SUPPLEMENTAL

CITY CLERKS: PLEASE POST

AGENDA

PALOS VERDES PENINSULA
PUBLIC SAFETY COMMITTEE

THURSDAY, AUGUST 12, 2021
7:30 A.M.

VIRTUAL MEETING

Pursuant to Section 3 of Executive Order N-29-20, issued by Governor Gavin Newsom on March 17, 2020, the meeting of the Palos Verdes Peninsula Public Safety Committee for Thursday, August 12, 2021, at 7:30 a.m., will be conducted via teleconference using the Zoom platform. Please see separate cover for public participation options.

  I. **CALL TO ORDER**

 II. **ROLL CALL**

III. **PLEDGE OF ALLEGIANCE**

 IV. **PUBLIC COMMENT**

   NOTE: *This is the appropriate time for members of the public to make comments regarding items not listed on this agenda. Pursuant to the Brown Act, no action will take place on any items not listed on the agenda.*

  V. **APPROVAL OF MINUTES**

   A. MINUTES OF MAY 13, 2021

 VI. **OLD BUSINESS**

   A. UPDATE ON JOINTLY FUNDED SCHOOL RESOURCE OFFICER (PVPUSD VERBAL REPORT)

B.   LOS ANGELES COUNTY FIRE DEPARTMENT ANNUAL BRUSH CLEARANCE INSPECTIONS (LACoFD VERBAL REPORT)

C.   UPDATE ON THE PENINSULA EMERGENCY PREPAREDNESS TASKFORCE (RHE VERBAL REPORT)

VII.   NEW BUSINESS

A.   UPDATED DRAFT OF THE PENINSULA WHITE PAPER ON UTILITY COMPANIES' RESPONSE TO A DISASTER (RPV)

B.   PALOS VERDES PENINSULA INGRESS AND EGRESS MAP AND STRATEGY FOR ESTABLISHING PENINSULA WIDE MASS EVACUATION PLANS (RPV)

C.   PREPARED PENINSULA EXPO SAVE THE TENTATIVE DATE FOR SUNDAY, OCTOBER 24, 2021. (RPV VERBAL REPORT)

VIII. OTHER MATTERS FROM REGIONAL EMERGENCY PREPAREDNESS COMMITTEE MEMBERS

NOTE: *This is the appropriate time for Committee Members to direct the placement of items for future action on upcoming agendas.*

IX. ADJOURNMENT

A.   Next regular meeting Thursday, November 11, 2021 at 7:30 a.m.

PALOS VERDES PENINSULA
PUBLIC SAFETY COMMITTEE
MINUTES TO MEETING ON THURSDAY, MAY 13, 2021

I.   CALL TO ORDER

A meeting of the Palos Verdes Peninsula Regional Emergency Preparedness Committee was called to order by Chair Dieringer at 7:30 a.m. via Zoom.

II.   ROLL CALL

PRESENT: **Rancho Palos Verdes**
                Eric Alegria, Mayor
                David Bradley, Mayor Pro Tem
                Rolling Hills Estates
                Steve Zuckerman, Mayor
                Rolling Hills
                Bea Dieringer, Mayor
                Palos Verdes Estates
                Dawn Murdock, Councilmember

ABSENT: Velveth Schmitz, Councilmember, Rolling Hills Estates
                David McGowan, Councilmember, Palos Verdes Estates

ALSO PRESENT: **Rancho Palos Verdes**
                Ara Mihranian, City Manager
                Karina Bañales, Deputy City Manager
                Jesse Villalpando, Emergency Services Coordinator
                Mckenzie Bright, Administrative Analyst
                Rolling Hills Estates
                Greg Grammer, City Manager
                Alexa Davis, Assistant City Manager
                Jessica Slawson, Administrative Analyst
                Rolling Hills
                Elaine Jeng, City Manager
                Palos Verdes Estates
                Laura Guglielmo, City Manager
                Tony Best, Acting Police Chief
                Marcelle Herrera, Community Relations Officer
                Los Angeles County Sheriff's Department

Captain James Powers, Lomita Sheriff's Station
Palos Verdes Peninsula Unified School District (PVPUSD)
Brenna Terrones, Assistant Superintendent of Administrative Services
Linda Reid, Board Member
Los Angeles County Fire Department
Chief Hale, Los Angeles County Fire Department

III.   PLEDGE OF ALLEGIANCE

IV.   PUBLIC COMMENT

V.   APPROVAL OF MINUTES

A. MINUTES OF FEBRUARY 11, 2021

Member Zuckerman motioned to approve minutes as amended, and Member Alegria seconded the motion.

AYES: Members: Alegria, Bradley, Zuckerman, and Chair Dieringer

NOES:

VI.   OLD BUSINESS

A. UPDATE ON THE PENINSULA EMERGENCY PREPAREDNESS TASKFORCE (VERBAL REPORT)

Administrative Analyst Jessica Slawson reported that at the March 30, 2021 Peninsula Emergency Preparedness Taskforce (PEPT) meeting, participating agencies provided updated information regarding COVID-19 safety re-opening protocols and vaccination resources obtained from the Los Angeles County Department of Public Health. The Palos Verdes Peninsula Unified School District (PVPUSD) reported that they will continue to assist with transitioning students to return back to schools safely, but will support families if they opt out of returning to school and continue distance learning until the end of the school year. Furthermore, it was informed that Southern California Edison and CalWater are working with the Peninsula cities on wildlife mitigation information and programs. Palos Verdes Peninsula Transit reported an increase in ridership; however, bus capacity continues to be limited due to COVID-19 safety protocols. Additionally, Palos Verdes Peninsula Transit is expected to return to having 50% of their regular operation, serving intermediate and high schools as of April 12. The Palos Verdes Peninsula CERT Coordinator and the Los Angeles Fire Department (LACoFD) continue to work together to coordinate and schedule an in-person or hybrid CERT course in October depending

on status of public health restrictions and guidelines. Also, after the Lomita Sheriff Station and Palos Verdes Estates Police Department suspended their volunteer programs due to COVID-19, as vaccination rates increase and volunteers feel comfortable with their assignments, volunteers programs are beginning to open. Lastly, Peninsula cities are working with LACoFD for wildfire and brush clearance efforts throughout the Peninsula region. Each respective city is gathering and providing important fire safety information by promoting wildfire resources, educational campaigns, and brush clearance inspection dates through social media networks and community newsletters.

B. UPDATE ON JOINTLY FUNDED SCHOOL RESOURCE OFFICER (PVPUSD VERBAL REPORT)

Assistant Superintendent of Administrative Services Brenna Terrones reported that the SROs continue to monitor their campus, and have continued to assist during the multiple changes caused by COVID-19. Schools have now opened and the SROs have been assisting with protocol screenings and ensuring students follow in-place procedures. Assistant Superintendent Terrones expressed that one of the SROs will be retiring by the end of the school year, and the process to replace this positon will begin. Lastly, she reported how PVPUSD applied for a Tobacco Grant for additional funding, and results are pending.

Member Eric Algeria questioned if PVPUSD will recruit from other agencies and if they are following up with Captain Powers and Chief Hale regarding potential officers who might retire soon from service, as there is potential these future retirees might be interested in the SRO role.

C. SUMMARY REPORT ON THE PENINSULA WIDE EMERGENCY PREPAREDNESS EXERCISE ON FEBRUARY 25, 2021 (RPV)

Coordinator Jessie Villalpando expressed how the tabletop exercise included all four Peninsula Cities, and representatives from the LACoFD, the Palos Verdes Estates Police Department (PVEPD), and the Los Angeles County Sheriff Department (LASD). The goal was to be able to design adequate coordination, communication, and response efforts between the cities and the first responders that assist the cities in case that a disaster affects the Peninsula. The meeting emphasized how critical it is to have accurate information, given that emergency events can grow. Also, he explained how at the moment, the four cities are communicating with a group text. Lastly, Coordinator Villalpando summarized the importance it is for the four cities to coordinate a Peninsula wide message addressing any emergency events to be able to get in contact with their residents in a timely manner.

Member Steve Zuckerman requested clarification on who attended scheduled meeting. He also asked if an emergency preparedness team has considered software programs, such as Slack, designed for sharing data other than text messaging. Furthermore, he

stated his concern regarding how resident who do not use mobile phones at home will be contacted to become aware of an evacuation, and Member Dawn Murdock agreed, adding there needs to be a secondary option. Lastly, Member Zuckerman expressed interest in having city staff trained and assist first responders, if there are not enough first responder personnel available for secondary alerts.

City Manager Ara Mihranian explained that mostly everyone in the current meeting normally attend, except elected officials. He also commended Coordinator Villalpando for what was presented in the Peninsula Wide Emergency Preparedness Exercise meeting, and asked if he could provide further information regarding an upcoming exercise occurring in the preserve with the assistance of LACoFD. Lastly, he clarified that no real fires will be used in the upcoming drills.

Chair Dieringer asked what are the upcoming exercises and expectations from the emergency preparedness team, and if residents will be involved in the near future. She also asked if such in-person field training exercises will occur as a Peninsula wide exercise, or individually.

Coordinator Villalpando informed the members of who attends the meeting. He also clarified that other software programs have been considered, but witnessed that text messaging tends to be as effective. Furthermore, he explained how currently there is a plan to conduct an in-person field training exercise, where residents practice their evacuation routes, and such drill will include residents, city staff, and first responders. Coordinator Villalpando then informed committee members and participants that on May 25, 26, and 27 the LACoFD will be providing a brush fire drill outside the nature preserves, which will assist in establishing better communication with the LACoFD, the rangers, and city staff, and clarified that it will be a Peninsula wide exercise, and clarified how the LASD will use vehicles and helicopters to alert residents of evacuation as a secondary alert. Lastly, Coordinator Villalpando also informed councilmembers that he will address concerns regarding cellphone usage, as they have also realized there can be potential loss of power if cell towers stop working.

Captain Power expressed how the LASD have created relationships with other law enforcement offices and the LACoFD if more first responders are needed to coordinate evacuations, and such relationships and assistance have been effective in the past. However, he did agree that not everyone relies on cell phone usage, but feels confident first responders can coordinate accordingly to be of assistance when needed. Coordinator Villalpando for what was presented in the Peninsula Wide Emergency Preparedness Exercise meeting, and asked if he could provide further information regarding an upcoming exercises occurring in the preserve with the assistance of LACoFD.

Assistant City Manager Alexa Davis explained how all four cities are contracted with Everbridge Software, which allows a reverse 911 call to occur in landlines. She explained how Everbridge has the ability to gather necessary data in regards to 911 calls, and even

push calls to cellphones and through text messages if needed. She also explained that there is also the South Bay Alert System that uses iCause to create emergency alerts to cellphones, which are alerts similar to Amber alerts. Lastly, she mentioned how there is a robust radio system in place, which can assist with transmitting necessary information and emergency alerts.

Community Relations Officer Marcelle Herrera reiterated the information regarding the South Bay Alert System as well as the robust radio system. She provided the information regarding RPV District Program and how they have placed city volunteer response containers that, if needed, can assist with communicating at a regional level. Lastly, she realizes that there are alternatives to communicate any emergencies.

D. UPDATED DRAFT OF THE PENINSULA WHITE PAPER ON UTILITY COMPANIES' RESPONSE TO DISASTER (RPV)

Coordinator Villalpando presented the second draft of the white paper. He reported how the name of the letter was changed, to better reflect the purpose of the white paper. He included an outline pertaining to the upstream and downstream dependencies, and then provided the meanings of each. Furthermore, he summarized how the rest of the paper includes information pertaining to the natural gas, telecommunication, information, water, and waste sectors. He mentioned he is currently discussing the paper and the assessments with the utility companies. He explained how CalWater and Southern California Edison actually work together to provide water to the residents of the Peninsula. Lastly, he mentioned a brief summary of his meeting with the Supervising Engineering William Chen from the Los Angeles County Sanitation Services. Coordinator Villalpando received the information from Supervising Engineer Chen that they currently do have an emergency preparedness plan already in motion. Coordinator Villalpando will continue to work with both the cities and the utility companies for further information to adopt a crisis intervention protocol for all Peninsula cities.

Member Zuckerman questioned if there are any programs that assist with pricing to install gas shut off valves as incentives for residents to update and install the upgrades. He also wanted clarification regarding LACoFD mentioning water pressures. Lastly, he wanted clarification if the new v500 system with the pump will supply water system wide, and regarding designating an evacuation center and appointing one specific individual to be the primary reporter if an emergency event happens.

Chair Dieringer clarified that in the City of Rolling Hills area there are no providers that provide landlines, and only Voiceover System provides the landlines through internet usage. Also, she expressed an interest in addressing ahead of time any vulnerabilities regarding utilities that the utility services are yet to address. Lastly, Chair Dieringer agreed that a uniformed protocol to address emergency events across all Peninsula cities will benefit the communities.

Member Murdock expressed the importance of being able to communicate with the community on incidents and educate resides on how to properly store water. She then added how continued training on communication and drills are very important for the safety of the communities.

City Manager Mihranian suggested that the white paper should include vulnerabilities related to cyber-attacks and how utilities can act based on given attack.

Coordinator Villalpando responded that he will look into such programs, and clarified that other stations can provide water if one system fails, although it might be a reduced amount. He also expressed that at this time water pressures are not addressed in the white paper. Furthermore, he provided an example regarding CalWater and how they are subcontracted with other vendors in case of an emergency, but will explore more with other utility services about additional vulnerabilities. Lastly, Coordinator Villalpando responded that alongside the partnership with Red Cross, additional work needs to be done to the current evacuation centers, but he did explain how residents can also be housed in hotels if needed, and explained that one of the follow up question will be addressed shortly in another agenda item.

VII.   **NEW BUSINESS**

A. **PENINSULA CITIES COVID-19 VACCINATION REPORT (RPV VERBAL REPORT)**

Coordinator Villalpando presented the pharmacies that are providing the COVID-19 vaccinations, as well as the link to schedule an appointment. Additionally, he presented data pertaining to the number of residents per city that have been vaccinated with at least one dose of the vaccination as of May 7, 2021. He also reported that the US Food and Drug Administration (FDA) approved the Pfizer vaccine to become available to age groups 12 to 15 years of age that must be accompanied by a parent when receiving their vaccine.

Member Murdock asked PVPUSD if students in the appropriate age group will need to be COVID-19 vaccinated by the next school year starting fall 2021.

PVPUSD Board Member Linda Reid answered that PVPUSD will wait for public health guidance to determine if children will need to be vaccinated in order to return to school, but provided additional information that at the local level it has been determined that staff are required to be vaccinated. She also explained that there are resources and events being established to assist families with getting vaccinated.

Member Bradley commended Rolling Hills Estates for the number of residents in their community that have received at least one dose of the COVID-19 vaccination, and commended all the cities for the statistics provided by Coordinator Villalpando.

Member Zuckerman is interested in getting the percentage of the adult population who got vaccinated because they were eligible, and create some sort of explanation for the public explaining that the numbers Coordinator Villalpando presented pertained only to eligible members of the community, and not the community as a whole.

Coordinator Villalpando clarified that the LAC Public Health Department only provides data pertaining to the ages 16 and up, which are the current eligible ages able to receive the COVID-19 vaccination.

B. BRUSH CLEARANCE (LACFD VERBAL REPORT)

Chief Hale reported that the LACoFD will start their brush inspections in the Peninsula Cities beginning June 1, 2021. He explained that the process can take up to 6 weeks from when LACoFD is notified to start such project, and if there are any residencies that did not pass, there is a follow up inspection within 30 days of those residencies being informed, and full project should be completed by August 12. The reports are then forwarded to their brush department, and if there are any residencies not completed, then LACoFD will send out crews to assist and complete the clearance for those residencies. Additionally, there was a new bill passed by the state to support the fire code of a 5 foot clearance around each and every residency classified in a high fire hazard area that will be enforced starting 2023, but no major details have been provided to the LACoFD as of now.

Acting Police Chief Tony Best asked if the information pertaining to the new bill changes and requirements will be provided for the cities to be able to inform residents through their platforms.

Chief Hale explained that they will add it to their Ready, Set, Go magazine.

C. STRATEGY FOR PENINSULA WIDE EMERGENCY COORDINATION THROUGH A SHARED COORDINATOR (RH)

City Manager Elaine Jeng explained that previously, the Peninsula cities shared an emergency coordinator, but that has shifted to each city having a dedicated party addressing emergency related needs for their city. The goal is to be able to coordinate between the Peninsula cities, and having one person of contact for such request. The proposal is for Coordinator Villalpando, who has been assisting already, to take on the role of being the main emergency preparedness coordinator for all the Peninsula cities. The second recommendation is to have a strategy of what is addressed every quarter, to fully develop a process of how the cities will communicate with their residents given an emergency event.

Mayor Alegria questioned how the lack of an MOU will affect the cautionary for Coordinator Villalpando as an FTE. He also state his concern regarding a shared burden

of cost-of-time, since there will be no MOU, and expressed interest in having a process in place and cost-sharing with all the cities.

Member Dieringer expressed the importance of addressing home hardening, because embers are one of the main sources for home fires, and gathering further data on options to home hardening options with certain discounts if it is a Peninsula wide request. She also requested there be an amendment to check for additional discounts for Peninsula wide usage if vents or gutter guards are purchased.

Member Zuckerman suggested to even consider having the cities purchase at least 100 shut off valves to attempt to get a discount from vendors and give other residents incentives to participate as well.

Chief Hale expressed that home hardening is an important factor in attempting to reduce home fires, and informed the committee members and representatives that Firefighter Trevor is already inspecting homes.

City Manager Mihranian explained that there is no impact to their budget, since they allocated funds for such position without considering a contribution from the other cities

City Manager Jeng explained that all cities are working on attaining their own emergency preparedness coordinator, but feel it is adequate to have one person of contact. Coordinator Villalpando can be that person of contact to assist and manage all the cities and address items pertaining to Peninsula wide emergency needs. Lastly, she explained how these suggestions do not prevent individual cities to continue working on their own individual needs.

City Manager Greg Grammer provided a successful example when the Peninsula cities assigned one person from one city to run and lead a particular program.

Mayor Algeria made motion supportive of the recommendation proposed by staff with amendments to check for additional discounts for Peninsula wide purchase for vents and gutter guards, and Member Zuckerman seconded the motion.

AYES: Members: Alegria, Bradley, Zuckerman, Murdock, and Chair Dieringer.

NOES: None.

VIII. <u>OTHER MATTERS FROM REGIONAL EMERGENCY PREPAREDNESS COMMITTEE MEMBERS</u>

None

IX. <u>ADJOURNMENT</u>

There being no further business before the Palos Verdes Peninsula Regional Emergency Preparedness Committee, Chair Dieringer adjourned the meeting at 8:40 a.m. The next meeting is scheduled to be held on Thursday, August 12, 2021, beginning at 7:30 a.m.

Respectfully submitted,

_____

Janely Sandoval
City Clerk
City of Rolling Hills

Approved,

_____

Bea Dieringer
Chair and Mayor,
City of Rolling Hills

AGENDA TITLE:

Presentation of a revised draft of the White Paper on Interdependency Vulnerabilities of Utilities Servicing the Palos Verdes Peninsula.

RECOMMENDED COMMITTEE ACTION:

(1)   Review a revised draft of the Peninsula White Paper on utility companies' response to a disaster and provide further direction to Staff.

(2)   Provide input on a revised draft of Palos Verdes Peninsula Crisis Communications Protocol.

STAFF COORDINATOR: Jesse Villalpando, Emergency Services Coordinator   J. V.

ATTACHED SUPPORTING DOCUMENTS:

   A. Revised Draft of White Paper on Interdependency Vulnerabilities of Utilities Servicing the Palos Verdes Peninsula.

   B. Redline Version of amendments to the Peninsula-Wide Incident Communication protocol.

BACKGROUND AND DISCUSSION:

At its meeting on November 12, 2020, the Peninsula Public Safety Committee (PPSC) was provided with a high-level update on the status of the creation of a White Paper that examines the interrelationship vulnerabilities between power, water, gas and sewer utilities servicing the Palos Verdes Peninsula, as well as outlining the potential consequences that could result from cascading and escalating failures of these utilities.

During this meeting, the City of Rancho Palos Verdes Emergency Services Coordinator identified the following six-tiered framework for the drafting of this White Paper:

   • **Identification of Primary Contacts and Stakeholders**
   • **Review of Relevant Policies & Plans**
   • **Identification of Critical Facilities & Infrastructure**
   • **Assessment of Utility Interrelationship Vulnerabilities**
   • **Development of a Crisis Communications Protocol**
   • **Integration with Peninsula Cities Emergency Operations Plans**

The current draft of this whitepaper uses a "Top-Down" approach to infrastructure interdependency analysis by outlining the following: (1) Overall on critical infrastructure system functions in general; (2) Background on the physical infrastructure sectors located in the community; (3) The interdependencies between that sector and other critical infrastructure system; and, (4) The potential consequences that could result from cascading failures.

The following critical infrastructure sectors servicing the Palos Verdes Peninsula are currently analyzed in this white Paper:

⇒ Electricity (Energy Sector)
⇒ Natural Gas (Energy Sector)
⇒ Telecommunications Systems (Communication Sector)
⇒ Information Systems (Communication Sector)
⇒ Water systems (Water Sector)
⇒ Wastewater systems (Water and Wastewater Sector)

Revisions to the Draft of White Paper on Interdependency Vulnerabilities of Utilities

On May 13, 2021, the PPSC reviewed a draft of this Whitepaper, analyzing the interdependencies vulnerabilities of infrastructure utilities and provided direction to Staff to incorporate suggested changes. Per the direction of the PPSC Staff has completed the following revisions to this Whitepaper.

- **Revisions made to the Executive Summary Section (Pages 1 & 2)**
  - Addition of a *"What is Critical Infrastructure"* section highlighting the official de finition and an overall generalized description of critical infrastructure use in everyday society.
  - Identification of designated critical infrastructure lifeline functions of transportation, Water, energy, and communications.
  - Addition of a section titled *"What are the Threats and Hazards to Critical Infrastructure"* identifying natural, man-made, and cyber threats to critical information infrastructure sectors.
  - Insertion of an overall summary table of identifying Critical Infrastructure Interdependencies.

- **Revisions made to the Community Profile Section (Page 6)**
  - Inclusion of a map illustrating the locations of Peninsula Cities City Halls, as well as fire and police stations serving the Palos Verdes Peninsula.

- **Addition of Cyber Security Vulnerability Considerations and Mitigation Strategies section (Page 9)**

- **Revisions made to Palos Verdes Peninsula Communications Sector background information section (Page 18)**
  - Removal of references to Peninsula landline telephone services.

- **Addition of *Appendix A: Peninsula-Wide Incident* Communication Protocols (Page 28)**

A copy of the revised draft of this Whitepaper is included in this report as Attachment A.

Revisions to the Crisis Communications Protocol

The Palos Verdes Peninsula's Shared Emergency Services Coordinator has reviewed the Peninsula Cities' established incident communications protocols, which were previously established by the Palos Verdes Peninsula Regional Law Committee in response to the homicide at the Promenade Shopping Center in May 2018 and has incorporated the following updates. Attachment B contains a copy of the existing Communication protocol's redline changes.

Protocol Number 6:
- *During a regional emergency declared by the county, state, or federal government, the Peninsula Cities will coordinate with the County Office of Emergency Management to ensure unified messaging about incident.*

Protocol Number 7:
- *To ensure unified messaging, the Peninsula Cities will only post-incident emergency information that has been approved by the agency that has jurisdiction over the incident. Individual Peninsula Cities may still post-emergency and incident information that is directly under the City's purview.*

Protocol Number 8:
- *In the event of a power outage and/or a loss of cell service impacting the entire Palos Verdes Peninsula the Peninsula Cities will work cooperatively (to the best extent possible) to implement the following strategies for information distribution:*
  - Regional Emergency Phone hotline
  - *Deployment of Information Stations (large wooden sandwich boards) to post information when other means of communication are impaired at key locations (dependent on the situation and where it is needed.)*
  - *Printed materials to distribute to Emergency Information Stations*
  - *Flyers for in-person distribution*
  - *Loudspeakers in vehicles*

Protocol Number 9:
- *During an emergency of any level, the Peninsula Cities will communicate and coordinate with one another, as well as with any other partner agency responding to or involved in the incident, to issue uniform coordinated emergency alerts via all appropriate and available notification platforms, including the individual Cities' disaster and emergency alert systems, Wireless Emergency Alerts (WEA), and social media.*

CONCLUSION

During the August 12, 2021, meeting, the Palos Verdes Peninsula Emergency Services Coordinator will provide the PPSC with a high-level update on the revisions made to this

White paper based on input received at the May 12th meeting and seek additional direction in the development and implementation of a Peninsula-Wide Crisis Communications Protocol.

INFRASTRUCTURE INTERDEPENDENCY VULNERABILITIES ASSESSMENT PALOS VERDES PENINSULA

WHITE PAPER (DRAFT)
AUGUST 2021

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EXECUTIVE SUMMARY

This White Paper was developed as a result of the four Peninsula Cities of Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills, and Rolling Hills Estates' efforts to ensure a constant state of preparedness to provide uninterrupted services to their respective communities, before, during and after an emergency event. The City of Rancho Palos Verdes led the development of this White Paper as a result of the Palos Verdes Peninsula Public Safety Committee's direction in exploring the potential effects of cascading failures of critical utility systems servicing the Palos Verdes Peninsula due to their interdependencies vulnerabilities.

The Palos Verdes Peninsula communities' comfort and security rests upon a myriad of highly interdependent critical infrastructure sectors that currently provide essential everyday services. Critical infrastructure consists of a large number of sectors, including the electric power grid, natural gas production, water and water waste systems as well as telecommunications and information systems. These infrastructure systems depend upon extensive interconnections and are part of a "system of systems"[1] that ensures the quality of life for the entire Palos Verdes Peninsula Community.

What is Critical Infrastructure?

In the United States (U.S.), the Patriot Act of 2001 defines critical infrastructure as those "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters."

Generally critical infrastructure can be defined as the electricity that powers our homes, the water we drink, the transportation that gets us around, the stores where we shop, and the Internet and communications that enable us to stay in touch with friends, family, and coworkers.

There are four designated lifeline functions – transportation, water, energy, and communications, which means that their reliable operations are so critical that a disruption or loss of one of these functions will directly affect the security and resilience of critical infrastructure within and across numerous sectors.

The energy infrastructure sector is of most importance as the sector needs to be operating properly in order for all other sections of critical infrastructure, such as natural gas production, water and wastewater systems as well as telecommunications and information systems, to perform as needed. These other critical infrastructures are dependent on the energy sector to maintain functionality, and vice versa—that is, they are interdependent.

What are the "Threats and Hazards" to Critical Infrastructure?

Both natural and man-made (intentional or unintentional) events have the potential to harm, damage, disable, or destroy critical infrastructure. Critical infrastructure has long been exposed to physical threats and natural disasters and is now becoming increasingly vulnerable to cyber threats. These risks arise as a result of the increasing integration of information and communications technologies with critical infrastructure, as well as adversaries intent on exploiting potential cyber vulnerabilities. As physical infrastructure becomes increasingly reliant on complex cyber systems to operate, critical infrastructure may become more vulnerable to specific cyber threats, including transnational threats.

Due to the interconnections and interdependence of infrastructure elements and sectors, damage, disruption, or destruction to one infrastructure element can have cascading effects, affecting the continued operation of another.

Identifying and comprehending the interdependence (two-way) or dependency (one-way) between infrastructure elements and sectors is critical for assessing risks and vulnerabilities and determining the best course of action for increasing security and resilience. For instance, the electric grid operates with the assistance of integrated information and communication systems from other critical infrastructure sectors.

Consequences resulting from one infrastructure sector failing can generate cascading failures across the entire infrastructure systems. The location of critical infrastructure lifelines is typically not shared among different utility operators, thus resulting in a majority of these infrastructures placements being unknown.[2] The colocation of multiple lifelines also increases the likelihood that failure in one system can damage and interrupt others. Severe disruption of one section of the critical infrastructures sector caused by natural or manmade disasters, can cause undue damage to the security and sustainable living of a community. Because of the essential role the infrastructure sector plays and the ability for its failure to cause severe disruption to a society's stability, the understanding of interdependencies among these critical infrastructure systems is essential in ensuring the resilience of a local community.

Overall Summary of Critical Infrastructure Interdependencies

	ELECTRICITY	NATURAL GAS	WATER	COMMUNICATIONS	WASTEWATER
ELECTRICITY	Highly connected and interdependent infrastructure	Power needed for pumping stations, storage, control systems and facilities.	Power for control system monitoring, pumps and facilities Temperature control (e.g., cooling of equipment), fire suppression, potable water.	Power needed for control facilities, communication towers, and remote monitoring capabilities.	Power needed for control systems, sewage pumping and treatment, and for facilities
NATURAL GAS	Fuel for heat, generators & facilities	Highly connected and interdependent infrastructure	Fuel for treatment, heat, pumps and lift stations, and facilities	Fuel for heat, generators & facilities	Fuel for treatment, heat, pumps and lift stations, and facilities
WATER	Temperature control (e.g., cooling of equipment), fire suppression, potable water	Water for production, cooling and emissions control	Highly connected and interdependent infrastructure	Temperature control (e.g., cooling of equipment), fire suppression, potable water	wastewater removal service, raw water supply for hydroelectric generation
COMMUNICATIONS	Telecommunication for daily operations; and SCADA systems	SCADA communication, and customer service and crew repair communication	Control system SCADA communication, and customer service and crew repair communication	Highly connected and interdependent infrastructure	SCADA communication ,and customer service and crew repair communication
WASTEWATER	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.

INTRODUCTION

The four Cities consisting of the Palos Verdes Peninsula share similar geography, development patterns and exposure to similar types of natural hazards. Recognizing that greater efficiencies are possible when emergency preparedness occurs in a regionally coordinated manner the Peninsula Cities formed a Regional Emergency Preparedness Committee (REPC). The Regional Emergency Preparedness Committee (REPC) (now known as the Palos Verdes Peninsula Public Safety Committee) consists of two Council Members from each of the Peninsula Cities and meets on a quarterly basis to discuss collaborative efforts on ensuring Peninsula-wide emergency preparedness. The objective of the Palos Verdes Peninsula Public Safety Committee (PPSC) is to enhance emergency preparedness on the Peninsula by addressing joint preparedness efforts and responses to widespread disasters affecting the greater Peninsula region.

Following presentations from utility companies servicing the Peninsula, the Palos Verdes Peninsula Public Safety Committee (PPSC) expressed concern regarding the risks associated with the possible loss of power to critical infrastructure utilities servicing the Peninsula Community. In response to this concern, the Committee motioned for the City of Rancho Palos Verdes' Emergency Services Coordinator to take the lead in creating a White Paper that examines the interrelationship vulnerabilities of utilities servicing the Peninsula community.

This White Paper highlights historically known interdependencies of the critical infrastructure sector and evaluates the potential effects of the failure of these utilities. Utilizing potential cascading and escalating effects established by existing research and lessons learned on best practices in responding to utility failures, this study will recommend areas of improvement in the Integration of analysis findings into emergency planning considerations for the Palos Verdes Peninsula Communities.

This paper first discusses a general overview of how utilities currently provide services, then this paper will cover background on the physical infrastructure sectors located in the community, and the interdependencies between that sector and other critical infrastructure systems; and the potential consequences that could result from cascading and escalating failures.

The goal of this project is to support long-term emergency planning for the Peninsula Cities through an infrastructure interdependency vulnerability assessment, contributing to the resiliency of the Palos Verdes Peninsula community.

PROJECT OBJECTIVES
The following five objectives were established at the outset of the Whitepaper Project:
- ⇒ Identification of critical facilities & infrastructure
- ⇒ Identification of primary critical infrastructure contacts and stakeholders
- ⇒ Assessment of utility interrelationship vulnerabilities
- ⇒ Development of a crisis communications protocol
- ⇒ Integration with Peninsula cities emergency operations plan

Following this section, the paper will discuss the background of the community profile for the Palos Verdes Peninsula and the identification of critical infrastructure sectors.

COMMUNITY PROFILE

The Palos Verdes Peninsula is a geographic sub-region within southwestern Los Angeles County. The Palos Verdes Peninsula consists of Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills, and Rolling Hills Estates. The City of Torrance borders the peninsula on the north, the Pacific Ocean is on the west and south, and the Port of Los Angeles is east. As of the 2010 Census, the population of the Palos Verdes Peninsula is 68,243.[*]

The Palos Verdes Peninsula's unique geography was formed over millions of years of volcanic activity, plate tectonics and terracing from changing sea levels. The nine-mile wide Peninsula, once an island, now rises above the Los Angeles Basin to a maximum of 1,480 feet, with uniquely terraced configurations and steep, rocky cliffs jutting upward 50 to 300 feet from the ocean formed over millions of years of submerging and lifting from the Pacific Ocean.

MAP OF THE FOUR PENINSULA CITIES
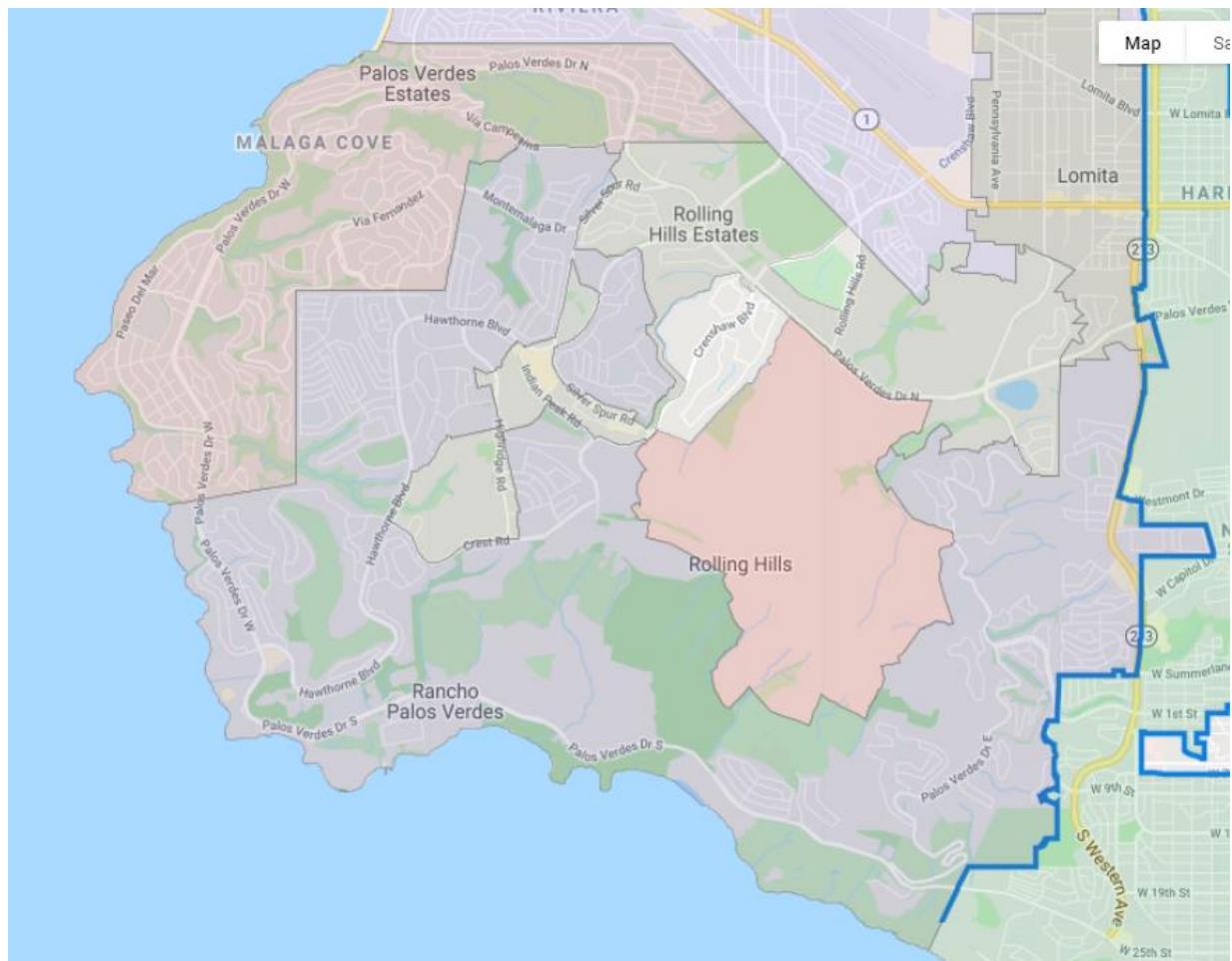
THREATS AND HAZARDS

The Peninsula Cities' Hazard Mitigation Plans[*] identify the following hazards posing a significant threat against the Palos Verdes Peninsula area:

- Earthquake
- Wildfire
- Earth Movement
- Tsunami
- Hazardous Materials
- Human-Caused Events
- Utility-Related Events

CRITICAL FACILITIES

Critical Facilities are essential to the health and welfare of the whole population and are especially important following hazardous events. The most critical municipal facilities for the Palos Verdes Peninsula are those that support public administration and emergency operations, police, fire, and emergency medical and emergency communications.

CITY HALL LOCATIONS FOR THE PENINSULA CITIES

PENINSULA CITY	CITY HALL LOCATIONS	PHONE NUMBER
Palos Verdes Estates City Hall	340 Palos Verdes Drive West Palos Verdes Estates, CA 90274	310-378-0383
Rancho Palos Verdes City Hall	30940 Hawthorne Blvd. Rancho Palos Verdes, CA 90275	310-544-5200
Rolling Hills City Hall	2 Portuguese Bend Rd. Rolling Hills, CA 90274	310-377-1521
Rolling Hills Estates City Hall	4045 Palos Verdes Drive North Rolling Hills Estates, CA 90274	310-377-1577

EMERGENCY SERVICES

Law Enforcement Services:

The Cities of Rolling Hills, Rolling Hills Estates, and Rancho Palos Verdes jointly contract with the Los Angeles County Sheriff's Department for law enforcement services. The Lomita Sheriff Station provides police protection to the Peninsula Region. The City of Palos Verdes Estates has its own police department. Officers are assigned to different divisions such as traffic, patrol, and detectives. The city also has its own dispatch center and jail. Both are staffed 24 hours a day.

**Fire protection Services:**

Currently, the four Peninsula Cities contract with Los Angeles County for Fire Department for fire suppression, enforcement of the Fire Code, and paramedic services. Concurrently, Los Angeles County Fire also provides emergency ambulance service.

FIRE AND POLICE STATIONS SERVICING THE PALOS VERDES PENINSULA

Type of Asset	Name	Address	Phone Number
Police (PVE)	Palos Verdes Estates Police Department	340 Palos Verdes Drive West Palos Verdes Estates, CA 90274	310-378-4211
Police (RPV, RH, RHE)	LA County Sheriff Department - Lomita Station	26123 Narbonne Ave, Lomita, CA 90717	310-539-1661
FIRE	LA County Fire Dept. Station 2	340 Palos Verdes Drive West Palos Verdes, CA 90274	310-373-6539
FIRE	LA County Fire Dept. Station 6	25517 S. Narbonne Ave. Lomita, CA 90717	310-326-2461
FIRE	LA County Fire Dept. Station 53	6124 PV Drive South RPV CA, 90275	310-377-3333
FIRE	LA County Fire Dept. Station 56	12 Crest Rd. West Rolling Hills, CA 90274	310-377-1584
FIRE	LA County Fire Dept. Station 83	83 Miraleste Plaza, Rancho Palos Verdes, CA 90275	310-831-4624
FIRE	LA County Fire Dept. Station 106	27413 Indian Peak Rd. Rolling Hills Estates, CA 90275	310-377-9523

Location of Palos Verdes Peninsula City Hall facilities, fire and police stations
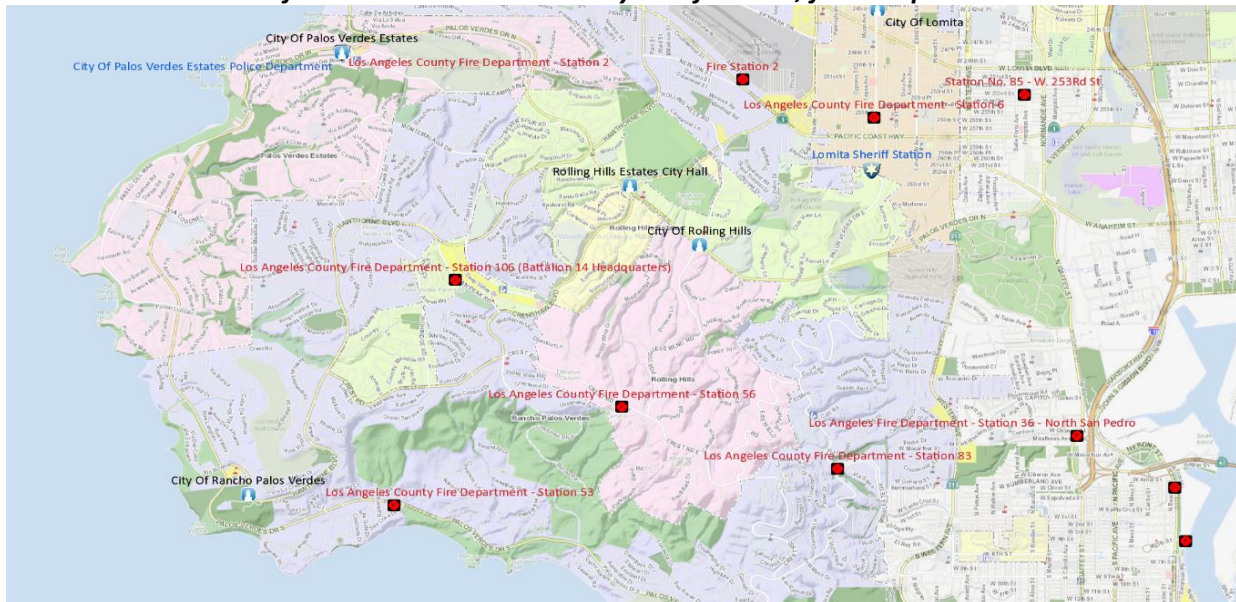
Area Hospitals: The Palos Verdes Peninsula has the following acute care hospitals in Torrance and San Pedro located approximately 15 minutes away.

AREA HOSPITALS

Name	Address	Phone Number
Del Amo Hospital Torrance	23700 Camino Del Sol, Torrance, CA 90505	(310) 530-1151
Harbor - UCLA Medical Center	1000 W Carson St, Torrance, CA 90502	(424) 306-4000
Providence Little Company of Mary Medical Center - Torrance	4101 Torrance Blvd, Torrance, CA 90503	(310) 540-7676
Providence Little Company of Mary Medical Center -San Pedro	1300 W 7th St, San Pedro, CA 90732	(310) 832-3311
Torrance Memorial Medical Center	3330 Lomita Blvd, Torrance, CA 90505	(310) 325-9110

IDENTIFYING INFRASTRUCTURE INTERDEPENDENCIES

Due to the complexity and highly interdependent nature of the critical infrastructure sectors currently providing essential services to the Peninsula Community, disruption of one section by natural or manmade disasters, can severely impact the security and sustainable living for the community. Due to the essential role that critical infrastructures play on society and the ability for its failure to causing severe disruption to societal stability, the understanding of interdependencies among critical infrastructure systems is essential in ensuring the resilience of a local community.

DEFINING KEY TERMS:

- **DEPENDENCY:** A dependency is a unidirectional relationship between two assets where the operations of one asset affects the operations of the other[6]. For example, a water treatment plant depends on communications services that support the supervisory control and data systems required to control plant operations.

- **INTERDEPENDENCY**: An Interdependency can be defined as a two-way relationship between two assets where the operations of both assets affect each other.[6] For example, water treatment plants require electricity for its data processing systems and, in turn, provides water that the communications system uses to cool its equipment.

The interactions between critical infrastructure and its environment can be characterized into three categories:

- **UPSTREAM DEPENDENCIES:** The products or services provided to one infrastructure by another external infrastructure that are necessary to support its operations and functions[7].

- ***INTERNAL DEPENDENCIES***: The interactions among internal operations, functions, and missions of the infrastructure[7]. Internal dependencies are the internal links among the assets constituting a critical infrastructure (e.g., an electric generating plant that depends on cooling water from its own onsite water well).

- **DOWNSTREAM DEPENDENCIES:** The consequences to a critical infrastructure's consumers or recipients from the degradation of the resources provided by a critical infrastructure[7].

James P. Peerenboom, Ronald E. Fisher, "Analyzing Cross- Sector Interdependencies,"40th Annual Hawaii International **Conference on System Sciences (HICSS'07), 2007** Http://www.computer.org/portal/web/csdl/doi?doc=doi/10.1109/HICSS.2007.78

Public Technology Institute, 2011, "Local Government Energy Assurance Guidelines"
https://www.naseo.org/Data/Sites/1/documents/energyassurance/documents/pti_local_governement_energy_guidelines .pdf

APPROACHES TO CHARACTERIZING DEPENDENCIES

Each dependency has its own characteristics, therefore analyzing dependencies requires different approaches to successfully consider their category, class, and dimension(s). These approaches can generally be described as either top-down or bottom-up. Top-down approaches consist of analyzing a system in its entirety and then focusing on its component parts. Bottom-up approaches consist of analyzing the component parts of a system and building on this analysis to describe the system as a whole[*].

TOP-DOWN APPROACH

Infrastructure interdependencies are complex and dynamic and continue to grow in number, resulting in systems that are increasingly vulnerable to cascading and escalating effects across infrastructure sectors. There are numerous approaches to identifying interdependencies, to manage these complexities, this Whitepaper uses a Top-Down approach, by first defining how the overall critical infrastructure system functions in general; current infrastructure functions in a particular geographical region context; the interdependencies between that sector and other critical infrastructure systems; and the potential consequences that could result from a disruption of services.

In the case of Palos Verdes Peninsula, this White Paper infrastructure interdependency analysis provides the following:
1. Overall critical infrastructure system functions in general.
2. the interdependencies between that sector and other critical infrastructure system.
3. and the potential consequences that could result from cascading failures.

This initial analysis serves as the basic building blocks for more advanced analyses incorporating these inputs in models and simulations.

INFRASTRUCTURE SECTORS SERVICING THE PALOS VERDES PENINSULA

Six critical infrastructure sectors servicing the Palos Verdes Peninsula are analyzed in this White Paper:
- ⟹   Electricity (Energy Sector)
- ⟹   Natural Gas (Energy Sector)
- ⟹   Telecommunications Systems (Communication Sector)
- ⟹   Information Systems (Communication Sector)
- ⟹   Water systems (Water Sector)
- ⟹   Wastewater systems (Water and Wastewater Sector)

Cyber Security Vulnerability Considerations

Cyber security refers to the protection of everything related to the Internet, from networks to information stored in computer databases and other applications, to devices that control equipment operations via network connections. Without launching a physical attack, attackers can cause damage to physical infrastructure by infiltrating the digital systems that control physical processes, damaging specialized equipment, and disrupting vital services. While often dismissed as an issue only for information technology departments, cyber security is an area of increasing concern for Infrastructure resiliency.

Almost every aspect of Critical infrastructure sector is vulnerable to a cyberattack. As an example, In addition to generation capacity, the transmission and distribution system that transports power from the generator to the users is vulnerable to cyber-attack. Power misrouting, spoofed reports of power outages, and other malicious attacks could result in power outages even when the system was functioning normally. In the worst-case scenario, such an event could cause a cascading failure, in which one outage causes a power surge, which causes another outage.

While their effects are not as immediate as those of direct threats, additional Cyber Security threats include data breaches, in which unauthorized users obtain personal or other confidential information, such as billing and account information or even meter data. Keeping all of these kinds of Data is critical for retaining customer trust in the power distribution system.

MITIGATING CYBER SECURITY THREATS

There are a variety of protocols and techniques for mitigating cyber security threats that may be appropriate to incorporate and address in emergency planning efforts, many of which are already widely used in the information technology industry. The first step is to understand the vulnerabilities. Once threats are identified, some common methods of mitigating them include:

- **Instituting access control policies:** Restricting access to key terminals, files, and networks to individuals who have the training and the need to work with those resources.

- **Adopting security protocols:** In some cases, failure to use industry-standard antivirus software and failure to install security patches and upgrades have resulted in severe consequences.

- **Monitoring systems:** Constant monitoring of system usage and assessing abnormal usage patterns on systems can help identify vulnerabilities and attacks before major problems occur.

- **Training:** Individuals responsible for ensuring the reliability of the system need to be trained to recognize and respond to security threats, as even the most advanced security technology can be undermined by lack of awareness.

- **Testing:** Security protocols and procedures need to be tested, and it may make sense for the planning process to include regular exercises (some of which simulate cyber attacks and responses), as well as penetration tests/ security evaluations by third parties to identify potential vulnerabilities.

- **Verifying information:** In some instances, taking major corrective actions in response to news of a problem could trigger unintended consequences if the information is not valid.

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9. *Department of Energy and Department of Homeland Security, 2007, "Critical Infrastructure and Key Resources Sector-Specific Plan as input to the National Infrastructure Protection Plan (Redacted)",* https://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/Energy_SSP_Public.pdf

ELECTRICITY GENERAL OVERVIEW

The electricity Infrastructure sector includes the generation, transmission, and distribution of electricity. Electricity is universal, impacting all critical infrastructure systems[9]. Electricity is generated at power plant stations, transmitted across high voltage lines to substations and then delivered at lower voltages to end users through the distribution system.

FIGURE 2: ELECTRICITY GENERATION, TRANSMISSION AND DISTRIBUTION
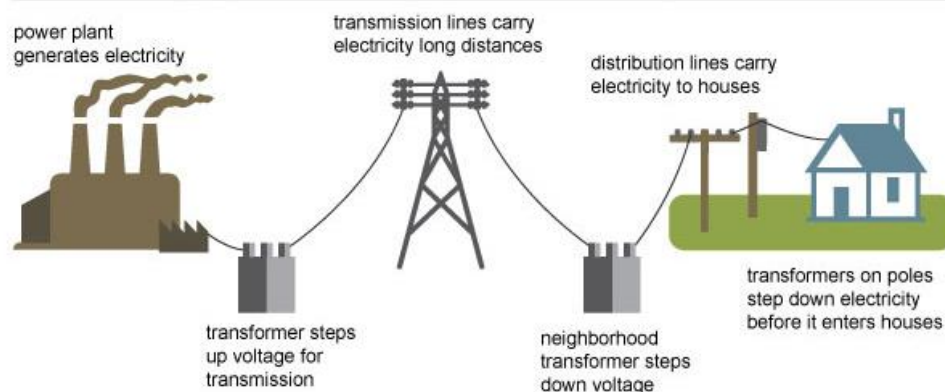
Source: Adapted from National Energy Education Development Project (public domain)

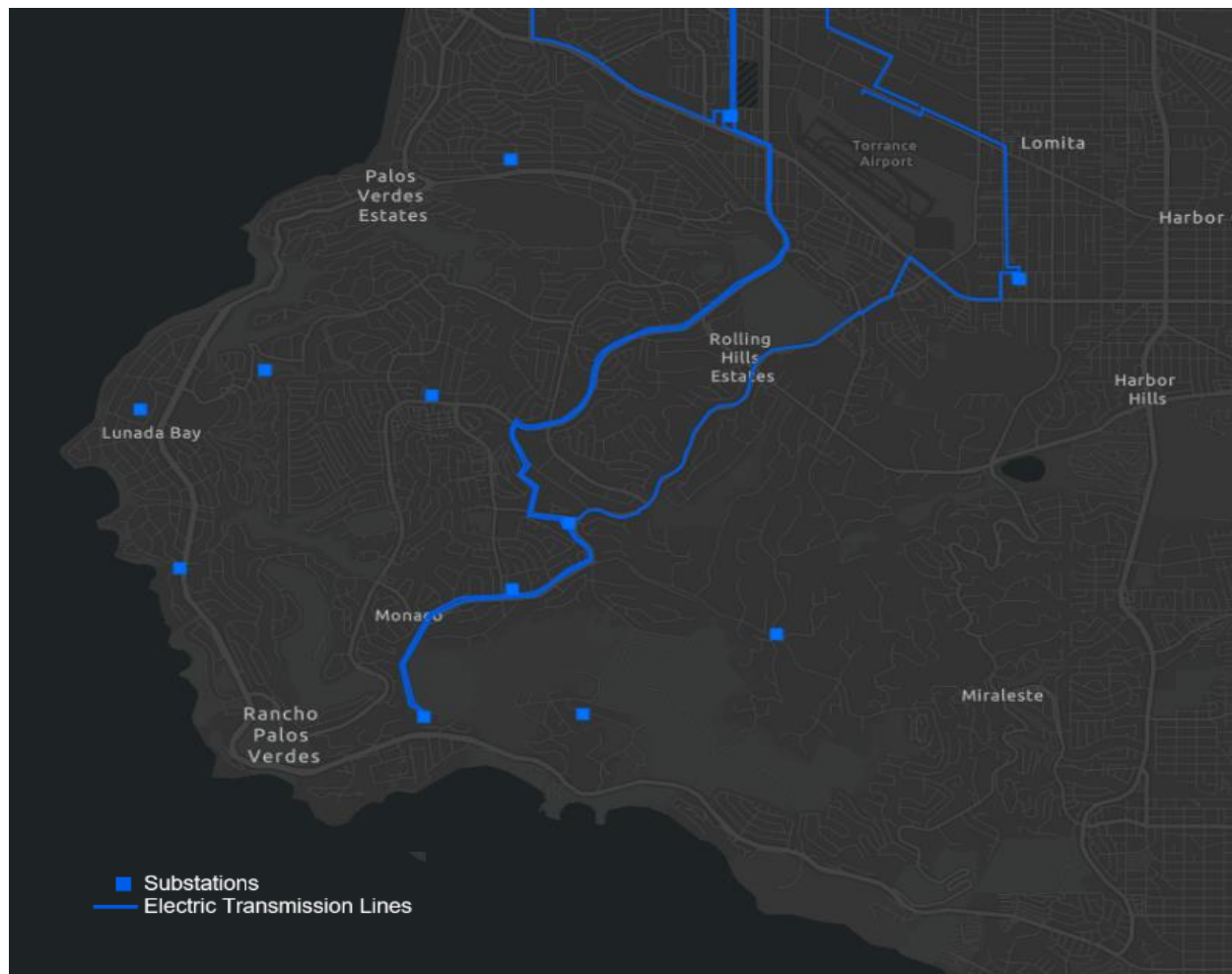## HOW ELECTRICITY GETS TO YOUR HOME

1. **Electricity Generation:** Electricity is made at a power plant station, large spinning turbines generate electricity, powered by wind, coal, natural gas, or water and deliver it to the transmission system.

2. **Transformers**: Once generated, the electrical current is then sent through transformers, which increase the voltage so the power can be pushed over long distances.

3. **Transmission Lines:** The electrical charge then goes through high-voltage transmission lines that stretch across the country.

4. **Substations**: At the other end of a transmission line, is a substation that uses transformers to lower the voltage, so the electricity can be distributed to customers at a usable voltage.

5. **Distribution Lines:** The electricity is then sent through distribution lines to neighborhoods. Smaller transformers reduce the voltage again to make the power safe to use in homes. These smaller transformers may be mounted on power poles or sitting on the ground (they're the big green boxes, called pad mount transformers).
   - The electricity then connects to consumers' homes, where it passes through a meter which measures the amount of electricity used.
   - Finally, electricity travels through wires inside the walls to the outlets and switches in consumers' homes.

ELECTRICITY BACKGROUND: PALOS VERDES PENINSULA

Southern California Edison (SCE) provides the supply of electrical power to municipal, commercial, and residential customers on the Palos Verdes Peninsula. SCE operates the Harbor Generating Station, a 474-megawatt natural gas facility located south of Wilmington which supplies a majority of electrical power to the Palos Verdes Peninsula. The electrical power distribution infrastructure for the Peninsula is designed as an integrated grid system, principally for ease of maintenance and uniform current flow.[4]

The Peninsula is currently served by transmission lines which parallel Hawthorne Blvd., Crest Rd. and Crenshaw Blvd. Substations located on the Palos Verdes Peninsula receive power from the transmission system and make electricity available at a usable voltage, which then gets distrusted to Peninsula Residents homes through a network of distribution lines, in some areas, both transmission and distribution lines are co-located on the same poles.

SCE TRANSMISSION LINES AND POWER SUBSTATIONS SERVICING THE PENINSULA, INFORMATION GATHERED FROM: SOUTHERN CALIFORNIA EDISON POWER SITE.

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U.S. Department of Homeland Security, 2018, "Infrastructure Interdependency Assessment Puerto Rico"
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7415906/

SOUTHERN CALIFORNIA EDISON (SCE) NETWORK OF DISTRIBUTION LINES AND POWER SUBSTATIONS SERVICING THE PENINSULA, INFORMATION GATHERED FROM: SOUTHERN CALIFORNIA EDISON POWER SITE.
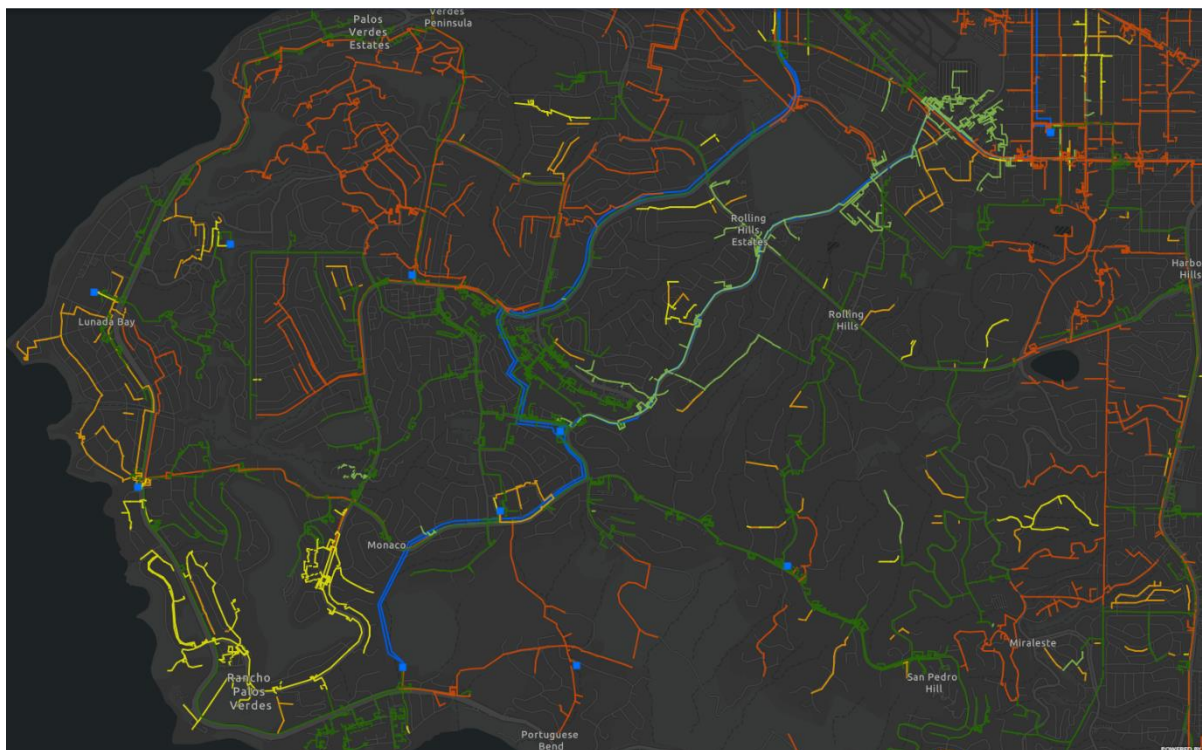
ELECTRICITY UPSTREAM DEPENDENCIES:

Electricity infrastructure depends heavily on other infrastructure sectors, such as natural gas for supplying fuels for power generation. Table 4 depicts critical infrastructure sectors that Electricity depends on to function properly.

ELECTRICITY UPSTREAM DEPENDENCIES

		UPSTREAM DEPENDENCIES			
ELECTRICITY	**Sector:**	**NATURAL GAS**	**WATER**	**COMMUNICATIONS**	**WASTEWATER**
	Service/ Resources Provide	Fuel for power generation.	Temperature control (e.g., cooling of equipment), fire suppression, potable water.	Telecommunication for daily operations; and SCADA systems.	Wastewater removal service, raw water supply for hydroelectric generation.

ELECTRICITY DOWNSTREAM DEPENDENCIES:

The Electricity Subsector has downstream dependencies with all critical infrastructure sectors, making it a fundamental need and community-wide requirement. Water treatment facilities, pumping stations, and communication systems rely heavily on electricity supply. Electricity is particularly important for heating, control systems, lighting, mechanical and electrical equipment, and security and safety. Additionally, electricity is required for the operation of petroleum refineries and distribution terminals[10].

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10. *U.S. Department of Homeland Security, 2018, "Infrastructure Interdependency Assessment Puerto Rico"*
     https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7415906/

ELECTRICITY DOWNSTREAM DEPENDENCIES

ELECTRICITY	DOWNSTREAM DEPENDENCIES				
	Sector:	NATURAL GAS	WATER	COMMUNICATIONS	WASTEWATER
	Service/ Resources Provide	Power needed for pumping stations, storage, control systems and facilities.	Power is needed to energize control system monitoring and controls at remote sites, including IT and Communications equipment.	Power needed for control facilities, communication towers, and remote monitoring capabilities.	Power needed for control systems, sewage pumping and treatment, and for facilities

POTENTIAL EFFECTS OF ENERGY DISRUPTIONS ON ESSENTIAL INFRASTRUCTURE:

Outside of the impacted region, the power system remains largely intact and functional. The impact of a disruption on local or regional infrastructure has a significant impact on the severity of a power outage and the restoration efforts required to return the system to normal operation. Table 5 illustrates the effects of electricity disruptions on critical services[10].

POTENTIAL EFFECTS OF DISRUPTIONS

ELECTRICITY	POTENTIAL EFFECTS OF DISRUPTIONS				
	Sector:	NATURAL GAS	WATER	COMMUNICATIONS	WASTEWATER
	Service/ Resources Provide	Failure of fuel for power generators and lubricants for facilities. Loss of heating and cooking abilities.	Loss of Control systems, lift stations, and facilities: transportation of water (pumps); cooling and emission controls; water transport for emergency response	Failure of communication facilities and towers, Loss of electronic transactions and ability to obtain data. Customer service and repair crew communications failure.	Monitoring equipment affected, Restriction of sewage pumping and treatment for stationary, scale systems. Challenges in communicating with Residents and business Potential impact to facility lighting, telecommunications; electronic data.

CONSIDERATIONS FOR ELECTRICITY INFRASTRUCTURE SERVICING THE PALOS VERDES PENINSULA:

At the present time, the Peninsulas electrical power needs are being reliably met by Southern California Edison (SCE). A potential problem of electricity reliability for the Peninsula is that facilities in the area are susceptible to damage from earth movements, such as earthquakes and landslides. Additionally, overhead transmission lines, transformers, and associated poles pose potential significant adverse safety hazards for the Peninsula. Overhead wires and associated hardware have caused brush fires and are vulnerable to damage caused by natural conditions (such as high winds, lightning, and tree growth) and human-caused conditions (such as automobile accidents), creating power outages and, in some cases, safety hazards if severed or broken.

The interdependencies of the Electrical infrastructure sector servicing the Palos Verdes Peninsula combined with impacts of natural disasters can lead to a ripple effect of disruptions of Critical Infrastructures serving the Palos Verdes Residents. The understanding of the Electricity infrastructure sector interdependencies and critical failure points is therefore vital to achieving long term resilience planning for the Palos Verdes Peninsula.

NATURAL GAS GENERAL OVERVIEW

Natural gas accounts for a significant percentage of the primary energy consumed in the United States. Natural gas consumption in the United States is highly seasonal, with the higher demand in winter for heating and lower demand in summer. The natural gas section of the critical infrastructure sectors includes the production, processing, transportation, distribution, and storage of natural gas; and gas control systems[11].

Natural Gas Production – A majority of natural gas comes from natural gas production fields in New Mexico, west Texas, and Oklahoma, as well as in the Rocky Mountains and Canada. The remaining natural gas supply percentage is produced locally in Central and Southern California from onshore and offshore fields.

Natural Gas Processing – Natural gas processing consists of separating all of the various hydrocarbons and fluids from the pure natural gas to produce pipeline-quality dry natural gas.

Natural Gas Transmission- The interstate natural gas pipeline network transports natural gas from processing plants in producing regions to areas with high natural gas demands, particularly large urban areas. Compression stations along the pipeline transmission route keep the gas moving at the desired pressure.

Natural Gas Storage – Gas is typically stored underground and under pressure as an efficient way to balance discrepancies between supply input and market demand. Three types of facilities are used for underground gas storage: depleted reservoirs in oil and/or gas fields, aquifers, and salt caverns.

Natural Gas Distribution – Local distribution companies, typically transport natural gas from interstate pipeline delivery points to end-users through thousands of miles of distribution pipe. Delivery points for local distribution companies are often termed city gates, especially for large municipal areas, and are important market centers for the pricing of natural gas.

Natural gas production and delivery
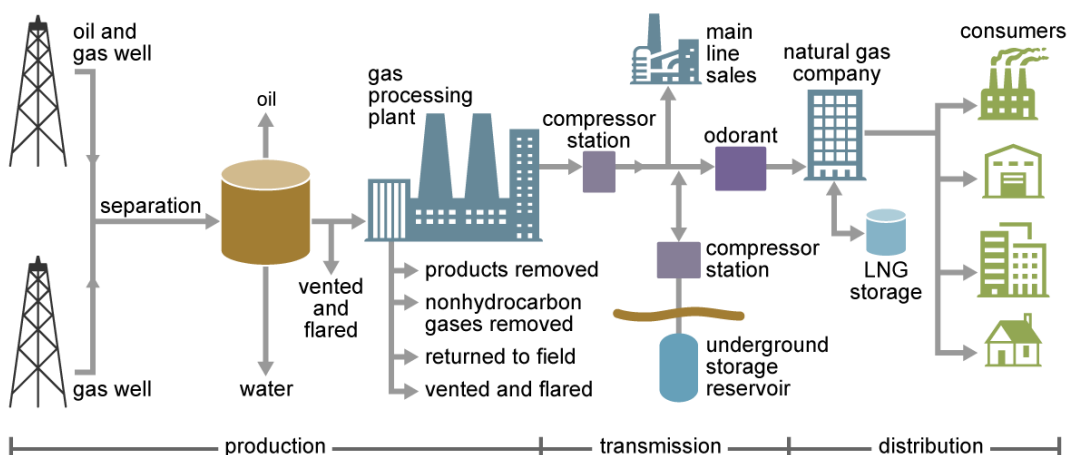
Source: U.S. Energy Information Administration

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11.   *State of Oregon, 2012, "Oregon State Energy Assurance Plan" https://www.oregon.gov/energy/safety-resiliency/Pages/Energy-Assurance- Plan.aspx#:~:text=The%20Oregon%20State%20Energy%20Assurance,resources%2C%20and%20identifies%20system %20interdependencies.*

NATURAL GAS BACKGROUND: PALOS VERDES PENINSULA

Southern California Gas Company (SoCalGas) provides natural gas to the Palos Verdes Peninsula through a network of transmission lines, high-pressure distribution supply lines and medium pressure distribution pipelines. Although part of the larger SoCalGas system, the Peninsula is also included in SoCalGas distribution sections, which function principally as sub-administrative districts and are responsible for all lines and service systems that feed from transmission lines to the point of delivery[4].

The natural gas distribution system consists of resource facilities and networks. Resource facilities include natural gas processing and transmission facilities that are located outside the Peninsula area. Natural gas networks, on the other hand, consist of the physical infrastructure in place on the Peninsula that is used to deliver natural gas to residents; in many cases, the natural gas network parallels water and electric networks.[10]

NATURAL GAS TRANSMISSION AND HIGH-PRESSURE DISTRIBUTION LINES: INFORMATION GATHERED FROM SOCALGAS NATURAL GAS PIPELINE MAP

NATURAL GAS UPSTREAM DEPENDENCIES:

Significant Interdependencies exist between Natural Gas infrastructure and the Communications, Transportation, Water, and Wastewater Systems Sectors. Natural gas is used for generating electric power, while electric power is used for core operations in each fuels subsector (e.g., for pumping stations, storage, control systems). Table 6 depicts critical infrastructure sectors Natural Gas depends on to function properly[9].

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12   *Department of Energy and Department of Homeland Security, 2010, "Communications Sector-Specific Plan Annex of the National Infrastructure Protection Plan",* https://www.cisa.gov/sites/default/files/publications/nipp-ssp-communications-2010-508.pdf

NATURAL GAS INFRASTRUCTURE UPSTREAM DEPENDENCIES

NATURAL GAS	UPSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	COMMUNICATIONS	WASTEWATER
	Service/ Resources Provide	Power needed for pumping stations, storage, control systems and facilities.	Temperature control (e.g., cooling of equipment), fire suppression, potable water.	Telecommunication for daily operations; and SCADA systems.	Wastewater removal service, raw water supply for hydroelectric generation.

NATURAL GAS DOWNSTREAM DEPENDENCIES:

Historically, natural gas was primarily used for heating. However, natural gas has been increasingly used to generate electricity since the late 1990s. Natural gas-fired generation was also increased by the advent of combined-cycle generation capacity additions. Additionally, The Natural Gas sector has downstream dependencies with all of the critical infrastructure sectors as, Natural Gas provides all sectors with heating, steam generation, and cooking abilities. Table 7 depicts critical infrastructure sectors Electricity depends on to function properly.

NATURAL GAS INFRASTRUCTURE DOWNSTREAM DEPENDENCIES

NATURAL GAS	DOWNSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	COMMUNICATIONS	WASTEWATER
	Service/ Resources Provide	Natural Gas in needed for fuel for power generation.	Natural Gas is needed for heating, pumps and lift stations, and facilities.	Natural gas needed for fuel for generators and facilities.	Natural gas needed for fuel for generators and facilities.

POTENTIAL EFFECTS OF NATURAL GAS DISRUPTIONS ON ESSENTIAL INFRASTRUCTURE:

A power outage can effectively halt the flow of fuel through pipelines. An interruption or pressure loss in natural gas pipeline systems may result in the loss of multiple natural gas-fired power generators, significantly reducing available power and jeopardizing the reliability of the energy sector. Although underground natural gas storage facilities can provide a backup for the natural gas supply to certain power sources, natural gas pipeline disruptions, would cause significant reductions in electric power services. Table 8 gives an example of Potential Effects of Natural Gas Disruptions on Essential Services[10.]

POTENTIAL EFFECTS OF DISRUPTIONS

NATURAL GAS	POTENTIAL EFFECTS OF DISRUPTIONS			
	Sector:	ELECTRICITY	WATER	COMMUNICATIONS	WASTEWATER
	Service/ Resources Provide	Significant impact to power generation. Impact on fuel for heating, generators and for facilities.	Impact on fuel for water treatment, heating, pumps and lift stations, and facilities.	Impact to facility lighting, telecommunications; electronic data. Impact on fuel for heating, generators and for facilities.	Restriction of sewage pumping and treatment for stationary, scale systems.

COMMUNICATIONS SYSTEMS GENERAL OVERVIEW

The Communications Sector provides products and services that enable the efficient operation of our global information-based society. The communications industry has evolved rapidly over the last decade to include mobile broadband, cloud computing, the Internet of Things, and software-defined networks. Convergence of voice and data networks has continued, and widespread adoption of mobile devices (e.g., smartphones and tablet computers) has created a massive demand for mobile broadband communications[12].

Communication networks enable people from all over the world to communicate with one another, instantly access information, and communicate from remote locations. This entails establishing a connection between a sender (including voice signals) and one or more recipients through the use of technology (e.g., a telephone system or the Internet) in order to transfer data from one location to another. Communication networks comprise both physical infrastructure (structures, switches, towers, and antennas) and cyber infrastructure (routing and switching software, operational support systems, and user applications), posing significant interdependencies on all sectors of critical infrastructure[12].

The Communications sector includes the following five component areas that have similar functions and operations[*].

- **Broadcasting Systems:** Broadcasting systems are composed of free and subscription-based over-the-air radio and television (TV) stations that provide analog and digital audio, video, and data programming. Broadcasting systems operate on three different frequency bands: medium frequency (MF (AM radio)), very high frequency (VHF (FM radio and television)), and ultra-high frequency (UHF (TV).

- **Cable:** The cable industry is made up of over 7,700 cable systems that provide analog and digital video programming, digital telephone service, and high-speed broadband. The cable systems provide bidirectional signal paths to the customer via a combination of fiber and coaxial cable. This hybrid fiber/coaxial (HFC) network effectively benefits Business and residential customers because it improves signal performance, expands available bandwidth, and increases overall network reliability.

- **Satellite:** Satellites are launched into orbit to relay voice, video, or data signals as part of a telecommunications network. Earth station antennas transmit signals to the satellite, which are amplified and sent back to Earth for reception by other earth station antennas. Antennas on stationed on Earth transmit signals to the satellite, which are amplified and received via other ground stations antennas. Satellites perform a variety of functions through the use of a combination of terrestrial and space-based components, including bidirectional transmission of voice, video, and data services; data collection; event detection and timing; and navigation.

- **Wireless**: Wireless refers to telecommunication in which electromagnetic waves rather than wire carry a signal over a portion of or the entire communication path. Wireless technologies consist of cellular phones, wireless hot spots (WiFi), personal communication services, high-frequency radio and commercial and private radio services to provide communication services.

- **Wireline:** Comprises circuit- and packet-switched networks connected via copper, fiber, and coaxial cable. It consists of private enterprise data and telephony networks, the Internet's core backbone, and the public switched telephone network (PSTN).

COMMUNICATIONS SECTOR BACKGROUND: PALOS VERDES PENINSULA

Communication systems are critical for disseminating news and information, relaying personal and business messages, providing audio and visual entertainment, and transmitting and receiving emergency messages. The communication component of the Palos Verdes Peninsula infrastructure system is a multifaceted and highly complex system of resource facilities and networks that contribute to the economic and social well-being of the peninsula[4].

Telephone systems in the Peninsula consists of a network of transceivers (telephones), transmission lines, and switching centers. Residents can contract their cell phones and laptops with any company of their choice.

Cable Television, on the Peninsula, cable television is supplied by Frontier, AT&T, and Cox Communications. All three companies use fiber-optic lines to provide instant access to numerous television channels, high-speed Internet, and digital telephone for their customers. There is also satellite TV provided by companies such as DirectTV and DishNetwork, who can provide similar access to television channels. The difference is that with satellite TV, a satellite dish will need to be installed.

Broadcast Communications are systems that have no wires or transmission lines, but rather transmit signals through the airwaves. Of the three primary broadcast systems, radio and television are by far the most popular, while microwave remains a more specialized communications medium. Radio and television communication systems are operated by privately owned companies that supply free audio and audio/visual communication to people with appropriate receivers. These broadcast systems are used primarily for the dissemination of news, information, and entertainment.

The County of Los Angeles currently owns and operates a microwave station near the intersection of Highridge Road and Crestridge Road in the City of Rancho Palos Verdes. The facility is a broadcast communication system designed to relay signals to and from the Palos Verdes Peninsula area. The prime users of the facility are the County Fire and Sheriff Departments and other County agencies[4].

COMMUNICATIONS SYSTEMS UPSTREAM DEPENDENCIES:

The Communications Sector's primary upstream dependency is on electricity, which is generated either commercially or on-site. Water can also be a limiting factor in the operation of buildings that require heating, ventilation, and air conditioning or cooling (e.g., data centers). Additional, upstream dependencies of the Communications System sector are depicted in Table 9.

COMMUNICATIONS SYSTEMS UPSTREAM DEPENDENCIES

COMMUNICATIONS	UPSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Power needed for control facilities, communication towers, and remote monitoring capabilities.	Water is needed for Temperature control (e.g., cooling of equipment), fire suppression, potable water.	Telecommunication for daily operations; and SCADA systems.	Wastewater removal service, raw water supply for hydroelectric generation.

COMMUNICATIONS SYSTEMS DOWNSTREAM DEPENDENCIES:

Many other sectors of critical infrastructure are highly dependent on the Communications Sector, The Communications Sector is one of the few sectors that affects all other sectors. Each sector relies on communications services to support its operations and associated daily communication requirements for corporate and organizational networks and services (e.g., Internet connectivity, voice services, and video teleconferencing capabilities). Table 10 summarizes the extent to which other sectors rely on the Communications Sector.

COMMUNICATIONS SYSTEMS UPSTREAM DEPENDENCIES

COMMUNICATIONS	DOWNSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Telecommunication for daily operations; and SCADA systems	Telecommunication for daily operations; and SCADA systems	Telecommunication for daily operations; and SCADA systems	Telecommunication for daily operations; and SCADA systems

POTENTIAL EFFECTS OF COMMUNICATION SYSTEMS DISRUPTIONS ON ESSENTIAL INFRASTRUCTURE

The Communications sector has downstream dependencies with all critical infrastructure sectors. All sectors rely on Communications, making its reliability a fundamental need and requirement. Communications is particularly important for Telecommunication for daily operations, and Supervisory control and data acquisition (SCADA) systems monitoring. Large regional impacts across all infrastructure sectors can occur when communication systems disrupted. Table 11 summarizes the potential effects of disruptions of the Communications Sector.

POTENTIAL EFFECTS OF DISRUPTIONS				
Sector:	ELECTRICITY	WATER	NATURAL GAS	WASTEWATER
Service/ Resources Provide	Failure of communication facilities and towers, Loss of electronic transactions and ability to obtain data. Customer service and repair crew communications failure.	Loss of monitoring of pipeline status, loss of situational awareness.	Loss of monitoring of pipeline status, loss of situational awareness.	Monitoring equipment affected, Restriction of sewage pumping and treatment for stationary, scale systems. Challenges in communicating with Residents and business Potential impact to facility lighting, telecommunications; electronic data.

(Left vertical label: COMMUNICATIONS)

CONSIDERATIONS FOR COMMUNICATION SYSTEMS INFRASTRUCTURE SERVICING THE PALOS VERDES PENINSULA:

California has seen an increasing number of large-scale disasters over the last two decades as a result of climate change. Our communications systems, which are normally extremely reliable and dependable, failed during recent disasters. These failures jeopardize situational awareness, impact alerts and warnings, obstruct critical communications between multiple stakeholders, and can result in unnecessary deaths and other social harms.

During a community wide crisis, efficient, rapid and accurate information flow can save lives, especially during complex, evolving events like a wildfire. Given the importance of communication to the public in an emergency, it is critical to continue to examine the extent to which the Communication Sector depends on and impacts essential critical infrastructure servicing the Palos Verdes Peninsula.

WATER SYSTEMS GENERAL OVERVIEW

Water is drawn from a freshwater source, usually a lake, river, or stream, and treated before it is pumped to our homes and businesses. Water from reservoirs, streams, and rivers often contains a variety of organisms and dissolved chemicals or metals. This material must be removed from the water to ensure that it is safe for drinking or other uses. Most systems will include at least two to three filtration stages to remove harmful or dangerous particles such as bacteria, viruses and other debris.

After treatment, the system works by transferring quantities of water into the established water distribution systems. Water Distribution system infrastructure is generally considered to consist of the pipes, pumps, valves, storage tanks, reservoirs, meters, fittings, and other hydraulic appurtenances that connect treatment plants or well supplies to consumers' taps. [*]

Fundamentally, a water supply system consists of three basic components: the source of supply, the processing or treatment of the water, and the distribution of water to the users.

> **Water Sources** – These include surface reservoirs, rivers, and ground water from aquifers via wells. Utilities often use a combination of multiple water sources to ensure an uninterrupted supply.
>
> **Treatment** –Drinking water in a public water system is treated to make sure it is safe to drink before it enters all those pipes. Water treatment plants filter the water to remove particles of dirt, minerals, microorganisms and other contaminants. Chlorine is a chemical commonly used to disinfect water supplies.
>
> **Distribution and Collection** – Public drinking water systems include a series of pipes, storage tanks, pumps, valves, and gates. Flow rates are adjusted to ensure that the required pressure is available where it is needed.
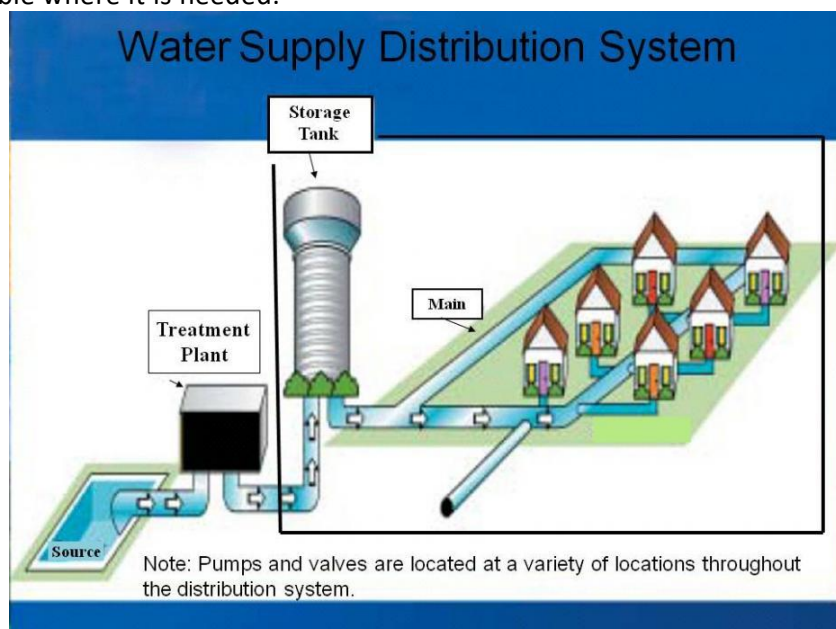
Source: Environmental Protection Agency: https://www.epa.gov/dwsixyearreview/drinking-water-distribution-systems

WATER BACKGROUND: PALOS VERDES PENINSULA

The Palos Verdes Peninsula's water needs are currently served by the California Water Service Company (Cal Water). Cal Water purchases surface water imported by the Metropolitan Water District of Southern California from the Colorado River and the State Water Project in Northern California, which is then used to serve the entire Peninsula, including the City, through the Palos Verdes water system.[4]

The Palos Verdes water system distributes water through two distinct water distribution systems. These systems are commonly referred to as the "D-500 System" and the "Ridge System." The D-500 System serves the lower-elevation areas of the Peninsula, about 13% of the total demand, and the Ridge System serves the upper-elevation areas, comprising the remaining 87% of demand. The average daily demand and maximum daily demand of the Ridge and D-500 Systems combined is 12,500 gallons per minute (gpm) and 20,600 gpm, respectively.

All of the supply to the Palos Verdes system is delivered through four connections located at the northeastern edge of the Peninsula[4].

Recently, Cal Water has completed the Palos Verdes Peninsula Water Reliability Project, the project enhances the reliability of the drinking water infrastructure on the Palos Verdes Peninsula and will help ensure that all Peninsula residents continue to have safe, reliable water service. Prior to the project's completion, 90% of the Palos Verdes Peninsula was served by one 60-year-old drinking water pipeline and a single pump station.

The project replaced a portion of the existing water pipeline and added a second pipeline to deliver drinking water to homes and businesses. In total, crews installed about seven miles of a new pipeline. Additionally, the project added a second pump station on a separate electrical grid that will help guard against the risk of prolonged water service outages caused by disruptions such as natural disasters.

FIGURE 6: CALIFORNIA WATER SERVICE (CAL WATER) FACILITIES SERVICING THE PENINSULA
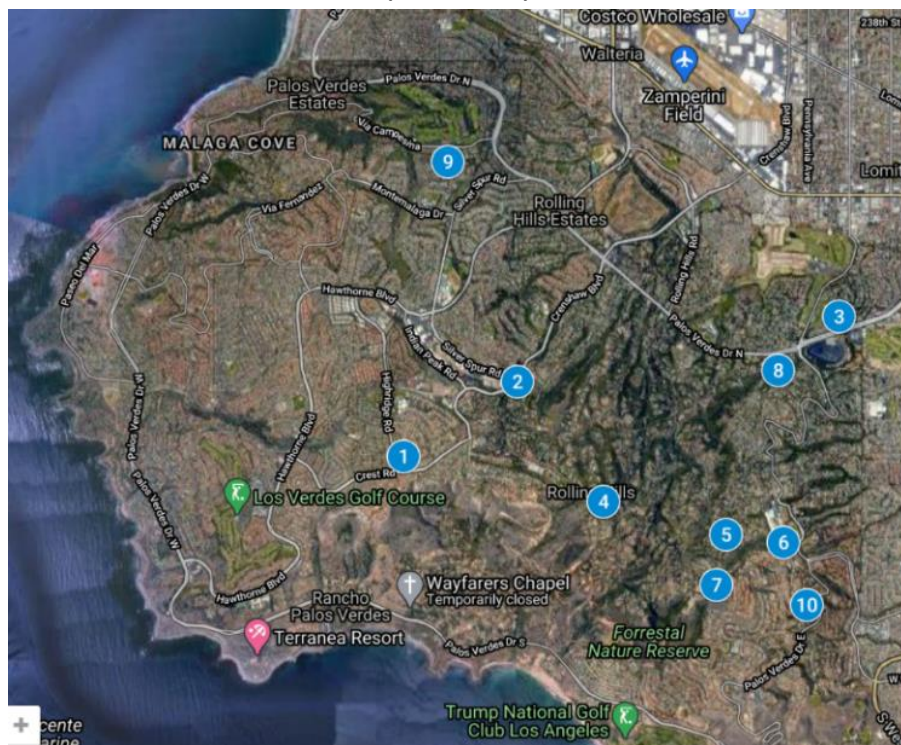
WATER UPSTREAM DEPENDENCIES:

The Water Sector is critical to all sectors, it is dependent on several key sectors. Upstream dependencies of the Water System sector are depicted in Table 12.

WATER UPSTREAM DEPENDENCIES

WATER	UPSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	COMMUNICATIONS	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Power needed for pumping stations, storage, control systems and facilities.	Telecommunication for daily operations; and SCADA systems	Natural Gas is needed for heating, pumps and lift stations, and facilities.	wastewater removal service, raw water supply for hydroelectric generation

WATER DOWNSTREAM DEPENDENCIES:

The Water Sector is considered one of the most critical lifeline sectors because its functions are essential to core operations in nearly every other critical sector. When water services are lost for relatively short periods (less than eight hours), the functioning of multiple sectors is significantly degraded.

WATER DOWNSTREAM DEPENDENCIES

WATER	DOWNSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	COMMUNICATIONS	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Temperature control (e.g., cooling of equipment), fire suppression, potable water	Water needed for cooling and facilities.	Water needed for production, cooling, emission reduction and facilities.	wastewater removal service, raw water supply for hydroelectric generation

POTENTIAL EFFECTS OF WATER DISRUPTIONS ON ESSENTIAL INFRASTRUCTURE:

When water services are lost, even for short periods, the consequences can be widespread and dramatic. When these services are lost for an extended period of time, the results can be catastrophic. potential impacts that a disruption in water service could cause include the following: Loss of water for cooling, resulting in impacts to electrical and telecommunications equipment; Lack of water for consumption, cooking, bathing, flushing, fire suppression, etc.; Loss of water for commercial irrigation, food supply, and production to meet consumer needs and a secreased public confidence in water supply[13].

POTENTIAL EFFECTS OF DISRUPTIONS

WATER	POTENTIAL EFFECTS OF DISRUPTIONS			
	Sector:	ELECTRICITY	COMMUNICATIONS	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Loss of water for cooling (disabling electrical and telecommunications equipment) Lack of water for consumption, flushing, fire suppression	Loss of water for cooling (disabling electrical and telecommunications equipment) Lack of water for consumption, flushing, fire suppression	Impact on Cooling and Emissions Reduction Lack of water for consumption, flushing, fire suppression, etc.	Significant Impact on wastewater treatment plants negatively affecting public health and the environment.

WASTEWATER SYSTEMS GENERAL OVERVIEW

The collection and treatment of wastewater is vital to public health and clean water. Sewers collect sewage and wastewater from homes, businesses, and industries and deliver it to wastewater treatment facilities. Wastewater systems move raw wastewater from the producer to wastewater treatment plants via a collection system The treatment plants remove hazardous materials from the wastewater via Physical, chemical, and biological processes prior to discharging the treated water safely into approved locations, typically reservoirs, streams, rivers, the ocean, etc.

Fundamentally, the basic function of wastewater treatment is to speed up the natural processes by which water is purified. The treatment of wastewater consists of two basic stages. The **primary and secondary**, which are outlined here. In the **primary** stage, solids are allowed to settle and removed from **wastewater**. The **secondary** stage uses biological processes to further purify **wastewater**. Sometimes, these stages are combined into one operation.

There are two basic stages in the treatment of wastewater. In the primary stage, solids are allowed to settle and removed from wastewater. The secondary stage uses biological processes to further purify wastewater. In the first stage primary stage, solids are allowed to settle and be removed from wastewater. The secondary stage uses biological processes to purify wastewater further.

Source: Environmental Protection Agency:
https://www.epa.gov/sites/production/files/2015-09/documents/primer.pdf

WASTEWATER BACKGROUND: PALOS VERDES PENINSULA

The four Peninsula Cities are located in District #5; the South Bay Cities Sanitation District is serviced by the Los Angeles County Sanitation District, which owns and operates the wastewater collection system within the Peninsula Cities[4].

The Los Angeles County Sanitation District operates ten water reclamation plants, which treat an estimated 510 million gallons per day. The Joint Water Pollution Control Plant is located in Carson, California. The Joint Water Pollution Control Plant is one of the largest wastewater treatment plants in the world and is the largest of the Districts' wastewater treatment plans. This facility provides both primary and secondary treatment for approximately 300 mgd of wastewater. This plant serves a population of approximately 3.5 million people throughout the County, including the Palos Verdes Peninsula. Prior to discharge, the treated wastewater is disinfected with hypochlorite and sent to the Pacific Ocean through a network of outfalls. These outfalls extend 2 miles off the Peninsula to a depth of 200 feet.

WASTEWATER UPSTREAM DEPENDENCIES:

Wastewater systems for the Palos Verdes Peninsula depend on a variety of external infrastructures to maintain normal operations. Electric power is one of the most important services necessary for maintaining pumping and treatment operations. Table presents some Upstream dependencies of the wastewater System sector are depicted in Table 15.

TABLE 15: WASTEWATER UPSTREAM DEPENDENCIES

WASTEWATER	UPSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	NATURAL GAS	WASTEWATER
	Service/ Resources Provide	Power needed for pumping stations, storage, control systems and facilities.	Essential and highly dependent infrastructure for health and safety	Natural Gas is needed for heating, pumps and lift stations, and facilities.	Telecommunication for daily operations; and SCADA systems

WASTEWATER DOWNSTREAM DEPENDENCIES:

A wide range of physical infrastructure in industries and other critical infrastructure relies heavily on the proper functioning of wastewater systems. Table 16 demonstrates the interdependencies between wastewater infrastructure and other critical infrastructure.

TABLE 16: WATER DOWNSTREAM DEPENDENCIES

WASTEWATER	DOWNSTREAM DEPENDENCIES			
	Sector:	ELECTRICITY	WATER	NATURAL GAS	COMMUNICATIONS
	Service/ Resources Provide	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.	Sewage wastewater services for facilities.

POTENTIAL EFFECTS OF WASTEWATER DISRUPTIONS ON ESSENTIAL INFRASTRUCTURE

The deterioration and subsequent failure of the Wastewater sector impacts the health of community, the environment, and has significant consequences for the additional utility sectors. Table 17 demonstrates the interdependencies between wastewater infrastructure and other critical infrastructure.

TABLE 17: POTENTIAL EFFECTS OF DISRUPTIONS

		POTENTIAL EFFECTS OF DISRUPTIONS			
	Sector:	ELECTRICITY	WATER	NATURAL GAS	COMMUNICATIONS
WASTEWATER	Service/ Resources Provide	Lack of wastewater services, posing public health and sanitation issues.	Lack of wastewater services, posing public health and sanitation issues.	Lack of wastewater services, posing public health and sanitation issues.	Lack of wastewater services, posing public health and sanitation issues.

CONSIDERATIONS FOR WATER AND WASTEWATER INFRASTRUCTURE SERVICING THE PALOS VERDES PENINSULA:

Water system infrastructure is critical to a community's economic and social viability. Although these systems ensure the basic health and safety of residents, businesses, and industry, they are frequently taken for granted due to the high level of service and reliability provided by water and wastewater utilities. The critical nature of these systems is not appreciated until a water main breaks or another type of service interruption occurs.

The interdependence of the water sector serving the Palos Verdes Peninsula, combined with the impact of natural disasters, can result in a ripple effect of critical infrastructure disruptions serving Palos Verdes residents. Understanding the interdependence and critical failure points of the water infrastructure sector is therefore critical for achieving long-term resilience planning for the Palos Verdes Peninsula.

CONCLUSION

It is important to recognize that infrastructure sectors interoperate together in myriad ways in a "systems of systems" that supports the quality of life, wellbeing, and overall security for residents of the Palos Verdes Peninsula. Understanding these independencies is crucial to ensure that the Peninsula Cites are prepared to continue critical services to residents in times of emergencies. As critical infrastructures become more complex, the probability increases that infrastructure failures will cascade and escalate in multipart ways. Additional research is needed to understand better the infrastructure sectors processes and interoperability with other infrastructures. The infrastructure sector analysis in this White Paper provides a high-level summary of inter-operations that affect infrastructure servicing the Palos Verdes Peninsula. This White Paper serves as an initial framework for recognizing interdependencies in the analysis of critical infrastructures and is intended to provide emergency planners with a foundational understanding of infrastructure interdependencies and how they could inform future emergency operation protocols.

Critical infrastructure sectors can lead to the proliferation of cascading and escalating failures across all infrastructure sectors. It is essential to integrate the characterization of interdependencies into emergency planning methodologies. This White Paper on *Infrastructure Interdependencies* is intended to convey this central concept. Future emergency planning efforts will address the specific interdependencies threats to the Palos Verdes Peninsula.

The Palos Verdes Cities of Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills and Rolling Hills Estates comprehend the importance of the analysis of infrastructure interdependencies vulnerabilities in the belief that this analysis is a key in addressing the catastrophic challenges of infrastructure failures during an emergency response.

APPENDIX A: PENINSULA-WIDE INCIDENT COMMUNICATION PROTOCOLS

The existing protocol for communication from LASD to RPV, RH and RHE typically involves an email and or text message from the Captain or Watch Commander to the City Managers. Depending on the particulars of the incident, a phone call may be made as well. Similarly, PVEPD advises the PVE City Manager in the most immediate and appropriate manner available. The City Managers then disseminate the information to their respective City Councils via email or phone depending on the situation. Appropriate information is then disseminated to the public via applicable electronic platforms.

LASD and PVEPD typically advise each other of incidents that may result in involvement by the other agency. This also occurs with other neighboring jurisdictions such as Torrance PD and LAPD. LASD and PVE also advise adjacent schools when warranted on a case by case basis.

ADDITIONAL STRATEGIES: IMPROVED FLOW OF COMMUNICATION

1) It would be appropriate to include the Superintendent of PVPUSD in any communication going to the City Managers;

2) All communication with City Council Members or School Board Members should come through their respective City Managers or Superintendent so as to relieve first responders from excessive communication burdens;

3) The City in which an incident occurs will act as lead agency in dealing with the media as well as posting and updating information as it becomes available;

4) Inasmuch as it is possible, the lead agency will communicate electronically with the other cities and PVPUSD immediately prior to posting or updating information;

5) Each City and PVPUSD will determine the information it wishes to post and where to post it;

6) During a regional emergency declared by the county, state, or federal government, the Peninsula Cities will coordinate with the County Office of Emergency Management to ensure unified messaging about incident.

7) To ensure unified messaging, the Peninsula Cities will only post-incident emergency information that has been approved by the agency that has jurisdiction over the incident. Individual Peninsula Cities may still post-emergency and incident information that is directly under the City's purview.

8) In the event of a power outage and/or a loss of cell service impacting the entire Palos Verdes Peninsula the Peninsula Cities will work cooperatively (to the best extent possible) to implement the following strategies for information distribution:
- Regional Emergency Phone hotline
- Deployment of Information Stations (large wooden sandwich boards) to post information when other means of communication are impaired at key locations (dependent on the situation and where it is needed.)

- Printed materials to distribute to Emergency Information Stations
- Flyers for in-person distribution
- Loudspeakers in vehicles

9) During an emergency of any level, the Peninsula Cities will communicate and coordinate with one another, as well as with any other partner agency responding to or involved in the incident, to issue uniform coordinated emergency alerts via all appropriate and available notification platforms, including the individual Cities' disaster and emergency alert systems, Wireless Emergency Alerts (WEA), and social media.

10) Each City and PVPUSD will provide the other agencies with priority contact lists for purposes of communicating during incidents of joint concern.

It is universally recognized that many times judgment is required in determining when and whom to notify in any given circumstance. There is concern about inundating each other and the public with non-critical information. Generally speaking, though, the consensus would be to err on the side of over-communicating.

An emergency contact list has been developed and will be distributed to key staff in each agency to facilitate inter-agency communication. It is not meant to be publicly available. This list will be dynamic, and each agency will provide updated contact information as changes occur. RHE will act as the central point for receiving updates and then disseminating the updated information to all.

COMMUNICATION PROTOCOL: PENINSULA-WIDE INCIDENT

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An emergency contact list has been developed and will be distributed to key staff in each agency to facilitate inter-agency communication. It is not meant to be publicly available. This list will be dynamic, and each agency will provide updated contact information as changes occur. RHE will act as the central point for receiving updates and then disseminating the updated information to all.

AGENDA TITLE:

Palos Verdes Peninsula Ingress & Egress Map and Strategy for Establishing Peninsula Wide Mass Evacuation Plans

RECOMMENDED COMMITTEE ACTION:

(1) Review and provide direction on a draft Palos Verdes Peninsula Ingress & Egress Map;

(2) Provide further direction to Staff on establishing Peninsula wide evacuation plans; and,

(3) Direct Staff to seek proposals a consultant to prepare a comprehensive emergency operations evacuation "playbook" for the Peninsula.

STAFF COORDINATOR: Jesse Villalpando, Emergency Services Coordinator   J. v.

ATTACHED SUPPORTING DOCUMENTS:

A. Draft Peninsula Palos Verdes Peninsula Ingress & Egress Map

EXECUTIVE SUMMARY:

Following the direction provided by the Peninsula Public Safety Committee (Committee) at its August 12, 2021 meeting, City of Rolling Hills Staff and the Peninsula's shared coordinator are presenting a draft map highlighting the egress and ingress points of the four Peninsula Cities for the Committee's review and input. In addition, staff is requesting that the Committee consider recruiting a consultant experienced in preparing a comprehensive emergency operations evacuation "playbook" for the Peninsula that incorporates the components of an effective emergency evacuation plan as outlined in this report.

BACKGROUND:

At its May 13, 2021, meeting, the Committee adopted a strategic work plan to guide the Committee's efforts in addressing the numerous facets of emergency preparedness. The Committee-adopted strategic work plan was developed based on an inventory of recent Committee discussions, and identifies the following three critical areas for emergency preparedness for the Committee to focus on over the next six to twelve months: (1) Study Peninsula evacuation routes; (2) Understand utility vulnerabilities and implement readiness measures; and, (3) Develop communication protocols among Peninsula cities.

Staff additionally recommended the following goals for each of the critical areas of emergency preparedness for the Committee to consider:

1. **Study Peninsula Evacuation Routes**
   - Obtain First Responder's input on routes
   - Identify exit points and measures to improve these locations for readiness
   - Establish communication contact to respective cities for traffic control
   - Protocols for evacuating large animals
   - Identify temporary shelter locations

2. **Understand Utility Vulnerabilities and Implement Readiness Measures**
   - Understand utilities' contingency plans for continuous service
   - Obtain utilities' recommended measures for individual contingency plan

3. **Communication Protocols Among Peninsula Cities**
   - Establish incident command protocols to respective cities EOC to community
   - Establish outlets to receive emergency notifications
   - Identify Neighborhood watch organizations

Additionally, at the May 13, 2021, meeting, the Committee moved to formally recognize the Rancho Palos Verdes Emergency Services Coordinator as the Peninsula-wide Emergency coordinator.

DISCUSSION:

In recent years, California has seen an increase in unprecedented and destructive wildfires, posing a threat to lives, livelihoods, and communities. 2020 was the worst year on record, with nearly 10,000 fires consuming nearly 4.2 million acres, and serves as a stark reminder that the majority of the four Peninsula Cities are generally classified as a Very High Fire Hazard Severity Zone by the State of California Department of Forestry (Cal Fire).

Due to its numerous steep canyons and open scrub brush-covered hillsides, the Palos Verdes Peninsula has always been at risk for a devastating wildfire. The most recent significant fire on the Palos Verdes Peninsula was on August 27, 2009, when a wildfire burned through approximately 230 total acres. The fire is believed to have originated in the Portuguese Bend Reserve in the City of Rancho Palos Verdes where 165 acres were charred. The remaining 65 acres were burned in the City of Rolling Hills. Dozens of homes were threatened and approximately 1,200 residents were forced to evacuate (City of Rolling Hills Local Hazard Mitigation Plan, pg. 82.)

Palos Verdes Peninsula Ingress & Egress Map

Given the increased attention that today's climate related fire danger has garnered, the Peninsula Cities have received a number of requests from residents regarding pre-determined evacuation routes. Evacuation routes can vary greatly depending on the scenario. As a result, law enforcement and fire officials are circumspect about disclosing predetermined evacuation routes, as they do not want residents to follow a route they learned about prior to an emergency that does not fit the current emergency scenario, preferring instead that residents follow contextually appropriate real-time directions.

Recognizing that evacuation routes can vary significantly depending on the situation, staff collaborated to create a map highlighting the ingress and egress routes for the entire Palos Verdes Peninsula. The intention of this ingress and egress map in its current state is to outline the major arterial roads in each Peninsula city in order to advance the Committee's strategic workplan strategy of studying Peninsula evacuation routes and related objectives as outlined above.

The attached draft map highlights the following major arterial roads for each city:

⇒ **City of Palos Verdes Estate:** Palos Verdes Drive West, Palos Verdes Blvd, and Palos Verdes Drive North

⇒ **City of Rancho Palos Verdes:** Palos Verdes Drive West, Palos Verdes Drive South, Palos, Verdes Drive East, Crest Rd., Hawthorne Blvd., Silver Spur Rd., Crenshaw Blvd., Western Ave. and Miraleste Dr.

⇒ **City of Rolling Hills:** Crenshaw Blvd., Crest Road West, Crest Road East, Portuguese Bend Rd., Eastfield Drive and Palos Verdes Drive North.

⇒ **City of Rolling Hills Estates:** Palos Verdes Drive North, Palos Verdes Drive East Rolling Hills Road, Crenshaw Blvd, Hawthorne Blvd, and Crest Road

General Overview of an Evacuation Process During a "Real-World Event"

The Woolsey Fire, which began on November 8, 2018, killed three people, burned 96,949 acres of land, destroyed 1,643 structures, and led to the evacuation of more than 295,000 people in the 13 days before it was contained. The fire was the most destructive ever in Los Angeles County. The City of Malibu was especially hard-hit, with at least 670 structures destroyed, including more than 400 single-family homes with an estimated market value of at least $1.6 billion.

The evacuation process during the Woolsey Fire received significant community and media attention due to high traffic and long wait times for residents. The City of Malibu had its own evacuation plan in place, however a city is not responsible for determining if and when mandatory evacuation is necessary or how it is executed.

During an emergency, law enforcement and fire agencies are responsible for organizing and implementing evacuations. In most cases the decision to evacuate an area, the areas to be evacuated and the route to be used is made by the responding Fire Departments Incident Commander (individual responsible for all aspects of the emergency response); and is based on the fire's location, behavior, winds, terrain, etc.

Once a decision to evacuate has been made, it is then communicated to Law Enforcement Personal who implement the evacuation plan and are responsible for enforcing an evacuation order. California law authorizes officers to restrict access to any area where a menace to public health or safety exists due to a calamity such as flood, storm, fire, earthquake, explosion, accident or other disaster. Refusal to comply is a misdemeanor. (Penal Code 409.5)

The three standardized evacuation terms include the following:

- **Evacuation Order**: Immediate threat to life. This is a lawful order to leave now. The area is lawfully closed to public access.

- **Evacuation Warning:** Potential threat to life and/or property. Those who require additional time to evacuate and those with pets and livestock should leave now.

- **Shelter in Place:** Go indoors. Shut and lock doors and windows. Prepare to self-sustain until further notice and/or contacted by emergency personnel for additional direction

While a city does not determine when and how mandatory evacuations are issued, local jurisdictions play a critical role in relaying information to the public and ensuring that members are aware of and able to evacuate during a mass evacuation. Local governments issue emergency alerts in the event of an evacuation and will utilize all appropriate notification platforms, including mass notification emergency alert systems, Wireless Emergency Alerts (WEA), and social media.

Additionally, law enforcement personnel assist local jurisdictions in notifying residents of an evacuation by going door-to-door, by using their in-car PA systems or sirens in a restricted area, or by utilizing any available and operable mass notification systems.

Elements of an Effective Evacuation Coordination Plan

While protective measures, such as identifying ingress & egress routes to be used in the event of a mass evacuation are critical to emergency response, it represents only a portion of effective evacuation planning, necessitating a more in-depth examination of the concepts and principles upon which emergency evacuation plans should be built.

The following section highlights successful evacuation practices gleaned from research conducted by the Peninsula's Shared Coordinator and outreach to cities and organizations recently impacted by wildfires and/or disasters regarding best practices and lessons learned in regard to evacuation planning and coordination.

Implementation of Evacuation Zones:

Evacuation zones are pre-identified geographical areas used by emergency responders to improve coordination and span of control during an evacuation. In the event of a large fire or other disaster, officials may use the Evacuation Zones to quickly identify the timing, order, and routes of evacuation for specific areas to be more effective and avoid traffic bottlenecks.

Pre-designated evacuation zones enable jurisdictions to concentrate evacuation efforts on the most vulnerable areas, while minimizing the need to evacuate large areas that are not at risk from the hazard. Evacuation Zones enable community members, emergency services,


TOPANGA TACTICAL ZONE MAP

emergency managers, and 9-1-1 to communicate effectively when a mass evacuation is initiated in response to an emergency.

Identification of Safe Refuge Areas:

A Safe Refuge Area is a temporary staging area either within or outside of the evacuation area, designed to hold people safely during a mandatory evacuation. Safe Refuge Areas may also be used to help move traffic off the road to speed up the movement of people out of the immediate danger area. Safe Refuge Areas are pre-determined to be a safer alternative for residents then remaining in their homes the event of a wildfire evacuation.

Examples of Existing Practices:

⇒ **Topanga:** Due to the unique challenges this community faces during a wildfire, Topanga has been divided into nine Tactical Zones to assist emergency responders in issuing targeted evacuation orders based on the size and direction of the fire. The Topanga Tactical Zone Map (pictured above) also includes the designation of a public refuge areas which individual residents can seek refuge during a large wildland fire.

⇒ **City of Malibu:** As part of the City's Mass Evacuation Plan, the City of Malibu has been divided into four evacuation zones to maximize the efficiency of any evacuation and to alleviate congestion. These zones define evacuation areas that can be activated quickly. Additionally, they can be used to execute phased evacuations.
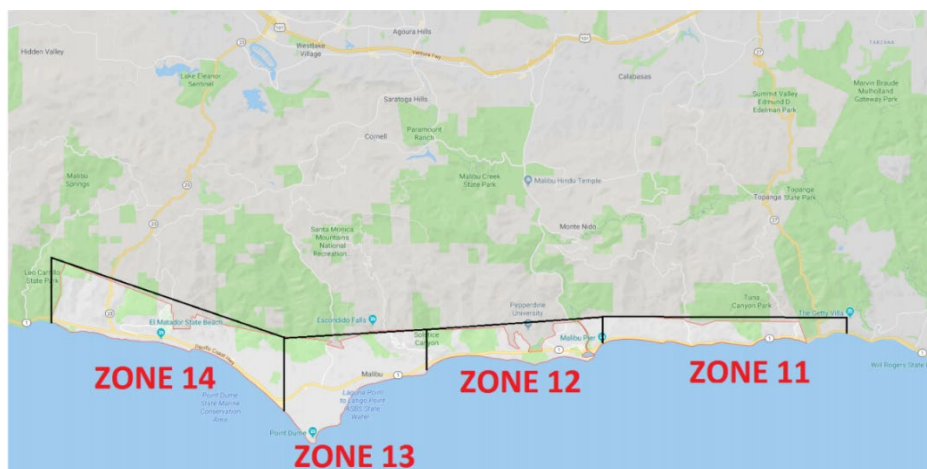
Additionally, the City of Malibu has Pre-identified the following Safe Refuge areas within the City of Malibu:

- Zuma Beach Parking Lot 30000 Pacific Coast Highway Malibu, CA 90265
- Topanga State Beach Parking Lot 18700 Pacific Coast Hwy Malibu, CA 90265
- Will Rogers State Beach Parking Lot 17000 Pacific Coast Hwy Pacific Palisades, CA 90272
- Santa Monica Beach Parking Lots Pacific Coast Hwy Santa Monica, CA 90401

Mass Care & Sheltering Services Considerations:

Planning for mass care is critical during an evacuation planning process. While not the primary focus of this staff report, it is critical for local jurisdictions consider both short- and long-term mass care needs in the planning for effective mass evacuation, to quickly establish operations to provide essential services to evacuees. The majority of initial evacuee support is provided in the form of mass care in temporary congregate evacuee shelters. However, once the immediate life safety concerns have passed, some evacuees may require shelters for an extended period of time.

Repopulation Considerations:

As with an evacuation order, a local jurisdiction has little to no control over displaced residents' repopulation. It is critical that evacuation plans include a repopulation strategy to ensure the effective and safe return of evacuees to their communities once the threat or hazard has passed. One of the most crucial lessons learned from the Woolsey Fire's evacuation and repopulation efforts is the critical role that local city officials must play in collaborating with first responders to ensure that re-entry plans adequately address the City's unique needs and conditions.

Strategy for Community Outreach & Awareness

While it is crucial to develop an effective Peninsula-wide evacuation plan that incorporates the elements listed above, it is even more vital to ensure that residents who may be impacted are aware of the plan. It is essential that emergency evacuation planning efforts incorporate a strategy for community outreach that includes activities to educate the public and opportunities for the public to provide input.

Proposal Requests for Professional Services

Due to the specialized nature of the service required to plan and coordinate a peninsula-wide coordinated response to a mass evacuation scenario successfully, staff is requesting that the Committee consider hiring an independent third-party consultant to develop a comprehensive emergency operations evacuation "playbook" for the Peninsula. Engaging an experienced consultant to develop a comprehensive plan for the entire Palos Verdes Peninsula would enable the Peninsula Cities to pool resources and eliminate duplication efforts.

If acceptable to the Committee, Staff will publish a Request for Proposals to independent third-party consultants. Staff will collaborate with representatives from each city, the Los Angeles County Sheriff and Fire Departments, and the Palos Verdes Estates Police Department to develop the proposal. A report on the scope of work, cost estimates, and potential funding would be brought by to the Committee for consideration at a future meeting.
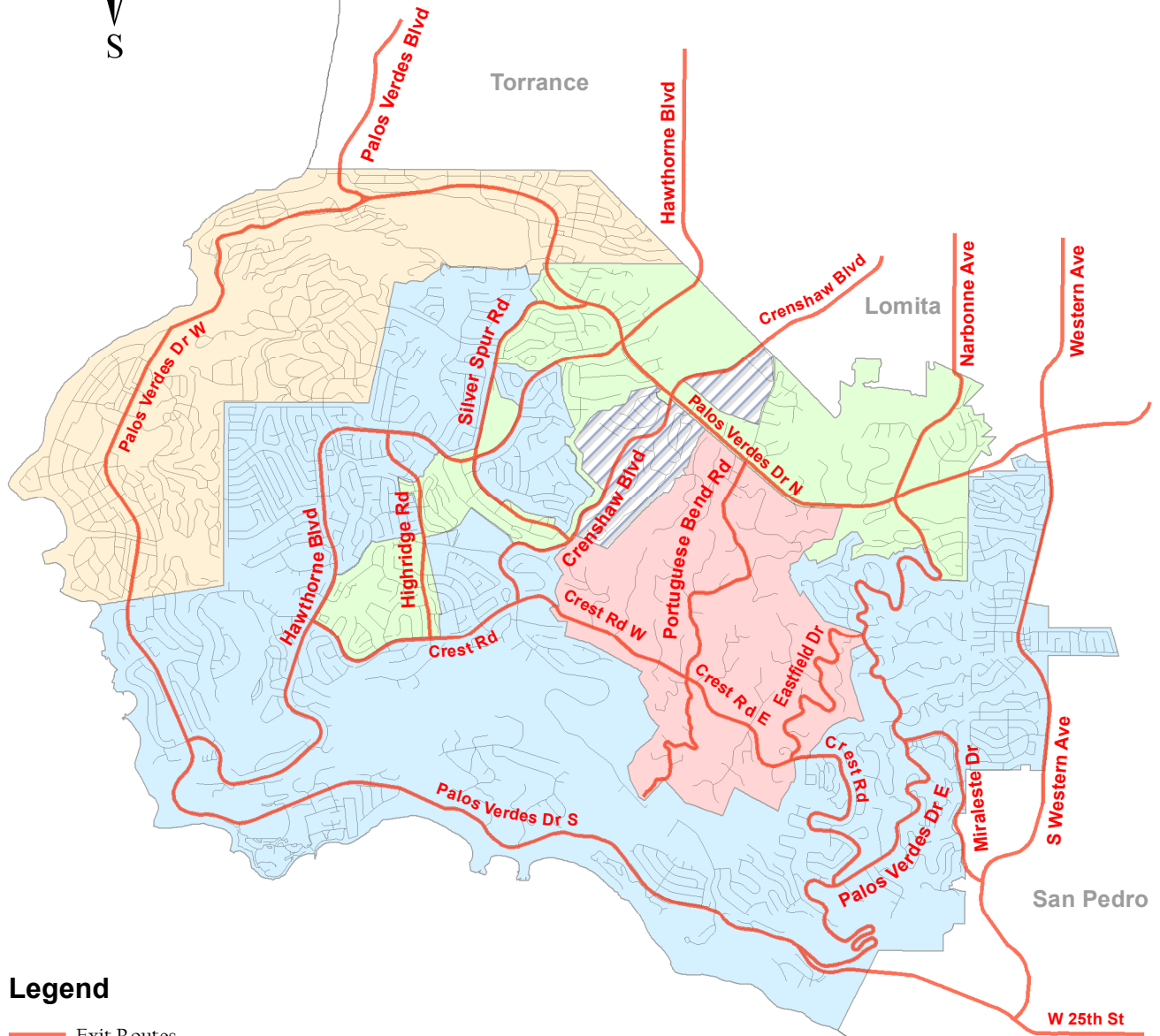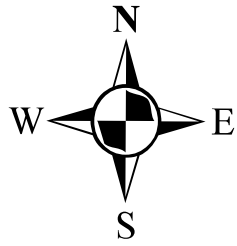
CONCLUSION

To provide residents with a comprehensive mass evacuation plan tailored to the unique needs of the Palos Verdes Peninsula Community, and to further prepare Peninsula Cities to respond to and recover from a future large-scale disaster event, Staff recommends the following:

1. Review, and provide direction on a draft of Palos Verdes Peninsula Ingress & Egress Map;

2. Provide further direction to Staff on establishing Peninsula wide evacuation plans; and,

3. Direct staff to seek proposals from an independent consultant to develop a comprehensive emergency operations evacuation "playbook" that incorporates the aforementioned elements and any other critical considerations as necessary.

Palos Verdes Peninsula
Ingress & Egress Map

Torrance

Lomita

San Pedro

Palos Verdes Blvd

Hawthorne Blvd

Crenshaw Blvd

Narbonne Ave

Western Ave

Palos Verdes Dr W

Silver Spur Rd

Palos Verdes Dr N

Crenshaw Blvd

Portuguese Bend Rd

Hawthorne Blvd

Highridge Rd

Crest Rd W

Crest Rd E

Eastfield Dr

Crest Rd

Crest Rd

Palos Verdes Dr E

Miraleste Dr

S Western Ave

Palos Verdes Dr S

W 25th St

PACIFIC OCEAN

Legend

Exit Routes

City Name

Palos Verdes Estates

Rancho Palos Verdes

Rolling Hills

Rolling Hills Estates

Unincorporated

0 1 2 3 4 Miles