City of Palo Alto
City Council Staff Report

(ID # 12315)

Report Type: Informational Report   **Meeting Date: 6/21/2021**

Summary Title: Informational Report for Foothills Fire Mitigation Strategies

Title: Informational Report for Community and Economic Recovery: City Priority Initiatives Focus Area - Foothills Fire Mitigation and Safety Improvement Strategies

From: City Manager

Lead Department: Office of Emergency Services

Recommendation
No Council action is required. This is an update requested by the City Council as part of the City's Community and Economic Recovery workplan.

This report provides a status of numerous related ongoing activities, and is provided to give the City Council and public an initial overview of this work. Staff anticipate bringing this topic for discussion with the City Council following the July recess, at which time further strategic direction will be communicated.

Background
The COVID-19 pandemic necessitates that the City conduct contingency planning and to concurrently address other hazards and to maintain essential public safety services. With the wildland fire season of CY 2020 in the State of California in mind and as we enter the 2021 fire season, and at the direction of City Council, it is imperative that the City improve situational awareness and efficiencies in mitigation, response and recovery in the greater Palo Alto foothills, as described below.

CAL FIRE stated in a recent press release: "Because of dryer and warmer conditions, coupled with a second year of drought, fuels are apt to burn. Rainfall totals are 50% of normal for this time of year for the region. … This is shaping up to be a potentially significant wildfire year."[1]

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[1] https://files.constantcontact.com/13ae4c7f701/51545f4e-d548-45f7-84b7-713554c4b5e3.pdf

Human activity is the cause of the vast majority of wildland fire ignitions (such as sparks from vehicles, cigarettes, gardening equipment, and electrical utility lines).[2] Arson is another cause of wildland fires.

The Council directed staff specifically to identify improvements to the:
   A. Foothills Fire Management Plan[3]
   B. Capabilities to detect fires and means to notify the public
   C. Coordination and communication among first responders and other assisting agencies, including the use of volunteers and other non-government resources

Where applicable, the above topics will be addressed with respect to:
   • Current State: What exists already; what is being done now.
   • Near Term: What is planned or possible using existing resources (staff, budget).
   • Longer Term: What might be done; what are the potential resource impacts and requirements.

This topic is part of the Community and Economic Recovery workplan, specifically 'Item K – Create a Foothills Fire Protection Plan' under the City Priority Initiatives focus area.

As shelter in place and other health orders have substantially increased use of our parks and open spaces, the demands on public safety and open space ranger staff have outstripped resources, not just in the City but in the region, especially these open spaces that are in our Wildland Urban Interface (WUI). The City Council has also noted the increased utilization of parks and open spaces and the risks associated.

Furthermore, staffing reductions for public safety and open space rangers occurred in FY21 and additional reductions are proposed in FY22 as a consequence of the financial disruptions and budgetary uncertainty.[4]

Finally, fires are only one of several hazards and risks in the foothills. Earthquakes, dam failures, landslides, medical incidents, missing persons, crime[5], and other scenarios must be considered, as described in our community's plans already.[6]

Discussion
The lead agency for this effort is the City's Office of Emergency Services (OES) with the direct support of the Palo Alto City Manager's Office (CMO) (executive), the Palo Alto

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[2] See March 2021 wildfire presentation conducted by the Bill Lane Center at Stanford University: https://www.youtube.com/watch?v=YszXvlfV8Qg
[3] https://www.cityofpaloalto.org/files/assets/public/oes/plans/foothills-fire-management-plan-update-2016-final.pdf
[4] The City Council will deliberate on these reductions during the FY22 budget process.
[5] We have recently seen increases in reckless driving, drunk driving, and illegal fireworks being set off in the greater Palo Alto foothills, for example. This includes "side shows" – large convoys of vehicles racing and doing "stunts" in our foothills. This sort of dangerous activity is occurring throughout the U.S.
[6] www.cityofpaloalto.org/thira

Fire Department (PAFD), the Palo Alto Police Department (PAPD), the Palo Alto Utilities Department (CPAU), the Palo Alto Public Works Department (PWD), the Community Services Department (CSD), the Information Technology Department (IT), and other City departments.

Geographic Scope of Project:

The general focus of most of what is described herein will be on the longstanding region defined as the "greater Palo Alto foothills," which includes areas of the Wildland Urban Interface (WUI), regions defined by Cal Fire (both SCU and CZU) as Mutual Threat Zones (MTZ), by the California Public Utilities Commission (CPUC) as Tier 2 & 3 (high and extreme) fire zones, considered High Fire Threat Designation (HFTD), and sites of significant critical infrastructure and key resources (CIKR) and precious environmental resources.

The boundaries of this Area of Operation (AO) are:
- West Side: Skyline Blvd (Hwy 35) from Route 84 (Woodside Rd/La Honda Rd.) to Hwy 9
- North Side: Route 84 from Skyline to Alameda de las Pulgas
- East Side: Alameda de las Pulgas to Santa Cruz Ave to Junipero Serra Rd. to Foothill Expwy.
- South Side: Draw a line from the intersection of Hwy 9 @ Hwy 35 to the intersection of Foothill Expwy @ Magdalena

The Palo Alto City Council has determined this area to be at "significant risk of catastrophic wildfire," as have other authorities.[7] Please refer to our online Fire Hazard and Evacuation Route Map[8]:
https://drive.google.com/open?id=1v_-rjWXC_6h7gwvzCa4oK6FLqTziB6U2&usp=sharing

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[7] http://cityofpaloalto.org/civicax/filebank/documents/74692
[8] Note this map is static and for planning purposes. A future objective of FFEWS is to turn this into a dynamic map with views for agencies and a version for the public, similar to https://www.google.com/maps/d/u/0/edit?mid=1upb4XwdtJzrHXsN0sMqQuJHshrY&usp=sharing
The San Mateo County Grand Jury (looking at our area's similarities to the Town of Paradise after the Camp Fire) also noted a need (at the top of p. 12) for such dynamic maps:
https://www.sanmateocourt.org/documents/grand_jury/2018/wildfire.pdf
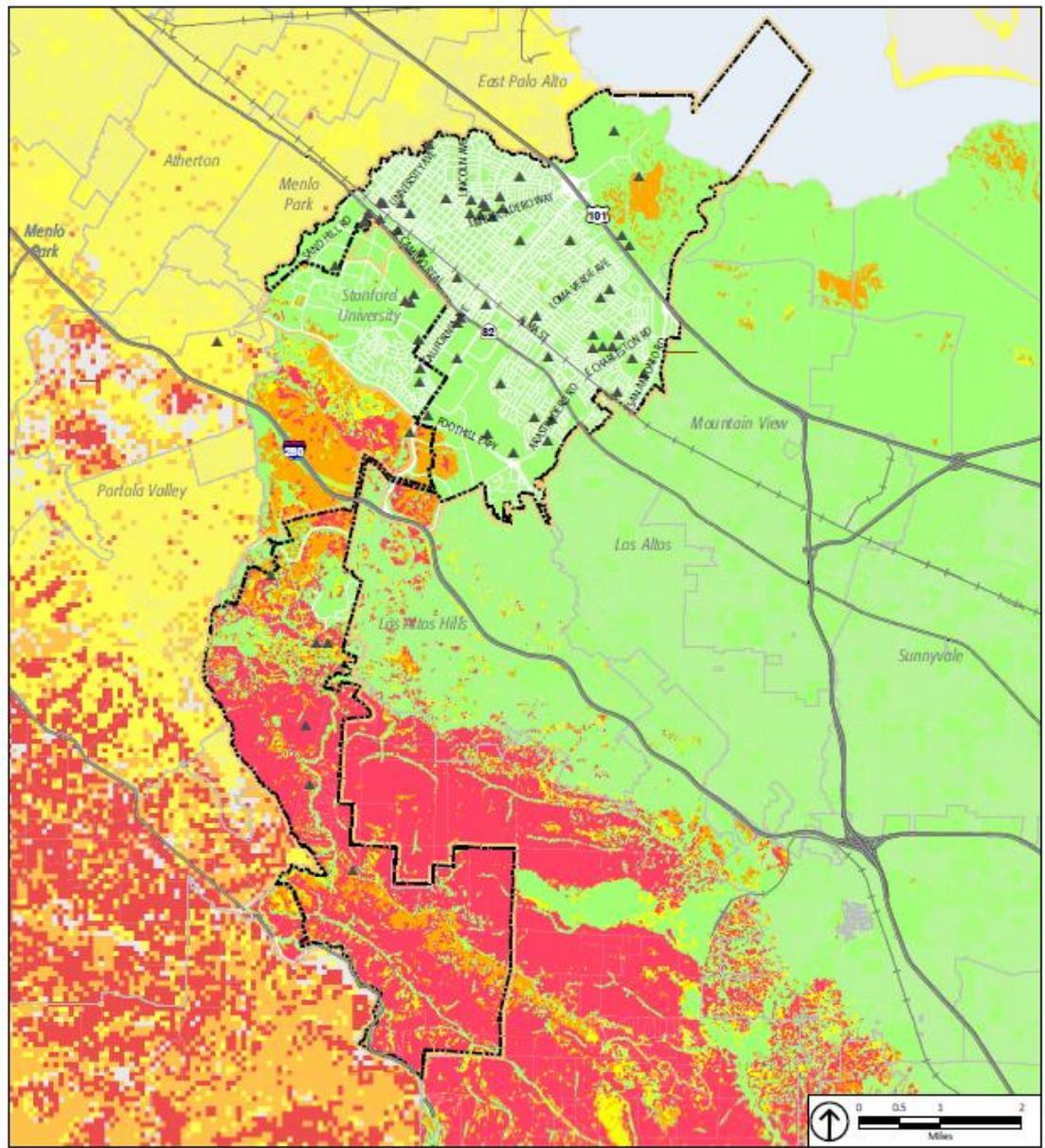
Source: City of Palo Alto, 2017; CAL FIRE and Santa Clara County Fire Department, 2017; SWCA Environmental Consultants, 2017; ESRI, 2010; Tiger Lines, 2010; PlaceWorks 2017.
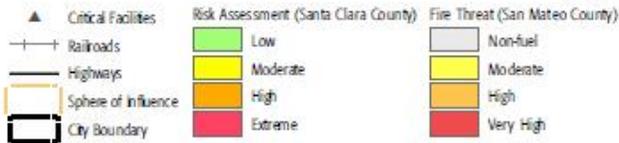
MAP S-8
WILDFIRE HAZARD ZONES

Figure 1: City of Palo Alto Wildfire Hazard Zones

The City of Palo Alto Comprehensive Plan identifies wildfire hazards in the Safety Element. Policy S-2.14 "requires that the planning and design of development in areas

exposed to wildland fire hazards minimize the risks of wildfire and include adequate provisions for vegetation management, emergency access and firefighting." This policy describes the related programs to reduce risk including funding, implementation of the Foothills Fire Management Plan, low density zoning, treatment and management of vegetative fuels, mutual aid relationships, and citizen engagement.

A. Foothills Fire Management Plan

Santa Clara County follows the State of California best management practices in developing and maintaining a Community Wildfire Protection Plan (CWPP).[9] The City, along with other jurisdictions and applicable special districts, integrates its respective Foothills Fire Management Plan as an annex thereof.

Current State:
The Foothills Fire Management Plan (FFMP) is complete and available on the web.[10] The discussion below will focus on the mitigation and prevention measures, such as the removal of flammable vegetation ("fuel"), evacuation routes, and so on.

The City first published a Foothills Fire Management Plan in 1982 to provide a planning framework for fire control activities for the City and the Palo Alto Foothills Area. The goal of the 1982 Fire Management Plan is "to reduce government costs and citizen losses from wildland fire by increasing initial attack success and/or protecting assets at risk through focused pre-fire management activities".[11] Since that time there have been three updates to the FFMP: 1997 (a draft that was never adopted), 2009, and 2016.

The 2009 FFMP update had three main goals, that also followed in the 2016 update.
1. Develop recommendations for wildland fuels (vegetation) and fire management to reduce fire hazards in Palo Alto's Wildland Urban Interface.
2. Maintain ecological and aesthetic values of Foothills Nature Preserve and Pearson-Arastradero Preserve consistent with fire reduction goals.
3. Provide a fuel management plan for Foothills Nature Preserve and Pearson-Arastradero Preserve that is cost effective and sustainable for the City of Palo Alto.

The Plan identifies 58 areas (approximately 330 acres of City land) where treatments are to be conducted. These treatments are found within Foothills Nature Preserve (formerly Foothills Park), Pearson-Arastradero Preserve, and 12 miles of City roadways. The highest priorities are the treatment of roadways which are evacuation routes and entrapment hazards (citizens to evacuate and allow emergency personnel and

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[9] https://www.sccfd.org/santa-clara-county-community-wildfire-protection-plan
[10] https://www.cityofpaloalto.org/files/assets/public/oes/plans/foothills-fire-management-plan-update-2016-final.pdf
[11] Palo Alto Foothills Fire Management Plan, 2009, p.14.

equipment to access safety). The plan has a five-year time horizon in order to manage the annual cyclical growth of fuels, as well as a longer-term strategy to reduce slower growing fuels over the plan's time horizon.

In FY2012, Council approved a new Capital Improvement Plan (CIP) (PO-12003) Foothills Wildland Fire Mitigation Program, which was funded for $200,000 for FY2012 shared among the departments with FFMP responsibilities. This CIP ceased in FY2016, but since there was a continued need for funding, the City allocated specific funds annually to three departments to pursue the goals of the FFMP: Fire Department ($60,000), the Public Works Department ($ 54,800), and the Community Services Department ($66,700) for a total of $181,500. Appendix A provides annual funding for FFMP related activities from 2009 to 2021.

The City has also used various methods to meet the goals of the FFMP. For many years, each department implemented local staff or contracts with small businesses for departmental responsibilities. This required a large amount of staff time and resources to manage FFMP activities. In 2013 the City entered into a five-year Stewardship Agreement, S13147834, for the Santa Clara County Fire Safe Council (SCCFSC) and City of Palo Alto to cooperate in the preservation, protection, and enhancement of the Foothills Fire Management Plan project area in which the City allotted $50,000 per year to the SCCFSC for FFMP activities. By doing so, the City was able to manage the 58 required FFMP treatment areas using a combination of City staff resources and SCCFSC contracted efforts. In 2017, the City amended this agreement for an additional 2-year term and increased the allotment to $181,500.   During this time the City has successfully implemented the FFMP through the partnership with the SCCFSC; they provided significant accomplishments on behalf of the City of Palo Alto.

In the last seven years, the City used an interdepartmental staff team to manage the program activities of the FFMP and provide oversight to the SCCFSC, comprised of the Fire Department, Public Works Department, Community Services Department, Office of Emergency Services, and the Palo Alto Utilities Department.

In additional to FFMP related projects, the Fire Department provides annual "defensible space" assessments to residences within the Palo Alto jurisdiction of the WUI. These visits by fire crews provide an opportunity for the residents to receive specific input on what they can do to reduce fire hazards on their properties. After that, it is up to the residents to take action or not.

In 2019, the City of Palo Alto Utilities Department (CPAU) began work on the Utilities Wildfire Mitigation Plan mandated by SB901. The Utilities Wildfire Mitigation Plan was presented to the City Council in January 2020 (CMR 10670). This plan, among other elements, provides mitigation actions in the form of recurring maintenance of overhead electrical lines (inspections, vegetation management along lines, and maintenance of electrical hardware) as well as longer-term capital projects such as undergrounding

lines in the WUI area. CPAU has completed two pilot projects to underground electrical lines at the Foothills Country Club Golf Course (800 feet of electrical line and the reduction of 4 poles and associated overhead wires) and Arastradero Road (2000 feet of electric line and fiber wire as well as the removal of 8 poles and associated overhead wires.

On April 7, 2021, the Utilities Advisory Commission (UAC) received a staff update regarding the Utilities Fire Mitigation project EL-21001 Overhead Line Project Wildfire Plan (Staff Report 12064). This report describes the undergrounding of certain electrical lines as an ongoing capital improvement program and a key element of risk mitigation.   On June 2, 2021 the UAC received a staff report on the annual update to the Utilities Wildfire Mitigation Plan (Staff Report 12190).

Near Term:
The Foothills Fire Management Plan will go through a revision cycle, in coordination with the County's Community Wildfire Protection Plan. The County anticipates a revision later in 2021, but that may be delayed, due to the pandemic. Until this update is performed, the City will continue to use the 2016 FFMP to guide the program efforts of the FFMP interdepartmental team. As discussed below, the City does not anticipate major changes to the FFMP in the next revision and is facing challenges to implement already-identified mitigation tasks.

The City is looking at alternative ways to meet the recurring program requirements, some of which will be a return to more staff supported work while others will require separate contracting efforts as a result of resource reductions across multiple departments in the City including Public Works and Community Services. Of the 58 current Foothills Fire Management Plan plan actions, staff believes 44 can be done with existing staff resources or existing contracts, while 10 will require outside capacity. Staff has deferred maintenance on 4 areas and are re-examining the necessity of these areas.

In early 2021, the City began renegotiations with the Santa Clara County Fire Safe Council (SCCFSC) for either a new or amended service agreement, since the prior agreement expired in 2020. The City is currently at an impasse with the SCCFSC because the work under the Stewardship Agreement between them and the City of Palo Alto likely is subject to prevailing wage and related labor laws – including but not limited to registering with the Department of Industrial Relations (DIR) and the provision of certified payroll records to DIR by the contractor and its subcontractors. The SCCFSC (a small non-profit) believed this to be too complex an issue for them to adhere to and therefore were unwilling to move forward with a new stewardship agreement. Staff is considering new contracts to perform the work in light of this.

The resource reductions due to the contraction in the FY 2021 and FY 2022 budgets reflect a need to staff to look across departments and share resources to the extent

practical and feasible, however, an increase reliance on inhouse prioritization of FFMP while balancing safety, maintenance, and services.

Longer Term:
The future revisions to the FFMP may or may not have additional elements to support projects or initiatives beyond its current scope. The State of California may change some of the guidance, as well.

The Palo Alto lands within the WUI are predominantly Public Conservation Land, followed by Open Space/Controlled Development. These include properties along the following routes and associated side streets: Los Trancos Road, Page Mill Road, Alpine Road, Arastradero Road, and Skyline Boulevard. Such properties include single family residences, public, educational, commercial, and agricultural lands. Public infrastructure in the area includes electrical and water distribution, wastewater, telecommunications, and public buildings.

The California state building code chapter 7A describes materials and construction methods for exterior wildfire exposure.[12] The Palo Alto building code incorporates this chapter into our local building code. Fire resistant construction is effective: analysis shows that many homes in the Town of Paradise during the Camp Fire in 2018 were saved because of the building codes that called for fire resistant construction. (This is also coming from our direct observation: Palo Alto OES staff spent weeks deployed to assist in the Town of Paradise and deployed to other fires and recovery efforts subsequently.)

In response to Senate Bill 190 signed into law in 2019, the City could also adopt a local ordinance requiring the enforcement of defensible space and related mitigation measures for the properties located in the WUI. While the Palo Alto Fire Department conducts annual inspections, there is not a direct consequence for those who do not mitigate identified hazards. City Code Enforcement and other resources could facilitate accountability following fire department inspections, however, additional resources would be necessary as there is only one code enforcement officer citywide and is a severely stretched work unit. Additionally, the City could provide resources such as free wood chipping days to encourage participation as is commonly done in other jurisdictions.

B. Capabilities to Detect Fires & Means to Notify the Public

Unlike fires in urban and suburban settings, WUI fires often can be difficult to detect in a timely manner. This section provides a brief overview of the issues and potential

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[12] https://hcd.ca.gov/building-standards/state-housing-law/wildland-urban-interface/docs/2010-part-2-cbc-ch7a.pdf - note: copy and paste this link into your browser.

actions the City and other partners are taking and might consider. This is a highly complex topic, but a few improvements could greatly enhance the situation.

Current State:
Current means to detect fires and other unsafe conditions are inefficient and labor-intensive:
- City staff patrols
- Emergency Services Volunteers (ESV) deployments
- Reports to 9-1-1 from witnesses/victims
- Occasional use of public safety aircraft from other agencies such as the Civil Air Patrol

Consider the case of an "unwitnessed" fire that might start in the middle of the night and remain undetected for a period of hours, leading to a major conflagration. To modify an aphorism: If a tree burns in the forest, and nobody is there to call 9-1-1, is there still a fire? The answer, of course, is yes, and it will be a much larger fire the longer a wildland fire burns without being reported. Early detection is of paramount importance to facilitate public warning, evacuation, and first responder mobilization. Pease see the wildfire evacuation and warning information on www.cityofpaloalto.org/wildfire

It is also important to consider the indirect effects of wildland fires, such as air quality, traffic disruption, loss of utilities and other infrastructure (including Public Safety Power Shutoffs or unplanned failures that could result in widespread power outages). Most fundamentally: If firefighting resources are not brought to bear quickly enough, many wildland fires quickly move past the point of realistic intervention, meaning a "defensive" posture is the only option left for the first responders.

Near Term:
The City is supporting regional efforts to expand the AlertWildfire camera system.[13]

The City is working to replace legacy (non-functioning) City-owned cameras covering the WUI, including improvements to CPAU cameras.

The City is partnering with Carnegie Mellon University to explore Internet of Things (IoT) and other novel approaches regarding data communications and sensors.

The City has a research agreement with a local startup, Perimeter, to help staff evaluate various tools to improve government as well as Emergency Services Volunteer coordination methods. OES is also in contact with other potential research developers and commercial entities to evaluate new and emerging solutions. OES also routinely

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[13] http://www.alertwildfire.org

meets with venture capital investment firms, academic researchers, and others to see what emerging potential technologies could be applicable.

The City has been working with the County on the Zonehaven evacuation zone project.

The City has a public-private partnership with VMware to leverage their solar-battery micro grid to allow the operation of the Mobile Emergency Operations Center (MEOC) and other incident command resources at the company's Palo Alto campus. This could provide an incident base during a major fire in our foothills.

The City has partnered with Stanford Land Management on the new Stanford Research Park Emergency Radio Network (SRP ERN) to facilitate two-way radio communication among SRP tenants and with Palo Alto public safety agencies. The MOU with VMware anticipates possible hosting of radio and wireless data and sensor equipment that could support the longer term FFEWS project, described below.

Longer Term:
The City is exploring the creation of a Foothills Fire Early Warning System (FFEWS). The City has gained some experience in the use of advanced sensor technology, artificial intelligence, and remote monitoring services through the Intrusion Detection System (IDS).[14] Sonoma County is also deploying cameras and artificial intelligence tools for wildfire detection.[15] Australia is developing an even more ambitious program, called Fire Shield.[16] The City of Palo Alto seeks to join these other efforts as a partner and innovator.

The City may issue a Request for Information (RFI) to gain more knowledge about the complex technologies and other best practices, many of which are evolving.

Likely elements of a future RFI would ask respondents to provide their input on providers, system integrators, and other services regarding:
- Cameras, thermal imaging, and other sensors
- Locations: Evaluate site and equipment locations
- Methods to verify or evaluate fixed-sensor (fixed-site cameras, etc.) data. For example, if a "plume of smoke" is seen, could a UAS be flown to the location to provide further information, validation?
- Networking: Some sites have fiber optics; others require wireless (microwave, etc.)
- Emergency back-up power: solar, battery storage
- Sensor/camera monitoring: use of artificial intelligence, rules-based systems, third-party monitoring.

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[14] https://www.cityofpaloalto.org/civicax/filebank/documents/58232
[15] https://www.firerescue1.com/fire-products/technology/articles/calif-county-tests-ai-technology-to-combat-wildfires-izxkuIdJcCSe0Cvw
[16] https://cdn.minderoo.org/content/uploads/2020/09/14223039/MFFFR-Blueprint-V1-200915.pdf

- Other methods to warn the public: sirens, digital signage (networked), fixed signage.
- Integration of utility related wildfire plans
- Criminal activities (deter, detect, facilitate prosecution): arson, vandalism, environmental crimes; awareness of existing and planned license plate reader (LPR) systems in the foothills, such as the Town of Portola Valley has recently installed in the Wildland Urban Interface in numerous locations.
- Information Sharing: "middleware" to facilitate the efficient and intuitive information sharing among 1) City of Palo Alto users, 2) allied agency and non-government organizations, and 3) the public.
- Costs of the above: acquisition, recurring fees (SaaS, monitoring services, UAS as a service, and so forth)
- Service Level Agreement (SLA) options
- Warranty and Support: maintenance contracts, other ongoing costs, including equipment replacement and repair.

Ongoing legislation may also provide guidance and perhaps funding for FFEWS:
- After Action Reports (AAR) from CA Fires[17]
- Recent CA legislation such as AB 477 re: Emergency Preparedness[18] and SB 901 (Utilities)

The FFEWS information presented below is preliminary but gives a flavor of the challenges and some possible solutions.

Purpose of Project:

This Foothills Fire Early Warning System (FFEWS) is envisioned to provide public safety agencies, allied organizations (rangers, hospitals, etc.), and the general public with timely and accurate situational awareness (SA) regarding fires and other critical incidents in the greater foothills of Palo Alto.

Current State:

The greater Palo Alto foothills AO presents a number of challenges for public safety agencies with increased risk to the community:
- Jurisdictional Complexity: The various city limit lines are obtuse. Certain ZIP codes and "city names" do not, in fact, reflect the actual jurisdiction. There are two counties (San Mateo, Santa Clara, and this operational area (OA) touches Santa Cruz County). There are two Cal Fire units (SCU & CZU).

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[17] This report is particularly salient:
https://www.dhs.gov/sites/default/files/publications/wui_fire_report_of_findings_july_24_2019v2_508.pdf
[18] https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB477

- Assets at Risk: In addition to the priceless environmental resources and habitats, the foothills are the location of high-value residences, commercial buildings, and infrastructure (known as critical infrastructure and key resources, CIKR).
- Command and Control: There is no unified system (platform) to facilitate unified command or on-scene management. Incident Command System (ICS) implementation is brought about through paper forms, in-person briefings, and other mechanisms that are indeed tried and true, but also wholly inadequate for a wildland fire in an area such as this. There are times where multiple 9-1-1 Centers receive calls about the same incident (deconfliction). See the North Bay 2018 and 2019 fire after action reports for what could happen: assumptions that another jurisdiction "has it" or there are, in fact, multiple incidents, but the various centers falsely assume otherwise.
- Communications: The area is rife with "dead zones" where cell phones, public safety radios, etc. do not function at all or are intermittent.[19]
- Public Warning: In addition to residents, businesses, and people on other private lands, there is a significant number of visitors: hikers, bicyclists, motorcycle riders, equestrians, etc.
- Evacuation Routes & Public Safety Vehicle Access/Egress: The area is served by narrow, winding, dangerous mountain roads. Civilians evacuating are likely to interfere with first responders' egress. Routing needs to be dynamic and real-time, based on current conditions and circumstances (a fixed, static plan is wholly inadequate).
- First Responder Resources: There are generally very few public safety responders in the foothills, except the MRSOD and Palo Alto open space rangers. These rangers do not operate at nighttime, however. Thus, early detection is a core goal of FFEWS, along with "force multiplier" concepts to improve the efficiency of response.

Desired End State:

FFEWS seeks to address, resolve or mitigate many of the above issues through a phased deployment of equipment and a novel approach to community risk reduction.

Some of the key anticipated outcomes include:
- Improved Situational Awareness: Sensors will allow public safety agencies to be aware of emergent conditions. Future "middleware" (platform) will integrate such data and help represent it geospatially and otherwise to

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[19] There is ca. $200,000 in CIP TE-05000 that will be used to improve public safety (and other government) radio communications in the foothills. Some of the CPAU improvements to the Montebello Reservoir site, especially the extension of fiber optic cables to that location, will be supportive of that effort.

facilitate a common operating picture (COP) among 911 Centers, EOCs, and ICPs, etc. Early detection is key as is being able to share and visualize data.

- Emergency Public Warning and Information: Members of the public (the vast majority of whom, realistically, will not be in any "opt in" database) will receive timely, trusted, accessible (AFN), actionable information.
- Efficiency: Limited public safety resources will be utilized effectively. Responding to the same call when multiple agencies believe the same call is "theirs" will be curtailed, as will the more dire case of them believing multiple incidents are the same call. Furthermore, "good intent" responses to what turns out to be steam, a barbeque, etc. will be reduced.
- Innovation: It is a core mission of the City of Palo Alto's Office of Emergency Services to foster new technologies. We anticipate all technologies to change over time, some rapidly. This is an opportunity for regional leadership in this regard, as well.

Note: Because of the high risk of power failure in these areas and the criticality of FFEWS, solar-battery backup systems will be part of the design.

Unmanned Aircraft System (UAS):

As cited above, the CPAU Utilities Wildfire Mitigation Plan[20] (presented to Council in January 2020) references a number of specific use cases for UAS, including power line inspection, visual inspections of infrastructure, vegetation encroachment, and other related activities. Like other utility operators, such systems in the foothills are both at risk for damage from wildfires and other hazards (such as earthquakes) but are potential source of ignition. Thus, the so-called Public Safety Power Shutdown (PSPS) practice has been implemented by PG&E and other electric utilities to de-energize such lines when conditions dictate.   Utilities staff have reviewed the capabilities as part of this Staff Report and are in support of the FFEWS.

Camera networks such as ALERTWildfire (see above) are starting to be deployed, but, for the reasons stated in the CPAU Utilities Wildfire Mitigation Plan, cannot practicably achieve the coverage and inspection use case objectives. UAS are also preferable to the current practice of using helicopters, since helicopters are expensive, noisy, polluting, and are often in short supply.

Cameras do have the advantage of providing constant coverage. However, even if multiple additional sites were added with cameras, the topography (valleys, etc.) and dense forestation would make it impractical to have full coverage of the area. Furthermore, a camera that sees a possible plume of smoke or even a 911 call "begs the question" of what is going on and where, exactly, the problem (or lack thereof) is.

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[20] https://www.cityofpaloalto.org/civicax/filebank/blobdload.aspx?t=53268.17&BlobID=74684

Thus, FFEWS will include UAS (drones) as part of the approach.

Furthermore, as part of the 2019 4th of July Safety Watch, OES had a local UAS company, Impossible Aerospace, fly drones over the foothills to evaluate their effectiveness. The live video from the drones which was fed to the Incident Commander and others involved in the operation was quite useful.

UAS options may be part of the aforementioned RFI, since there are so many options and legal complexities in this arena.

Future UAS Options:
FFEWS could be expanded to have drones stationed at various FFEWS sites that would be auto-launched when certain conditions or events are triggered (or called in to 911).

In addition, UAS platforms can also serve as a "flying network node" to help with coverage issues – and Palo Alto OES and Carnegie Mellon University have conducted proof of concept exercises in the foothills to that end.

We also intend to evaluate the addition of UAS to the Intrusion Detection System[21], since the IDS does not currently cover the entire rail corridor.[22]

C. Coordination and Communication among First Responder and other Assisting Agencies, including the use of Volunteers and other Non-Government Resources

The stakeholder engagement necessary for the successful implementation of this FFEWS will be robust. It is anticipated that regional partners will collaborate and coordinate on this effort, including,
but not limited to:

- San Mateo County: Public Safety (Sheriff, OES, Fire), Rangers, others
- Santa Clara County: Public Safety (Sheriff, OEM, Fire), Rangers, others
- Special Districts: Midpeninsula Regional Open Space District (MROSD), Woodside Fire Protection District, Foothill-De Anza College District Police Department, Menlo Park Fire Protection District, Valley Water, SFPUC (Crystal Springs and water infrastructure in WUI)

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[21] https://www.cityofpaloalto.org/civicax/filebank/documents/58232
[22] This is being done with a similar IDS rail operator in another state:
https://www.palmbeachpost.com/business/20191204/brightline-ramps-up-push-to-prevent-suicide-by-train

- State Agencies: Cal OES, Cal Fire (CZU, SCU), CHP, National Guard, Fish and Wildlife, San Jose State University (research partner)
- Federal Agencies: FEMA, EPA, USGS, USFS, Civil Air Patrol, FAA
- Municipalities: Los Altos, Los Altos Hills, Woodside, Portola Valley, La Honda, etc.
- Site Hosts and Research Partners: Stanford University, Stanford Health Care (Stanford Hospital), SLAC, Stanford Jasper Ridge Preserve, Stanford Research Park (SRP), Carnegie Mellon University (CMU) (research partner)
- Private Sector: VMware, California Water Service Co. (Cal Water) (site host), Perimeter (www.perimeterplatform.com)
- Regional Organizations: Bay Area Urban Areas Security Initiative (UASI), South Bay Incident Management Team (South Bay IMT), Fire Safe Councils (FSCs) (San Mateo, Santa Clara, South Skyline, etc.)
- Private Property Owners and Associations: Palo Alto Hills Neighborhood Association, Los Trancos/Vista Verde Neighborhood Association, etc.

A great deal of stakeholder engagement has already been done in various meetings over the past several months. OES has socialized this concept to the vast majority of the listed stakeholders, including a wildfire preparedness community meeting in Palo Alto Hills on 20 July 2019 where we described a vision for some of these proposed improvements and where those community members present were supportive thereof.

More stakeholder engagement will continue once council authorizes the FFEWS to promote the technology and resulting capabilities. Since FFEWS will be accessible by all member agencies, by Emergency Services Volunteers (ESVs), and depending on the architecture, eventually by the general public (like the former fire camera on Fire Station 8 and the emergent AlertWildfire camera network), OES will continue to coordinate an ongoing dialog among stakeholders.

It should be noted that most of the above agencies and entities already participate annually in a coordinated 4th of July Safety Watch operation. This entails an Incident Action Plan (IAP) to facilitate unified command (UC) among these various agencies, some of which are deployed for that evening and several of which are on call (contingency).

The Safety Watch also includes Emergency Services Volunteers (ESVs), such as Community Emergency Response Team (CERT) and Amateur Radio (ham) operators.[23] In addition to 4th of July, such ESVs are also routinely deployed by Palo Alto OES at certain look-out locations during high fire conditions (Red Flag). The ESVs utilize binoculars and two-way radios with cell phones being unreliable.

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[23] www.cityofpaloalto.org/emergencyvolunteers

The technologies discussed in this Proposal will allow ESVs (and, of course, public safety staff) to view the Foothills remotely, to receive alerts (with "conditional selectivity" depending on conditions, time of day, and so forth), and to "compare notes" with others much more rapidly. One might call this a "Virtual Safety Watch." Thus, the FFEWS also seeks to use ESVs more efficiently to help monitor for unsafe actions, events or hazards.

Timeline, Resource Impact, Policy Implications

The timeline for each component is addressed earlier in the report and recongnizes that the future state of wildfire mitigation actions is to be determined. Wildfire mitigation resources will continue to be prioritized along with other programs in a fiscally constrained budget environment. Additionally, further expansion and build out of capabilities will likely require augmenting resources depending on the tools that City Council wants to further pursue.

Stakeholder Engagement

OES developed this staff report in conjunction with the Community Services Department, the Public Works Department, the Fire Department, and the Utilities Department. As previously mentioned in this staff report OES among other departments have engaged the Foothills community and allied public safety agencies with respect to this subject matter.

Environmental Review

This informational report is not a project under the California Environmental Quality Act (CEQA).