NGFR

NEXT GENERATION FIRST RESPONDER
PROTECTED, CONNECTED & FULLY AWARE ™

Next Generation First Responder –
Harris County Operational Experimentation

Playbook

December 2018

Science and Technology Directorate

Homeland Security
Science and Technology

NGFR
NEXT GENERATION FIRST RESPONDER
PROTECTED, CONNECTED & FULLY AWARE ™

Message from the Operational Experimentation Director

Today's first responders face dangerous, evolving threats, and are often equipped with outdated and proprietary technologies that restrict their ability to communicate between agencies at the incident scene. Responders need access to advanced, interoperable, plug-and-play technologies that can augment their capability to save lives.

To address these gaps, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) launched the Next Generation First Responder (NGFR) Apex program to develop, adopt and integrate cutting-edge capabilities using a standards-based approach to make responders better protected, connected and fully aware. By leveraging the open standards documented in the NGFR Integration Handbook, first responders can have plug-and-play technologies to help them rapidly adapt to changing environments and evolving threats while sharing mission-critical information between all responding agencies.

DHS S&T will host the NGFR – Harris County Operational Experimentation (OpEx) from December 4-5, 2018, at the Port of Houston in Houston, Texas. The OpEx will integrate first responder technologies using open standards in the NGFR Integration Handbook to enhance the mission capabilities of Houston-area responders and the U.S. Coast Guard during a HAZMAT scenario.

DHS S&T chose Houston-area partners for the OpEx because urban area response agencies have significant collaboration and information-sharing needs. As of 2016, 81.7 percent of Americans live in urban areas, and urban responders have different technology needs and budgets than those in rural areas. By hosting the NGFR – Harris County OpEx in the Houston area, DHS S&T and industry partners can learn about the interoperability and integration requirements of coordinated urban response and develop recommendations for both urban and rural responders.

The willingness and dedication of Houston-area first responders, as well as DHS partners and performers, has facilitated the development of innovative technology that will help the nation's first responders become better protected, connected and fully aware to maintain the safety of American lives and communities.

Sincerely,

Sridhar Kowdley, Project Manager
Science and Technology Directorate
U.S. Department of Homeland Security

Administrative and Handling Instructions

The title of this document is the "Next Generation First Responder – Harris County Operational Experimentation Playbook." This document provides players, actors, observers, data collectors and controllers from participating organizations the information necessary to observe or participate in the OpEx. The information in this document is current as of the date of the OpEx, December 4, 2018. All preparation and documentation for the NGFR – Harris County OpEx is unclassified. Any control of information is based more on potential public sensitivity regarding scenario-related events, which are fictional, rather than the actual Playbook content. All participants should ensure the proper control of information within their areas of expertise and to protect this material in accordance with current jurisdictional directives.

Reference herein to any specific commercial products, processes or services by trade name, trademark, manufacturer or otherwise does not necessarily constitute or imply its endorsement, recommendation or favoring by the U.S. government. The information and statements contained herein shall not be used for the purposes of advertising, nor to imply the endorsement or recommendation of the U.S. government.

If you have any questions about this Playbook, or to request more information about the NGFR – Harris County OpEx, please contact NGFR@hq.dhs.gov. Public release of information is at the discretion of DHS S&T.

Accessibility

The Department of Homeland Security Science and Technology Directorate is committed to providing access to our webpages for individuals with disabilities, both members of the public and federal employees. If the format of any elements or content within this document interferes with your ability to access the information, as defined in the Rehabilitation Act, please contact the Next Generation First Responder Apex program for assistance by emailing NGFR@hq.dhs.gov or calling 202-254-6060. A member of our team will contact you within two business days. To enable us to respond in a manner most helpful to you, please indicate the nature of your accessibility problem, the preferred format in which to receive the material, the web address (URL) or name of the document of the material with which you are having difficulty, and your contact information.

Acknowledgements

Table of Contents

1 Background

1.1 Next Generation First Responder Overview

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) works with America's first responders to ensure they are more effective and safer—regardless of the hazards they face. DHS S&T develops and adapts innovative technologies that help first responders make communities more secure and resilient, because we know that homeland security truly starts with hometown security.

The Next Generation First Responder (NGFR) program is a five-year program that began in January 2015 and is part of a longer-term DHS S&T commitment to envision and assist the responder of the future. The NGFR program works to make responders better protected, connected and fully aware by developing, adopting and integrating cutting-edge first responder technologies using open standards. This complex, multi-disciplinary program consists of a diverse but related portfolio of projects that span from basic research to advanced technology development, and an initiative to define a common set of open standards for technology integration. These open standards enable industry partners to develop standards-based solutions that easily plug-and-play into an interoperable responder ecosystem, including legacy systems. This approach opens doors to industry while lowering costs and increasing choices for public safety organizations, helping them rapidly adapt to changing environments and evolving threats as they secure communities nationwide.

1.1.1 NGFR Integration Demonstrations

DHS S&T has held a series of NGFR Integration Demonstrations to incrementally test and evaluate interoperable technologies currently in development, and to assess how DHS-funded technologies, commercially-developed technologies and existing first responder systems integrate to improve response operations. One key component of the NGFR Apex program is that it is both modular—meaning that responders can select different components that will easily integrate via open standards and interfaces—and scalable—meaning that responders can build a large and complex system or a small and streamlined system, depending on their mission needs and budget. Throughout the course of the NGFR Apex program, it has been essential to test both the modularity and scalability of the system with first responders. In addition, it is critical to gather responder feedback to help improve both individual NGFR-developed technologies and the NGFR integration approach. Collecting responder feedback and testing integration, modularity and scalability are core objectives of NGFR Integration Demonstrations.

Since 2016, these demonstrations have evolved from tabletop integrations to field exercises with partner public safety agencies and have matured to include more commercial technologies. Past NGFR Integration Demonstrations include:

- **_NGFR PlugTest – February 2018_**
  The PlugTest was conducted on February 20-22, 2018, at the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) in Pasadena, California. The NGFR PlugTest tested the architecture and standards documented in

the NGFR Integration Handbook, which provides guidance for technology providers in the areas of device design, system architecture, message standards and data formats for on-body and enterprise systems to support first responders. NGFR calls this on-body architecture the SmartHub system. The event was structured to validate interoperability characteristics in three primary functional categories: sensors (e.g., physiological, chemical, location), communication hubs, and situational awareness tools.

- ***Grant County – DHS S&T NGFR Technology Experiment (TechEx) – June 2017***
  The Grant County DHS S&T TechEx was the first partnership with a rural public agency that tested the integration of physiological and location sensors, situational awareness systems, drones, datacasting and deployable communications into a cohesive public safety solution in an operational environment. The TechEx took place in Grant County, Washington, and assessed both the technology integration as well as how the new technologies improved the mission response of the participating law enforcement, fire rescue and emergency medical agencies.

- ***Boston Communications Experiment – October 2016***
  The Boston Communications Experiment assessed two communications systems—Mutualink and datacasting—to address requirements defined in Section 212 of Public Law 114-120 2015 (U.S. Congress, 2015). This law stipulates the execution of a pilot of three or more DHS components to assess the effectiveness of commercially available systems certified by the U.S. Department of Defense Joint Interoperability Test Center. These systems should allow multiagency collaboration and interoperability, and wide-area, secure, and peer-invitation-and-acceptance-based multimedia communications. The results identify both positive and negative features of the communication systems during the experiment, which have helped determine the next steps for these, or similar, technologies.

- ***NGFR Integration Demonstration – May 2016***
  The NGFR Integration Demonstration highlighted the ways in which various proprietary technologies come together to improve communications and situational awareness of first responders in the field. The demonstration integrated a number of physiological monitoring devices, environmental sensors, live video-streaming from body cameras and unmanned aerial systems (UAS), hybrid communications, wearables, and alerting devices during an emergency scenario requiring a coordinated response from law enforcement, firefighters and emergency medical technicians.

- ***Internet of Things (IoT) Pilot – January 2016***
  The IoT Pilot prototyped how open-source standards could allow various proprietary technologies to integrate to improve communications and situational awareness of first responders. This table top demonstration integrated a wide array of sensors, including physiological monitoring devices, environmental sensors and wearables, and investigated sensor catalogs, geospatial displays and alerting.

DHS S&T has incorporated the results and responder feedback from the NGFR Integration Demonstrations into the NGFR Integration Handbook, which outlines a standards-based environment that enables commercially-developed technologies to integrate with existing first responder infrastructure. Using the lessons learned and responder feedback from these integration demonstrations, DHS S&T has also produced materials to help public safety agencies implement new technologies that address their capability gaps and operational priorities. For example, the NGFR Case Study series helps agencies understand how tools like

[location services](#), [deployable communications](#), [video services](#), [physiological monitoring](#) and [situational awareness](#) can improve their mission response and provides guidance on how agencies can best implement them.

1.1.2 NGFR – Harris County Operational Experimentation (OpEx)

DHS S&T is hosting the NGFR – Harris County Operational Experimentation (OpEx) December 4-5, 2018, at the Port of Houston in Houston, Texas, in partnership with regional public safety agencies and technology providers. During the OpEx, Houston-area first responders and the U.S. Coast Guard will use integrated responder technologies to enhance their mission capabilities in a HAZMAT and mass casualty incident scenario. The OpEx will employ new technologies to streamline collaboration through response, triage and decontamination, including capabilities to improve responder safety, enhance operational communications, increase operational coordination and augment situational awareness. Together, DHS S&T and responders will evaluate how selected DHS-developed and commercial technologies integrate with existing public safety systems using open standards, and how those integrated capabilities enhance operational communications, increase operational coordination, improve responder safety and augment situational awareness.

DHS S&T and industry partners are providing technologies including responder and patient physiological monitoring sensors, indoor location tracking sensors, HAZMAT sensors, smart alerting for responders and incident command, advanced data analytics, and situational awareness and collaboration dashboards. DHS S&T and partners hope to demonstrate how integrated solutions deliver greater operational impact for first responders and communities.

1.2 Harris County, Houston and the OpEx Venue

Harris County, with an estimated 4,652,980 residents, is the third most populous county in the United States. The county seat is the City of Houston, which is the fourth most populous city in the United States at an estimated 2,312,717 residents, and is one of 34 cities in the county. The county is home to the largest medical center in the world, the largest port (by export tonnage) in the United States, as well as the Lyndon B. Johnson Space Center. In Harris County, there are 54 fire departments, 7 emergency medical services agencies and 125 law enforcement agencies. The geography of the incorporated and unincorporated areas of the county make partnerships between public safety agencies particularly important.

One of the regional partner objectives was to build relationships across agencies, across response disciplines and across jurisdictions to improve everyday response coordination as well as major event and natural disaster response coordination. Since 1979, there have been 46 federally declared disasters in the county, including 23 major FEMA disaster declarations. In the flood-prone Houston metropolitan area, there is a high probability that Hurricane Harvey will not be the last catastrophic natural disaster to hit the area, requiring a massive response and partnership between federal, state and local agencies. In addition, Houston hosts major sporting events that require regional public safety coordination, including the 2017 Super Bowl LI and the 2016 Final Four NCAA Division I Tournament.

Figure 1. Harris County Emergency Operations Center during Hurricane Harvey, August 2017. Picture courtesy of the Harris County Office of Homeland Security and Emergency Management.

DHS S&T chose to work with Harris County, City of Houston, the Port of Houston Authority and other regional response partner agencies for the OpEx because urban areas response agencies have significant collaboration and information-sharing needs. As of 2016, 81.7 percent of Americans live in urban areas, and urban responders have different technology needs and budgets than those in rural areas. By hosting the NGFR – Harris County OpEx in the Houston area, DHS S&T and industry partners can learn about the interoperability and integration requirements of coordinated urban response and develop recommendations for both urban and rural responders. Additionally, DHS S&T has long-standing stakeholder relationships with the Houston-area public safety community, appreciates their willingness to assess and adopt new technologies, and welcomed the opportunity to build on the lessons learned of Hurricane Harvey to improve regional resilience.

1.2.1 OpEx Venue: Port of Houston's Sam Houston Pavilion

The Port of Houston is a 25-mile-long complex of nearly 200 private and public industrial terminals along the 52-mile-long Houston Ship Channel. The eight public terminals are owned, operated, managed or leased by the Port of Houston Authority and include the general cargo terminals at the Turning Basin, Care, Jacintoport, Woodhouse and the Barbours Cut and Bayport container terminals. The Port of Houston is the largest port on the Gulf Coast.

Each year, more than 247 million tons of cargo move through the greater Port of Houston, carried by more than 8,200 vessels and 215,000 barges. The port is consistently ranked first in the United States in foreign waterborne tonnage, first in U.S. imports, first in U.S. export tonnage, and second in the U.S. in total tonnage. It is also the nation's leading breakbulk, handling 52 percent of project cargo at Gulf Coast ports.

The NGFR – Harris County OpEx will take place primarily at the Sam Houston Pavilion, home to the M/V Sam Houston tour boat, which has provided public tours of the Port and the Houston Ship Channel since 1958. The tour boat itself will also be part of the OpEx.

1.3 OpEx Participants

Although there are many types of OpEx participants, most fall under the categories of DHS, regional public safety agencies and technology providers.

1.3.1 Department of Homeland Security

DHS has a vital mission: to secure the nation from the many threats we face. This requires the dedication of more than 240,000 employees in jobs that range from aviation and border security to emergency response, from cybersecurity analyst to chemical facility inspector. With honor and integrity, DHS will safeguard the American people, our homeland and our values.

1.3.1.1 Science and Technology Directorate – OpEx Management

Technology and threats evolve rapidly in today's ever-changing environment. DHS S&T monitors those threats and rapidly capitalizes on technological advancements, developing solutions and bridging capability gaps at a pace that mirrors the speed of life. DHS S&T's mission is to enable effective, efficient and secure operations across all homeland security missions by applying scientific, engineering, analytic and innovative approaches to deliver timely solutions and support departmental acquisitions. Created by Congress in 2003, S&T conducts basic and applied research, development, demonstration, testing and evaluation activities relevant to DHS. For more information, visit the agency website: www.scitech.dhs.gov.

OpEx management is the support team that is responsible for planning and executing the NGFR – Harris County OpEx, including leading coordination between all the different participants. As the OpEx is hosted by DHS S&T, the OpEx management team is comprised of DHS federal and contractor staff providing exercise management, logistics coordination, data collection, technical support and VIP facilitation.

- **DHS S&T Next Generation First Responder Apex Program**

  The NGFR Apex program is a five-year program that began in January 2015 as part of a longer-term DHS S&T commitment to envision and assist the responder of the future. NGFR continually collaborates with first responders across the nation on various projects – from developing program requirements to testing prototypes of technology. These cutting-edge technologies will improve emergency response time and accelerate decision-making to save more lives.

  NGFR is comprised of more than 40 research and development projects geared towards making responders better protected, connected and fully aware. NGFR will incrementally deliver these capabilities over the program cycle and will continue to partner with first responders to test and evaluate technologies before they are available on the market. For more information, visit the program website: www.dhs.gov/NGFR.

- **DHS S&T National Urban Security Technology Laboratory (NUSTL)**

  NUSTL is a federal laboratory within DHS S&T with a mission to test, evaluate and analyze homeland security capabilities while serving as a technical authority to first responder, state and local entities in protecting cities. As part of that mission, NUSTL works with NGFR and other S&T responder technology projects to ensure the durability of new technologies to enhance responder performance and safety. NUSTL supports the development, evaluation and transition of homeland security technologies into field use for law enforcement, fire and other emergency response agencies. Staff experts work side-by-side with the nation's first responders to effectively plan and execute tests, evaluations and assessments of existing and emerging technologies. The laboratory also works to enhance

first responder capabilities by partnering with stakeholders to develop viable solutions to radiological and nuclear threats.

In supporting DHS and first responder projects, NUSTL:

- Conducts test programs, pilots, demonstrations and other evaluations in the lab and in the field alongside responders;

- Provides expert technical assistance to first responders for the development and execution of training and exercises and assessment of equipment performance;

- Applies knowledge of responder environments, operations and mission requirements into the development of more effective technologies; and

- Supports the development and use of homeland security standards.

For more information, visit the laboratory website: https://www.dhs.gov/science-and-technology/national-urban-security-technology-laboratory.

1.3.1.2   U.S. Coast Guard – Sector Houston-Galveston

U.S. Coast Guard Sector Houston-Galveston is in the Eighth Coast Guard District and supports a wide range of Coast Guard operations to include marine environmental protection, aids to navigation, ports, waterway, law enforcement, and search and rescue. For more information, visit the agency website: https://www.atlanticarea.uscg.mil/Our-Organization/District-8/District-Units/Sector-Houston-Galveston/.

1.3.1.3   Federal Emergency Management Agency (FEMA) Integrated Public Alert and Warning System Office

The FEMA Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure and will save time when time matters most, protecting life and property. Local police and fire departments, emergency managers, the National Weather Service, FEMA, and private industry are working together to make sure you can receive alerts and warnings quickly through several different technologies no matter where you are—at home, at school, at work or even on vacation. The IPAWS uses different pathways to simultaneously send alerts through many different channels.

The National Weather Service uses IPAWS to send alerts for: tornadoes, flash floods, hurricanes, extreme wind, blizzards and ice storms, tsunamis, and dust storms. Wireless Emergency Alerts allow public safety officials to send warnings directly to cell phones and other mobile devices in affected areas. These short messages look like text messages, but unlike texts, which are sent directly to your phone number, these warnings will be broadcast to all phones within range of designated cell towers. The alerts will tell you the type of warning, the affected area and the duration. You will need to turn to other sources, such as television or radio, to get more detailed information about what is happening and what actions you should take. For more information, visit the agency website: https://www.fema.gov/integrated-public-alert-warning-system.

1.3.2 Regional Public Safety Agencies

The participating regional public safety agencies, more commonly referred to as Players, will include personnel from the U.S. Coast Guard, FEMA, Port of Houston Authority, Harris

---

County, City of Houston, South East Texas Regional Advisory Council (SETRAC), Cy-Fair Volunteer Fire Department and Atascocita Fire Department.

The objectives of the regional public safety agencies are as follows:

- Identify and evaluate responder technologies to enhance unified operations amongst the regional public safety agencies;

- Further the practice of mutual and automatic aid amongst regional public safety agencies;

- Support innovation of public safety communications technologies to promote the regional public safety agencies obligations for ensuring public first responder safety; and

- Meet the regional public safety agencies individual organizational requirements to conduct exercises.

1.3.2.1 Port of Houston Authority

The Port of Houston Authority values its relationships with partners and numerous local, state and federal Port Authority stakeholders. The members of the Port Commission are appointed by local jurisdictions; the State of Texas authorized the creation of the Port of Houston Authority as a navigation district and granted certain property to it; and the federal government partners with the Port of Houston Authority in some of its most important projects, including the maintenance of the Houston Ship Channel. For a full list of Port Partners, see http://porthouston.com/port-partners/.

- **Police Department**: The Port Police and security officials work together to provide around-the-clock emergency response on Port of Houston facilities, and coordinate activities with federal, state and local law enforcement agencies. The police department also operates a 24/7/365 Dispatch Center for all police, fire, medical and HAZMAT emergency responses.

- **Fire Department**: The Port of Houston Fire Department currently operates three fire stations strategically stationed along the Houston Ship Channel. The personnel and equipment fight marine and land fires and respond to other emergencies throughout the ship channel and its tributaries. The Port of Houston Fire Department operates three fireboats, three HAZMAT trucks, and three class A pumpers to respond to fires, rescue, hazardous materials and oil spills and releases. The boats are capable of long-range stays at terminal or shipboard fires with quick crew change over, helping the ship channel industrial complex stay strong and safe.

- **Emergency Management**: The Office of Emergency Management is responsible for the preparedness, response, recovery and mitigation of emergencies and major disasters at the Port of Houston. Emergency Management is also responsible for many of the resources that are used before, during and after an emergency, including: a Mobile Command Center, an Emergency Operations Center (EOC), all public safety radio equipment and mass emergency notifications.

1.3.2.2 Harris County

- **Fire Marshal's Office**: The Harris County Fire Marshal's Office mission is to safeguard the lives and property of citizens in the unincorporated areas of Harris

County through effective fire prevention, fire investigation, education and emergency response. The department comprises five branches:

- o **Emergency Operations Branch**: Sometimes referred to as the HAZMAT group, this branch is staffed by Hazardous Materials Technicians. It is responsible for the effective planning, mitigation and recovery from emergencies and disasters—whether natural, accidental or deliberate. The Harris County Hazardous Materials Response Team (HMRT) supports local fire departments and law enforcement with hazardous spills and chemical releases. It conducts inspections of hazardous materials facilities and provides training on hazardous materials and Weapons of Mass Destruction (WMDs).

  With Harris County being home to many of the world's largest energy producing companies and with Harris County being strategically located in the petrochemical capitol of the world and having such strong ties to our national infrastructure, a decision was made to create the Harris County Hazardous Materials Response Team as a division of the Harris County Fire Marshal's Office. The Harris County HMRT is a FEMA, Type-1 Hazardous Materials Response Team. The Team was established in early 2002 by the Harris County Commissioners Court. Currently, Harris County HMRT is the second-busiest HAZMAT Team in the region. The Team is staffed by 12 full-time Texas Commission on Fire Protection (TCFP) certified Hazardous Materials Technicians and 23 part-time Techs.

- o **Fire Investigation Branch**: Also known as Arson, this branch is staffed by Fire/Arson Investigators responsible for the effective investigation of fires and explosions. It determines the origin and cause of the fire and whether there was criminal intent.

- o **Fire Prevention Branch**: Sometimes called Inspections, this branch is staffed by Fire Inspectors. It is responsible for the effective prevention of fires though periodic inspection of commercial and public buildings, licensed facilities and operations of other buildings.

- o **Operational Support Branch**: This branch is staffed by personnel assigned to handle the accounting, purchasing, payroll, budgetary, logistics, planning and human resource needs. It is responsible for effective accounting, budgeting and payroll procedures.

- o **Training Branch**: The Training Branch is responsible for providing comprehensive and effective training in Hazardous Materials response, investigation, inspection and other fire-centric training.

For more information, visit the agency website: HCMO-Who We Are.

- • **Central Technology Services**: The Harris County Central Technology Services delivers technology, public safety and fleet vehicle services and products to Harris County. The Information Technology Center supports the mission of Harris County by developing, implementing and supporting high quality, innovative and cost-effective information technology solutions. Harris County Public Safety

Technology Services supports the infrastructure and applications used by Harris County's law enforcement and emergency response departments. Harris County Fleet Services is responsible for Harris County's vehicle fleet. Services provided include new vehicle procurement, managing fuel stations and routine vehicle maintenance. For more information, visit the agency website: Harris County Universal Services.

- **Office of Homeland Security and Emergency Management**: The Harris County Office of Homeland Security and Emergency Management (HCOHSEM) vision and mission is to be a national model of "best practices" in emergency planning, preparation, response and recovery.

  HCOHSEM helps prepare, safeguard and protect the residents and property of Harris County from the effects of disasters through effective planning, preparation, response and recovery activities. To accomplish this mission, they:

  - Develop, maintain and coordinate a comprehensive emergency management plan.

  - Activate and staff an EOC to coordinate and support efforts to respond to and recover from emergencies and disasters.

  - Develop and assist in the delivery of effective public outreach programs.

  - Collect, provide and disseminate information for elected officials, the media, our residents, partners and other stakeholders.

  - Train, educate and prepare for emergencies through the development and delivery of effective classes, drills and exercises.

  For more information, visit the agency website: http://prepare.readyharris.org/.

- **Sheriff's Office**: The Harris County Sheriff's Office (HSCO), founded in 1837, is the largest sheriff's office in Texas and the third largest in the United States. The HCSO has nearly 4,600 employees and 200 reservists dedicated to ensuring the safety of over 4.1 million residents who call Harris County home. Harris County encompasses 1,788 square miles (1,729 land) and includes 41 incorporated municipalities. Harris County is a burgeoning and vast metropolitan area - home to one of the most culturally rich cities in the nation. HSCO is committed to creating and maintaining a safe and secure community. The partnership between the organization and the residents of Harris County is critical in the fight against crime. For more information, visit the agency website: Harris County Office of Homeland Security and Emergency Management preparedness website.

  - **HSCO Marine Division**: The HSCO Marine Division has been patrolling the waterways of Harris County for more than 50 years. The Marine Division consists exclusively of reserve deputies and responds to all drownings, boating accidents and other water related emergencies in the unincorporated areas of Harris County. Marine Division deputies also respond to incidents along the beaches and waterfronts of Harris County, including assaults, disturbances, ATV accidents and medical emergencies. The Marine Division has extensive search capability and has assisted

agencies outside of Harris County on a variety of investigations. It has also conducted extensive rescue efforts during hurricanes, tropical storms and floods.

HCSO's Marine division has a large fleet of 17 boats, ranging from river patrol boats to airboats to offshore capable patrol and rescue craft. The Marine Division also maintains two bases in Harris County and several dual-purpose towing and high-water rescue trucks. For more information, visit the agency website: [HSCO Marine Division.](.).

- o **HCSO Security Monitoring & Assessment Group (SMAG)**: The HSCO SMAG was established in September 2011 and officially integrated into the U.S. Coast Guard Maritime Interagency Operations Center (IOC) in October 2015. The SMAG uses state-of-the-art sensors to monitor strategic areas within the Houston Ship Channel Security District (HSCSD). These sensors include High Definition Pan/Tilt/Zoom cameras and Thermal cameras. The SMAG communicates with the units in the field by using Moxtra, IP Based Radio and a Superion Computer Aided Dispatch system to provide situational awareness to responders in the air, on the water and on land within the HSCSD. The SMAG also works closely with other local, state and federal agencies to assist in Search and Rescue Operations and Criminal Investigations.

  The SMAG consists of one full-time Sergeant, two full-time Deputy Sheriffs and thirteen part-time Deputy Sheriffs. The collective experience of these Deputies spans over 300 years in various specialties, including Investigations, Patrol, Detention and Dispatch. Several of the part-time Deputies are former HCSO Supervisors. Four Deputies in this unit are also prior Military and bring that experience to the table while working closely with the U.S. Coast Guard. The SMAG currently holds the distinction of being the only unit of its type in the Nation.

- **Community Emergency Response Team (CERT)**: The Harris County CERT training is a FEMA program that educates citizens about the hazards they face in their community and trains them in lifesaving skills. If needed following a disaster, these citizen-responders use their training as part of a neighborhood or workplace team to help others when professional responders are overwhelmed or not immediately available. CERT members provide immediate assistance to victims in their area, organize spontaneous volunteers who have not had the training, and collect disaster intelligence that will assist professional responders with prioritization and allocation of resources when they arrive.

  CERT promotes a partnering between emergency management and response agencies and the people in the community that they serve. The goal is to train members of neighborhoods and workplaces in basic response skills. Then CERT teams are formed and maintained as part of the emergency response capability for their area.

  If there is a natural or man-made event that overwhelms or delays the community's professional responders, CERT members can assist others by applying the basic

response and organizational skills that they learned during their CERT training. These skills can help save and sustain lives until help arrives. CERT members also can volunteer for special projects that improve a community's preparedness. For more information, visit the <u>Community Emergency Response Team (CERT)</u> agency website.

1.3.2.3 City of Houston

- **Houston Fire Department**: The Houston Fire Department (HFD) is the third largest fire department in the United States and is responsible for preserving life and property to a population of more than 2 million in an area totaling 654 square miles. Over the last few years, HFD has evolved into a highly sophisticated public safety rescue system that has saved hundreds of lives and reduced the severity of countless injuries and illnesses. HFD has a vision that guides the organization towards excellence. That goal is achieved through deliberate planning, adaptability and the courage to embrace challenges and opportunities.

  The preservation of life remains the number one goal of HFD, beginning with the responder and extending to the public. Our citizens must be reasonably free from danger and harmful acts. With the best equipment and training, the department can reduce the risk to the public and its members at all emergency incidents. They commit to the health, safety and welfare of members, thus protecting them and enhancing capability and readiness. They aim to eliminate preventable work-related injuries and illnesses through the systematic management of risks. For more information, visit the <u>Houston Fire Department</u> agency website.

- **Houston Police Department**: The mission of the Houston Police Department (HPD) is to enhance the quality of life in the City of Houston by working cooperatively with the public and within the framework of the U.S. Constitution to enforce the laws, preserve the peace, reduce fear and provide for a safe environment. HPD has 5,200 sworn law enforcement officers and 1,200 civilian support personnel, with annual general fund budget of $825 million.

  The HPD Air & Marine Division provides an array of airborne and waterborne law enforcement services to citizens and law enforcement officers in the Greater Houston area. The Port Patrol Unit within the Air & Marine Division is participating in this OpEx**.** The Port Patrol Unit is responsible for maritime response on all waterways within the Port of Houston/Ship Channel and its connecting waterways, providing boater safety, search and recovery, and security patrols of critical infrastructure. For more information, visit the <u>Houston Police Department</u> agency website.

- **Houston Information Technology Services**: The Houston Information Technology Services (HITS) department provides enterprise IT services for the City of Houston. These services include voice and network, cyber-security, email, and communication platforms and shared enterprise applications that are used by all city employees.

  HITS is comprised of five separate divisions that proved technical services and support. The Project Management Office, Enterprise Applications Services,

Enterprise Infrastructure Services, Enterprise Cyber-Security and Radio Communication Services all provide a professional approach to providing their customers. The Department's vision is to be an information and technology organization recognized for collaborative partnership, proactive leadership, strategic innovation and quality of customer service. For more information, visit the Houston Information Technology Services agency website.

1.3.2.4 Cy-Fair Volunteer Fire Department

The Cy-fair Volunteer Fire Department (CFVFD) is one of the largest, busiest volunteer fire departments in the United States with over 15,000 emergency responses each year. CFVFD covers the 165-square mile area of the Harris County Emergency Services District #9 in the unincorporated part of the northwest Harris County, and provides emergency services, fire, medical and rescue. The CFVFD relies on more than 500 women and men of different backgrounds and all have one thing in common: a desire to serve their community. Operating out of 12 stations, the department covers an area of approximately 164 square miles of northwest Harris County.

The EMS division is staffed with more than 100 full-time employees, plus volunteers. Emergency medical services are provided around the clock every day by members on 13 medic units, and by first responders from the suppression division as necessary. Each medic unit is staffed with state-licensed EMTs with certification levels from basic to paramedic. CFVFD currently holds the highest award for chest pain management in the American Heart Association's "Mission: Lifeline" quality achievement program. Each year, CFVFD manages more than 200 STEMI (ST-Elevation Myocardial Infarction) heart attacks and has return of spontaneous circulation (ROSC) percentages above the national average. For more information, visit the agency website: Cy-Fair Volunteer Fire Department.

1.3.2.5 Atascocita Fire Department and Emergency Medical Service

The Atascocita Fire Department (FD) is a full-service, all-hazards emergency service organization that serves the jurisdiction of Harris County Emergency Service District No. 46 (HCESD46). HCESD46 is solely responsible for the delivery of emergency services within its boundaries and provides fire suppression, rescue and EMS/transport. Atascocita FD is committed to providing the highest quality of service to residents and others working in and passing through the Atascocita area. The professional interactions Atascocita FD provides are achieved through the dedication of highly-trained and committed paid and volunteer staff. Atascocita FD uses the latest cutting-edge equipment, apparatus and procedures to serve its community.

Atascocita FD averages 5,000 calls for service annually; this number continues to increase as our community grows. With 26 pieces of apparatus, including five mobile incident command units, transport ambulances, four pumpers, one tower-ladder and six command vehicles strategically placed across the district, their customers are well protected. The Department also operates one of the State's 13 Mass Casualty and Mass Evacuation ambulance buses (AMBUS). The AMBUS can hold 20 patients on litters and many more seated or in wheelchairs or car seats.

The Atascocita FD provides education and skills training to staff as well as to the community. The Department provides CPR training several times per month for citizens

interested in becoming certified. The Department also participates in multiple public relations events throughout the year. As the Atascocita community continues to grow, more calls for service will be received and handled by the Atascocita FD. The Department's commitment is to continue to serve the community and strive for excellence in the delivery of emergency services or whatever services customers ask for. For more information, visit the Atascocita FD agency website.

1.3.2.6 SouthEast Texas Regional Advisory Council (SETRAC)

The mission of SETRAC is to develop and sustain a powerful coalition of providers, responders and other healthcare related partners united together to save lives and improve health outcomes through research, education and collaboration. This mission is accomplished by providing stakeholder support through planning, facilitation, data collection, operations and the provision of technical assistance to the region for Clinical and Preparedness services.

On the clinical side, the Trauma, Stroke, Cardiac, Pediatric, Maternal and Perinatal committees work to establish standards of care and protocols for consideration/adoption by area hospitals, EMS agencies and other providers. They foster collaboration to educate the communities, and to collectively deliver appropriate care with appropriately trained providers and embracing best practices. For more information, visit the agency website: SouthEast Texas Regional Advisory Council.

1.3.3 Participating Technology Providers

Technology providers are developers of new, cutting-edge first responder technologies that have worked with DHS S&T to integrate their solutions using open standards. During the OpEx, the responders will use these new technologies and DHS S&T will evaluate how well the technologies support the mission response and gather feedback for the technology providers. The technology providers can then improve their technology development to better meet first responder needs.

1.3.3.1 DHS-Funded Technology Providers

DHS S&T has funded the following performers as part of the NGFR Apex program to research, develop, adopt, test and evaluate specific technologies that first responders have requested.

- Ardent Management Consulting, Inc.
- FEMA IPAWS Office
- Integrated Solutions for Systems, Inc. (IS4S)
- Luna Innovations, Inc.
- Metronome Software, LLC
- MobileIron, Inc.
- N5 Sensors, Inc.
- NASA JPL
- Pacific Northwest National Laboratory

- SensorUp, Inc.

1.3.3.2 Industry Technology Providers

Industry vendor technology providers have signed Cooperative Research and Development Agreements with DHS S&T to facilitate their participation in this event. While both DHS and the industry vendors benefit from the event, these participants are not on contract nor receiving monetary compensation for attending, but are receiving direct first responder feedback to improve their technologies.

- ARES Security Corporation
- AT&T Corporation
- Centrex Solutions LLC
- Haystax, a Fishtech Group Company
- Intrepid Networks, LLC
- Keys Net LLC
- Sonim Technologies, Inc.
- TRX Systems, Inc.
- Utility Associates, Inc.

2 Introduction

2.1 Introduction for Players

You are participating in an *operational technology-focused experiment*, which is structured very similar to a full-scale exercise in that resources and assets will be deployed to respond to a scenario. However, *the focus of this effort is on the performance and integration of new technologies* to support response operations that fall under the following DHS Core Capabilities:

- Environmental Response/Health and Safety
- Situational Assessment
- Operational Coordination
- Operational Communications
- Intelligence and Information Sharing
- Access Control and Identity Verification
- Mass Search and Rescue Operations
- On-Scene Security, Protection and Law Enforcement

The overarching focus of this experiment is the assessment of new technologies to support first response operations directly in their mission space. In order to achieve this, a scenario (accidental release of a volatile chemical from a vessel parked across/near the Sam Houston Boat Park) will be used that ensures opportunities for players to employ the use of these technologies to support their routine operations. There will NO EVALUATION of operations, CONOPs, policies or response activities.

DHS S&T data collectors will be in the same location as many players to obtain data during the scenario vignettes. Data collectors will record information on datasheets and may need to interact with players to obtain information during the hot wash. Audio/video recordings will also be a part of the effort; the video data from these recordings will be reviewed and analyzed by DHS S&T to help evaluate aspects of the technologies. Cameras will be both fixed at some locations and body-mounted on some data collectors.

Players are encouraged to "think out loud" (as/if doable) by verbalizing what they are seeing/hearing, what they are thinking, and what actions they are performing to help the data collection effort and minimize the interruptions needed by the data collectors. Data collectors will also retrieve data from the technology files at the completion of each vignette and record pertinent information provided during hot wash session.

2.2 Purpose and Organization of Playbook

The OpEx Playbook provides participants with the necessary tools for their roles in the NGFR – Harris County OpEx. Some material is intended for the exclusive use of planners, facilitators and data collectors; however, all participants may view and use this Playbook. This Playbook provides all available, relevant documents used in the planning for this OpEx.

The OpEx will be conducted over two days and is based on a scenario comprised of three vignettes. The primary OpEx location is the Port of Houston along the Buffalo Bayou Turning Basin at the Sam Houston Pavilion, home to the M/V Sam Houston tour boat. The experiment focuses on communications and information sharing technologies, and how these technologies support first responder needs during a hazardous materials and mass casualty incident at the Port.

The OpEx will employ new technologies in an operational scenario based on three vignettes:

- **Vignette A**: Notification and Deployment
- **Vignette B**: Unified Command and HAZMAT Response
- **Vignette C**: Search and Rescue and Mass Casualty Incident

2.3 Goals, Objectives and Core Capabilities

DHS S&T is hosting the OpEx to validate and advance the NGFR program as it enters its final year. The OpEx plays an essential role in making the NGFR program successful, and local agency and industry contributions are critical to that success. The DHS S&T OpEx objectives defined in Figure 3 will help DHS S&T better measure and communicate OpEx successes and identify the long-term benefits of the event and NGFR program.

OpEx Goals	OpEx Objectives	
Validate the direction of the NGFR program's research and development through operational test and evaluation	1	Evaluate NGFR technologies' technical and operational capabilities and assess how technology improves first responder safety and effectiveness in a field environment
	2	Demonstrate the successful integration between NGFR-funded technologies, industry solutions and existing first responder systems to validate and refine the NGFR Integration Handbook
	3	Improve regional core capabilities in a multi-agency response
Identify pathways for transitioning NGFR-developed products	4	Facilitate transition of NGFR-developed technologies, integration approach and knowledge products
	5	Promote innovation and adoption of public safety technologies to make responders better protected, connected and fully aware

Figure 2. DHS S&T programmatic objectives for the NGFR - Harris County OpEx. These tell what DHS S&T hopes the event will achieve for the *program*, rather than what DHS S&T hopes will occur at the event.

In the Memorandum of Agreement between DHS S&T and Houston-area public safety agencies signed in May 2018, the regional parties identified their objectives as:

- Identify and evaluate responder technologies to enhance unified operations amongst the Regional Parties' public safety entities.
- Further the practice of mutual and automatic aid amongst Regional Parties' public safety entities.
- Support innovation of public safety communications technologies to promote the Regional Parties' obligations for ensuring public and first responder safety.
- Meet the Regional Parties' individual organizational requirements to conduct exercises.

During the initial NGFR – Harris County OpEx kickoff meeting in November 2017, Houston-area public safety agencies identified their operational priorities, capability gaps and technology needs. DHS S&T later worked with the local agencies to distill those needs to the nine DHS Core Capabilities aligned to key technologies that would be integrated and assessed during the event, as outlined in Table 1.

Table 1. DHS Core Capabilities that will be assessed during the NGFR - Harris County OpEx

Core Capability	Description
Operational Communications	Enhance capabilities for timely communications to support security, situational awareness and operations for all response forces to include intelligence information sharing.
Operational Coordination	Support efforts to establish and maintain a unified and coordinated operational response that integrates with existing systems and networks.
Environmental Response/Health and Safety	Conduct appropriate measures to ensure the protection of the health and safety of the public and workers, as well as the environment, from all-hazards in support of responder operations and the affected communities.

Core Capability	Description
Intelligence and Information Sharing	Provide timely, accurate and actionable information resulting from the planning, direction, collection, exploitation, processing, analysis, production, dissemination, evaluation and feedback of available information concerning physical and cyber threats to the United States, its people, property or interests; the development, proliferation or use of WMDs; or any other matter bearing on the U.S. national homeland security by local state, tribal, territorial, federal and other stakeholders. Information sharing is the ability to exchange intelligence, information, data or knowledge among government or private sector entities, as appropriate.
Access Control and Identity Verification	Apply and support necessary physical, technological and cyber measures to control admittance to critical locations and systems.
Mass Search and Rescue Operations	Deliver traditional and atypical search and rescue capabilities, including personnel, services, animals and assets to survivors in need, with the goal of saving the greatest number of endangered lives in the shortest time possible.
On Scene Security, Protection and Law Enforcement	Ensure a safe and secure environment through law enforcement and related security and protection operations for people and communities located within affected areas and also for response personnel engaged in lifesaving and life sustaining operations.
First Responder Safety	Improve capabilities related to the identification, discovery and location of threats and/or hazards, and ensure responder safety through enhanced surveillance and sensor technologies.
Situational Awareness	**Augment decision-making capabilities by providing relevant information related to the extent of the event, status of the response and project resource needs**

2.4 Assumptions and Artificialities

The terms "OpEx," "experiment" and "exercise" will be used interchangeably throughout this event, and just as with an exercise, this event will be conducted in a no-fault learning environment wherein systems and processes associated with technologies, not individuals or their skills, will be evaluated. Assumptions constitute the implied factual foundation for the exercise and, as such, are assumed to be present before the exercise starts. The following general assumptions apply to the event:

- The OpEx will be conducted in a no-fault learning environment wherein systems and processes, not individuals, will be evaluated.
- Exercise simulation will be realistic and plausible and will contain sufficient detail from which to respond.
- Exercise simulation does not occur in "real time;" assume time stalls and/or jumps in the delivery of exercise injects.
- Exercise players will react to information and situations as they are presented, in the same manner as if the exercise were a real incident. Actions may be stalled or sped up dependent on the need to assess the technology, or to better understand CONOPs.

- Participating agencies may need to balance exercise play with real-world emergencies. Real-world emergencies take priority.
- Communication and coordination is limited to participating organizations, venues, and the Control Cell and Simulation Cell (SimCell)

2.5 Constructs and Constraints

Constructs are exercise devices that are designed to enhance or improve exercise realism. Constraints are exercise limitations that may detract from exercise realism. Constraints may be the inadvertent result of the exercise construct, or limitations related to time and resources. Although there are constructs and constraints (also known as exercise artificialities) in any exercise, the exercise planning team recognizes and accepts the following as necessary:

- Exercise communication and coordination will be limited to the participating exercise venues and the SimCell.
- Only communication methods listed in the Communications Plan in the Player Brief will be available for players to use during the exercise.
- Participating agencies may need to balance exercise play with real-world emergencies. Real-world emergencies will take priority. The code word or phrase that will be used if a real-world event or an emergency would take place, and the exercise would require to be stopped or stalled, is: **Real World Event—Stop Exercise**.

3 Logistics

3.1 OpEx Schedule

While the OpEx takes place from December 4-5, 2018, the on-the-ground preparations and clean-up will last from December 2-6. The following schedules include the events and preparations for the entire duration.

3.1.1 Sunday, December 2

Participants: DHS OpEx Management, Technology Providers

Location: Port Coordination Center (PCC)

Time	Event	Participants	Location
0800 - 0815	Registration	Technology Providers, OpEx Management	PCC
0815 - 1600	Technology Testing	Technology Providers	PCC
0815 - 1600	Logistics Prep	OpEx Management	PCC
1600 - 1700	Prep for Next Day	Technology Providers, OpEx Management	PCC

3.1.2 Monday, December 3

Participants: DHS OpEx Management, Technology Providers, Controllers, Data Collectors, Responder Agency Liaisons

Locations: PCC, Sam Houston Pavilion

Time	Event	Participants	Location
0700 - 0730	DHS Morning Meeting	OpEx Management	PCC
0730 - 0800	Registration	Technology Providers, OpEx Management, Data Collectors	PCC
0800 - 0830	Orientation	Technology Providers and Data Collectors	PCC
0830 - 1200	Tech Network Setup and Testing	Technology Providers	PCC
0830 - 0930	Data Collector Training	Data Collectors	PCC
1000 - 1030	Pavilion Signage Setup	OpEx Management	Pavilion
1030 - 1115	VIP Staging at Pavilion	Logistics Team	Pavilion
1100 - 1200	Controller Training	Controllers	PCC
1115 - 1200	VIP Narration and Panel Rehearsal	Logistics Team, Agency Liaisons	Pavilion
1200 - 1300	Lunch	All	
1300 - 1600	Tech Work Complete, Technologies on Chargers	Technology Providers	PCC
1600 - 1700	Flip Room for Responders and Registration	OpEx Management	PCC
1600 - 1700	Tech Bagging and Final Check	OpEx Technology Team	PCC
1700 - 1730	End of Day Meeting	OpEx Management	PCC
1830 - 2000	Dinner with Agency Liaisons POCs	OpEx Management Team and Agency Liaisons	

3.1.3 Tuesday, December 4

Participants: DHS OpEx Management, Technology Providers, Controllers, Data Collectors, Responders, Actors

Locations: PCC, Sam Houston Pavilion

Time	Event	Participants	Location
0700 - 0730	DHS Morning Meeting	OpEx Management	PCC
0730 - 0830	Registration	OpEx Management, First Responders, Technology Providers, Actors, Data Collectors, Observers	PCC

Time	Event	Participants	Location
0830 - 0900	Players Brief	OpEx Management, First Responders, Technology Providers, Actors, Data Collectors, Observers	PCC
0900 - 1000	Equipment Checkout/Training and Actor Training	First Responders, Actors	PCC
1000 - 1015	Transit to Pavilion/Staging Locations	OpEx Management, First Responders, Actors, Data Collectors, Observers	PCC
1015 - 1130	Run Vignette A	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1130 - 1200	Hotwash Vignette A with Data Collectors	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1200 - 1300	Lunch	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1300 - 1430	Run Vignette B	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1430 - 1500	Hotwash Vignette B with Data Collectors	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1500 - 1515	Transit to PCC	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1515 - 1545	Hotwash – Identify Improvements for Day 2	OpEx Management, First Responders, Actors, Data Collectors, Observers	PCC
1545 – 1645	Check-in Equipment & Data Collection Sheets	OpEx Management, First Responders, Actors, Data Collectors, Observers	PCC
1645 - 1700	Technology Providers, Responders and Actors Released	Technology Providers, First Responders, Actors	PCC

3.1.4 Wednesday, December 5 – Responder Schedule

Participants: DHS OpEx Management, Technology Providers, Controllers, Data Collectors, Responders, Actors

Locations: PCC, Sam Houston Pavilion

Time	Event	Participants	Location
0700 - 0730	DHS Morning Meeting	OpEx Management	PCC
0730 - 0830	Morning Check-in	OpEx Management, First Responders, Technology Providers, Actors, Data Collectors, Observers	PCC
0830 - 0900	Day Two In-Brief and Schedule Review	OpEx Management, First Responders, Technology Providers, Actors, Data Collectors, Observers	PCC
0900 - 0930	Equipment Checkout	First Responders	PCC
0930 - 0945	Transit to Pavilion	OpEx Management, First Responders, Actors, Data Collectors, Observers	PCC
0945 - 1045	Run Vignette C	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1045 - 1115	Hotwash Vignette C with Data Collectors	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1115 - 1230	Lunch Break	OpEx Management, First Responders, Actors, Data Collectors, Observers	Pavilion
1200 - 1215	Transit to Pavilion & Observers Released	Observers	Pavilion
1230 - 1330	Reset for VIP Event/VIP Vignette	OpEx Management, First Responders, Actors, Data Collectors	Pavilion
1330 - 1400	Responders in Place for VIP Vignette/Data Collection Discussions before VIP Startex	OpEx Management, First Responders, Actors, Data Collectors	Pavilion

Time	Event	Participants	Location
1400 - 1405	Remarks at Pavilion – re: OpEx	OpEx Management, First Responders, Actors, Data Collectors, VIPs	Pavilion
1405 - 1425	Run VIP Vignette	OpEx Management, First Responders, Actors, Data Collectors, VIPs	Pavilion
1425 - 1600	Data Collector Discussions & Surveys	OpEx Management, First Responders, Actors, Data Collectors	Pavilion
1600 - 1615	Transit to PCC	OpEx Management, First Responders, Actors, Data Collectors	Pavilion
1615	Actors Released	Actors	PCC
1615 - 1650	Hotwash OpEx & Equipment Check-in	OpEx Management, Technology Providers, First Responders, Data Collectors	PCC
1650 - 1700	Closing Remarks & Release	First Responders	PCC

3.1.5 Wednesday, December 5 – VIP and Media Schedule

Participants: DHS OpEx Management, Technology Providers, Responder Agency Liaisons

Locations: PCC, Sam Houston Pavilion

Time	Event	Participants	Location
1230 - 1300	Registration	VIPs	PCC
1300 - 1330	VIP Opening Remarks	VIPs	PCC
1300 - 1345	Transit to Pavilion	VIPs	PCC
1345 - 1405	Remarks at Pavilion	OpEx Management, First Responders, Actors, Data Collectors, VIPs	Pavilion
1405 - 1425	Run VIP Vignette	OpEx Management, First Responders, Actors, Data Collectors, VIPs	Pavilion
1425 - 1455	Q&A Panel w/Press Conference	OpEx Management, VIPs, First Responder Panelists	Pavilion
1455 - 1510	Transit to PCC	VIPs	Pavilion

Time	Event	Participants	Location
1510 - 1545	Tech Showcase	Technology Vendors, VIPs and Agency Liaisons	PCC
1545 - 1550	Closing Remarks	Technology Vendors, VIPs and Agency Liaisons	PCC
1550	VIPs Released	VIPs	PCC

3.1.6 Thursday, December 6

Participants: DHS OpEx Management, Technology Providers, Controllers, Data Collectors

Location: PCC

Time	Event	Participants	Location
0800 - 0900	Full Debrief	OpEx Management, Technology Providers	PCC
0900 - 1000	After Action Planning	OpEx Management, Technology Providers	PCC
1000 - 1200	Clean-up	OpEx Management, Technology Providers	PCC
1200	Leave the Port	All	PCC

3.2 Participant Roles and Responsibilities

The term participant encompasses many groups of people. The specific types of participants involved in the OpEx are delineated below and include their respective roles and responsibilities:

3.2.1 Players

Players are personnel (e.g., first responders, emergency managers, public safety personnel) who have an *active* role in performing their regular roles and responsibilities during the scenario response. Players initiate actions in response to the events (both simulated and real).

Players should ensure the following:

- Review their appropriate plans, procedures and protocols.

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

- Obtain all necessary equipment ahead of time from DHS.

3.2.2 Actors

Actors are personnel (e.g., CERT volunteers, Coastguardsmen) who are playing victims during the scenario. Coast Guard actors will be playing crewmembers of the M/V Hatchet and will be afflicted by the toxic gas release on their boat. CERT volunteers will be playing civilian tourists aboard the M/V Sam Houston who are also afflicted by the toxic gas.

Actors should ensure the following:

- Review their appropriate plans, procedures and protocols.

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

3.2.3 Agency Liaisons

Agency liaisons serve as the key point of contact with their agency's participating players and actors and have been the main coordinators with DHS S&T on all OpEx activities and plans. Some agency liaisons may also serve as players during the exercise.

Agency liaisons should ensure the following:

- Review their appropriate plans, procedures and protocols.

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

- Obtain all necessary equipment ahead of time.

3.2.4 Observers

Observers from local and nationwide public safety organizations are participating in this OpEx to identify operational and technological lessons learned that can be shared by DHS S&T and themselves to benefit first responders as they adopt new technologies.

Observers should ensure the following:

- Review their appropriate plans, procedures and protocols.

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

- Share all observations and documented feedback with DHS S&T data collectors at the end of the event.

3.2.5 Data Collectors

Data collectors for this OpEx are assigned to observe, note and document events and actions (e.g., send and receipt of communications, video quality and clarity, timeliness of information received, human performance factors, etc.) associated with the intended use of the technologies. Their primary role is to observe and *document* actions, discussions, timing, results and end user comments.

Data collectors should ensure the following:

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

- Obtain all necessary forms ahead of time.

- Review the data collection forms and fully understand the data collection requirements.

- Report to their assigned locations.

- Participate in all pre-OpEx events (e.g., dry run, training, etc.).

- Participate in all post-OpEx events (e.g., vignette debriefs, final hotwash, AAR review, etc.).

3.2.6 Controllers

For this OpEx, there are three types of Controllers: 1) Master Controllers, 2) Venue Controllers, and 3) Technical Controllers. All Controllers should have a thorough understanding of the MSEL and have participated in a controller training prior to the event.

Master Controllers:

Master Controllers will be located in the Simulation Cell (SimCell) - a location from which the master controllers can deliver messages representing actions, activities, as well as monitor the overall progression of the event. The Master Controllers will use the Master Scenario Events List (MSEL) to guide or prompt player responses. Accompanying maps and a list of ad-hoc injects will also be available in the event additional prompts are needed. In the event of a real-world event, the Master Controller will communicate a pre-determined code word to stop the event. The code word for this event is **Real World Event—Stop Exercise**.

Venue Controllers:

Venue controllers will be located at each venue or facility participating in the OpEx (e.g., docking locations, staging areas, emergency management entities, firehouse, command centers, information center, etc.). Venue controllers ensure smooth execution of operational play by ensuring MSEL injects and expected player actions occur as intended. Venue controllers will also assist players if needed in understanding injects, the sequence of the events, the technologies being used and the expected actions/outcomes from each inject. The venue controller assigned to incident command may assist the Incident Commander with initiating events to prompt players to take action, as well as provide situational updates and ad-hoc injects to prompt a response when/if needed.

Technical Controllers:

Technical controllers will be located at the major venues. Technical controllers focus on the use of the technologies within operational play and ensure that the technology objectives of the OpEx are met through conduct. Technical controllers are technical subject matter experts who understand the participating technologies, how they integrate and how to trouble-shoot issues should any arise during operational play.

Controllers should ensure the following:

- Attend required training and other briefings.

- Review appropriate exercise materials included in the OpEx Playbook.

- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.

- Be at your pre-assigned location (e.g., pre-staging) at least 30 minutes before the start of each vignette.

- Obtain all necessary forms ahead of time.

- Review the data collection forms and fully understand the data collection requirements.

- Venue-based controllers should communicate any changes or adjustments to the MSEL to the Master Controllers in the SimCell.

- Technical controllers should communicate any significant technology issues to the Master Controllers in the Sim Cell.

- Participate in all pre-OpEx events (e.g., dry run, training, etc.).

- Participate in all post-OpEx events (e.g., vignette debriefs, final hotwash, after action report [AAR] review, etc.).

3.2.7 OpEx Management

OpEx management are dedicated to ensuring all components of the event run smoothly, with a particular focus on logistics, VIP coordination, communications and outreach. OpEx management produces all OpEx materials and documentation, runs registration, coordinates with the agency liaisons and Port facility owners, provides overarching technical and evaluation guidance, and facilitates capture of lessons learned.

OpEx management should ensure the following:

- Lead required training and other briefings.
- Review appropriate exercise materials included in the OpEx Playbook.
- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.
- Be at your pre-assigned location at least 30 minutes before the start of each event.
- Coordinate with all types of participants to ensure they have the information they need and that every event is running smoothly.
- Lead all pre-OpEx events (e.g., dry run, training, etc.).
- Lead all post-OpEx events (e.g., vignette debriefs, final hotwash, AAR review, etc.).

3.2.8 Technology Providers

For this OpEx, there are two types of technology providers: 1) DHS-funded, and 2) industry vendor. All technology providers have been engaged in extensive pre-OpEx technical integration work using the NGFR Integration Handbook.

- **DHS-funded Technology Providers**: DHS-funded technology providers are currently on contract or sub-contract with DHS S&T to develop, adapt, test or evaluate technologies for first responders.
- **Industry Vendor Technology Providers**: Industry vendor technology providers have signed Cooperative Research and Development Agreements with DHS S&T to facilitate their participation in this event. While both DHS and the industry vendors benefit from the event, these participants are not on contract or receiving monetary compensation for attending.

Technology providers should ensure the following:

- Review their appropriate plans, procedures and protocols.
- Bring all necessary equipment and have it ready and charged for player use ahead of time.
- Attend required integration meetings and other briefings.
- Review appropriate exercise materials included in the OpEx Playbook.
- Report to the event check-in location at the designated time to sign in, receive your identification and receive your copy of the OpEx materials.
- Set up, staff and tear-down your technology's presentation table at the OpEx VIP Technology Showcase.
- Record and provide a log of your technology's actions and technical support interventions during the vignettes for post-OpEx data analysis.

3.3 Participant Safety

3.3.1 Safety

Exercise participant safety takes priority over exercise events. Although the personnel involved in this exercise come from various response agencies, they share the basic responsibility for ensuring a safe environment for all personnel involved in the exercise. Professional health and safety ethics should guide all participants to operate in their assigned roles in the safest manner possible. The following general requirements apply to the exercise:

- All controllers, data collectors and exercise staff members will serve as safety observers while exercise activities are underway. Exercise participants must immediately report any safety concerns to the Safety Controller or Exercise Director.

- Participants will be responsible for their own and one another's safety during the exercise. All persons associated with the exercise are responsible to stop play if, in their opinion, a real safety problem exists. After the problem is corrected, exercise play can be resumed.

- All organizations will comply with their respective environmental, health and safety plans and procedures, as well as appropriate federal, state and local environmental health and safety regulations.

The OpEx Safety Officers (Rodney Reed and Colin Rizzo) have the authority to stop, and/or modify play as needed to ensure participant safety.

The following are the general rules that govern the OpEx:

- Real-world emergencies and participant safety take priority over exercise events. The code word that will be used if a real-world event or an emergency would take place and the OpEx would require to be stopped, or stalled, will be **Real World Event—Stop Exercise**.

- OpEx participants will comply with real-world response procedures, unless otherwise directed by control staff.

- All communications (written, radio, telephone, etc.) made during the exercise will begin and end with the phrase, "Exercise, Exercise, Exercise."

To facilitate the full implementation of the scenario, simulations are somewhat plausible and will contain sufficient detail from which players can respond, including actors who are demonstrating symptoms as if exposed to the HAZMAT chemical in the scenario. Do not be alarmed.

3.3.2 Accident Reporting and Real Emergencies

Due to the nature of this OpEx, it is not anticipated that any accidents will occur; however, if an accident or real world emergency does occur, the participant is to immediately stop exercise play by using the code word "**Real World Event—Stop Exercise**," attend to the accident or real-world emergency as necessary, and notify the OpEx Director and Master Controller as soon as possible. If a real emergency occurs that affects the entire event, the exercise may be suspended or terminated at the discretion of the OpEx Director, Mr. Sridhar Kowdley.

3.3.3 Player Communication

Players will use a combination of the routine, in-place agency communication systems, as well as the communications-based technologies that are a part of the event. The need to maintain capability for a real-world response may preclude the use of certain communication channels or systems that would usually be available for an actual emergency incident. In no instance will TechEx communication interfere with real-world emergency communications.

The incident radio communications plan, ICS 205, is included in Appendix E.

3.4 Venue Logistics and Security

3.4.1 Directions and Parking

The Port of Houston has a single street address for the entire Port, which directs to the main administration building.

> Port of Houston Authority
> 111 East Loop North
> Houston, TX 77029

Our event starts in the PCC, which is about 1.2 miles into the port property from the main gate. When entering the port through the main gate, follow signs for "Police Station" and continue straight down the road, then make a right at the second stop sign. The PCC is the first building on the right. Enter the parking lot through the chain link fence and park in the designated areas shown in the map below.
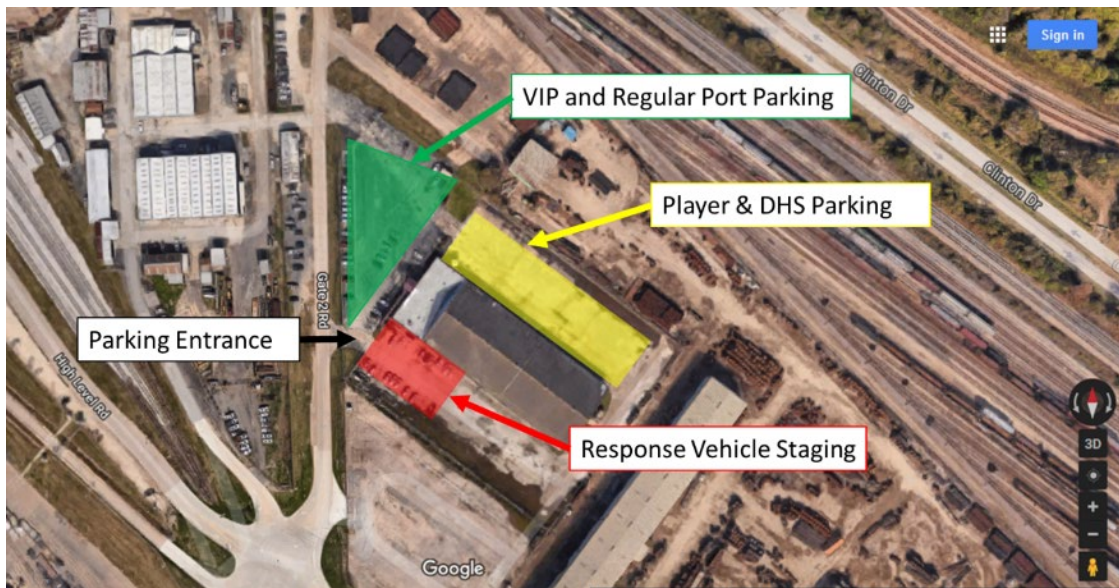
3.4.2 Shuttle

The Port of Houston is generously providing shuttle busses to help with transit between the PCC and the Sam Houston Pavilion, so OpEx participants do not fill up the parking at the Pavilion, leaving room for response vehicles.

- If you are driving a **response vehicle** (i.e., ambulance, command vehicle) to the OpEx, you should park at the PCC in the Responder Vehicle Staging section in red on the map, and then drive it to the Pavilion when the OpEx starts.

- If you are driving a **personal vehicle** to the OpEx, you should park in the Player and DHS Parking section in yellow on the map, and then **take the Port shuttle** to the Pavilion before the OpEx starts.

- All DHS OpEx Management, Data Collectors and Controllers should take the shuttle unless specifically directed otherwise.

3.4.3 Check-in Procedures and Locations

All who are participating in the NGFR OpEx will be required to check in at the registration table located inside the port coordination center each morning. If the participant has not already signed the rules of behavior or a photo/video release form, they will be required to sign one at the time of check-in.

3.4.4 Photography Limitations

As the Port of Houston is a Critical Infrastructure site, **photography and videography are forbidden** unless you have requested permission and been pre-approved by the Port Security Office. If you would like to request authorization to take pictures and video, please contact NGFR@hq.dhs.gov for the Port Photography Authorization form.

Even with approval from the Port Security Office, the following photography limitations apply:

- **Sam Houston Pavilion and Sam Houston Vessel**

  - Not Restricted:
    - Media/recording at the Sam Houston Pavilion for media/DHS
    - Media/recording on the Sam Houston Vessel except in those areas listed below
  - Restricted:
    - Sam Houston Vessel Wheelhouse, access points to the Wheelhouse and Engine Room

- **Port Coordination Center**

  - Not Restricted:
    - Media/recording at the PCC Training Room, East Parking Lot (Staging and COLT) and Emergency Operations Center
  - Restricted:
    - No media/recording will be allowed in the other areas of the PCC unless specifically approved by PHA

- **City Dock 3 and Southside**

  - Restricted:
    - No media on the Southside (City Dock 3). Any DHS recordings will need to be reviewed by PHA.

- **Railroad bridge upstream of Pavilion:**

- Restricted: The Port requests that participants limit video recording and photography of the railroad bridge

3.4.5 OpEx Badges and Designations

<mark>Yellow</mark>: First Responders

Grey: Actors

Green: Observers

Black: Agency Liaisons

Orange: Data Collectors

Purple: OpEx Management Team

Blue: Technology Vendors

Red: VIPs

Teal: Media

4 Scenario

4.1 Overview

The Scenario is comprised of 3 vignettes based on the accidental release of a volatile chemical from a vessel parked across/near the Sam Houston Boat Park followed by alerts, notifications, activations, response, triage and decontamination. The DHS Core Capabilities for this experiment include: 1) Operational Communications, 2), Environmental Response/Health and Safety, 3) Situational Assessment, 4) Operational Coordination, 5) Intelligence and Information Sharing, 6) Access Control and Identity Verification, 7) Mass Search and Rescue Operations, and 8) On-Scene Security, Protection and Law Enforcement. The 3 vignettes of the scenario are:

- **Vignette A**: Notification and Deployment
- **Vignette B**: Unified Command and HAZMAT Response
- **Vignette C**: Search and Rescue and Mass Casualty Incident

4.2 Vignette Descriptions and Storyboards

4.2.1 Vignette A – Notification and Deployment

Description: A distress notification is received from the U.S. Coast Guard Cutter (USCGC) Hatchet Captain reporting they have just docked near City Dock 03 and noticed white smoke/haze coming from the aft cargo hold. The Captain reports he has crew members complaining of headaches, nausea, irritated eyes and vomiting. All crew members have evacuated the cargo hold and are clustered on deck. The Captain also reports the M/V Sam Houston (S/H) Tour Boat was not far behind his vessel. Both vessels (Hatchet and S/H) are moored at designated locations. Assets are deployed from the Port of Houston Authority to respond per protocol. Incident Command (IC) is established by the Port Battalion Chief and assistance has been requested per protocol. Resources and responding units deployed, arrive at PHA and report to PHA IC.

Storyboard:

Vignette A Timeline Storyboard (Day 1)

A-001 — STARTEX — USCG Hatchet Docked with Symptomatic Crew — MAYDAY from Captain

PHA Dispatch Notifications

USCG Sector H/G Watchstander — Marine Strike Team Notifications

PHA Police On-scene

PHA Battalion Chief Deployed Assumes Incident Command — Marine Units Self-Deploy via Moxtra

SMAG Moves Cameras For SA

A-021

A-056 — Sam Houston Tourists, also Symptomatic, was following — USCG Hatchet, Now Docked

A-059 — Incident Command Requests Additional Resources

ENROUTE

A-112 — Incident Commander Determines Exclusion Zone — SHELTER IN PLACE

Plume Model is Provided

A-111 — Incident Command Posts for SA

A-114 — All Responders On Scene At Pavilion — Unified Command Established — EOC's Activated — Monitoring

Agency Color Legend
- Atascocita
- Cy-Fair
- Harris County
- Houston
- Port of Houston
- US Coast Guard

Summary: Distress call from USCG Hatchet. Captain . . . just docked near City Dock 03. Noticed white smoke/haze in aft cargo hold. Crew members complaining of headaches, nausea, irritated eyes, and vomiting . . . have evacuated and clustered on deck. The Captain also reports the M/V Sam Houston Tour Boat was not far behind his vessel. Assets are deployed from PHA to respond per protocol. Incident Command is established by the Port Battalion Chief and assistance requested. Resources and responding units deployed, arrive at PHA and report to IC.

4.2.2 Vignette B – Unified Command and HAZMAT Response

Description: Assets and responders on scene. IC has evolved into Unified Command (UC). Tourists from S/H also exhibiting chemical-like exposure symptoms. The USCG Sector Houston / Galveston notifies MAUG & VTS. Harris County Law Enforcement, Sheriff, and the Houston Police Department and Marine Division are on-scene (waterside) at both locations. USCGC Hatchet crew member reports seeing a carboy knocked over in the aft hold with chemicals spilling from it. A cargo list is obtained from the Captain. Harris County EOC is activated. After review of the cargo list, it is determined the accidental spill in the aft cargo area is methyl bromide. It is also determined that a crew member is missing from the Hatchet.

Storyboard:
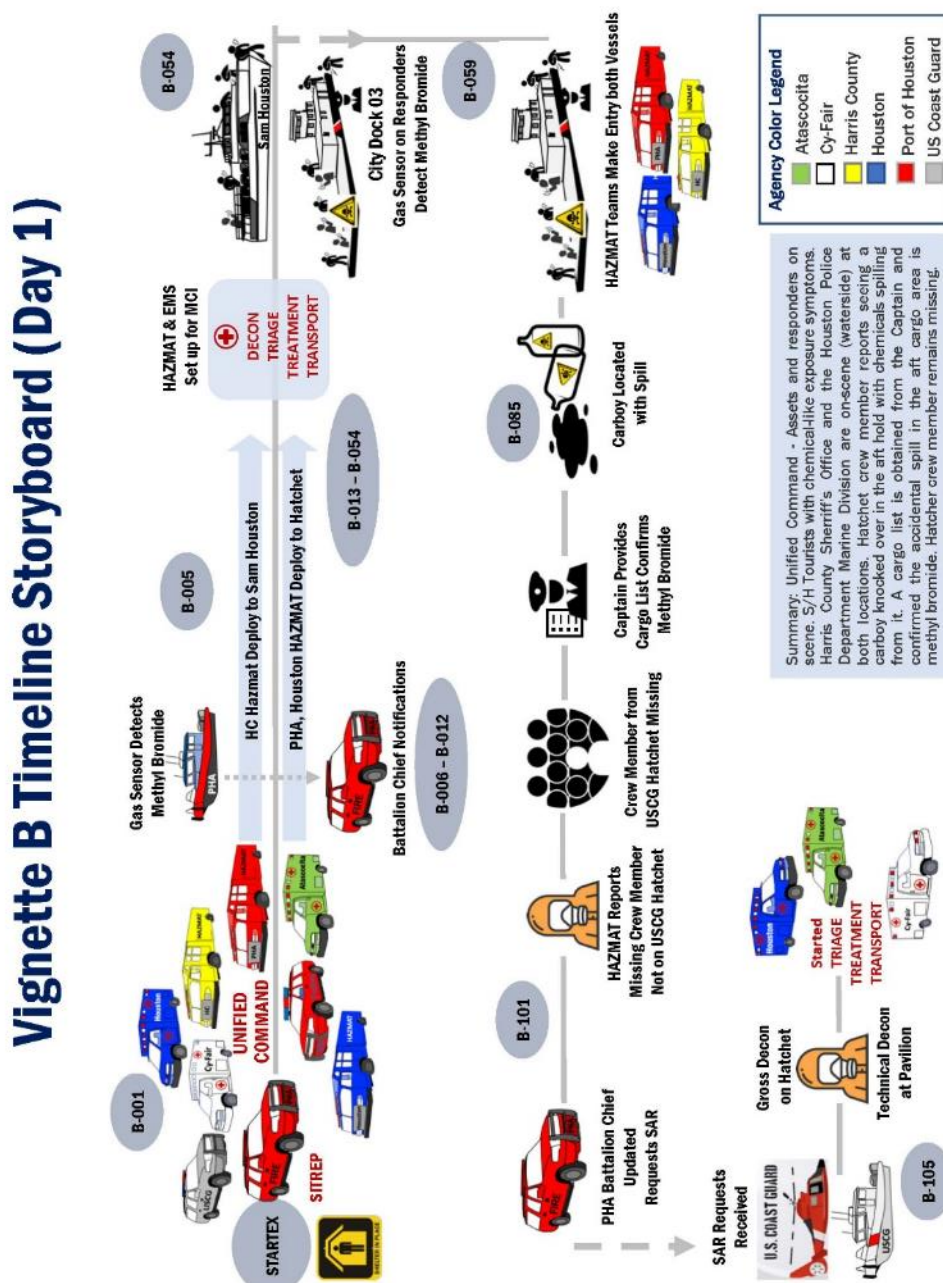
4.2.3 Vignette C – Search and Rescue and Mass Casualty Incident

Description: A plume model has been provided to the PHA IC. IC/UC has determined the need for shelter in place. Movement and Triage victims has commenced. The ship channel downstream from the Turning Basin is closed to prevent additional vessels from entering the area. USCG dispatches a small boat to establish a barrier patrol and block the ship channel / Buffalo Bayou to the SE of incident. A crew member remains missing from the Hatchet. IC/UC requests support for Search and Rescue (SAR) - the USCG deploys a small boat. The crew member is located by the small boat in the water and rescued via USCG Helo. HAZMAT units have commenced decontamination per protocol. Reports are logged and event closed.

Storyboard:
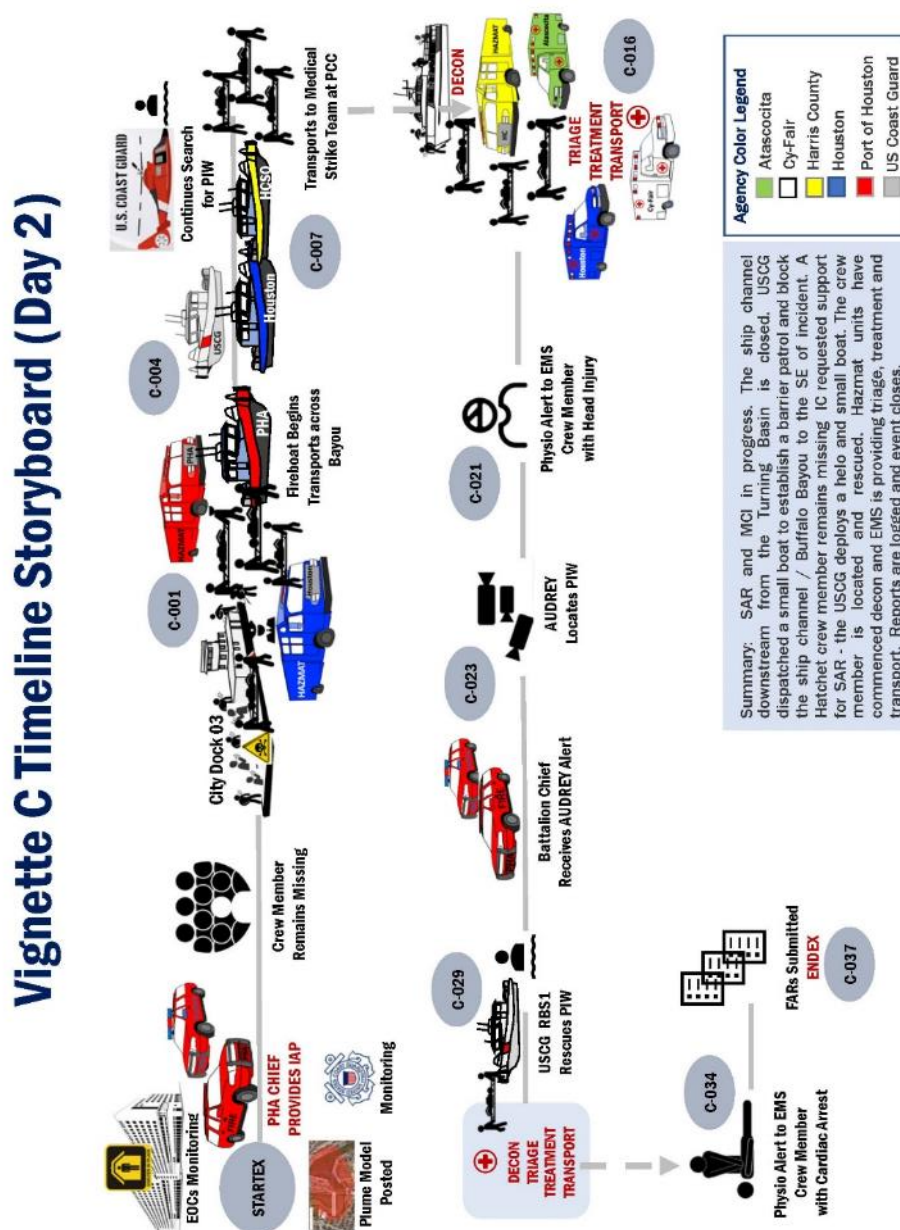
4.2.4 VIP Vignette

Description: The VIP Vignette is a condensed scenario with parts of vignettes B and C combined into a 20-minute demonstration to showcase key technologies.

Storyboard:
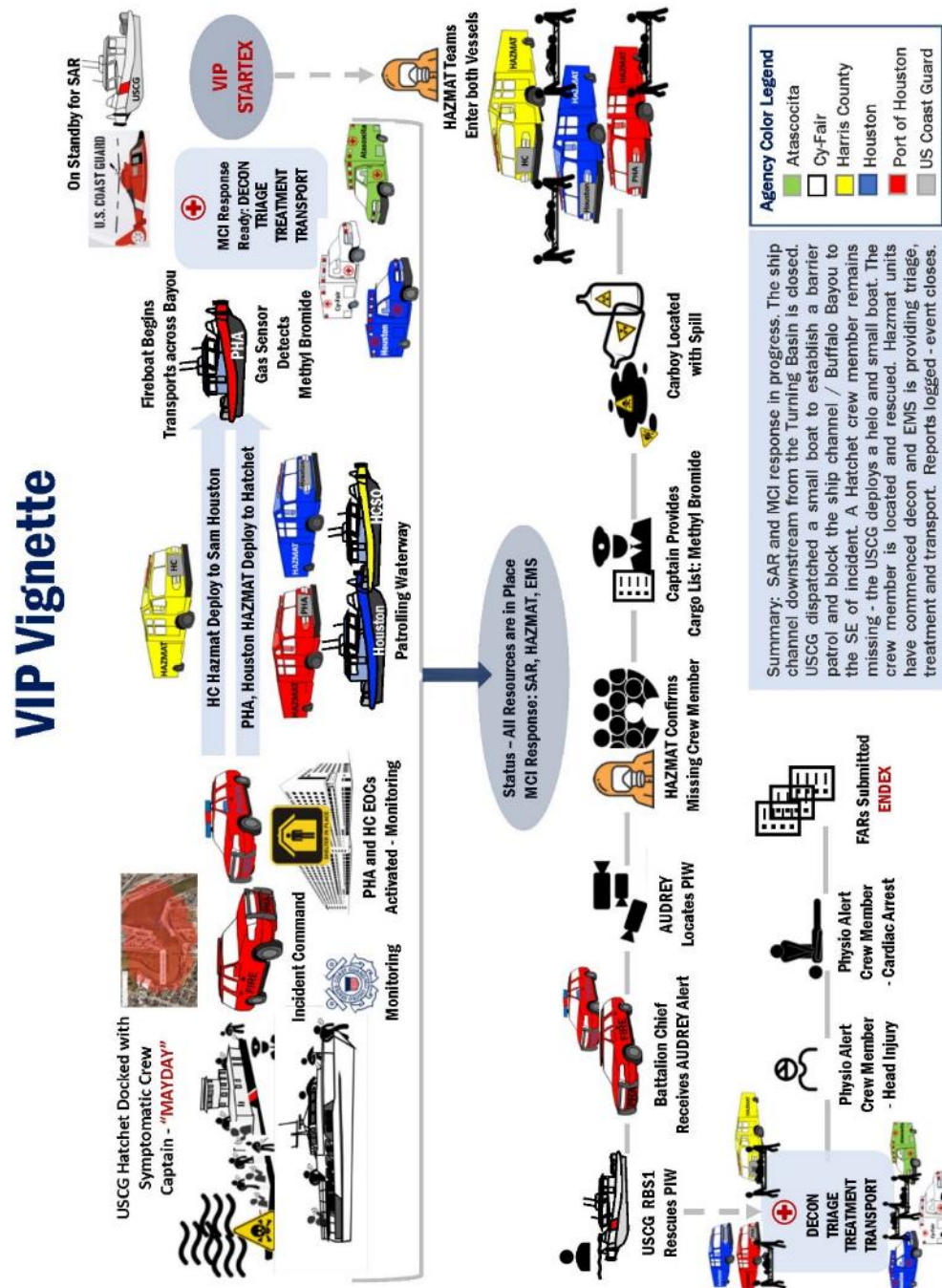
4.3 Master Scenario Events List

The Master Scenario Events List (MSEL) is a separate document that is available upon request from NGFR@hq.dhs.gov.

5 Appendix A: Maps and Incident Command Structure

Resources and placement are dependent on operational availability and these maps may not reflect the real-time deployment on event days.

5.1 OpEx Pre-Event Locations

PHA FIRE STATION 1
- PHA Hazmat 1 (4)
- PHA Fire SUV (1)
- PHA Fire Boat 1 - Moored

PRE-EVENT VEHICLE STAGING

SAM HOUSTON PAVILION
- PHA Mobile Command Center (PHA MCC)
- Harris County Hazmat Trailer 1 (MC HM1)
- FirstNet COW
- Harris County Fire Marshal (1) SUV?

PORT COORDINATION CENTER (PCC)
- PHA Police 1 (1)
- PHA Police 2 (1)
- Harris County Mobile Command Post (MCP3) (1)
- Harris County Hazmat Unit 1 (4)
- Houston Hazmat 1 (5)
- Houston EMS 1 (2)
- CyFair EMS 1 (2)
- Atascocita EMS 1 (2)
- USCG COTP SUV

CITY DOCK 3

SH MOORING

Master Control/SimCell – Location TBD

USCG STATION HOUSTON - WATER SIDE
- Harris County Marine 1 (5)
- USCG RB-S 1 (4)
- Houston PD Marine 1 (3)
- Houston PD Marine 2 (3)

MONITORING POSITIONS (DO NOT DEPLOY)
- PHA EOC
- Harris County EOC
- PHA DISPATCH
- SETRAC
- USCG Sector/SMAG/VTS

USCG HELO USCG Air Station Houston

5.2 POST VIGNETTE A – Expected Locations and Incident Command Structure

SH MOORING — M/V SAM HOUSTON

CITY DOCK 3

PHA DISPATCH

Communications · *Channels Patched*

On-Scene Incident Command
PHA Battalion Chief

PREPARING FOR ENTRY, SIZE-UP, GROSS DECON
- PHA Fire SUV (1)
- Harris County Hazmat Unit 1 (4)
- PHA Police 1 (1)
- PHA Police 1 (1)
- Harris County Fire Marshal (1) SUV

PREPARING FOR ENTRY, SIZE-UP, GROSS DECON
- PHA Fire Boat 1
- PHA Hazmat 1 (4)
- Houston Hazmat 1 (5)

STAGING – TURNING BASIN - STAND-BY
- Houston PD Marine 1 (3)
- Houston PD Marine 2 (3)
- USCG RB-S 1 (4)
- Harris County Marine 1 (5)

TRIAGE/TRANSPORT AREA
- Houston EMS 1 (2)
- CyFair EMS 1 (2)
- Atascocita EMS 1 (2)

STAND-BY
- USCG COTP SUV
- USCG HELO USCG – Positioned at Air Station Houston

MONITORING POSITIONS - DO NOT DEPLOY
- PHA EOC
- USCG Sector/SMAG/VTS
- SETRAC
- Harris County EOC

5.3 POST VIGNETTE B – Expected Locations and Incident Command Structure

SH MOORING

PHA DISPATCH

CITY DOCK 3

Communications

On-Scene Incident Command PHA Battalion Chief

Unified Command

Channels Patched

ENTRY, SIZE-UP, GROSS DECON

- PHA Fire SUV (1)
- Harris County Hazmat Unit 1 (4)
- PHA Police 1 (1)
- PHA Police 1 (1)
- Harris County Fire Marshal (1) SUV

ENTRY, SIZE-UP, GROSS DECON

- PHA Fire Boat 1
- PHA Hazmat 1 (4)
- Houston Hazmat 1 (5)

INITIATING SHUTTLE SERVICE

- Houston PD Marine 1 (3)
- Houston PD Marine 2 (3)
- Harris County Marine 1 (5)

USCG RB-S 1 (4) Deploys for SAR

STAND-BY

- USCG COTP SUV Deploys to Support
- USCG HELO USCG – Positioned at Air Station Houston

TRIAGE/TRANSPORT AREA

- Houston EMS 1 (2)
- CyFair EMS 1 (2)
- Atascocita EMS 1 (2)

MONITORING POSITIONS - DO NOT DEPLOY

- PHA EOC
- USCG Sector/SMAG/VTS
- SETRAC
- Harris County EOC

5.4 POST VIGNETTE C – Expected Locations and Incident Command Structure

SH MOORING

PHA DISPATCH

Communications

On-Scene Incident Command PHA Battalion Chief

Unified Command

Channels Patched

CITY DOCK 3

ENTRY, SIZE-UP, GROSS DECON

- PHA Fire SUV (1)
- Harris County Hazmat Unit 1 (4)
- PHA Police 1 (1)
- PHA Police 1 (1)
- Harris County Fire Marshal (1) SUV

ENTRY, SIZE-UP, GROSS DECON

- PHA Hazmat 1 (4)
- Houston Hazmat (5)
- PHA Fire Boat 1

USCG COTP SUV Support

SHUTTLE SERVICE

- Houston PD Marine 1 (3)
- Houston PD Marine 2 (3)
- Harris County Marine 1 (5)

USCG RB-S 1 (4) Deployed for SAR

USCG HELO USCG – DEPLOYED FOR SAR

TRIAGE/TRANSPORT AREA

- Houston EMS 1 (2)
- CyFair EMS 1 (2)
- Atascocita EMS 1 (2)

MONITORING POSITIONS - DO NOT DEPLOY

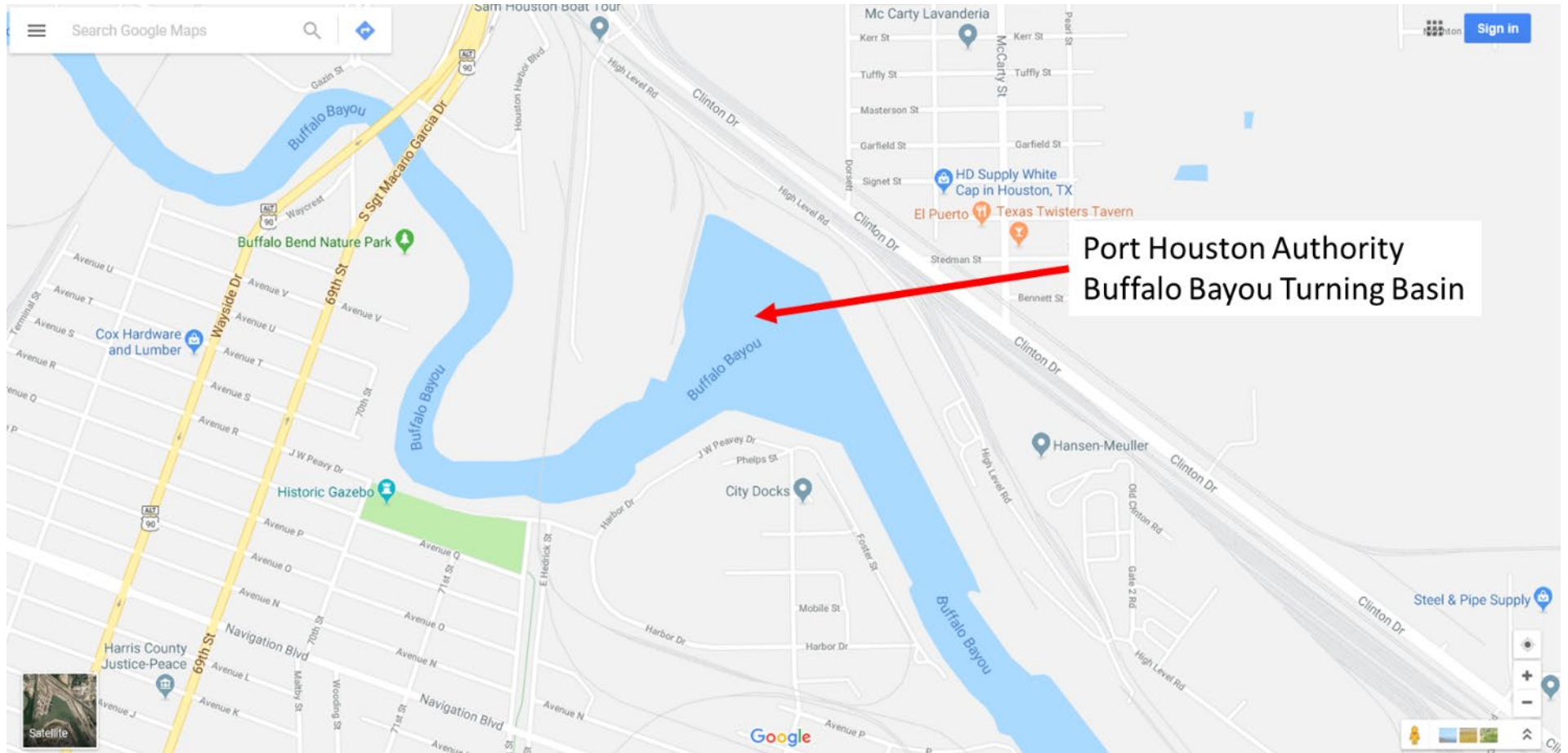| | PHA EOC | |
| USCG Sector/SMAG/VTS | SETRAC | Harris County EOC |

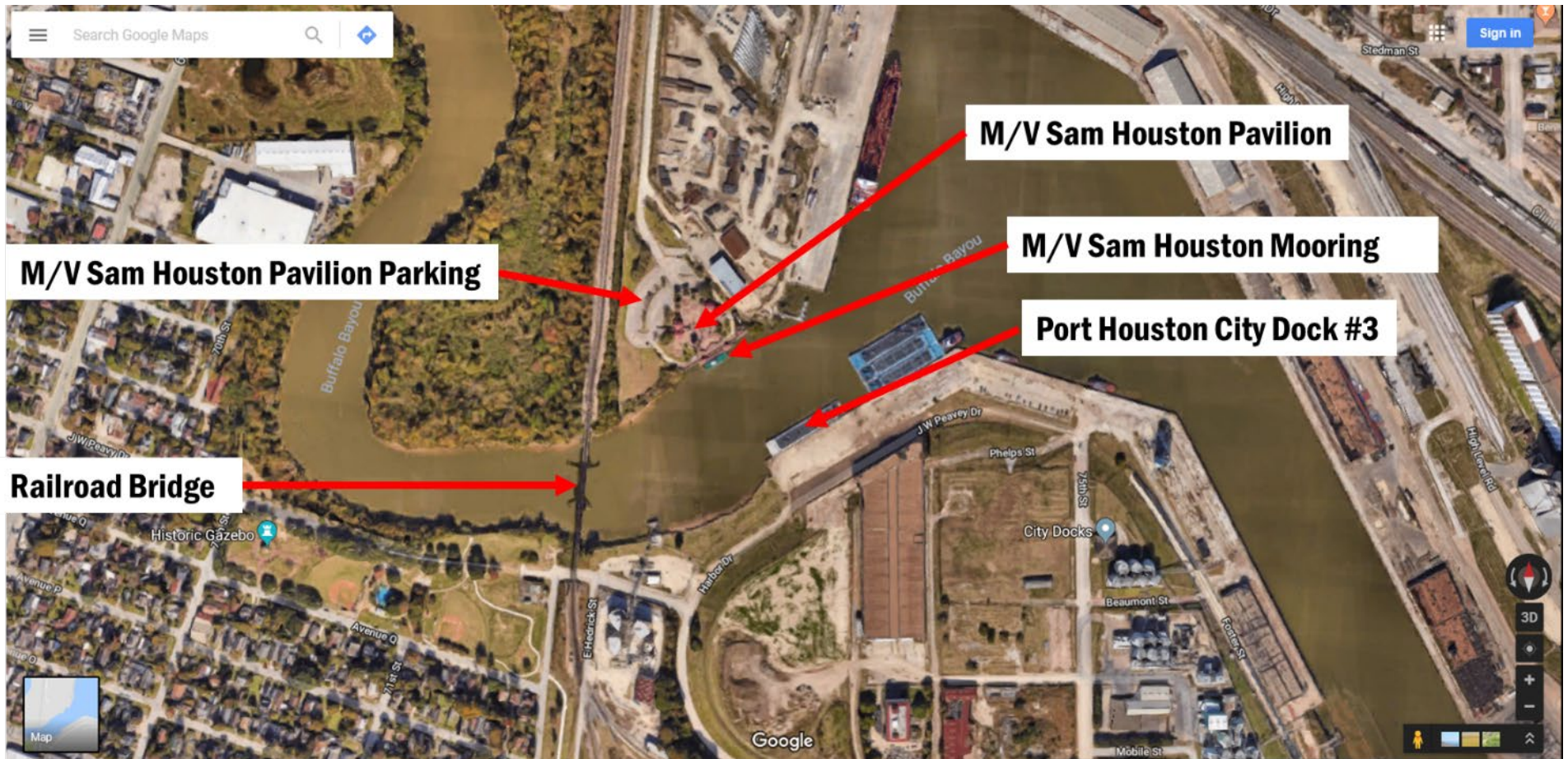## 5.5 City of Houston – Buffalo Bayou
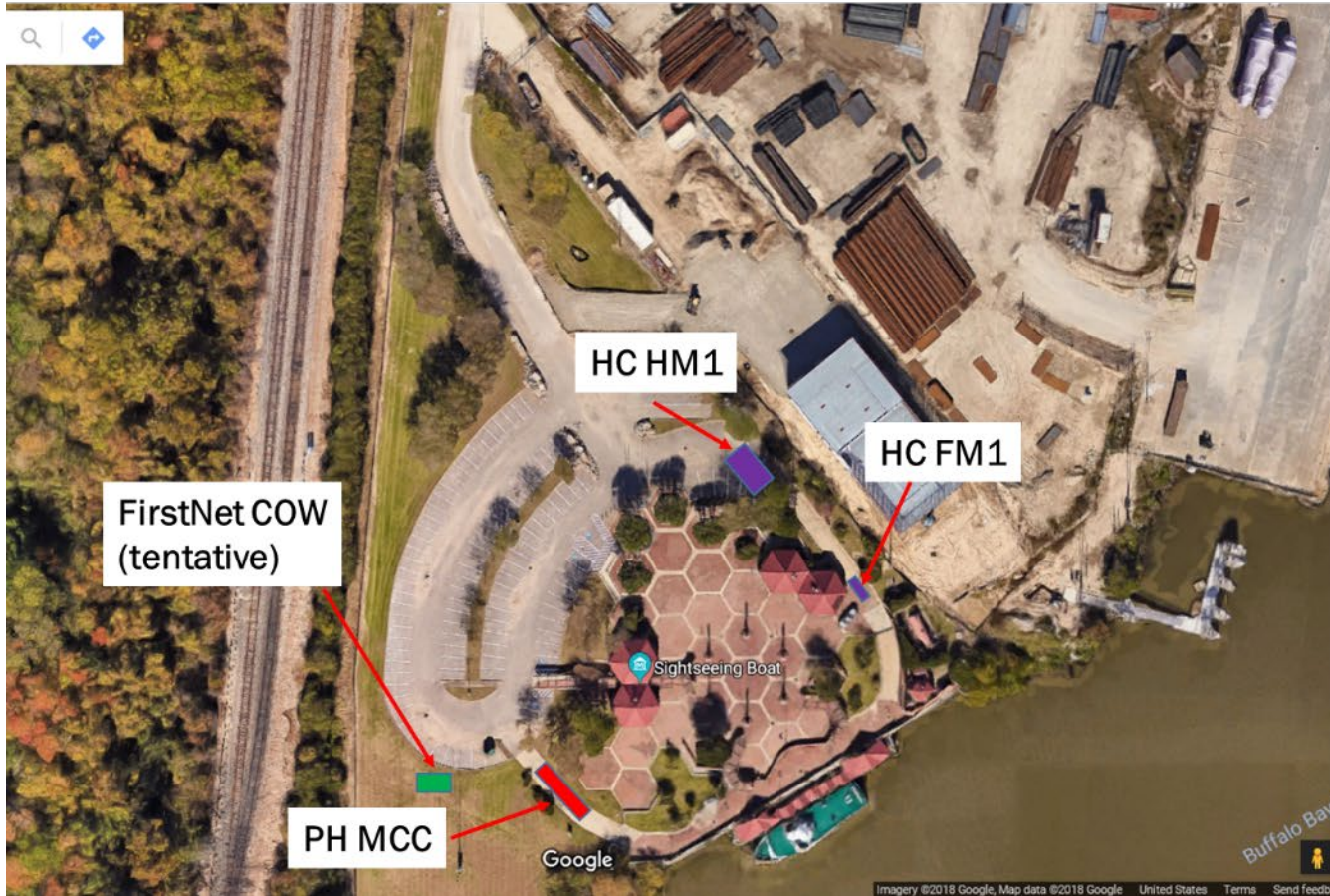
5.6 Buffalo Bayou Turning Basin

5.7 Port of Houston Authority – OpEx Site Overview
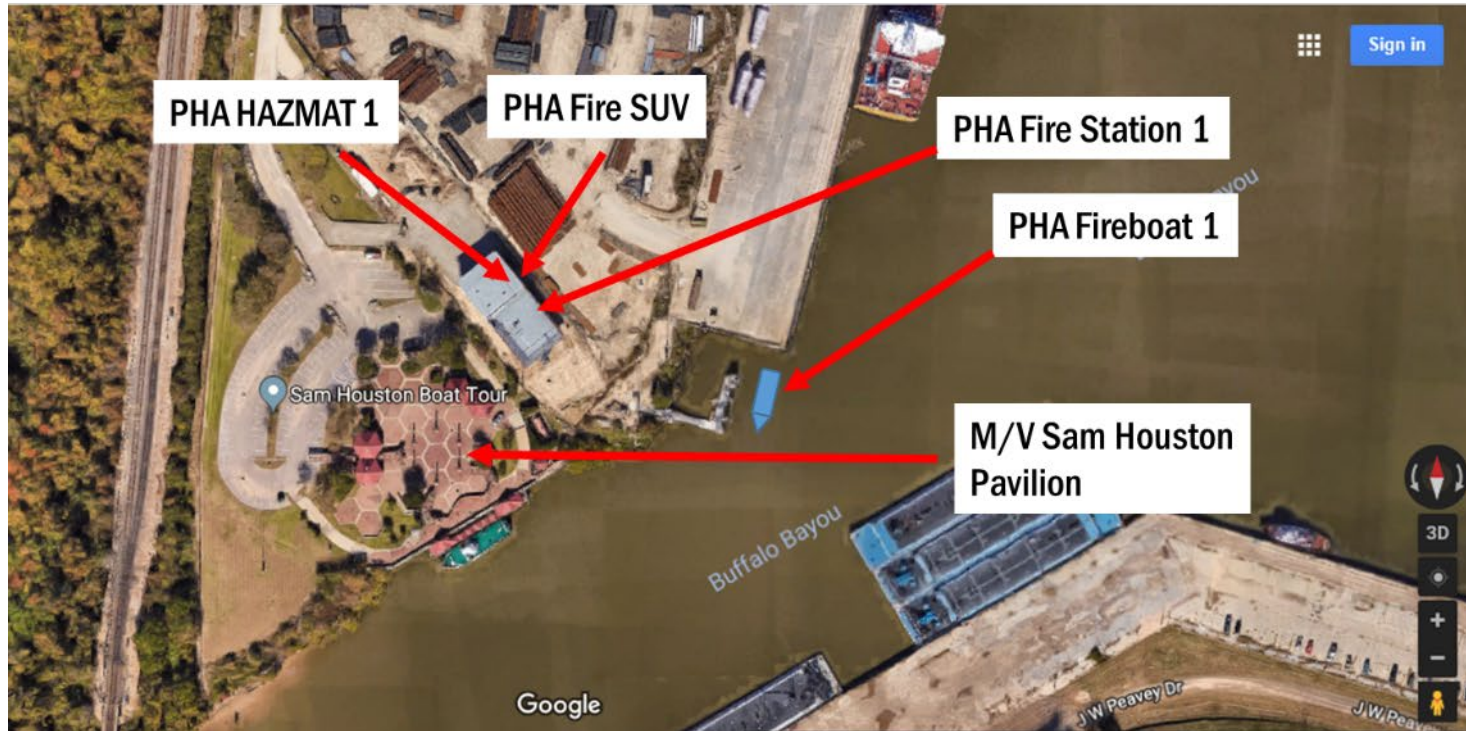
5.8 Pre-OpEx Staging Locations: Port of Houston Authority – Sam Houston Pavilion

- Port Houston Mobile Command Center (PH PCC)
- Harris County HAZMAT Equipment Trailer (HC HAZMAT 1)
- FirstNet Cell-on-Wheels/Cell-on-Light-Truck (COW) (tentative)
- Harris County Fire Marshall Vehicle (1 occupant)

5.9 Pre-OpEx Staging Locations: Port of Houston Authority – Fire Station 1 and Fireboat 1

5.10 Pre-OpEx Staging Locations: Port of Houston Authority – Port Location Overview

- Harris County HAZMAT (4)
- City of Houston HAZMAT (5)
- CyFair FD EMS (2)
- Atascocita FD EMS (2)
- City of Houston EMS (2)

- PHA Police 1 (1)
- PHA Police 2 (1)
- USCG COTP SUV (3)
- Harris County Mobile Command Post 3 (MCP3) (1 Dispatcher)

5.11 Pre-OpEx Staging Locations: Port of Houston Authority – Port Coordination Center

- Harris County HAZMAT (4)
- City of Houston HAZMAT (5)
- CyFair FD EMS (2)
- Atascocita FD EMS (2)
- City of Houston EMS (2)
- PHA Police 1 (1)
- PHA Police 2 (1)
- USCG COTP SUV (3)
- Harris County Mobile Command Post 3 (MCP3) (1 Dispatcher)
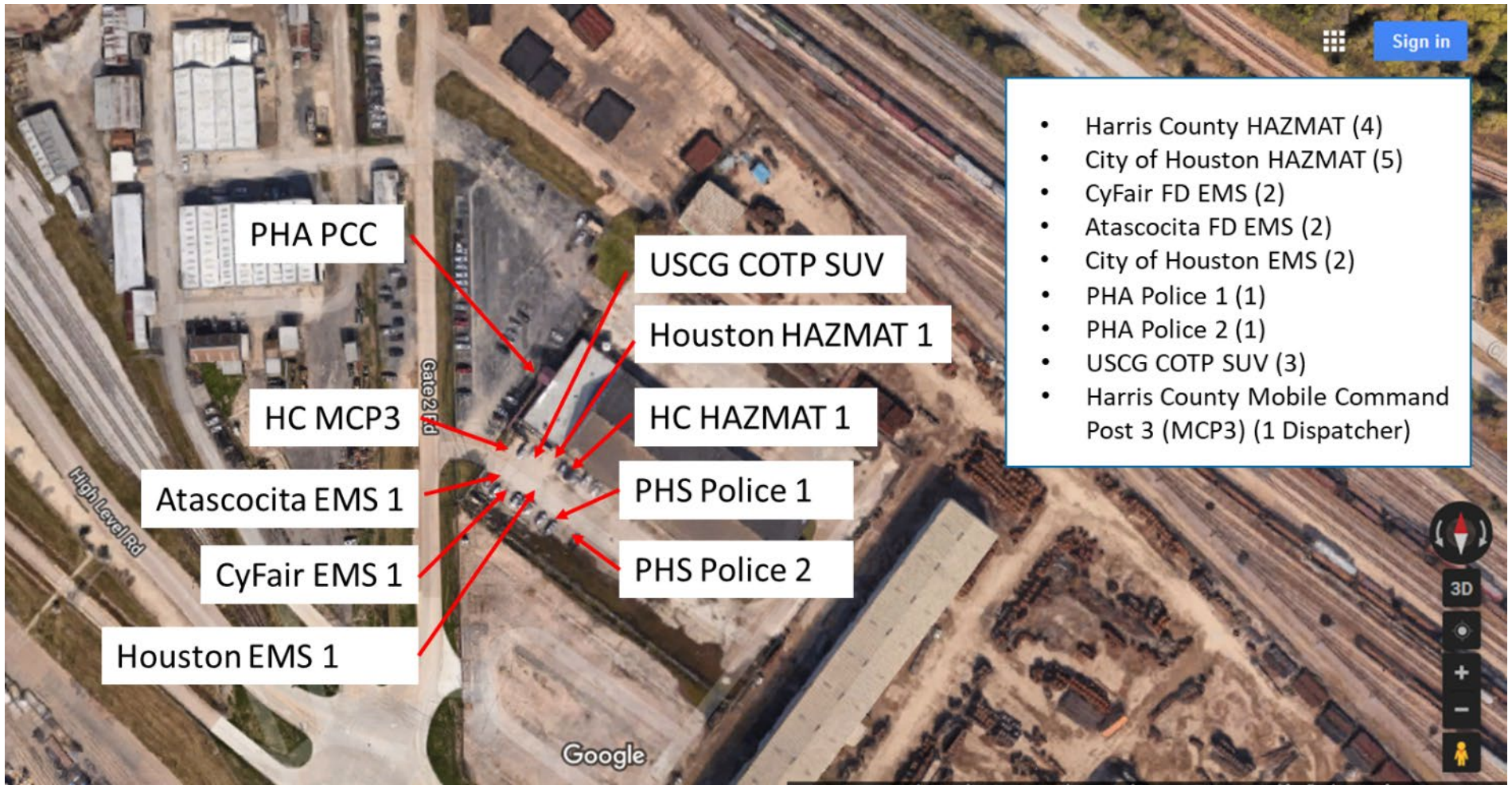
5.12 Pre-OpEx Staging Locations: USCG Station Houston

- USCG Response Boat-Small (RB-S) (4)
- Harris County Marine 1 (5)
- Houston Marine 1 (3)
- Houston Marine 2 (3)

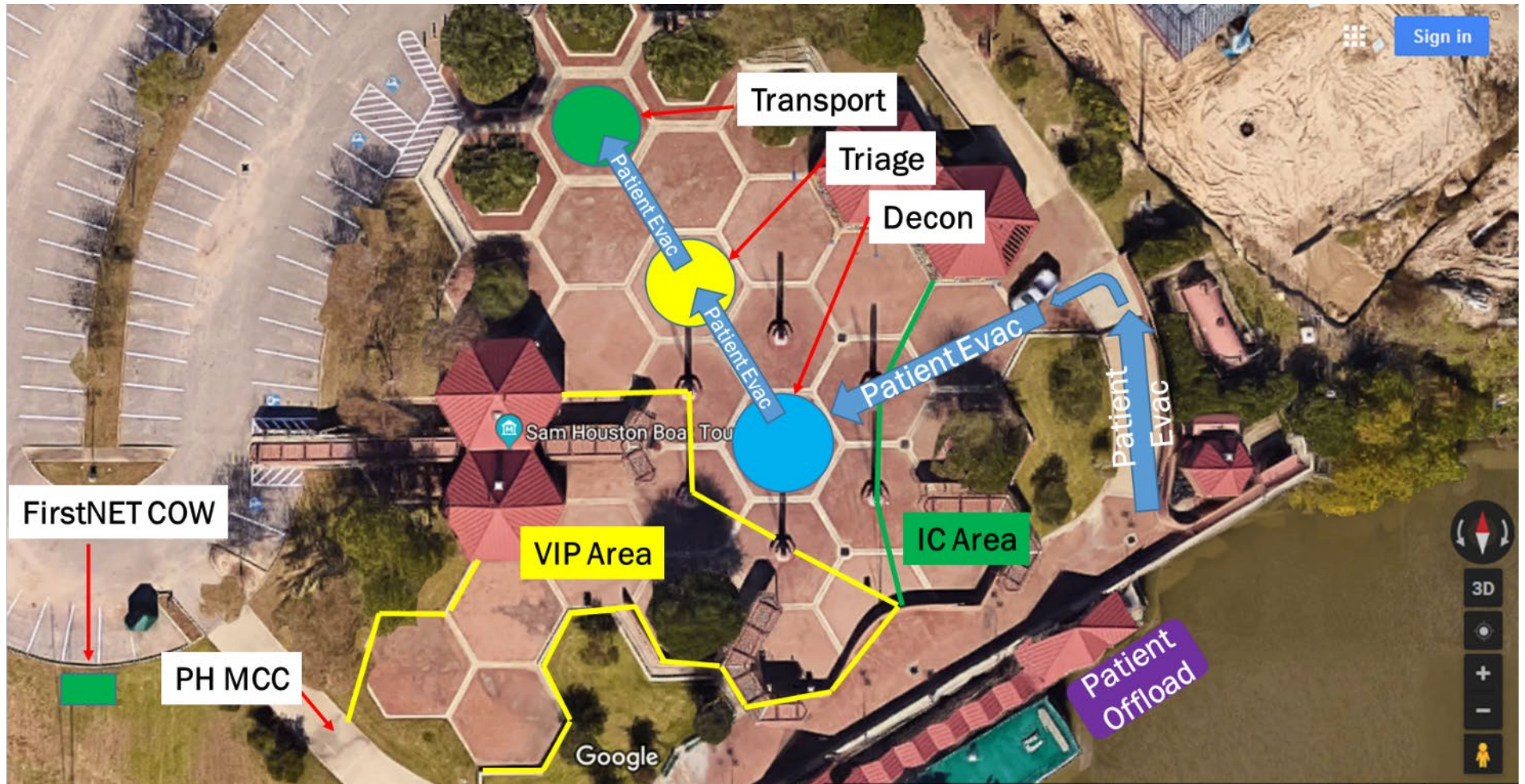## 5.13 Pre-OpEx Staging Locations: USCG Station Houston – Detailed View

- USCG Response Boat-Small (RB-S) (4)
- Harris County Marine 1 (5)
- Houston Marine 1 (3)
- Houston Marine 2 (3)

USCG Station Houston Response Boat - Small

Houston Marine 1

Houston Marine 2

Harris County Marine 1

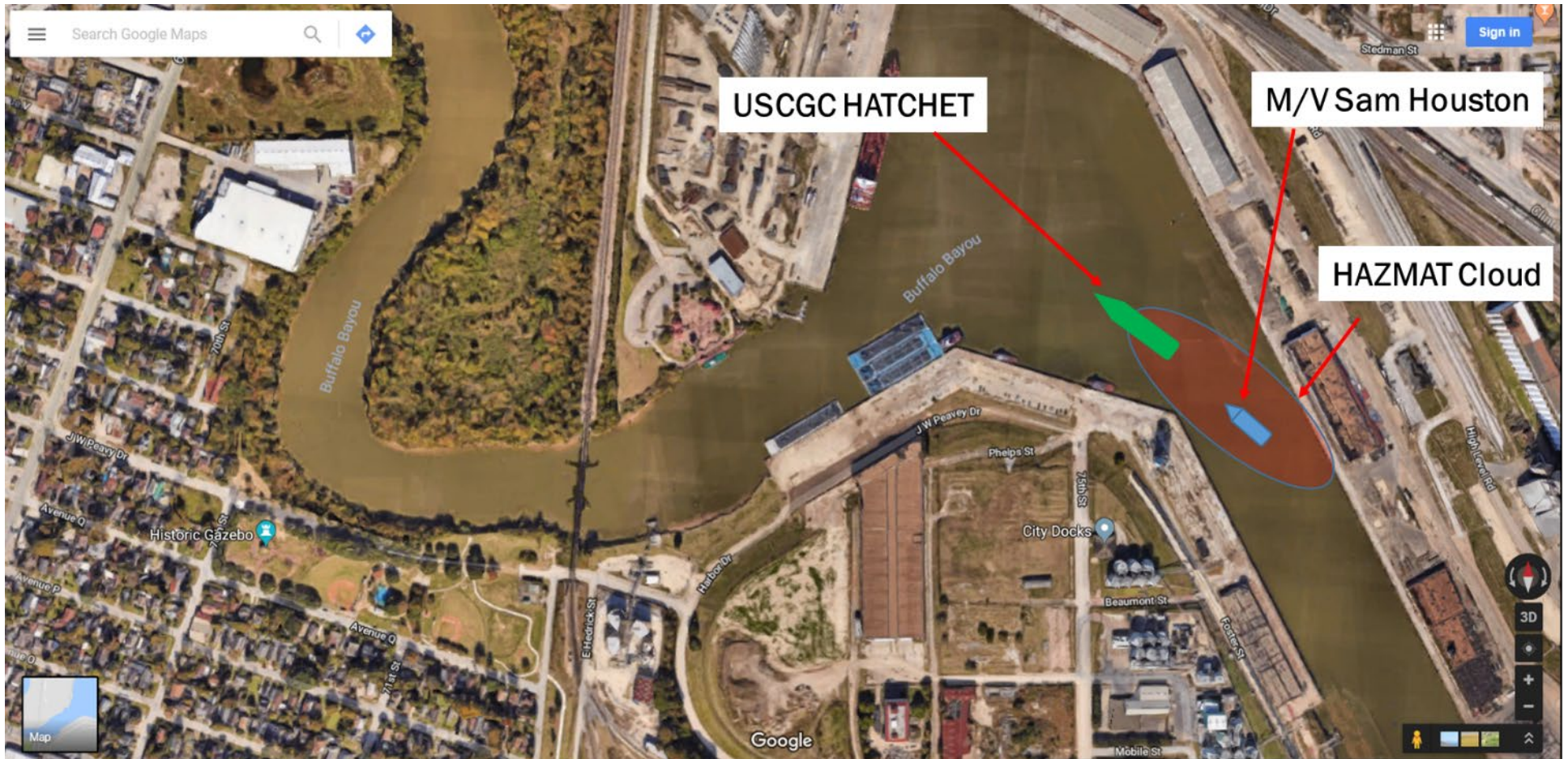Fidelity Island

5.14 Pavilion Space Assignments

5.15 Vignette A StartEx: Vessels are Moored – Simulated Incident in Bayou

5.16 Vignette A: Vessels Moored

5.17 Vignette A: Port of Houston Fireboat 1 / Battalion Chief Responds

PHA Battalion Chief and PHA Police Arrive On Scene, Establish Incident Command

PHA Fire Boat 1 Underway
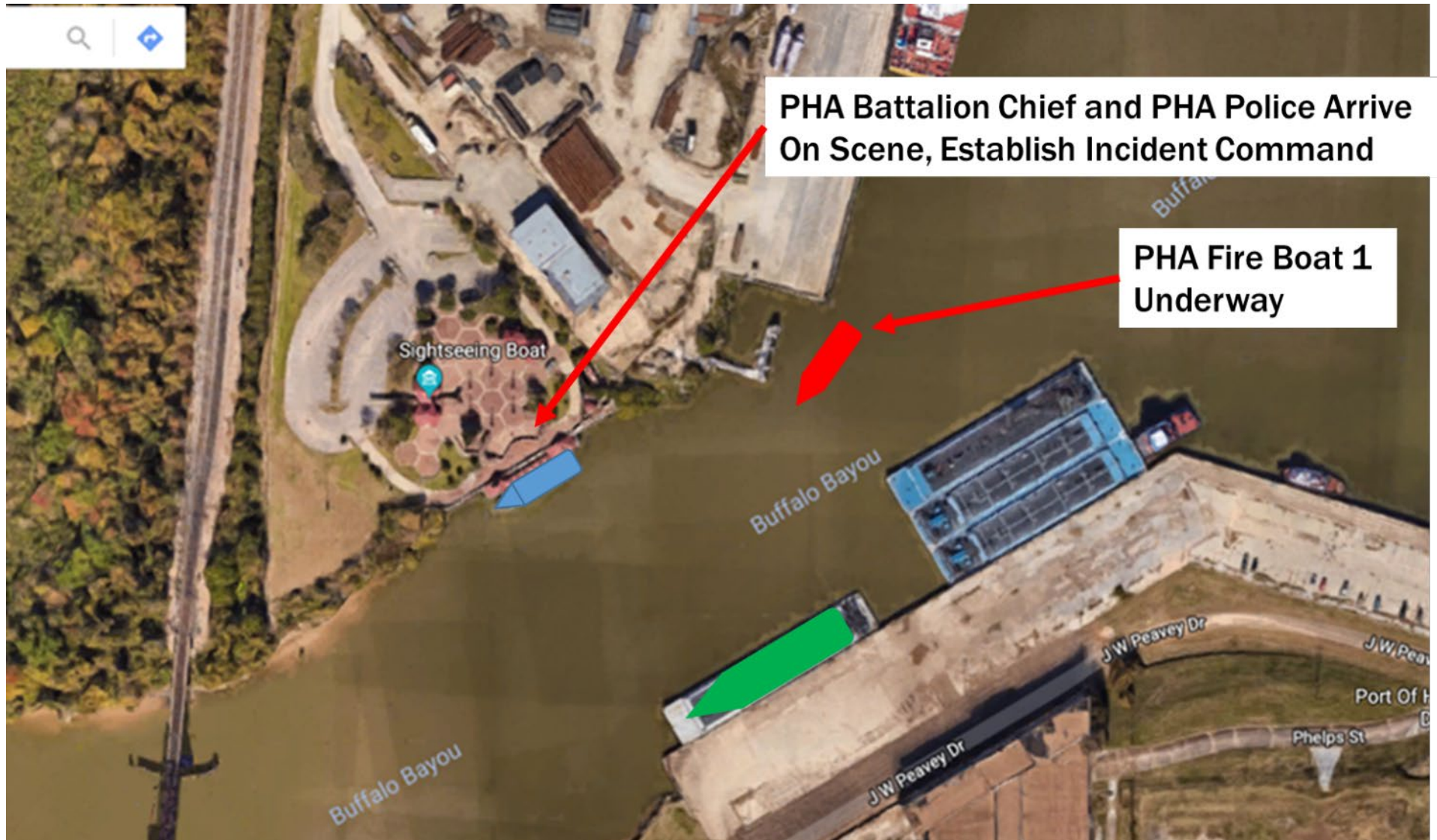
5.18 Vignette A: Houston and Harris County Respond
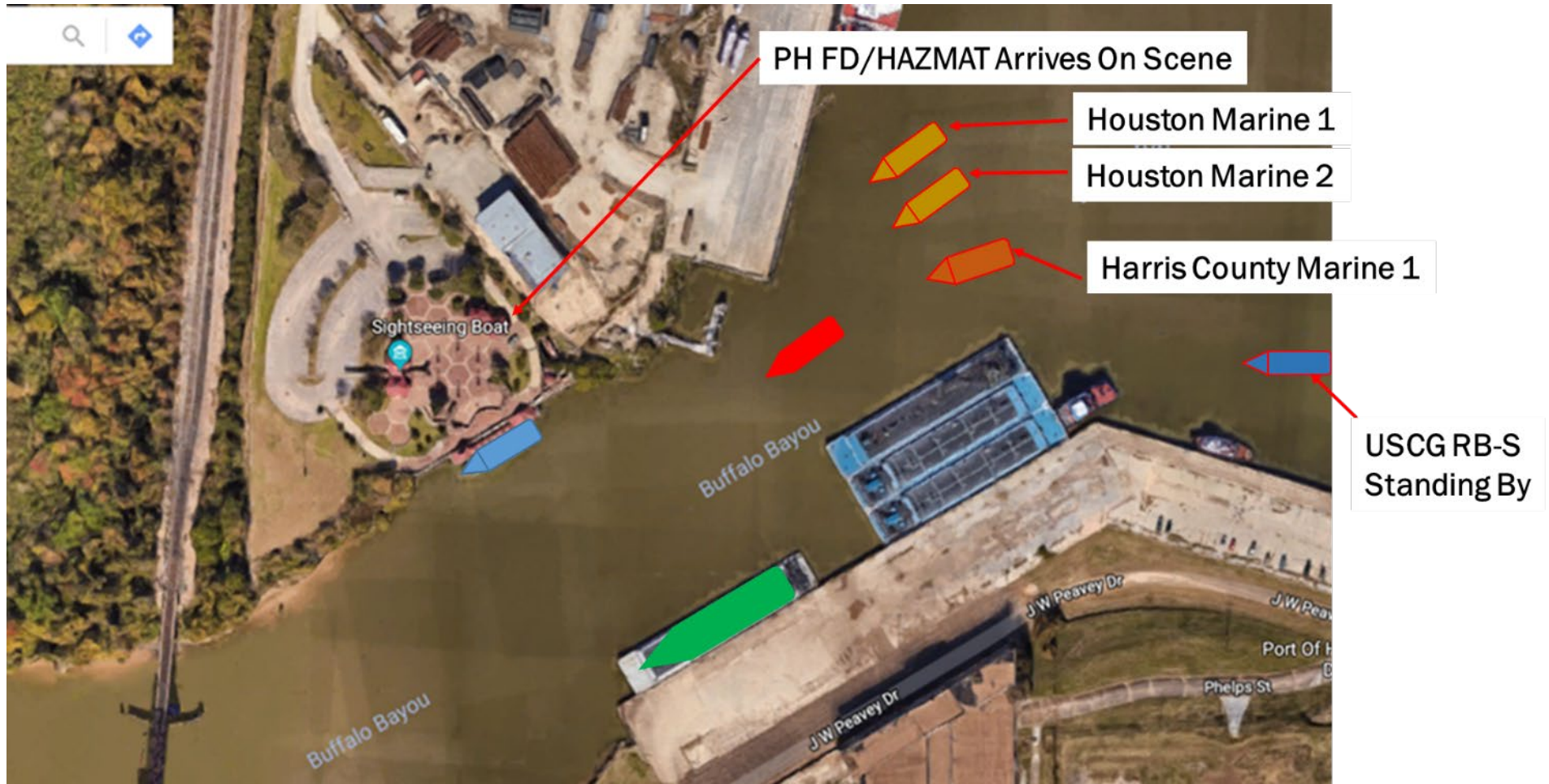
5.19 Vignette A: Wharf Operations

City of Houston / Harris County Marine Units Stand By to Provide Victim Transport

USCG stands by

Buffalo Bayou

PH Fireboat Transports HAZMAT Team 1

Security Perimeter (if needed)

J W Peavey Dr

5.20 End of Vignette A
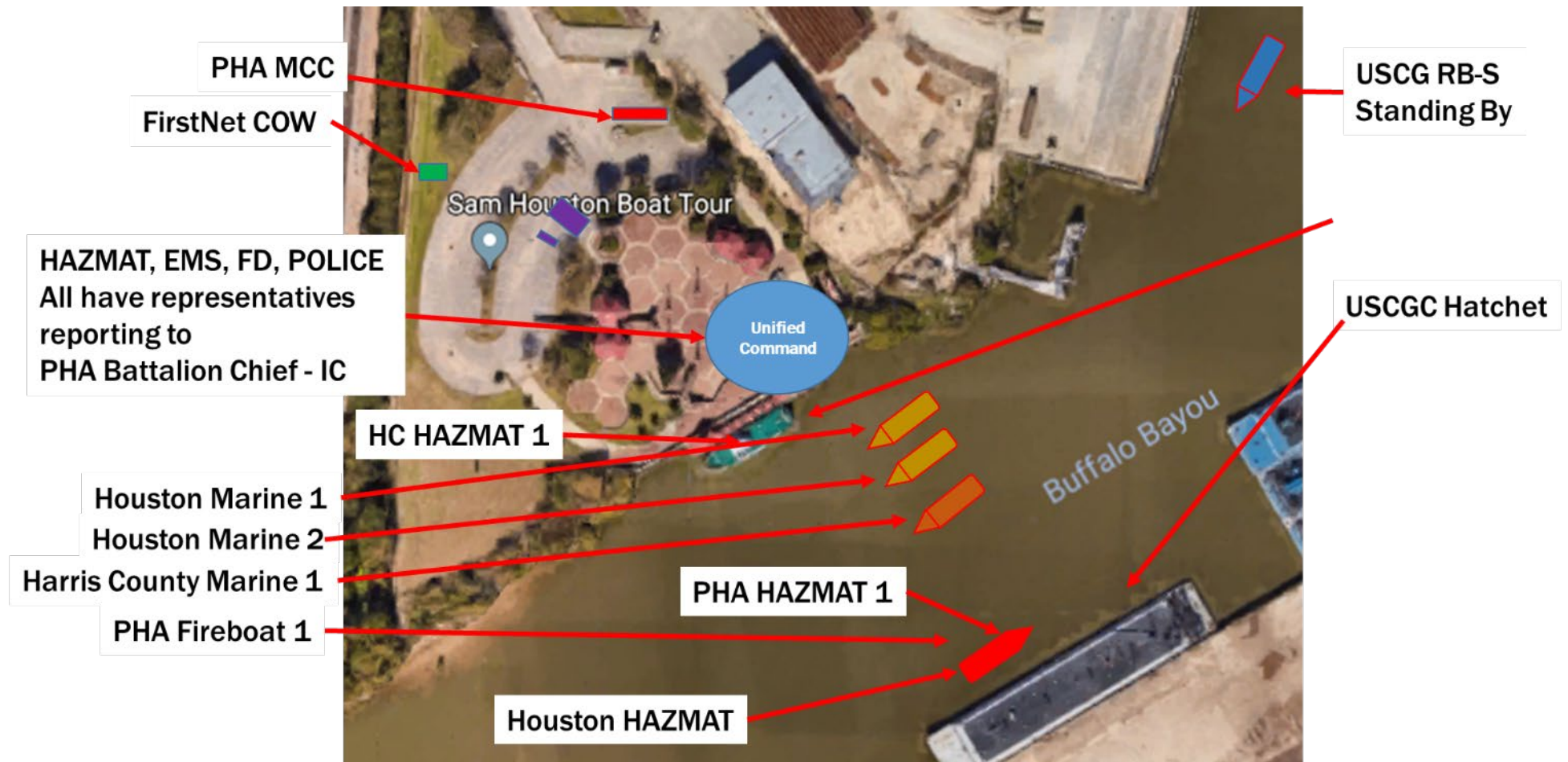
5.21 Vignette B: HAZMAT Teams Enter Vessels

HAZMAT Enters
M/V Sam Houston

Houston Marine 1

Houston Marine 2

Harris County Marine 1

PH Fireboat
Transports
HAZMAT Team 1 to
USCGC Hatchet

Security Perimeter

J W Peavey Dr
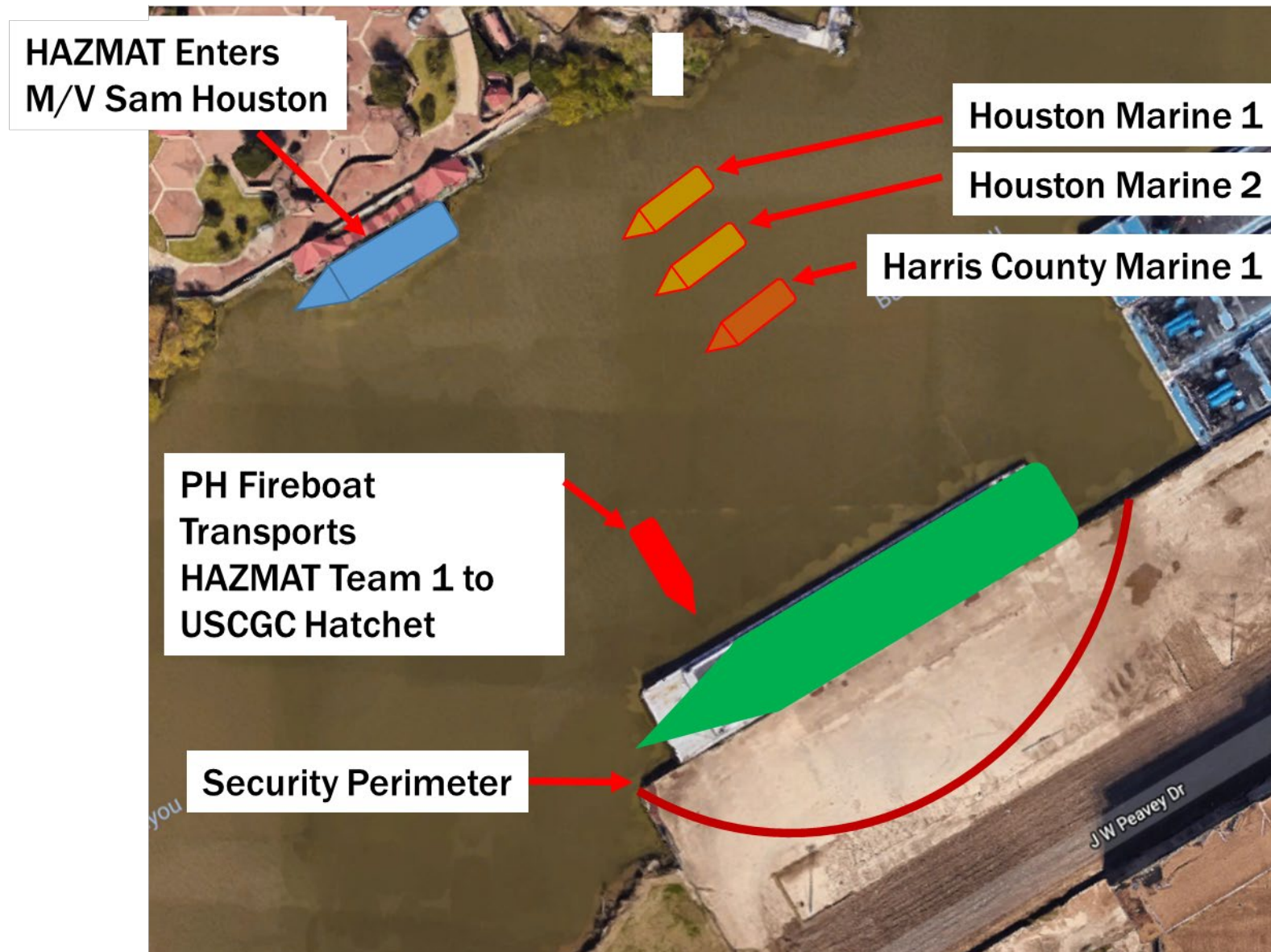
5.22 Vignette B: Pavilion Unit Shore-sided Placement
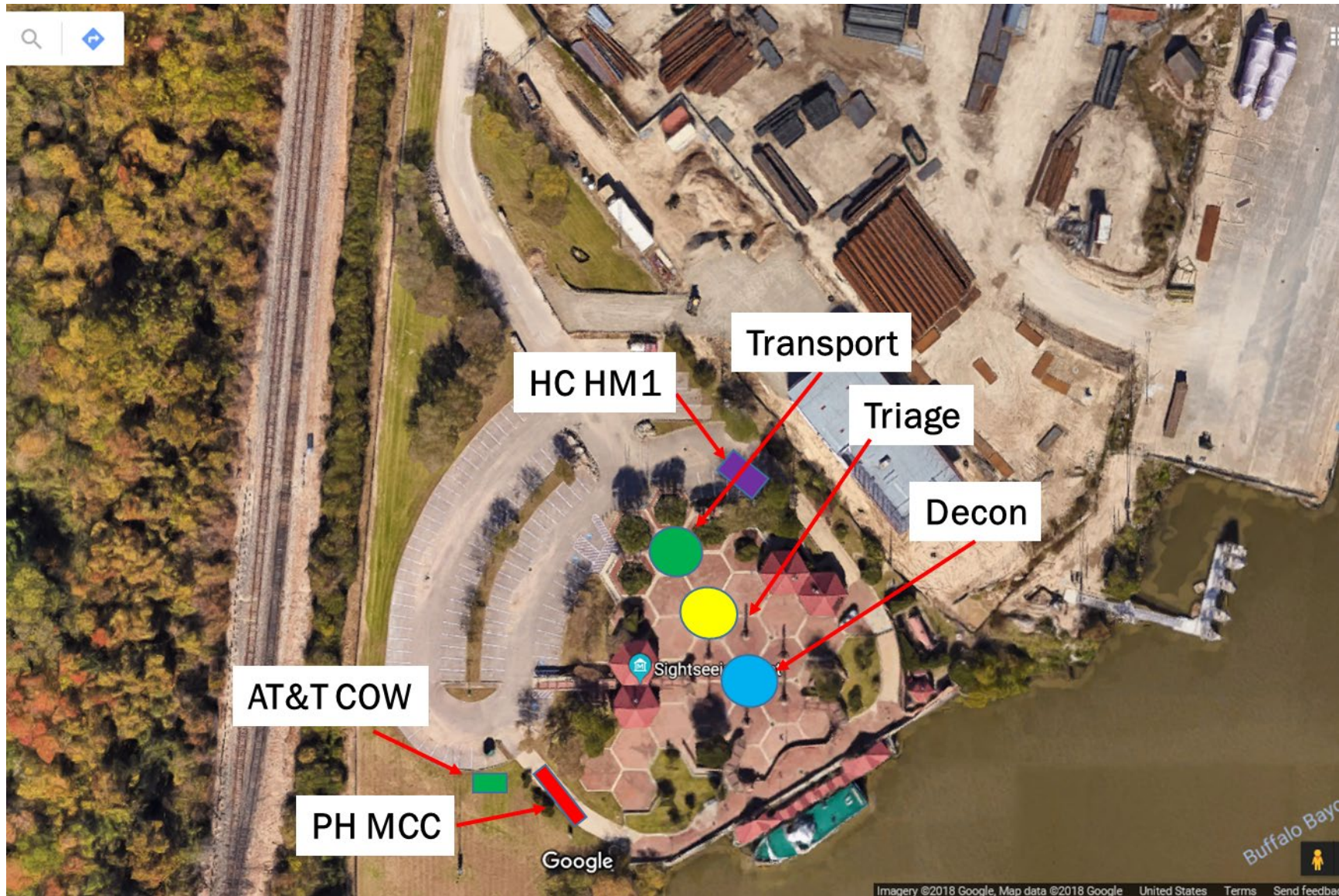
5.23 Vignette B: COTP / VTS Houston Closes Port Above I-610 Bridge

VTS Safety Broadcast indicates vessels not allowed to travel upstream of the I-610 Bridge

PHA Orders "Shelter in Place"

USCG Vessel commences search for PIW
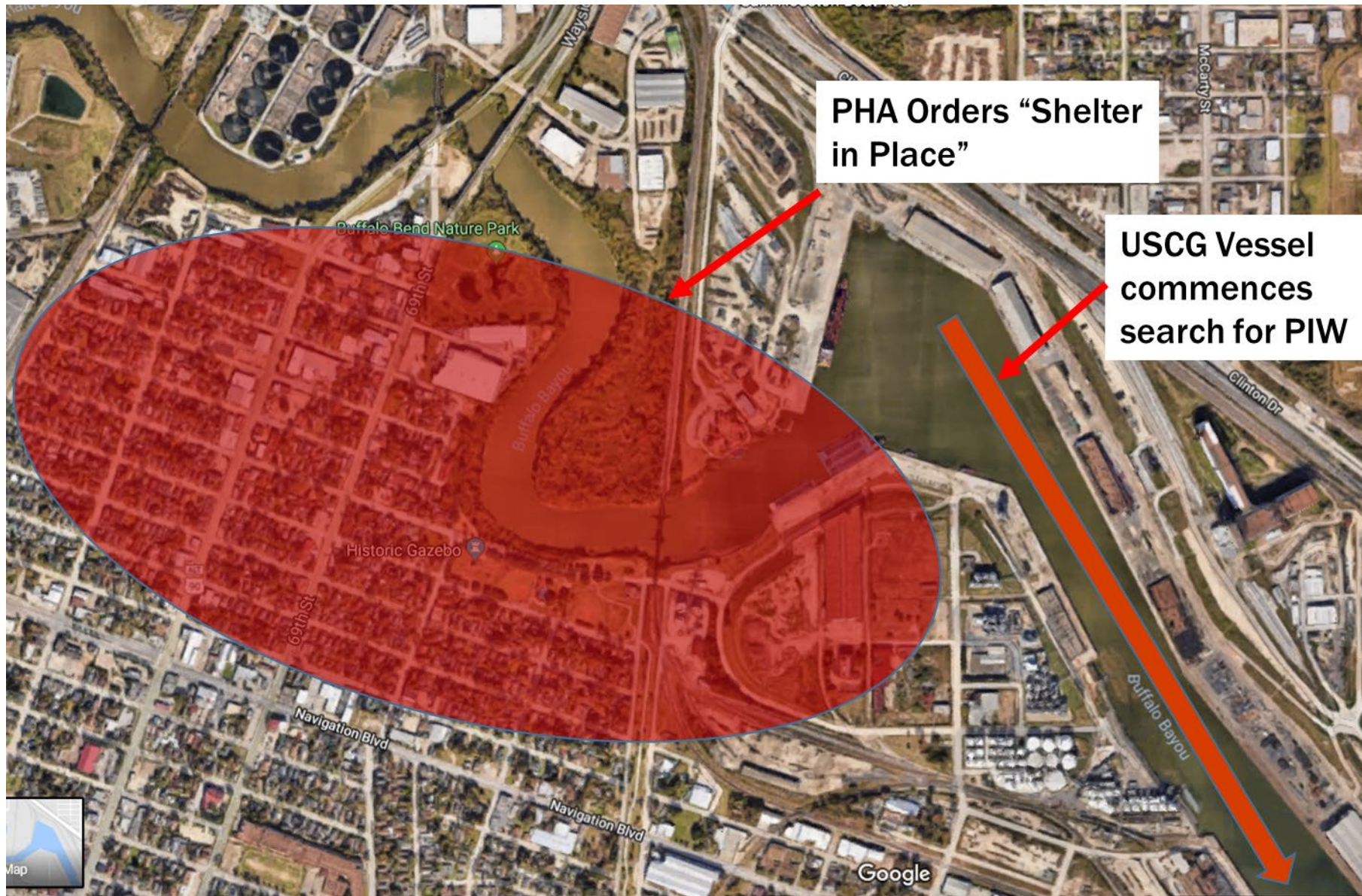
5.25 Vignette C: Decon, Triage and Transport HAZMAT & EMS Units

5.26 Vignette C: Search and Rescue Locates PIW

USCG Rescues PIW

6 Appendix B: Technology Descriptions

6.1 DHS S&T's Next Generation First Responder Technology Integration

Today's first responders save lives every day, using yesterday's technology. Both responders and the communities they serve deserve public safety services enabled with all the capabilities technology makes possible. To avoid overwhelming responders with too many devices or excessive amounts of data, responders need *smarter, integrated technologies* that increase their ability to focus on the mission, rather than distract from it. With the advent of public safety br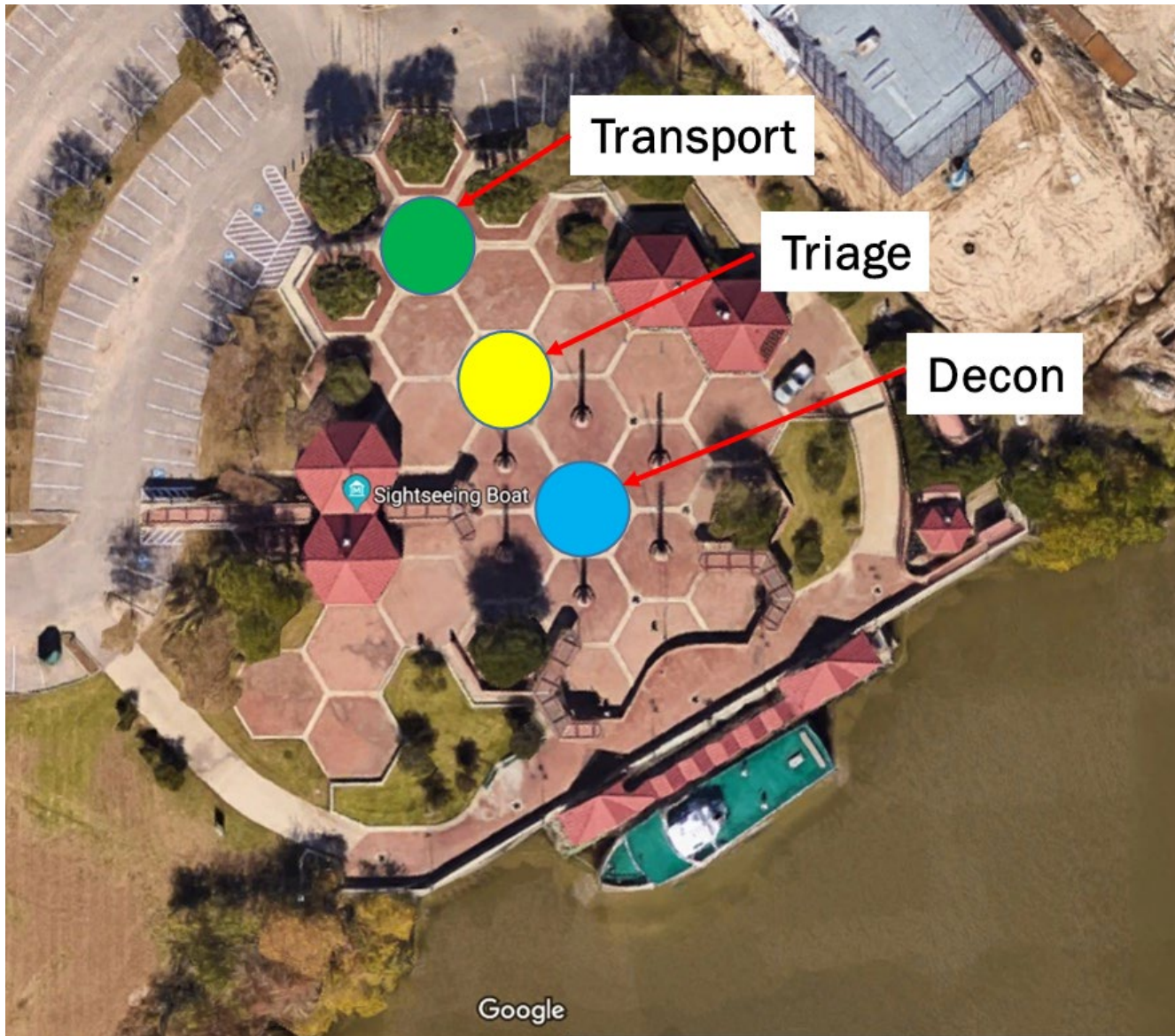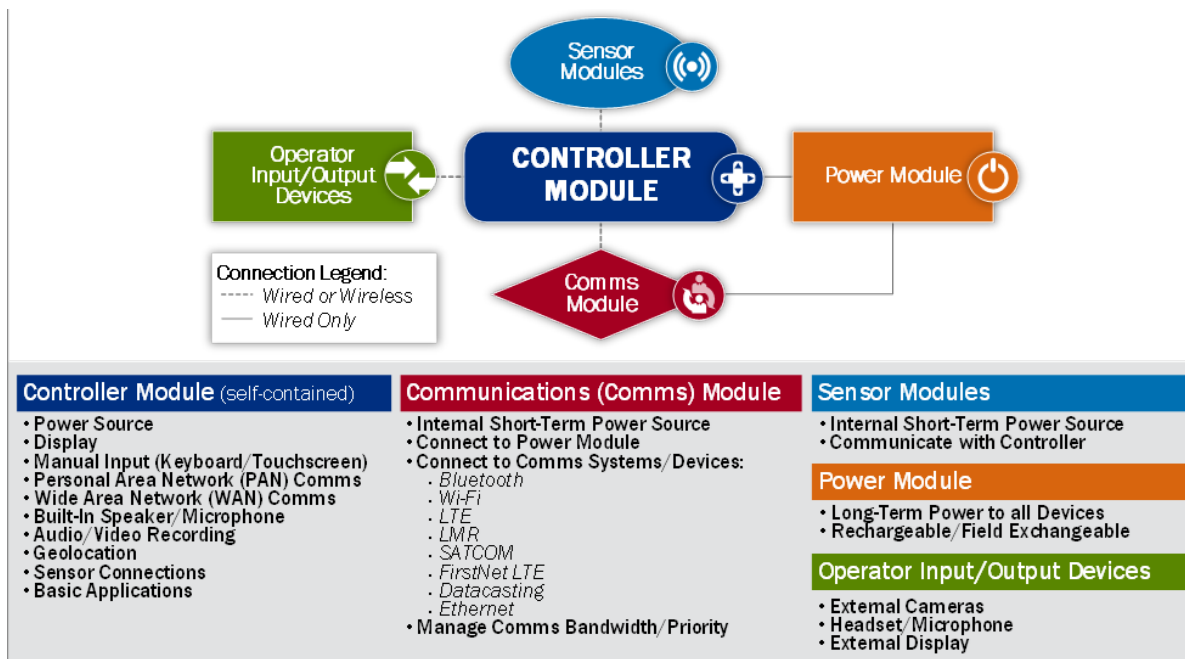oadband and initial deployment of FirstNet, it is critical to examine how technology supports public safety and how we can help responders get the right information at the right time to save lives. The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) initiated the Next Generation First Responder (NGFR) Apex program to address these gaps.

The NGFR Apex program works with first responders across the country to ensure they are protected, connected and fully aware, regardless of the hazards they face. The program is developing and integrating technologies that are modular (have the ability to integrate via open standards and interfaces) and scalable (have the ability to build a large and complex system or a small and streamlined system). Beyond developing individual technologies that can integrate, the goal of the program is to define the open-source standards that enable commercially developed technologies to integrate together and into existing first responder technologies. This approach opens doors to industry while lowering costs and increasing choices for public safety organizations, helping them rapidly adapt to changing environments and evolving threats as they secure communities nationwide.

6.2 NGFR Integration Handbook

DHS S&T published the initial NGFR Integration Handbook in February 2018 to guide industry to develop technologies using open standards, allowing easier system and device integration through a "plug-and-play" standards-based environment. The NGFR Integration Handbook identifies standards, interfaces and data flows that would allow public safety agencies to integrate hardware, software and data of different technology solutions, building their own public safety system. The handbook defined the following first responder architecture:

Controller Module (self-contained)
- Power Source
- Display
- Manual Input (Keyboard/Touchscreen)
- Personal Area Network (PAN) Comms
- Wide Area Network (WAN) Comms
- Built-In Speaker/Microphone
- Audio/Video Recording
- Geolocation
- Sensor Connections
- Basic Applications

Communications (Comms) Module
- Internal Short-Term Power Source
- Connect to Power Module
- Connect to Comms Systems/Devices:
  - Bluetooth
  - Wi-Fi
  - LTE
  - LMR
  - SATCOM
  - FirstNet LTE
  - Datacasting
  - Ethernet
- Manage Comms Bandwidth/Priority

Sensor Modules
- Internal Short-Term Power Source
- Communicate with Controller

Power Module
- Long-Term Power to all Devices
- Rechargeable/Field Exchangeable

Operator Input/Output Devices
- External Cameras
- Headset/Microphone
- External Display

6.3 NGFR- Harris County OpEx

The OpEx will evaluate how NGFR-developed and commercially-available technologies integrate with existing public safety systems using standards recommended by the NGFR Integration Handbook to enhance mission capabilities during a multi-agency response to a HAZMAT leak and mass casualty incident. The OpEx will employ new technologies to streamline collaboration through response, triage and decontamination, including capabilities to improve responder safety, enhance operational communications, increase operational coordination and augment situational awareness. The majority of participating technologies will be integrated into a single system.
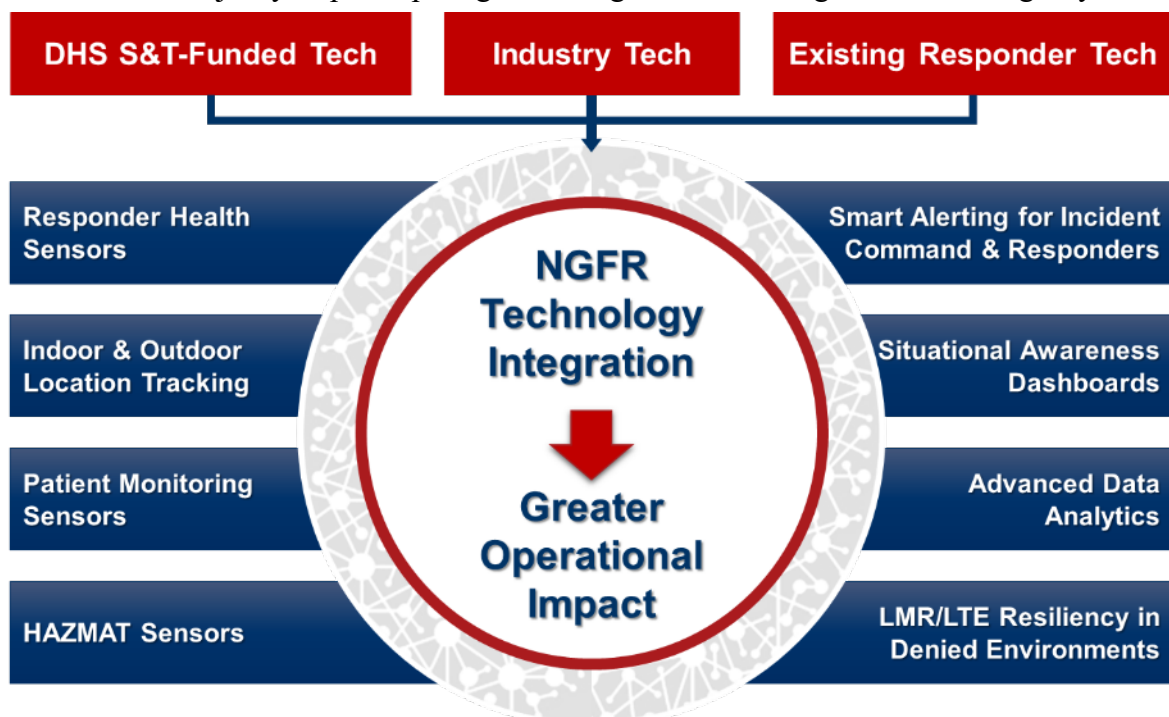
6.4 Participating Technologies

Ardent Management Consulting, Inc.

FRESH Router with the Esri Ops Dashboard

Aggregates and translates messages encoded with the Emergency Data Exchange Language (EDXL) Distribution Element (DE) standards. Utilizes a representational state transfer (REST) application programming interface (API) to allow for easy third-party integration and to encourage interoperability. The FRESH Router improves first responders' ability to dynamically share real-time data regarding emergency incidents and widespread disasters that may be affecting multiple jurisdictions across a large geographical area. Esri Ops Dashboard is a situational awareness tool to display data received in FRESH.

Ardent Management Consulting, Inc. is currently funded by DHS S&T for this project. The FRESH Router and Esri Ops Dashboard are currently commercially available.

ARES Security Corp.

CommandBridge

CommandBridge is an intelligent situational awareness and management platform that provides collaborative situational awareness by allowing each user to select the information sources and layers they need to understand and manage events as they unfold. CommandBridge ingests and visualizes data from virtually any sensor—including chemical sensors, biometric sensors, cameras, radar, access control and alarm systems—in order to manage all security information through a single user interface. This allows users to capitalize on existing investments by integrating current systems and sensors for a comprehensive security view, augment force and response capabilities by providing the team with 24/7 monitoring and alerts, and it provides a collaborative view that is sharable across agencies in a multi-jurisdictional response.

CommandBridge is currently commercially available.

AT&T Corporation

FirstNet Solutions

AT&T is honored to work with the First Responder Network Authority (FirstNet) to build, deploy and maintain the first-ever nationwide public safety broadband network for America's first responders. The FirstNet network will help ensure first responders and the public safety community have access to the interoperable communications and technologies they need when they need them. This will let first responders focus on what matters most: protecting communities and saving lives. During the OpEx, AT&T will have an on-site deployable satellite-cell-on-light-truck (SAT-COLT) for viewing, an Enhanced Push-To-Talk (EPTT) solution and Virtual Reality glasses to show situational awareness.

FirstNet Solutions by AT&T is currently commercially available.

Centrex Solutions LLC

Nightjar

The Nightjar Platform connects devices with systems and people, over a variety of long-range, low-power wireless technologies, allowing connectivity beyond cellular coverage areas. During the OpEx, first responders will be using Nightjar handheld, wearable and vehicle-mounted flammable gas sensors. These devices can detect a wide range of volatile substances in a single sensor and deliver that data over the Nightjar network to existing situational awareness applications used by incident command.
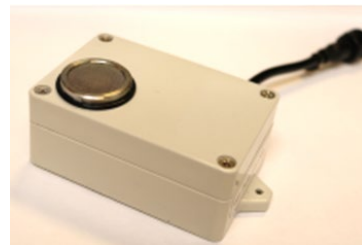
Nightjar is currently commercially available.

Haystax, a Fishtech Group Company

Constellation Analytics Platform

Constellation for safety and security helps first responders prepare and respond with confidence, using a cloud-based platform for early threat detection, situational awareness and information sharing. Constellation gives first responders advanced analytics to automatically score the highest-priority threat signals and rapidly deliver them to the right people at the right time and provides a tightly-integrated ecosystem of web and mobile apps that enables users to manage their critical assets and respond effectively to incidents and natural hazards.

Constellation Analytics Platform is currently commercially available.

Federal Emergency Management Agency (FEMA)

Integrated Public Alert and Warning System

The Integrated Public Alert and Warning System (IPAWS) modernizes the nation's emergency communication capabilities. Based on the Common Alerting Protocol and aggregated through FEMA's Open Platform for Emergency Networks, a single emergency notification can be disseminated to many media outlets. This gives Federal, state, local, tribal and territorial alerting authorities the ability to notify and warn their respective communities through multiple communication pathways thereby reaching more of the public. Communication pathways include broadcast to cellphones via the Wireless Emergency Alerts, radio and television by the Emergency Alert System, and various integrated IP-based systems such as desktop alerting, signage, siren systems, etc.

IPAWS is an open platform available to approved alerting authorities.

Integrated Solutions for Systems, Inc. (IS4S)

Communication Hub

Effective communication can often be the difference between life and death in emergency situations. The Communication Hub is a body-worn, smart router that interconnects multiple communications systems (e.g., land mobile radio (LMR), long-term evolution (LTE), FirstNet) with the variety of sensors and electronics (e.g., location, vitals) worn or carried by the user. It intelligently, efficiently, securely and resiliently routes data between first responders and

commanders using the best available communication link, removing the burden of handling increasing amounts of data, so first responders can focus on the task at hand.

IS4S is currently funded by DHS S&T for this project. The IS4S Communication Hub is currently available for pre-order.

Intrepid Networks, LLC

Intrepid Response

Intrepid Response is a mobile application that enables enhanced situational awareness by providing live responder locations and static locations of interest with a simple user interface. The mobile application extends situational awareness to the end users, effectively closing the communication loop between first responders, supervisors and commanders. Open API architecture provides integration capability for higher level command and control tools or other platforms.

Intrepid Connect (Moxtra)

Moxtra, powered by Intrepid Networks, provides robust team collaboration with rich multimedia sharing, whiteboarding, task management and secure text communication. Intrepid Connect supports multiple concurrent operations with role-based channel support, and dramatically reduces reliance on voice communication alone, thereby saving LMR voice traffic for emergency communications.
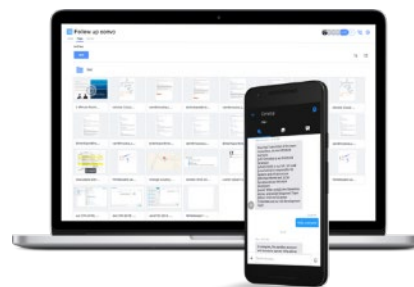
Intrepid Response and Moxtra are currently commercially available.

Keys Net LLC

Keys IoT Watch App

The best camera/sensor/platform is the one you have with you. Using the Keys IoT Watch App, first responders and incident commanders can leverage the devices they already own to provide location, heart rate and other sensor data into their current operational systems, as well as receive incident alerts (visual/audio/vibration), select sensor data, and view an incident / team map, all from their smart watch. Keys IoT Watch App is a software-based solution that utilizes mass-market consumer wearable computing and biometric platforms (such as the Apple Watch) to both send and receive location, sensor data and alert notifications. The solution uses non-proprietary, platform-independent and royalty-free open standards (e.g., SensorThings, MQ Telemetry Transport [MQTT]) for communication, to enhance interoperability and compatibility and reduce costs. This allows for both organization-provided and user-provided (Bring Your Own Device) implementations.
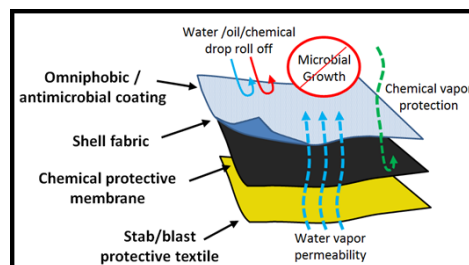
Keys Net LLC was previously funded by DHS S&T for this project. The Keys IoT Watch App is currently commercially available.

Luna Innovations, Inc.

Ergonimix Garments

First responders require a multi-threat protective ensemble that can be worn as a normal duty uniform but provides increased protection against threats when compared to traditional cotton or polyester uniforms. Ergonomix garments are manufactured from inherently fire-resistant fabric and provide splash protection for liquids/bodily fluids. Input from responders indicated they often experienced increased wear in the knee area. The Ergonomix pants address this issue by reinforcing the knees using a layer of TurtleSkin® between two layers of fabric. Ergonomix garments also provide extensive rip/tear protection in the knee and forearm areas, which extends up to the elbow on the back side of the sleeve. Ergonomix garments are certified to the National Fire Protection Association (NFPA) 1975 "Standard on Emergency Services Work Clothing Elements" – 2014 Edition. The Ergonomix garments are undergoing long-term wear testing with OpEx participating agencies.

Luna Innovations, Inc. was previously funded by DHS S&T for this project, which has been commercialized by Ergonomix. Ergonomix duty uniforms are not yet commercially available.

Metronome Software, LLC

SENSEI – Sensor Secure Enterprise Infrastructure

Currently partnered with MobileIron and Kryptowire, SENSEI integrates Enterprise Mobility Management and Mobile App Vetting technology to provide a comprehensive system of mobile security for Internet of Things and mobile endpoints. SENSEI ensures that mobile apps are risk analyzed prior to deployment and provides users confidence that their mobile devices are not compromised.
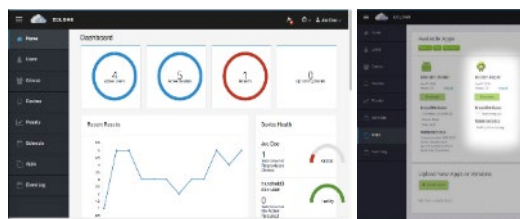
Metronome Software is currently funded by DHS S&T for this project. SENSEI is not yet commercially available.

MobileIron, Inc.

Unified Endpoint Management

Provides visibility and IT controls needed to secure, manage and monitor any corporate- or employee-owned mobile device or desktop that accesses business critical data. Secures all endpoint devices and their information, providing the assurance that lifesaving operational decisions can be made reliably.

MobileIron, Inc. is currently funded by DHS S&T for this project. Unified Endpoint Management is currently commercially available.

N5 Sensors, Inc.

Compact Multi-Gas and Particulate Matter Detector

A compact, low-cost gas and particulate detector leveraging N5's patented chip-scale nanoengineered gas sensor technology. It provides real-time detection of multiple of toxic and fire gases along with particulate matter counts in a wide range of environmental conditions. The breakthrough sensor technology

enables gas detector miniaturization while providing improved resistance to contaminants – providing awareness of both immediate and long-term chemical threats.

N5 Sensors, Inc. is currently funded by DHS S&T under the Small Business Innovation Research program for this project. The Compact Multi-Gas and Particulate Matter Detector is not yet commercially available.

National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory

AUDREY – Assistant for Understanding Data through Reasoning, Extraction and Synthesis

AUDREY is a state-of-the-art human-like Artificial Intelligence (AI) system designed to assist first responders in reducing the data overload problems and providing life-saving actionable intelligence by automatically analyzing relevant sensor data and synthesizing high-level situational awareness information while at the scene of an emergency. The selected AUDREY AI capabilities used during the OpEx includes automated physiological sensor alerting, video analytics and voice transcriptions.
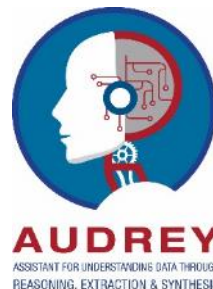
WAMS – Wearable Alert and Monitoring Systems

WAMS provides front-end processing for AUDREY, enabling AUDREY agents to efficiently receive personalized sensor data, alerts and events and supporting voice-to-text conversion. WAMS is a software-based Sensor Hub that is an interface to wearable sensors. It can discover new sensors wirelessly if they use Open Geospatial Consortium (OGC)-compatible standards and can convert sensor data into an OGC format. The controller builds upon an Android-based plug-in framework to enable on-demand updates to core functionality and intelligent Internet of Things networking.

NASA JPL is currently funded by DHS S&T for these projects. AUDREY and WAMS are not yet commercially available.

Pacific Northwest National Laboratory

VitalTag

During a mass casualty, first responders can be overwhelmed and outnumbered by victims. VitalTag is a small, disposable suite of sensors that securely detects and communicates vital sign data in real-time to first responders. This information helps first responders more effectively triage, treat and transmit patients during a mass casualty event.

The Pacific Northwest National Laboratory is currently funded by DHS S&T for this project. VitalTag is currently undergoing the U.S. Food and Drug Administration approval process and is not yet commercially available.

SensorUp, Inc.

SensorThings

SensorUp provides the Internet of Things (IoT) platform for customers who rely on geospatial information in their IoT Implementations. SensorUp is here to help make sense of data. Combine all different sensors into one easily-managed visualizer and get the bigger picture. SensorThings technology rapidly aggregates and coordinates disparate sensors and IoT systems transforming them into actionable insights. SensorThings provides the primary sensor integration platform for the OpEx by connecting and aggregating various sensors and providing that actionable information to situational awareness tools.

SensorUp, Inc. is currently funded by DHS S&T through a subcontract for this project. SensorThings is currently commercially available.

Sonim Technologies, Inc.

Sonim XP8 Smartphones

The Sonim XP8 is an ultra-rugged smartphone built to provide those who serve with the smart communication they need when and where they need it most. Military-rated design ensures reliable smart communication, and management applications improve business efficiency. A 5" puncture-resistant glove and wet compatible touchscreen allows easy interaction and clear visibility. The Sonim XP8 offers dedicated OneTouch Push-To-Talk for quick emergency communication, plus the ability to power remote speaker microphones without additional batteries. MIL810G, IP-68 and IP-69, Non Incendive Class I, II, III Div 2, and backed by the industry leading 3-year comprehensive warranty.

Sonim XP8 Smartphone is currently commercially available.

TRX Systems, Inc.

NEON Personnel Tracker

NEON Personnel Tracker delivers indoor and outdoor location, improving operational efficiency, command effectiveness and safety for security, public safety and industrial applications. NEON Personnel Tracker is an Android application tightly integrated with the NEON Location Solution where a suite of patented algorithms fuse inertial sensor data, Wi-Fi readings and inferred building data to deliver reliable 3D location. Personnel wearing a NEON Tracking Unit and carrying an Android device running the NEON Location Service can be seamlessly located both indoors and out.

TRX Systems, Inc. was previously funded by DHS S&T for indoor tracking solutions under the Firefighter Accountability and Proximity Systems project. The NEON Personnel Tracker is currently commercially available.

Utility Associates LLC, in Partnership with AT&T Corporation

BodyWorn

Generation 2 BodyWorn video camera with automatic recording, Gunshot Detection, Holster trigger, Officer Down reporting and live video streaming.

AVail Web

Web browser map-based real-time situational awareness for BodyWorn and in-car video, audio and metadata. Live video streaming, officer down alerts, video redaction and full chain of custody audit trail reporting.

Vehicle Wireless Router and Video Server

Hardened IP-67 cellular, FirstNet, Wi-Fi and Bluetooth access point and video storage server supporting up to four video cameras and unlimited BodyWorn cameras.

BodyWorn, Avail Web, and the Vehicle Wireless Router and Video Server are all currently commercially available.

7 Appendix C: Rules of Behavior

RULES OF BEHAVIOR FOR THE DHS NEXT GENERATION FIRST RESPONDER – HARRIS COUNTY OPERATIONAL EXPERIMENTATION

I.   Background.

(a) The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is hosting a multi-agency operational experimentation (OpEx) with Houston-area public safety agencies to assess how existing first responder infrastructure can integrate with commercial public safety technologies and cutting-edge solutions using open standards and interfaces. The DHS S&T Next Generation First Responder (NGFR) Apex program is assessing how existing first responder infrastructure can integrate with commercial public safety technologies and cutting-edge solutions using open standards and interfaces. This complex, multidisciplinary program consists of a diverse but related portfolio of projects that span from basic research to advanced technology development, and an initiative to define a common set of open standards for technology integration. Overall, the program's vision is first responders who are better protected, connected and fully aware – enabling faster, more efficient and safer responses to threats and disasters of all sizes. One key objective is to ensure interoperability between jurisdictions to ensure mission-critical communications and operational support during large incident responses.

(b) The NGFR – Harris County OpEx will take place during the week of December 3, 2018, at the Port of Houston Authority in Houston, Texas, and will integrate first responder technologies to enhance the mission-response capabilities of federal, state and local entities. During the NGFR – Harris County OpEx, DHS S&T will evaluate how DHS-developed technologies, commercial technologies and legacy public safety systems integrate using open standards, and how those integrated capabilities increase responder safety and efficiency.

(c) The data collected from this operational experimentation will be analyzed and used to:

1) Test and evaluate NGFR technology's and industry technology's ability to support Harris County's need to establish and maintain interoperability during a multi-jurisdictional emergency response;
2) Improve regional core capabilities in a multi-agency response;
3) Facilitate transition of NGFR –developed technologies, integration approach and knowledge products; and
4) Promote innovation and adoption of public safety technologies to make responders better protected, connected and fully aware.

II.   Voluntary Participation and Responsibility.

(a) Individuals participating in this field test acknowledge that they do so voluntarily at the request of DHS.
(b) Participants acknowledge that they have not been coerced into participating as a condition of maintaining employment and may withdraw from participating in this field test.
(c) Participation in this field test is not and nor should it be considered as an interview for future employment with DHS or any other branch of the Federal Government.
(d) Participation in this field test may include using DHS and industry-provided technology during an operational response scenario, connecting DHS-provided and industry-provided technology to technology that a participant's organization provides to them, and providing feedback on the technologies' impact to operational communications, responder health and safety, situational awareness and operational coordination.

III.   Use of Contact Information.

(a) DHS will maintain basic contact information from field test participants solely for the purposes of communication with the participants, admission to the field test and invitations for future events.
(b) DHS will not use the contact information for any other purpose.

IV.   Participation and Intellectual Property Rights.

As a condition of your participation in the NGFR – Harris County OpEx, you agree that you:

(a) Will refrain from pursuing any patent, trademark, copyright or other intellectual property rights associated with any of the technologies used during this OpEx.
(b) Will agree to relinquish and assign to DHS any intellectual property rights in any subsequent iterations of the systems, technologies, garments, or instruments used throughout this OpEx that may result from your direct participation during the course of this OpEx.

V.   Non-Disclosure of Information Regarding the Next Generation First Responder (NGFR) Harris County Operational Exercise (OpEx).

As a condition of your participation in the NGFR – Harris County OpEx, you agree that you:

(a) Will refrain from disclosing any information to the public regarding the purpose, subject matter, or location of this OpEx prior to or during the OpEx, unless DHS S&T authorizes the disclosure of specific information in writing. This includes the disclosure

of any information related to the OpEx via social media, internet, or any other viable means of communication. DHS S&T reserves the right to review and approve in writing all disclosures of information related to the NGFR – Harris County OpEx via the press, social media, internet, or any other viable means of communication before they are released, with the exception that participants have unrestricted rights to share or repost information that DHS S&T itself disseminates publicly first. DHS S&T reserves the right to request that participants delete or recant disclosures of information after they have been shared if those disclosures violate these Rules of Behavior.

(b) Will not disclose any information regarding the vulnerabilities of specific systems obtained by virtue of your participation in this OpEx.

(c) You have sufficient rights in any first responder equipment (radios, vehicles, LTE systems) that you have transported for the specific purpose of its use in the OpEx.

(d) Will refrain in engaging in any activity that infringes upon the patent, trademark, trade secret, copyright or other proprietary rights of any party.

(e) Understand your responsibilities and will comply with these Rules of Behavior for participation in the NGFR – Harris County OpEx. You understand that your failure to agree to or comply with these Rules of Behavior will result in the end of your participation and your removal from the OpEx location.

VI.   DHS Seal, Insignia, and Other Visual Identities.

(a) By participating in the NGFR – Harris County OpEx you do not gain authorization to use the official seal, insignia, or other visual identities of the Department of Homeland Security.

(b) Use of the DHS seal without proper authorization violates federal (e.g., 18 U.S.C. §§ 506, 701, 1017) and is against DHS's policies governing usage of the seal.

(c) Any use of the DHS seal, insignia, or other visual identities requires the advance written approval of the Department of Homeland Security.

VII.   Your Responsibilities Regarding Export Controls.

(a) Participants have the responsibility to comply with all applicable laws and regulations regarding the export of controlled information. These laws and regulations include those set forth in the Export Administration Regulations (EAR) and the International Traffic in Arms Regulations (ITAR) and with embargoes and sanctions programs administered by the Office of Foreign Assets Control (OFAC). These regulations and programs apply to ANY PERSON OR ENTITY, whether DHS personnel, Federal personnel, or ANY OTHER PERSON OR ENTITY.

(b) Under the EAR and ITAR, "export" includes the act of disclosing certain technical information to foreign nationals, whether from or within the United States, in chat rooms, electronic bulletin boards, emails, links, and other communications mechanisms.

VIII.   Video/Photo Release.

(a) You hereby grant DHS S&T full and unrestricted permission to use your likeness in any and all of its official videos, publications, websites, press releases, articles, and other media, without payment or any other consideration.
(b) You understand and agree that the video and/or photographs of you will become the property of DHS S&T.
(c) You hereby irrevocably authorize DHS S&T to edit, copy, exhibit, publish, and distribute this video footage/photographic imagery for purposes of publicizing DHS S&T's programs and activities.
(d) You waive the right to inspect or approve the finished product(s), including written copy and electronic media, in which your likeness appears.
(e) You also waive any right to royalties or other compensation arising from or related to the use of said video or photographs.
(f) You hereby hold harmless and release and forever discharge DHS S&T from all claims, demands, and causes of action which you, your heirs, representatives, executors, administrators, or any other persons acting on your behalf or on behalf of your estate have or may have by reason of this authorization.

IX.   Disclaimer of Compensation.

You hereby acknowledge your voluntary participation in the NGFR – Harris County OpEx:

(a) I understand and agree that DHS may accept my gratuitous services pursuant to 6 U.S.C. § 453 and section 507 of Public Law 108-90, the DHS Appropriation Act of 2004.
(b) I understand and agree that in providing my gratuitous services to the federal government, I am not displacing a federal employee.
(c) I understand and agree that I am providing my services without remuneration from the United States government, DHS, or any instrumentality thereof ("the government"), that I am not entitled to, nor do I expect, any present or future pay, compensation, benefit, or *quid pro quo* from the government for providing my gratuitous services, and that I will not be considered an employee of the government. I agree that I will participate fully in whatever training DHS may require of me to perform the gratuitous services I am offering and I will strictly follow all directions that I am given by authorized federal officials in the course of my participation and service.

X.   Disclaimer of Liability.

You hereby acknowledge your voluntary participation in the NGFR – Harris County OpEx:

(a) I have been informed and understand that my participation in this OpEx may expose

my property and me to certain foreseeable and unforeseeable risks of damage and/or bodily injury, including serious bodily injury, where I may need to be hospitalized.

(b) Having been informed of the risks, I voluntarily assume all risks as a consequence of my participation in this OpEx.

(c) In no event shall the Department of Homeland Security or its contractors or subcontractors be liable for any damages, including but not limited to direct, indirect, special or consequential damage arising out of, resulting from, or in any way connected with your involvement with the OpEx, whether or not based upon warranty, contract, tort, or otherwise, whether or not injury was sustained by was sustained by persons or property or otherwise and whether or not loss was sustained from, or arose out of participation in the NGFR – Harris County OpEx.

XI.   Signature of Participant.

Signature: _____

Printed Name: _____

Title: _____

Agency: _____

Date: _____

8 Appendix D: Public Information

8.1 Press Releases

8.1.1 News Release: DHS S&T Partners with Texas First Responders for Operational Experimentation

Release Date: July 9, 2018

For Immediate Release

DHS S&T Press Office, (202) 254-2385

Washington, DC – The U.S. Department of Homeland Security's (DHS) Science and Technology Directorate (S&T) has partnered with several public safety agencies from the Harris County, Texas, area for the Next Generation First Responder (NGFR) – Harris County Operational Experimentation (OpEx) set for December 2018.

The S&T NGFR program signed a Memorandum of Agreement with Harris County, the Port of Houston Authority, the Houston Fire Department, the Houston Police Department, the Southeast Texas Regional Advisory Council, the Cy-Fair Volunteer Fire Department and the Atascocita Fire Department, along with a Letter of Agreement with the U.S. Coast Guard, to establish a collaborative relationship for planning and executing the OpEx. This unprecedented partnership will test and demonstrate potential first responder communication, situational awareness, Internet of Things (IoT) and on-body technologies in an operational environment.

"Technology can be a force-multiplier for first responders, and OpEx events are one of S&T's best tools to demonstrate the real-world impact that integrated technologies may have on responder and DHS Component missions," said William B. Bryan, DHS S&T Senior Official Performing the Duties on Behalf of the Under Secretary for Science and Technology. "We chose partners in Texas because of strong existing relationships with the county and city, and their long-standing reputation as early-adopters for new public safety technologies."

The OpEx, one of DHS S&T's biggest operational integration demonstrations to date, will depict a HAZMAT leak and resulting mass-casualty incident scenario at the Port of Houston Turning Basin Terminal. The OpEx will employ alerts, notifications, activations, response, triage and decontamination. The port is North America's largest petrochemical complex and the second largest in the world.

The NGFR program and industry partners will provide participating first responders with interoperable technology solutions that use recommended guidelines found in the Next Generation First Responder Integration Handbook. The handbook, which provides guidance for public safety agencies and industry on standards-based interoperable environments, will help to ensure that DHS-funded and commercial technology solutions can integrate with existing regional public safety systems, applications, processes and procedures.

Some of the technologies and capabilities used in the OpEx will include communications hubs; public safety IoT sensors that assess hazardous gases, responder physiological condition, and patient status; artificial intelligence with data analytics and smart alerting; multi-threat resistant duty uniforms; and responder and incident commander field situational awareness tools. DHS S&T

---

is also coordinating with FirstNet to potentially run many of these cutting-edge networked devices on the newly-available FirstNet public safety broadband network.

"First responders must have systems that talk to each other and are budget-friendly for public safety agencies of all sizes," said DHS S&T Program Manager Sridhar Kowdley. "We hope this OpEx will inspire industry to develop more interoperable solutions, and no longer create stove-piped systems that do not integrate and are expensive to maintain."

The OpEx aims to fulfill DHS S&T and regional first responder objectives including supporting responder technology innovation, evaluating how integrated technologies make responders safer and more effective, fulfilling responders' annual training requirements, and receiving responder feedback on existing and emerging technologies to identify areas for improvement and continued DHS S&T focus.

"DHS S&T wants to maintain partnerships with Houston-area first responders to get feedback that helps drive the NGFR program's research and development. Our ultimate goal is to benefit first responders nationwide," said Kowdley. "We're partnering with the first responder community to better inform us on how DHS S&T can create an environment that keeps them better protected, connected and fully aware."

###

Credentialed media interested in attending the NGFR – Harris County OpEx should register by emailing NGFR@hq.dhs.gov by November 16.

8.1.2 News Release: DHS Partners with Industry for Operational Experimentation in Houston, Texas

Release Date: November 20, 2018

For Immediate Release
Contact: DHS S&T Press Office, John Verrico (202) 254-2385

WASHINGTON, DC – Through a Cooperative Research and Development Agreement (CRADA), the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is partnering with industry to evaluate first responder technologies. DHS, industry partners and 13 local Houston-area public safety agencies will integrate existing first responder technology with DHS-developed and commercial technology during a HAZMAT scenario. The Next Generation First Responder (NGFR) – Harris County Operational Experimentation (OpEx) is scheduled to take place December 4-5 at the Port of Houston.

"Today's first responders must have advanced technology to communicate and provide situational awareness as they face dangerous and evolving threats," said William N. Bryan, Senior Official Performing the Duties of the Under Secretary for Science and Technology. "Most importantly, these next generation technologies need to be interoperable in coordinated response efforts."

DHS S&T and industry partners are providing technologies such as responder and patient physiological monitoring sensors, indoor location tracking, HAZMAT sensors, smart alerting for responders and incident command, advanced data analytics, and situational awareness and collaboration dashboards. The integration will use open standards from the NGFR Integration Handbook.

Industry partners and their respective technology included in this agreement are:

- Ares Security Corporation and *Command Bridge* will provide first responder situational awareness;
- AT&T Corporation and *Rocket IOT* will provide communication for first response;
- Centrex Solutions and *Night Jar* will provide communication for first response;
- Compusult Limited and *Sensor Hub* will provide sensor hub capabilities;
- Defense Industrial Base (DIB) Information Sharing Analysis Center (ISAC) Inc. *LifeRing* will provide situational awareness;
- Haystax Technology, Inc. and *Constellation* will provide situational awareness; Intrepid Networks, LLC, and *Intrepid Response* will provide situational awareness;
- Keys Net LLC and its technology *Physiological Sensor* will provide first responder physiological monitoring;
- MobileIron, Metronome and Kryptowire will present *SENSEI* which will provide mobile device management and security overlay between sensors and servers;
- Moxtra, Inc. and *Intrepid Response* will facilitate enhanced situational awareness by providing responder locations and static locations of interest;
- SensorUp Inc provides the *SensorThings API* and will facilitate sensor integration and data provisioning for situational awareness and the common operating picture and;
- TRX Systems, Inc. and *NEON* will provide indoor and outdoor location data for security, public safety and industrial applications.

The OpEx will also evaluate technology from the following DHS partner performers:

- Pacific Northwest National Labs and its VitalTag patient monitoring technology;
- NASA Jet Propulsion Lab's AUDREY artificial intelligence and situational awareness technology;
- Ardent MC's FRESH Router to implement data standards of the NGFR architecture and;
- IS4S and Communication Hub (Comm Hub) will provide connectivity between wearable technologies and multiple communications devices.

"The CRADA provides DHS and industry partners the opportunity to learn about the interoperability and integration requirements of a coordinated urban response," said Sridhar Kowdley, Director of the NGFR – Harris County OpEx. "We hope that the outcomes from the OpEx will provide insight and help us develop recommendations for first responder technology integration for public safety agencies in both urban and rural communities across the nation."

S&T's NGFR program mission is focused on developing technologies for the responder of the future that will keep them better protected, connected and fully aware.

This press release has been updated with the inclusion of the following industry and performer partners: Metronome, Kryptowire, SensorUp, Inc., Moxtra, Inc. and IS4S.

8.2 Media Advisory: DHS S&T to Demonstrate Technology Integration During a Hazmat Scenario

Release Date: November 26, 2018

For Immediate Release
Contact: DHS S&T Press Office, (202) 254-2385

Houston, TX – The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) will host a demonstration of integrating emergency response technologies

during a simulated HAZMAT scenario at the Port of Houston on December 5, 2018. The Next Generation First Responder (NGFR) – Harris County Operational Experimentation (OpEx) will involve coordinated response by Houston public safety agencies, the U.S. Coast Guard, and others.

Over the last year, DHS S&T partnered with 13 Houston-area public safety agencies, the U.S. Coast Guard, the Federal Emergency Management Agency (FEMA), and the DHS Office of Emergency Communications to identify technical capabilities that could assist first responders at the scene of an emergency. Situational awareness, responder physiological and patient monitoring, personnel location tracking, and enhanced communications were identified as priority concerns. The OpEx will evaluate how DHS-developed, commercial, and existing first responder technologies integrate during an emergency to fill these gaps while using open standards.

WHO: Department of Homeland Security, Science and Technology Directorate, Next Generation First Responder Program (NGFR)

WHAT: Media availability and demonstration of the NGFR – Harris County OpEx

WHEN: 1:00 p.m. – 4:00 p.m. CST, Wednesday, December 5, 2018

WHERE: 1:00 p.m. – Remarks
              Port Coordination Center (follow signs for Police Station)
              Port of Houston
              111 East Loop North
              Houston, TX 77029

              1:45 p.m. – Technology Demonstration
              Sam Houston Tour Boat Pavilion
              Port of Houston
              7300 Clinton Drive
              Houston, TX 77020

To attend the press availability and demonstration, credentialed media must RSVP to NGFR@hq.dhs.gov by Friday, November 30, 2018, to register and receive a media packet and additional information about photographs and recording at the Port of Houston. Media must also check in at either the Port Coordination Center or the Sam Houston Tour Boat Pavilion prior to the demonstration. Media attendees must be U.S. citizens.

###

8.3 Fact Sheet

DHS Science and Technology Directorate
NGFR – Harris County Operational Experimentation

Integrating Responder Technology to Increase Impact

Today's first responders face dangerous, evolving threats, and are often equipped with outdated and proprietary technologies that restrict their ability to communicate between agencies at the incident scene. Responders need access to advanced, interoperable, plug-and-play technologies that can augment their capability to save lives.

To address this gap, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) launched the Next Generation First Responder (NGFR) Apex program to develop, adopt and integrate cutting-edge capabilities using a standards-based approach to make responders better protected, connected and fully aware. By leveraging the open standards documented in the NGFR Integration Handbook, first responders can have plug-and-play technologies to help them rapidly adapt to changing environments and evolving threats while sharing mission-critical information between all responding agencies.

NGFR Integration Demonstrations

DHS S&T has hosted several NGFR Integration Demonstrations to assess how prototype technologies integrate and augment first responder capabilities, including the most recent event in June 2017 in Grant County, Washington. At the Grant County – DHS S&T NGFR Technology Experiment (TechEx), DHS S&T integrated and deployed NGFR technologies during a search and rescue scenario. The TechEx included physiological and location sensors, situational awareness systems, drones, datacasting and deployable communications into a cohesive public safety solution in a rural setting.

During NGFR Integration Demonstrations, DHS S&T seeks first responder feedback on technologies in an operational setting, and uses their feedback and the test results to create knowledge products such as After Action Reports and NGFR Case Studies to help share lessons-learned and best practices with public safety agencies nationwide. The NGFR Case Study series, which stems from the TechEx, helps agencies understand how tools like location services, deployable communications, video services, physiological monitoring and situational awareness can improve their mission response and provides guidance on how agencies can best implement them. DHS S&T is building on the lessons of the Grant County TechEx to host the next NGFR Integration Demonstration in an urban environment.

NGFR – Harris County Operational Experimentation

DHS S&T will host the NGFR – Harris County Operational Experimentation (OpEx) from December 4-5, 2018, at the Port of Houston in Houston, Texas. The OpEx will integrate first responder technologies using open standards in the NGFR Integration Handbook to enhance the mission capabilities of Houston-area responders and the U.S. Coast Guard during a HAZMAT scenario.

DHS S&T and leadership from Harris County, City of Houston, Port of Houston Authority, U.S. Coast Guard, Southeast Texas Regional Advisory Council, Cy-Fair Volunteer Fire Department, and Atascocita Fire Department launching the partnership.

DHS S&T chose Houston-area partners for the OpEx because urban areas response agencies have significant collaboration and information-sharing needs. As of 2016, 81.7 % of Americans live in urban areas, and urban responders have different technology needs and budgets than those in rural areas. By hosting the NGFR – Harris County OpEx in the Houston area, DHS S&T and industry partners can learn about the interoperability and integration requirements of coordinated urban response and develop recommendations for both urban and rural responders.

During the OpEx, DHS S&T and responders will evaluate how DHS-developed and commercial technologies integrate with legacy public safety systems using open standards, and how those integrated capabilities enhance operational communications, increase operational coordination, improve responder safety, and augment situational awareness. DHS S&T and industry partners are providing technologies such as responder and patient physiological monitoring sensors, indoor location tracking, HAZMAT sensors, smart alerting for responders and incident command, advanced data analytics, and situational awareness and collaboration dashboards. DHS S&T and partners hope to demonstrate how integrated solutions deliver greater operational impact.

Homeland Security
Science and Technology

To learn more about the NGFR – Harris County OpEx, contact the Next Generation First Responder Apex Program at NGFR@hq.dhs.gov.

2018-13-06

9 Appendix E: Incident Radio Communications Plan

INCIDENT RADIO COMMUNICATIONS PLAN			Incident Name: **DHS OpEx**			Date/Time Prepared: **11/26/2018**		Operational Period Date/Time **Dec. 4-5, 2018 / 0800-1700**	
Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M	Remarks
1	COMMAND	HC-MA 10		TXWARN 800		TXWARN 800		T	INITIAL DISPATCH
2	TACTICAL	HC-MA 11	HATCHET OPERATIONS	TXWARN 800		TXWARN 800		T	
3	TACTICAL	HC-MA 12	SAM HOUSTON OPERATIONS	TXWARN 800		TXWARN 800		T	
4	TACTICAL	HC-MA 13	TRIAGE & TRANSPORT	TXWARN 800		TXWARN 800		T	OPS - EMS
5	TACTICAL	HC-MA 14	SECURITY	TXWARN 800		TXWARN 800		T	OPS - L.E.
6	SUPPORT	PHA EMGT	EXERCISE LOGISTICS	TXWARN 800		TXWARN 800		T	POHA ONLY
7	SUPPORT	HC-MA 8	CONTROL/SIM CELL	TXWARN 800		TXWARN 800		T	DHS ONLY