costs to the City are incorporated into staff requests and may include an</p>

additional \$20,000 to \$50,000 for technology or consulting work.

STAKEHOLDERS Fire Department, Code Enforcement, Property Owners, Digital Services and Open Government, Marin County, FIRESafe Marin

TIMELINE Updates to streamline and coordinate the VMP template with the County can begin with additional staffing. The creation of San Rafael RLTs would build off templates from other jurisdictions but require additional staff time and resources to complete.

OUTCOMES Property owners have resources to more easily comply with updated wildfire mitigation efforts while maintaining beauty and environmental consciousness.

23. Increase the number of completed Vegetation Management Plans (VMP)s and Resilient Landscape Templates (RLTs).

ACTION Ordinance change. Expand the permits, rebates, cost shares, and exemptions that require submission of a Vegetation Management Plan (VMPs) or Resilient Landscape Template (RLT). Consider retroactive requirement for VMP or RLTs for community owned space, such as HOAs, or for commercial space.

WHAT THIS MEANS Additional opportunities to have residents, landscapers and property owners complete a VMP or RLT would be explored. The City would develop a new RLT process to help property owners achieve beautiful, sustainable, and fire defensible space. A VMP or RLT would be required for any property requesting an exemption from vegetation standards. VMPs would still be required under existing ordinances. Property owners completing the work outlined in the VMPs or RLTs may receive City support for vegetation removal, such as participation in 'free chipper' days.

RATIONALE Increasing VMPs and establishing RLTs would help reduce and remove fuels. RLTs help property owners understand how landscaping choices impact the threat of wildfire. Expanded submission requirements would help the City educate and support more property owners. VMPs outline a landscape contractors' plan, including irrigation. Increasing the number of VMPs or RLTs required would increase public education and provide property owners with a path towards more beautiful, fire resistant, drought resistant, and carbon sequestering landscaping.

CONCERNS The current VMP template and process would need to be streamlined to accommodate an increase in number of VMPs while minimizing impact to property owners. Staff effort would be required to create new RLTs to help property owners adjust their landscape. Staff time to review and approve VMPs or RLTs.

COSTS A streamlined VMP process would reduce staff costs. The VMPs and RLTs would be a

resource for inspectors, property owners, and landscapers and should require minimal maintenance. Having VMPs to reference would support staff enforcement efforts and reduce reinspection's. Some costs may be recovered via a VMP fee schedule.

Total cost to the City is included in the staffing estimates in Objective 26.

STAKEHOLDERS	SRFD, Community Development, Homeowners and Property Management companies
TIMELINE	VMP related ordinance changes would be incorporated into fire and building code updates late in 2019. Development of RLT's can begin with availability of staff and resources. Update to vegetation standards would be reflected on the updated templates.
OUTCOMES	Additional VMPs and new RLTs would be submitted from contractors, residents, and property owners. Additional opportunities for outreach, education, and vegetation inspections.

24. Improve the public's fire risk awareness with sign improvements and installation

ACTION	SRFD and DPW program. Install new and improve existing signage at all open space access areas and along roads in high fire-risk areas.
WHAT THIS MEANS	Signs would be installed across City open space explaining fire danger and risks associated with being in the open space. New signage would be installed in areas of high fire risk to help keep public alert and avoid risky fire behavior. Staff would need to survey all open space access points, and high fire risk areas to determine sign needs.
RATIONALE	Educate public and visitors. Support increased enforcement. Provide consistent messaging. Improve aesthetics and readability of signs.
CONCERNS	Aesthetic concerns of signs in natural areas. Potential to create culture of fear.
COSTS	<p>\$\$\$ Additional funding would be needed to develop, produce, and install improved signage.</p> <p>@@ Current staff can complete the project with time reallocation or support of contractors.</p> <p>Total Cost for the City to implement is estimated between \$15,000-\$30,000.</p>
STAKEHOLDERS	Fire Department, Public Works, Police Rangers, residents

TIMELINE	Survey work can be completed within 90 days. With funding, message and signs can be developed within 90 days, with installation to occur shortly thereafter. If funding is available, the project could be completed before the peak 2019 fire season. If utilizing grant funding, the project may be delayed, but would be completed before May of 2020.
OUTCOMES	Reduction in fire risky behavior by public due to increased awareness of wildfire risk.

25. Reduce fire risk and keep visitors using short-term rentals safe

ACTION	Ordinance change and City project. Develop guidance for short-term rental units to reduce the risk posed by and to visitors. Require all short-term rental units to post emergency procedures, information on signing up for emergency alerts, and fire safety information. All short-term rentals would be required to have a VMP or RLT on file.
WHAT THIS MEANS	Efforts to better inform visitors of wildfire risk would be incorporated into interactions with short-term rental units. Visitors, potentially unfamiliar with the area or wildfire risk, would be informed about the emergency procedures and can register for emergency alerts during their stay. Outreach should be conducted with all short-term rentals, to improve property owner and renter wildfire awareness and general safety. Direct outreach to VRBO, AirBnB and similar companies would be considered.
RATIONALE	Short-term rentals represent a unique fire risk for a variety of reasons. Those using short-term rentals may be from out of the area and unfamiliar with wildfire risk and safety procedures. The information helps assure the safety of visitors and provide important fire prevention information to visitors unfamiliar with wildfire risks and necessary ignition precautions. Having a VMP or RLT would help assure the property is safe, unlikely to ignite from a careless visitor, and support enforcement of vegetation standards for property owners.
CONCERNS	Increased cost of compliance could reduce the number of short-term rentals. Potential for increased cost of permit processing and code enforcement.
COSTS	<p>\$ Ordinance change can be accomplished with current funding and staffing levels. Potential revenue to City from fees and fines.</p> <p>@@ Outreach, monitoring, and enforcement can be accomplished with current staff reallocating time.</p> <p>Total Costs to the City are included in the requests for additional staff outlined in Objective 26.</p>

STAKEHOLDERS	Fire Department, Code Enforcement, property owners renting space, visitors
TIMELINE	In Progress. General guidelines are in development for short-term rental units and include safety information requirements. Additional research is needed to determine the best method for developing VMPs or RLTs for short-term rental properties.
OUTCOMES	Incorporate fire safety, disaster preparedness, and emergency notification information into any regulations or guidance provided to short-term rentals

26. Hire additional staff dedicated to vegetation management and disaster mitigation

ACTION	City staffing. Convert the existing part-time employee to full-time, fixed-term. Hire three additional seasonal employees to support inspections, project management, and public education in the spring and summer of 2019 and 2020.
WHAT THIS MEANS	Increased staff levels would allow for a more strategic approach to vegetation management and fire mitigation while staff continues to offer inspections. There are currently 1.5 Vegetation management specialists.
RATIONALE	Additional staff is needed to meet the demand for strategic fuel removal, fire road improvements, increased outreach/education, increased number of VMPs and RLTs, and vegetation inspections. Ongoing maintenance would require less staffing to assure parcels and public space remain free of hazardous fuel loads. Additional staff can also help support volunteer efforts in open space, following Marin County model.
CONCERNS	Funding the position may require voters to approve additional revenue stream(s), which likely would mean FY 2020 at earliest. Fixed-term and seasonal positions result in higher rates of turnover.
COSTS	<p>\$\$\$ The fully burdened position would cost an additional \$76,000 annually.</p> <p>@ Recruitment, onboarding, and training can be managed by current staff.</p> <p>Total estimated vegetation management staffing costs would range between \$250,000 to-\$300,000 annually and decrease when fuel reduction work requires less staff. Part-time DPW staff to support fuel reduction work is estimated between \$100,000-150,000 annually.</p>
STAKEHOLDERS	Fire Department, residents, businesses, public, DPW
TIMELINE	Research needed into best funding approach for position as well as timeline. Increasing staff hours can begin immediately with funding. Recruitment would be necessary to

hire and train a seasonal vegetation inspector.

OUTCOMES

Increased inspections, enforcement, fuel reduction project coordination, and customized vegetation plans. Additional staff support for communities working on Firewise designation and chipper days.

27. Increase Police Ranger staffing

ACTION

City staffing. Provide for one full-time fixed-term police Ranger in addition to the two part-time police rangers currently employed to patrol open spaces.

WHAT THIS MEANS

Increased ranger capability would allow for year-round open-space patrolling for fire hazards and code violations in open spaces. Law Enforcement would continue coordination with City- and County-wide efforts. Additional funding should be allocated to SRPD to support additional evacuation drills, which was identified as an important area of improvement in the 2017 Lessons Learned report.

RATIONALE

A full-time ranger would allow for increased patrols, more active enforcement of code violations, a more dynamic reduction in potential ignition sources in open spaces, and the ability to support evacuation planning.

CONCERNS

Funding the position may require voters to approve additional revenue stream(s), which likely would mean FY 2020 at earliest. Legal constraints may impact code enforcement and policy development.

COSTS

\$\$\$ The cost of one fully-burdened Professional Temporary Ranger position is approximately \$250,000 per year. Measure A funding currently supports two-part time positions. Additional funding is needed to support increased staffing for open space enforcement.

@ Recruitment and training of the additional position is supported with current staffing.

Total additional annual cost to the City is estimated between \$250,000-\$350,000 and includes the addition of one full-time police ranger to the current staffing model of two-part time Ranger positions. Additional staff time dedicated to evacuation planning and community drills is also included. An additional one-time cost for an additional 4-wheel drive vehicle may be necessary.

STAKEHOLDERS

Police Department, Public Works

TIMELINE

Additional funding is necessary before recruitment can begin.

OUTCOMES

Increased law enforcement presence and enforcement of open space regulations. Additional staff time available to support evacuation drills.

Notifications and Evacuation

28. Reduce fuels along roadways

ACTION	City program and policy. Develop a policy to clearly direct the enforcement of current State regulations and SRMC relating to vegetation clearance along public roadways. Updates to SRMC may also be needed to update, clarify and uniformly apply standards.
WHAT THIS MEANS	Stronger and more consistent enforcement and abatement of vegetation along roadways with a focus on pre-identified primary and secondary evacuation routes. Consideration would be given to shade and maintaining San Rafael as a "Tree City USA". Fuel removal would target continuous fuels between the ground and canopy. Hardwoods and native trees would generally be excluded from these efforts. Highly flammable shrubs near roadways would require removal.
RATIONALE	Reduces the risk of fire ignition along roadways. Improves potential evacuation routes by limiting the fire fuel along roadways. Creates additional fuel breaks to stop and slow the spread of wildfire. Increased responder safety through improved visibility and decreased roadside fuel. Removing continuous fuels from along roadways would reduce potential fire tunnels and fire spreading from the ground into the canopy.
CONCERNS	Residents may be resistant to removing vegetation along roadways serving as a privacy fence for their property. Disposal of large amounts of woody biomass.
COSTS	\$\$\$ Additional funding is needed to support community chipper days and support for property owners removing vegetation. @@ Policy can be developed with current staff reallocating time @@@ Additional staff time is needed to effectively enforce policy and support community chipper days. Total cost to the City would include support for homeowners and chipper support which may cost \$50,000-\$75,000 for the first few years, decreasingly significantly after maintenance is reached.
STAKEHOLDERS	Fire Department, Public Works, property owners
TIMELINE	A policy clarifying implementation of existing standards can be drafted within 60 days. Enforcement can begin immediately. Fall and Winter are slower times for vegetation inspections, allowing for a concentrated effort relating to clearance along roadways. Community support, including chipper days, cannot begin until additional funding is secured. Additional evaluation is needed to determine what, if any, SRMC changes may be needed.
OUTCOMES	San Rafael would have safe evacuation routes and less changes of roadside ignitions.

29. Establish a residential hillside “parking box” program

ACTION	Ordinance change and City project. Establish a residential hillside “parking box” program on narrow roadways in hillside areas. Parking would only be permitted in “boxed” areas which are established in areas that allow emergency vehicles safe access and public safe egress.
WHAT THIS MEANS	An ordinance change would establish the parking box program and require that in designated areas, street parking would only be permitted in designated parking boxes. A fire engine would drive through high problem areas to determine where street parking can safely be designated. DPW then would mark the parking boxes, and enforcement would occur via parking tickets and/or towing. Parking would only be permitted on roadways with a clear space of 10' for access and a parking area that is a minimum of 8' wide by 15' in length. In designated areas, the parking box ordinance would replace the six feet from center parking ordinance. Ways to support property owners attempting to build off-street parking pads in the impacted areas would be considered, such as waived permit fees or exemptions. Parking for open space would also be reviewed to assure parking areas are adequately defined to assure emergency access and egress.
RATIONALE	SRMC section 5.40.080 currently prohibits parking on narrow streets unless six (6) feet from center is maintained unobstructed. This standard is confusing, hard to enforce, and does not guarantee fire engines and other large vehicles can safely access all areas of San Rafael. The “parking box” concept is easy to observe and understand for both residents and visitors. The program would assure emergency traffic can respond to daily calls for assistance and in a large-scale emergency. The easy to understand system would also make enforcement, particularly on red flag days, easier.
CONCERNS	Loss of parking spaces in impacted areas. Traffic congestion during implementation.
COSTS	<p>\$\$\$ Implementing and program maintenance would require additional funding. Simplified regulations would support strong enforcement may result in increased ticketing revenue.</p> <p>@@ The ordinance and program can be implemented with existing staff reallocating time. Contractors may need to be considered based on other concurrent priorities.</p> <p>Total cost to the City is estimated to be \$10,000-\$25,000 initially, and \$1,500 to repaint every three years.</p>
STAKEHOLDERS	Fire Department, Public Works, Parking Enforcement, Residents
TIMELINE	Within 180 days, a draft ordinance and proposed pilot project would be developed. Implementation would be dependent on funds, staff, and project prioritization. A full implementation could be completed in FY 2020.

OUTCOMES

Narrow roads in San Rafael would have clearly defined safe parking areas, allowing for emergency vehicle access and public evacuation.

30. Improve public emergency alerting capabilities and policies

ACTION

City project and County policy. In coordination with Marin County, develop a proactive policy for the use of Wireless Emergency Alerts (WEA) during emerging situations. Establish templates that clearly communicate risk, requested action, and sources for follow-up information. Enhance internal capabilities.

Currently, the City of San Rafael relies on Marin County for non-opt-in messaging. The City's internal ability to message is limited to SRPD's Nixle subscription, which only reaches those who opt-in for messaging. This item has two interacting parts; 1) a clear policy for when and how San Rafael can request the County to issue emergency alerts on its behalf and; 2) Staff's recommendation to upgrade the internal ability to send messages that do not require users to opt-in. In both situations, policies, templates, and coordination would be needed.

WHAT THIS MEANS

Considerations would also be given to other alerting methods including NOAA weather radios, sirens, or coordinated community efforts. Sirens may be considered to alert residents in open space of an active threat. Sirens are not designed to be heard indoors and therefore would not be considered for citywide implementation as a primary alerting tool. Plans and policies would be developed to better inform the public of red flag and high fire risk days and any associated access changes, such as closures of open space. Plans would also improve coordination between alerting authorities and all news providers, including TV, Radio, and print. Expansion of Neighborhood Response Groups would strengthen connections and peer-to-peer communication.

RATIONALE

Assure policy and templates in place empower WEA message to be sent if threat exists. Reduce the likelihood that a message would be delayed or won't be sent. Reduce risk of loss of life. WEA messaging was NOT issued during the North Bay fires of 2017 or the Butte County Camp Fire in 2018. Internally the City needs to improve its messaging capabilities, including access, training, and policies, to assure communication with residents in time of crisis. While broad-based alerting tools, such as sirens or coordinated church bell rings can be considered, it is imperative that each individual register for alerts and have a local alerting redundancy, such as a weather radio. Improvements to emergency notifications and Red Flag warnings is a consistent theme in the 2017 *Lessons Learned* report. Senate Bill 833 and Assembly Bill 1877 established new alert, warning, and planning requirements for State, county, and local officials.

CONCERNS

Over-messaging can reduce the impact of an essential message. Incomplete or inaccurate messaging may cause panic or undue traffic congestion during evacuation. Messaging may overreach to nonimpacted areas. Coordination between County and

	City alerting authorities is necessary. Develop plan and strategies to meet the needs of those with Access and Functional Needs (AFN) to include mobility limitations and communication or language barriers.
COSTS	<p>\$\$\$ To allow San Rafael the direct ability to message, without requiring a user opt-in, an annual \$6,000 increase in SRPD's Nixle subscription is expected. Cost share program between the City and residents to obtain NOAA weather radios should be considered.</p> <p>@@ Efforts can be accomplished with existing staff reallocating time. The objective would require coordination between San Rafael PD, San Rafael Fire, and Marin County.</p> <p>Total Cost to the City is expected to be about \$6,000 annually for the advanced Nixle technology and a \$2,000 one-time cost help low-income residents obtain weather radios.</p>
STAKEHOLDERS	County OES, MCSO, SROES, SRPD, SRFD, Residents
TIMELINE	In progress. A streamlined policy would rely on agreement from Marin County Sheriff's Office. Updating the Nixle subscription can be done within days of an identified funding source.
OUTCOMES	San Rafael has ability to message all residents in the event of an emergency.

31. Increase capability for early fire warnings and detection

ACTION	City program and policy. Increase San Rafael's access and control to partner technology, including cameras with heat detection and micro-weather stations. Install two additional cameras to cover the highest fire risk areas in San Rafael. Assure detected wildfires are promptly reported to the National Weather Service to promote weather radio announcements.
WHAT THIS MEANS	PG&E has and continues to install cameras and micro-weather stations to monitor fire and fire weather conditions. Only a limited number of County Fire employees can currently control the view on the cameras. The live stream of the existing cameras is publicly available at http://www.alertwildfire.org/northbay/ . To increase the camera coverage of San Rafael, new cameras could be installed on San Rafael Hill and San Pedro Ridge. San Rafael Fire staff could have direct control of the view and zoom of these additional cameras.
RATIONALE	Cameras would allow for increased ability to monitor open space, which in turn could mean early wildfire identification and response, increased knowledge of weather conditions impacting fire spread, and increased firefighter safety. The ability to directly control cameras monitoring San Rafael increases internal capabilities and reduces the

	delay and reliance on third parties.
CONCERNS	Access to monitoring technology is determined through partnerships. Ownership and space on existing towers impact possible installation locations.
COSTS	<p>@ Efforts are supported with currently allocated staff time. No significant impact on other programming is anticipated.</p> <p>\$\$ Expanding the existing camera network with a greater focus on San Rafael would have additional costs. The camera's costs about \$5,000 each. PG&E grants may be available to help cover the costs of the cameras.</p> <p>One-time costs to the City may total between \$12,000-\$20,000 and annual maintenance costs around \$1,000.</p>
STAKEHOLDERS	PG&E, Fire Department, Marin County Fire
TIMELINE	Discussions to install new cameras and/or gain further access to existing camera are ongoing. Installation of new cameras would require funding and an agreement with the site owners in the desired locations. Improved coordination with wildfire monitoring partners and new technology would be in place in the Summer of 2019.
OUTCOMES	San Rafael has direct access to early warning technology and improved response times.

32. Review and expand evacuation plans, incorporating areas of refuge, and support neighborhood evacuation drills.

ACTION	City project. Review Countywide evacuation plans and expand existing plans to address San Rafael's unique needs, neighborhoods and resources, including possible water evacuations.
WHAT THIS MEANS	Additional evacuation planning would establish additional redundancies and potentially reduce the burden on a single egress artery during an emergency. These efforts would consider evacuating to areas of refuge during a fast-moving wildfire. Maps of evacuation routes and potential safe areas would be shared with residents. Expanded plans would better address the unique needs of the AFN community, to include limited mobility, communication and language limitations, and transportation independence. Coordination with Waze, Google Maps, and other GPS providers would be considered. City resources, including the Fire Department, Police Department, and OES would help neighborhoods develop individuated evacuation plans and support community organized evacuation drills.
RATIONALE	San Rafael has multiple areas with limited egress options, due to water, open space and narrow roads. San Rafael should review alternate options for evacuation, including establishing agreements with Golden Gate Transit and Dutra to support a water

	evacuation. Providing residents with more detailed information about existing and expanded evacuation plans would allow residents to be better informed and prepared.
CONCERNS	Evacuations are dynamic and situation dependent, making comprehensive planning ineffective. Efforts may create false sense of security or avoidance of individual planning.
COSTS	<p>\$\$\$ Creating an evacuation annex to the City Emergency Response Plan would require a contractor or additional staff. Support of evacuation drills would require addition Police Department staff time.</p> <p>@@@ Efforts would require additional staff time.</p> <p>Total Cost to the City is estimated to be \$50,000 one-time costs, and reoccurring costs of \$10,000 annually.</p>
STAKEHOLDERS	Fire Department, Police Department, Golden Gate Transit, Dutra, Marin County, Residents
TIMELINE	Planning efforts are ongoing. Water evacuation planning can be established throughout 2019 with collaboration from partners. Updated evacuation plans would be incorporated in the City Emergency Operations Plan (EOP).
OUTCOMES	Improved public awareness of evacuation routes and areas of refuge.

33. Assure safe and resilient critical infrastructure

ACTION	In partnership with utility providers, determine best method(s) to reduce fuels around critical infrastructure such as power poles, power lines, and other combustible infrastructure. Work to remove fuels from roadways and primary escape routes. Work with all utility providers to assure they are protecting their infrastructure from wildfires and have redundancies in place to reduce gaps in service delivery.
WHAT THIS MEANS	The City would initiate an effort to identify the best approaches to vegetation management activities around critical infrastructure. This would include coordination with PG&E and Marin Municipal Water District (MMWD). Potential ordinance changes would be evaluated. Efforts would focus on reducing likelihood of damage to infrastructure, assuring access to infrastructure, and reducing likelihood of infrastructure contributing to a wildfire.
RATIONALE	Reduce the risk of fire ignition and protect critical infrastructure from fire. Share burden of protecting infrastructure with property owners and utility providers. Reduce the likelihood and impacts of utility outages and road closures during a disaster.

CONCERNS	Property owner confusion regarding the responsibility of maintaining clearance around the service lines from the pole to the structure. Esthetics of vegetation and tree trimming and removal. Difficult to determine which homeowner is responsible for the cost of tree trimming. Jurisdictional issues may create challenges.
COSTS	<p>\$\$\$ Funding needs would depend on partnerships with PG&E and other agencies responsible for maintaining infrastructure. Support for residents removing fuel around infrastructure on their property would require additional funding.</p> <p>@@ A policy can be developed with current staff reprioritizing projects.</p> <p>Total cost to City is included in vegetation work and additional staffing requests in Objective 26.</p>
STAKEHOLDERS	Fire Department, Public Works, Community Development, property owners, PG&E
TIMELINE	In Progress. Guidelines for fuel reduction around critical infrastructure are being established and coordinated with utilities. Outreach and education can begin within 30 days of policy being finalized, dependent on staff time. Programs to support residents would be dependent on securing additional funding.
OUTCOMES	San Rafael critical infrastructure would be better protected and less likely to contribute to a wildfire.

34. Assure that appropriate staff can send and receive emergency alerts

ACTION	<p>City program. Establish schedule to assure that all appropriate San Rafael staff members routinely issue Everbridge test messages. Maintain current database of all staff contact information to assure communication with staff during an emergency.</p>
WHAT THIS MEANS	<p>Staff with Everbridge/alerting capability would be required to send test messages at least quarterly to assure access and proficiency. Staff would have templates and training materials to help develop proficiency. Citywide effort is needed to assure correct cell phone numbers are on file and can be used to reach City staff in an emergency. Routine message tests would help maintain an accurate database. Tools include Everbridge (managed by Marin County OES) and upgraded Nixle.</p>
RATIONALE	<p>All staff with the authority to issue alerts must be able to log in and navigate the system to send time-sensitive information. A centralized system to communicate with staff in an emergency is necessary to confirm staff safety and communicate closures and requested actions.</p>

CONCERNS	Potential to issue test messages broadly. Lack of participation. Ongoing database management is time consuming.
COSTS	\$ Program can be implemented with current funding. @@ Program would require multiple staff members reallocate time for testing and database management.
STAKEHOLDERS	San Rafael Staff with emergency alert capabilities (about 10 people), Department Directors, Human Resources, All City staff
TIMELINE	A ‘how to’ guide is already created. Once City management agrees to the value of the tests, a routine test schedule can be developed and implemented. Maintaining an accurate alerting database is an ongoing process that would require an established process. Tests in Nixle are dependent on system update.
OUTCOMES	Designated City staff would be confident in their ability to internally message during an emergency. All staff would be able to receive messages in an emergency.

35. Assure that City staff can communicate during an emergency

ACTION	City program. Determine and implement the best method to assure City staff with assigned emergency response duties can use cell phones and landlines. This would require a combination of Wireless Priority Service (WPS), First Net, and Government Emergency Telecommunications Service (GETS).
WHAT THIS MEANS	Complete a cost-benefit analysis of using WPS, Verizon First Responder, and GETS options. Register all Fire, PD, DPW field staff, building inspectors, and EOC staff with WPS and/or Verizon priority accounts. A policy for personal cell phones registered on the system would need to be established.
RATIONALE	The ability to communicate via cell phone after a disaster is negatively impacted by infrastructure damage and peak usage. There are tools available to help cell phone providers prioritize responder traffic. Acting now would limit the impact on communications during an emergency.
CONCERNS	Staff time to implement. Data management and maintenance of multiple tools.
COSTS	\$ There is no cost directly associated with these programs. @@ Staff time would be needed to initially enroll all designated phones, estimated to be about 200. Routine maintenance would be required.

STAKEHOLDERS	Impacted agency staff, Digital Services and Open Government
TIMELINE	WPS access can be requested immediately with cell phone account information. More research is needed to understand the new Verizon responder accounts and potential costs. GETS access can be requested immediately after determining additional needs. Usage policy can be developed within 120 days.
OUTCOMES	City staff would have redundant and prioritized methods for communication in an emergency

36. Assure that residents can evacuate through garage doors if power is out

ACTION	City program. Develop program to encourage the implementation of garage door battery backup systems. Consider cost share programs with low- income individuals.
WHAT THIS MEANS	San Rafael Code Enforcement would need to start enforcing updated safety requirements for automatic garage doors. San Rafael Fire would immediately begin incorporating garage door functionality into evacuation and wildfire preparedness material. San Rafael could consider applying this standard to rental properties and/or encouraging battery back-up installation on legacy garage doors. The City should consider a retroactive requirement or other method to increase back-up battery systems.
RATIONALE	Power failures, impacting the functionality of automatic garage doors, can make evacuation by car impossible during an emergency. Effective, July 1, 2019, Senate Bill 969 requires all new and replacement automatic garage doors to have a backup battery or other means that assures the garage door can open in the event of a power failure. The new law does not have a retroactive requirement. Public education is necessary to alert people of the risk and relatively low-cost solutions available, as not everyone has the physical ability to open a garage door manually. Garage door failure was noted in the 2017 <i>Lessons Learned</i> report.
CONCERNS	The update to Health & Safety Code Section 19891 and addition to Section 19892 do not retroactively apply or protect people with existing garages. Outreach can help inform, but not require adherence to stronger safety requirements. Assure outreach addresses the needs of those with Access and Functional needs, including limited mobility.
COSTS	@@ Staff time to develop and coordinate information would require some time

reallocation

\$\$ Educational materials and outreach would require some reprogramming but can largely be incorporated into other wildfire prevention and protection outreach.

Total costs to the City are included in outreach materials, but could include a cost share program with low income residents totaling \$2,000-\$10,000.

STAKEHOLDERS Fire Department, Code Enforcement, Property owners.

TIMELINE The Senate Bill requires that garage door installations and replacements on or after July 1, 2019 meet the new requirements. Education and outreach about this new requirement should begin immediately.

OUTCOMES Increased community awareness and implementation of garage door backup batteries or other means assuring evacuation is possible in a power outage.

37. Prevent potential entrapments by requiring 2 gates in any fence in designated areas

ACTION Ordinance change. Update building code to require new and replacement fences have two gates. Existing fences within designated single-lane access parcels must install 2 gates.

What this means Designated parcels would be required to have more than one means and direction of egress in the event of a wildfire or other emergency. Fences over a designated height would be required to have two gates installed, accessing different cardinal directions. This would include new fences and replaced fences. Staff would consider programs to help low-income residents install an additional gate in areas with limited egress.

Rationale This would help assure that multiple escape routes exist in the most vulnerable areas and provide ease of access for firefighters.

Concerns Cost burden for property owners not currently up to the new code. Enforcement.

Costs \$ Ordinance change can be accomplished with current funding.
@@ Public education and ordinance enforcement would require reprioritization of staff time.

Stakeholders Fire Department, Code Enforcement, property owners

Timeline An updated ordinance, incorporating stakeholder input, can be brought to City Council within 160 days. Updates may be incorporated into the 2019 planned code updates.

Outcomes

Fenced properties would have additional means of egress, benefiting them, and potential neighbors during an evacuation.

.....

38. Maintain and expand coordination of wildfire prevention and response planning with Marin County, other Marin jurisdictions, Marin County Fire, FIRESafe MARIN, and neighboring landowning partners.

ACTION	Continue and expand the collaborative work throughout Marin County to address the risk of wildfire. Review and consider any wildfire mitigation plan proposed by Marin County and other land-managing neighbors. Assure prevention efforts address needs of unincorporated areas.
WHAT THIS MEANS	Coordinate mitigation work, and fire road repairs in bordering areas. Explore opportunities for collaboration that provide benefits of scale and efficiency. Any future guidance or regulations brought forth by the County would be reviewed and considered for local adoption. Coordinate 2019 countywide fire and building code updates with County and other cities and towns.
RATIONALE	Wildfire and disaster do not respect jurisdictional boundaries. A fire starting in one jurisdiction can spread and impact many others. Continuing and expanding current collaboration would help assure efforts are as effective as possible. Similar fire and building ordinances would help simplify outreach and education while allowing for unique local adjustments. When practical, sharing resources may reduce costs through economies of scale.
CONCERNS	Challenges of consensus building. Speed of implementation. Impact on direct local control, responsibility and accountability.
COSTS	@ Minimal costs associated with staff time dedicated to coordination. \$ Potential cost savings related to use of shared resources for fuel reduction and education and outreach.
STAKEHOLDERS	San Rafael Fire Department, Marin County, Marin County Fire, FIRESafe MARIN, SRAs and CSAs
TIMELINE	Ongoing. Updates to fire and building codes would be adopted late in 2019.
OUTCOMES	Provide effective wildfire mitigation to San Rafael. Benefit from economy of scale and collaboration.

Table 2 - Objective and Impact Summary

Objective	Exists, Plan expands	\$	\$\$	\$\$\$	Additional Staff Needed
1. Eliminate highly flammable vegetation near structures and roadways throughout San Rafael	X			X	X
2. Apply vegetation management and defensible space standards citywide				X	X
3. Reduce ember ignitions within immediate zones to prevent structure ignitions through enhanced standards and support				X	X
4. Expand goat grazing for vegetation maintenance	X			X	
5. Establish additional fuel interruption zones	X			X	X
6. Improve public education regarding fire-safe landscaping and living with wildfire	X		X		X
7. Establish more Firewise communities in San Rafael	X	X			
8. Reduce hazardous fuels through an abatement process on privately owned unimproved lots and within 200 feet of a structure or 20 feet roadway			X		
9. Effectively coordinate the removal of vegetative debris	X			X	
10. Engage Community Emergency Response Team (CERT) members, Neighborhood Response Groups (NRGs) and other volunteers in fire prevention		X			
11. Reengage volunteer "Broom Pull Days"				X	X
12. Review and update WUI map		X			
13. Adopt Public Resource Code 4290 and 4291	X			X	X
14. Develop new efforts, solutions, and resources dedicated to wildfire prevention and protection	X		X		
15. Immediately seize ignition sources at encampments and remove encampments in open space as quickly as possible				X	X
16. Reduce likelihood of ignition in undeveloped land	X				X

Objective	Exists, Plan expands	\$	\$\$	\$\$\$	Additional Staff Needed
17. Explore opportunities in Fire and Building Code updates to increase use of fire-resistant materials and application of CA Fire Code 7A	X			X	
18. Eliminate fire hazard associated with shake and wooden roofs				X	
19. Develop comprehensive San Rafael hazardous vegetation study and mitigation measures				X	
20. Complete an analysis of fire roads and strategic fuel breaks				X	X
21. Increase the number of hardened homes in San Rafael		X			
22. Improve development and implementation of Vegetation Management Plans (VMPs) and create new Resilient Landscape Templates (RLTs) and.	X		X		
23. Increase the number of completed Vegetation Management Plans (VMP)s and Resilient Landscape Templates (RLTs).	X	X			
24. Improve the public's fire risk awareness with sign improvements and installation	X			X	
25. Reduce fire risk and keep visitors using short-term rentals safe		X			
26. Hire additional staff dedicated to vegetation management and disaster mitigation	X			X	
27. Increase Police Ranger staffing	X			X	
28. Reduce fuels along roadways	X			X	X
29. Establish a residential hillside "parking box" program				X	X
30. Improve public emergency alerting capabilities and policies	X			X	
31. Increase capability for early fire warnings and detection	X		X		
32. Review and expand evacuation plans,	X			X	X

Objective	Exists, Plan expands	\$	\$\$	\$\$\$	Additional Staff Needed
incorporating areas of refuge, and support neighborhood evacuation drills.					
33. Assure safe and resilient critical infrastructure				X	
34. Assure that appropriate staff can send and receive emergency alerts		X			
35. Assure that City staff can communicate during an emergency	X	X			
36. Assure that residents can evacuate through garage doors if power is out			X		
37. Prevent potential entrapments by requiring 2 gates in any fence in designated areas		X			
38. Maintain and expand coordination of wildfire prevention and response planning with Marin County, other Marin jurisdictions, Marin County Fire, FIREsafe MARIN, and neighboring landowning partners.	X	X			

Table 3 - New and Draft plan Objective number Cross Walk

#	Objective	Draft #
1	Eliminate highly flammable vegetation near structures and roadways throughout San Rafael	1
2	Apply vegetation management and defensible space standards citywide	2
3	Reduce ember ignitions within immediate zones to prevent structure ignitions through enhanced standards and support	4
4	Expand goat grazing for vegetation maintenance	15
5	Establish additional fuel interruption zones	32
6	Improve public education regarding fire-safe landscaping and living with wildfire	11

#	Objective	Draft #
7	Establish more Firewise communities in San Rafael	22
8	Reduce hazardous fuels through an abatement process on privately owned unimproved lots and within 200 feet of a structure or 20 feet roadway	34
9	Effectively coordinate the removal of vegetative debris from public and private property	37
10	Engage Community Emergency Response Team (CERT) members, Neighborhood Response Groups (NRGs) and other volunteers in fire prevention	33
11	Reengage volunteer "Broom Pull Days"	35
12	Review and update WUI map	23
13	Adopt Public Resource Code 4290 and 4291	3
14	Develop new efforts, solutions, and resources dedicated to wildfire prevention and protection	7
15	Immediately seize ignition sources at encampments and remove encampments in open space as quickly as possible.	8
16	Reduce likelihood of ignition in undeveloped land	5
17	Explore opportunities in Fire and Building Code updates to increase use of fire-resistant materials and application of CA Fire Code 7A	24
18	Eliminate fire hazard associated with shake and wooden roofs	6
19	Develop comprehensive San Rafael hazardous vegetation study and mitigation measures	31
20	Complete an analysis of fire roads and strategic fuel breaks	14
21	Increase the number of hardened homes in San Rafael	
22	Improve development and implementation of Vegetation Management Plans (VMPs) and create new Resilient Landscape Templates (RLTs).	17
23	Increase the number of completed Vegetation Management Plans (VMP)s and Resilient Landscape Templates (RLTs).	26
24	Improve the public's fire risk awareness with sign improvements and installation	36

#	Objective	Draft #
25	Reduce fire risk and keep visitors using short-term rentals safe	29
26	Hire additional staff dedicated to vegetation management and disaster mitigation	9
27	Increase Police Ranger staffing	10
28	Reduce fuels along roadways	19
29	Establish a residential hillside “parking box” program	25
30	Improve public emergency alerting capabilities and policies	13
31	Increase capability for early fire warnings and detection	12
32	Review and expand evacuation plans, incorporating areas of refuge, and support neighborhood evacuation drills.	30
33	Assure safe and resilient critical infrastructure	20
34	Assure that appropriate staff can send and receive emergency alerts	18
35	Assure that City staff can communicate during an emergency	21
36	Assure that residents can evacuate through garage doors if power is out	16
37	Prevent potential entrapments by requiring 2 gates in any fence in designated areas	28
38	Maintain and expand coordination of wildfire prevention and response planning with Marin County, other Marin jurisdictions, Marin County Fire, FIRESafe MARIN, and neighboring landowning partners.	