City *of* Los Angeles

EMERGENCY OPERATIONS PLAN

COMMUNICATIONS

Functional Support Annex

June 2018




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ANNEX DEVELOPMENT AND MAINTENANCE

This Annex is developed in support of the City of Los Angeles Emergency Operations Plan (EOP) to facilitate response during incidents requiring communication among City departments.

This Annex is developed in cooperation and with input from the City departments with primary response or support activities, as well as input from appropriate non-City agencies with identified activities related to communications.

This Annex is developed to describe the overall citywide response function and capabilities, and is to be used by each department identified within this Annex to develop their own standardized operating procedures (SOPs) specifically for their department to direct tactical operations. When developing SOPs, each department is to take into consideration how all of the activities identified in this plan directly related to their own department, as well as how those activities interact with, support, or require support from other departments identified within this plan. Departments must ensure that their SOPs are inclusive of planning for people with disabilities and others with access and functional needs. If, at any time, any department identifies a conflict in how their field response or support activities are performed in comparison to what is described in this Annex, and/or identifies a conflict between their listed activities within this Annex and how they relate to or support another department's listed activities, such conflict is to be immediately reported to the Emergency Management Department– Planning Division.

If, at any time, a department, agency, or stakeholder to this plan changes, develops, or amends any policy, procedure, or operation that will change or affect the contents of this plan, that entity is to immediately notify the Emergency Management Department–Planning Division.

This Annex is to be corrected immediately upon notification or observation of any operational errors or conflicts. Such corrections are to be reflected within the Record of Changes.

Every other year, a formal review of this Annex will be conducted by departments and agencies that are identified within the Annex, as well as any other departments or agencies that may need to be part of the review process. The Emergency Management Department – Planning Division will lead such an effort. Upon completion of such formal review, all corrections to the document will be reflected within the Record of Changes.

APPROVAL AND IMPLEMENTATION

This document is a Functional Support Annex to the City of Los Angeles EOP. It serves as either a stand-alone plan or companion document to an applicable Hazard Specific Response Annex to the EOP. The Annex was developed with input from all applicable City of Los Angeles departments and allied stakeholders. Upon completion, it is reviewed by the City's Emergency Management Committee (EMC). When approved by the EMC, the committee presents the document to the Emergency Operations Board with a recommendation for approval. Upon review and approval by the Emergency Operations Board (EOB), the document goes to the Mayor of the City of Los Angeles with a recommendation to approve and forward to the City Council for adoption.

Upon formal approval by the Mayor and adoption by the City Council, this document becomes an official Annex to the City of Los Angeles EOP.

This Annex was developed with input from all applicable Los Angeles City departments. This Annex is compliant with the Federal Emergency Management Agency (FEMA) *Comprehensive Preparedness Guide (CPG) 101, Developing and Maintaining Emergency Operations Plans*, Version 2.0 (CPG 101 V.2)[1].

[1] *Developing and Maintaining Emergency Operations Plans. Comprehensive Preparedness Guide (CPG) 101*, version 2.0 ed. (n.p.: U.S. Department of Homeland Security, Federal Emergency Management Agency, 2010).

RECORD OF CHANGES

Each revision or correction to this Annex must be recorded. The record contains the date, location, and brief description of change, as well as who requested or performed such change.

Table 1: Record of Changes

Date	Section/Page	Description of Change	Changed By
June 2018	All	2 Year r\Revision Due	Larry Meyerhofer

CITY EMERGENCY OPERATIONS PLAN/ANNEX CROSS REFERENCE

During the response, the following functional support shall be used as deemed necessary:

- Throughout this document, where public information and communication with the public is referenced, see the **Emergency Public Information Annex.**

- Where internal communications systems is referenced, see the **Communications Annex.**

- Where early warning and notification is referenced, see the **Early Warning and Notification Annex.**

- Where sheltering, mass care, mass feeding and the provision of functional needs support services (FNSS) is referenced, see the **Mass Care and Sheltering Annex; Resettlement Processing Center Annex;** and the **Logistics Annex.**

- Where reference is made to evacuations, see the **Evacuation Annex.**

- Where reference is made to Federal, State, Local or Non-Governmental Organizations providing recovery information, see the **Local Assistance Center Annex** and **Recovery Annex.**

- Where reference is made to response and restoration of critical infrastructure, see the **Critical Infrastructure Annex.**

- Hazard specific Annexes include the **Tsunami Annex**, **Earthquake Annex, Adverse Weather Annex, Brushfire Annex, Urban Flooding Annex, Off-Airport Major Aircraft Response Annex, Debris Flow Annex, Civil Disturbance Annex**, **Terrorism Prevention and Protection Annex** and the **CBRN Annex (including the Chemical, Biological, Radiological, and Nuclear Annexes)**

- All actions related to fulfilling the purpose of this Annex will adhere to the City of Los Angeles Citywide American with Disabilities Act (ADA) guidance, documents, and checklists.

- Where City departments have tasks assigned relative to this Annex, please refer to that specific department's Standard Operating Procedures.

BACKGROUND

As the second largest city in the United States, the City of Los Angeles has a population of over four million people that depend on the City's response in a time of crisis. It is imperative that City departments involved in an emergency response identify and communicate communication tools and methods with one another.

The Communications Annex establishes the communication capabilities of identified City departments with distinct roles and responsibilities during an emergency. There three primary modes of communication the City utilizes are: radio, telephone, and computer based communications.

City departments that possess radio communication capabilities utilize four different radio systems: analog, conventional; analog, trunked; digital, conventional; and digital, trunked. Within each system, different frequencies are utilized which range from Very High Frequency (VHF) to Ultra High Frequency (UHF). Each of these systems are utilized in three basic forms – base, mobile, and portable radio. Other forms of radio are also utilized in the form of hand held amateur radios and two-way handy talky (HT) radios. Amongst all listed radios, some are interoperable or P25 compliant.

All City departments have a landline telephone system intended for day-to-day communications. They may utilize an analog, digital, or hybrid system among many others. Some departments also possess mobile telephone systems, which may include cellular telephones provided through private vendors, or satellite telephones, which are primarily intended for emergency use.

Computer based communications among City departments come in multiple forms. Internet connections range from cable connections to T3 leased lines, and are utilized via computer, tablet, or telephone for, but not limited to, email, instant messaging, and video conferencing. Data connections are also available to some departments for file and share data. Data connections include City intranet, wireless and direct connect data sharing, and microwave data.

I. PURPOSE, SCOPE, SITUATION, AND ASSUMPTIONS

A. Purpose

This Annex details government's responsibilities for a managed and communicated emergency response. This Annex can be used in conjunction with other annexes and plans designed for the protection of the population. Organizations, operational concepts, responsibilities, and procedures described in this annex are applicable to all locations and to all agencies, organizations, and personnel with communications responsibilities.

The Communications Annex has been developed to meet the following objectives:

- Provide a concept of operations and identify roles and responsibilities for each appropriate department within the City of Los Angeles.
- Ensure consistency with Federal, State of California, the Los Angeles County Operational Area (OA), and other local governments' emergency response plans and operations.
- Outline and detail the communications capabilities of departments with roles and responsibilities during an emergency.

B. Scope

This Annex is applicable to Los Angeles City departments with Emergency Operations Organization (EOO) responsibilities and other departments with essential resources. Of particular importance to this document are:

City departments with emergency public safety functions
City departments having routine interaction with the public
City departments performing emergency public safety or other critical services

C. Situation Overview

1. Characteristics
   a) Location
      The City of Los Angeles covers 498 square miles with approximately 468 square miles of land (214 square miles of which are hills and mountains) and approximately 29 square miles of water. The San Gabriel and Santa Susana Mountains bound the City on the north and the Santa Monica Mountains extend across the middle of the City. The Palos Verdes Hills and Pacific Ocean bound the City on the south and west.

   b) Demographics
      According to the California Department of Demographic Research Unit's "*E-1 Population Estimates for Cities, Counties, and the State*[2]", the 2016 population

[2] California Department of Finance, E-1 Population Estimates for Cities, Counties, and the State, January 1, 2015 and 2016

estimate for the City of Los Angeles is 4,030,904. This breaks down to approximately 8094 persons per square mile.

The City of Los Angeles is one of the most diverse cities in the world. Angelinos speak nearly 200 languages and are part of many different religious and belief systems. Community members who live, work, and play in Los Angeles include people with disabilities and others with access and functional needs.
This plan will use the phrase *people with disabilities and others with access and functional needs* to describe both those that meet the definition of disability as well as people who may or may not meet the definitions of civil rights laws or some of the 60 plus diverse definitions of disability[3]. The definitions for people with disabilities as well as others with access and functional needs are provided below:

People with Disabilities
"Disability" in this context is a legal term rather than a medical one. It refers to a federally protected class under the 1990 ADA. Nationally, people with disabilities make up about 20% of the population. To be in compliance with the law, emergency managers must apply the concepts of accessibility, inclusion, and nondiscrimination in providing services to the general public which includes communication of public information and warnings, transportation, mass care and sheltering, and evacuations.

Others with Access and Functional Needs
"Others with Access and Functional Needs" is a broad definition that includes anyone who might have additional needs before, during, or after a disaster in accessing services. This includes individuals that may or may not meet the definitions of disability under existing civil rights laws, such as people with limited or no English language proficiency, individuals that are institutionalized, women in late-term pregnancy, or those with limited or no access to transportation. With this broader definition, about 50% of the population is considered to have an access or functional need. Anyone with a disability has an access and functional need, but not everyone with an access and functional need has a disability.

2. Vulnerabilities
The City of Los Angeles has multiple, accessible, redundant warning and notification systems that it will utilize to reach the public for warnings, notification, and support. The primary mode of notification will be the NotifyLA application. Other modes will include news releases and public service announcements to the media and directly through social media. Factors to consider are the type of disaster, the population density, and the terrain in areas of Los Angeles. In some instances, the consequences of a disaster

[3] Los Angeles Department of Public Health, "Adult Disability in Los Angeles County." LA Health. Sept. 2006

along with terrain, and the geographical area, may impact the effectiveness of notification systems.

The City of Los Angeles recognizes that disasters may exhaust local resources. The City continues to develop, update and/or maintain memorandum of understandings (MOUs), memorandum of agreement (MOAs), and contract amendments with private vendors to increase response capability and available resources. In addition, the City of Los Angeles' Business Operations Center (BOC) maintains communication channels with the private sector who may provide donations in an emergency.

Due to the population density and terrain of the City of Los Angeles, the City recognizes that, despite a good faith effort, it may not have the capabilities or resources to reach every individual in terms of public warnings, notification and/or support.

D. Assumptions

This Annex was created to integrate the concepts and structure defined by the National Incident Management System (NIMS), the California Standardized Emergency Management system (SEMS), and the National Incident Command System (ICS).

- All City, State, and Federal processes, procedures, and protocols reflected or referenced in this document were current as of the date of approval of this Annex. Before implementing this Annex, confirm that the processes, procedures, and protocols are unchanged. If necessary, before implementing, modify the Annex to reflect updated processes, procedures, and protocols.
- Only departments that have a response role or a role closely supporting the response to an event will be included in this document. The departmental roles listed are limited to those applicable to the event.
- In any disaster, primary consideration is given to the preservation of life then incident stabilization, and property preservation. Additionally, time and effort must be given to providing critical life-sustaining needs.
- In a catastrophic incident, damage control and disaster relief will be required from the State and Federal government, other local governments and private organizations.
- The City Emergency Operations Center (EOC) may or may not be activated in support of an event. EOC activation will be determined based on the scope and scale of the event.
- Electronic communications utilizing information technology systems will be compliant with Section 508 of the Rehabilitation Act.
- All printed public education material produced to support this Annex for distribution to the general public shall be available in accessible formats.
- Many residential, commercial and institutional structures could be damaged; requiring a large Urban Search & Rescue/Heavy Rescue mobilization.
- Residents could be displaced; requiring shelter and social services. Sheltering activities could be temporary or long term depending on the severity of the incident.

- Vital infrastructure such as potable water supplies, electrical power, natural gas and sewer services could be compromised. Re-establishment of these vital resources will be critical.
- Transportation infrastructure could be damaged and in limited operation. Vital vehicle and rail corridors could be damaged and impassible. Re-establishment of transportation infrastructure will be critical.
- Communications infrastructure could be damaged; causing disruption in land-line telephone, cellular telephone, radio, microwave, computer and other communication services. Re-establishment of communications infrastructure will be critical.

II. CONCEPTION OF OPERATIONS

A. Terminology

Access and Functional Needs – Access and functional needs as defined by the National Response Framework may be present before, during, or after an incident in one or more areas and may include, but are not limited to, maintaining independence, communication, transportation, supervision, and medical care. Utilize Emergency Support Function (ESF) #6 to coordinate assistance without regard to race, ethnicity, religion, nationality, gender, age, disability, English proficiency, or economic status of those who are seeking assistance as a result of a disaster.

Analog – Analog transmission is the traditional method of sending and receiving telecommunications signals. These signals are sent in the form of waves, which duplicate the transmission as it was picked up at the source or input. An analog transmission is sent over a single channel.

Backbone – A larger transmission line that carries data gathered from smaller lines that interconnect with it.

Base Station – A wireless communications station installed at a fixed location.

Cable Broadband Internet Connection - Broadband Internet access that uses the cable television infrastructure.

Cellular Telephone – A type of short-wave analog or digital telecommunication in which a subscriber has a wireless connection from a mobile telephone to a relatively nearby transmitter. The transmitter's span of coverage is called a cell. As the cellular telephone user moves from one cell or area of coverage to another, the telephone is effectively passed on to the local cell transmitter.

Channel – A unique and individual path through which signals can flow.

Digital – Digital transmission is a method of sending and receiving telecommunications signals where information is digitized into data packets.

Digital Subscriber Line (DSL) – A technology for bringing high-bandwidth Internet access over ordinary copper telephone lines. A DSL line can carry both data and voice signals. The data part of the line is continuously connected.

Direct Connect Data Lines – Transfer files between mainframe computers, and midrange computers.

Disability: A physical or mental impairment that substantially limits one or more of the major life activities of such individual. Major life activities include, but are not limited to, caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, lifting, bending, speaking, breathing, learning, reading, concentrating, thinking, communicating, and working. A major life activity also includes the operation of a major bodily function, including but not limited to, functions of the immune system, normal cell growth, digestive, bowel, bladder, neurological, brain, respiratory, circulatory, endocrine, and reproductive functions.

Fail Soft - Used to describe systems that are designed to terminate any nonessential processing when there are hardware or software failures. Systems in fail soft mode are still able to provide partial operational capability.

Frequency – For an oscillating or varying current, frequency is the number of complete cycles per second in alternating current direction. The standard unit of frequency is the hertz (Hz). If a current completes one cycle per second, then the frequency is 1 Hz; 60 cycles per second equals 60 Hz. Larger units of frequency include:

- Kilohertz (kHz) representing thousands (1,000's) of cycles per second,
- Megahertz (MHz) representing millions (1,000,000's) of cycles per second,
- Gigahertz (GHz) representing billions (1,000,000,000's) of cycles per second.

The Federal Communications Commission (FCC) divides the radio spectrum into several categories, specific to this Annex are:

- High Frequency (HF): 3-30MHz
- Very High Frequency (VHF): 30–300 MHz
- Ultra High Frequency (UHF): 300–3000 MHz

Handheld Radio –A hand-held, portable, two-way radio transceiver.

Hybrid Telephone – The component at the ends of a subscriber line of the public switched telephone network (PSTN) that converts between two-wire and four-wire forms of bidirectional audio paths.

Integrated Services Digital Network (ISDN) – A set of CCITT/ITU standards for digital transmission over ordinary telephone copper wire as well as over other media.

Intranet – A private network that is contained within the City of Los Angeles. It consists of many interlinked local area networks. The purpose of an Intranet is to share company information and computing resources among employees.

Landline – Refers to a telephone which uses a solid medium telephone line such as a metal wire or fiber optic cable for transmission as distinguished from a mobile cellular line which uses radio waves for transmission.

Mobile radio –A radio mounted to a vehicle usually with the microphone and control panel in reach of the driver.

Mobile telephone – A device that can make and receive telephone calls over a radio or satellite link while moving around a wide geographic area as opposed to a landline.

P25 compliant – A suite of standards for digital radio communications for use by federal, state/province and local public safety agencies in North America to enable them to communicate with other agencies and mutual aid response teams in emergencies.

Portable radio – A hand held radio system that can be carried by an individual.

Public Switched Telephone Network (PSTN) – The world's collection of interconnected voice-oriented public telephone networks, both commercial and government-owned. It's also referred to as the Plain Old Telephone Service (POTS).

Push to talk (PTT) – A means of instantaneous communication commonly employed in wireless cellular telephone services that uses a button to switch a device from voice transmission mode to voice reception mode. The operation of telephones used in this way is similar to "walkie talkie" use. PTT switches a telephone from full duplex mode, where both parties can hear each other simultaneously, to half duplex mode, where only one party can speak at one time. Multiple parties to the conversation may also be included.

Receivers – Electronic devices that receive radio waves and convert the information carried by them to a usable form.

Repeaters – Electronic devices that receive signal and retransmit it at a higher level or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances.

Satellite Telephone – A type of mobile telephone that connects to orbiting satellites instead of terrestrial cell sites.

Simulcast – The simultaneous broadcast of data across more than one medium, or more than one service on the same medium, at the same time in order to preserve and deliver the message.

T-1 & T-3 lines – The most commonly used digital transmission service for Internet access. It consists of 24 separate channels using pulse code modulation (PCM) signals with time-division multiplexing (TDM).

Talkgroup – The same thing as a channel but in reference to a trunked radio system. Where a channel is on only one frequency, the nature of a trunked system means a talkgroup does not belong to any one frequency.

Transmitters – Electronic devices which, with the aid of an antenna, produce radio waves.

Trunked – A complex type of computer-controlled, two-way radio system that allows sharing of relatively few radio frequency channels among a large group of users. With a trunked system multiple talk groups utilize a pool of frequencies. The amount of conversations that can simultaneously occur is limited by the amount of frequencies the system possesses. Unlike a conventional system, the amount of channels/talk groups is not limited by the amount of frequencies a system has. A conventional system has a one to one ratio of channels to frequencies; a trunked system can have 10 frequencies but 20 talk groups.

Voice over Internet Protocol (VoIP) – An IP telephony term for a set of facilities used to manage the delivery of voice information over the Internet. VoIP involves sending voice information in digital form in discrete packets rather than by using the traditional circuit-committed protocols of the PSTN.

Wireless Internet Connections – Wireless broadband is high-speed Internet access and data service delivered through a wireless local area network (WLAN) or wide area network (WWAN).

For a list of acronyms, see Attachment A.

B. Communication Responsibility and Authority

The Information Technology Agency (ITA) is the primary department in the City of Los Angeles that provides and maintains communications capabilities. However, to a varying degree, each department in the City may manage and maintain its own communications capabilities. Some departments, including the Port of Los Angeles (POLA), Los Angeles World Airports (LAWA), and the Department of Water and Power (LADWP), consult with ITA at a limited capacity. Other departments, including the Emergency Management Department (EMD) and the Department of Disability (DOD), rely heavily or solely on ITA. The responsibility and authority over a department's mode of communication varies with each department and at times may overlap.

C. Radio Communication

Radio communication in the City of Los Angeles varies based on department. Some departments, such as the Los Angeles Fire Department (LAFD), use Radio Communication as a primary mode of communication; while other departments, such as the Department of General Services (GSD), may only use it during an emergency. Departmental radios are only to be used by respective department personnel and are not permitted to be used by members of the public or other departments. System types, equipment, number, and frequencies vary by department.

D. Telephone Communication

Telephone communication in the City of Los Angeles is divided into two categories: landline telephone and mobile telephone. Landline telephones are used for day-to-day operations and possess myriad capabilities which include voice, voicemail, conference calls, and multiline use. Mobile telephones can be further subdivided into two categories: cellular and satellite. Cellular phones are used for communication with personnel when they are outside the office. Depending on the department, they are used as a primary mode or secondary mode of communication and possess more than voice capabilities. Not all departments have cellular phones. Satellite phones are only used in an emergency to back up failing modes of communication. Department telephones are only to be used by department personnel and are not permitted for use by members of the public or other departments. Mobile phones tend to be maintained internally by department, while landline telephones are usually maintained by ITA.

E. Computer Network and Data

Computer networks and data in the City of Los Angeles vary by department. These are used to facilitate computer based communications such as email, file transfer, internet access, and intranet access. System types, connections, and servers also vary by department. Computer networks and data are only to be used by department personnel and are not permitted for use by members of the public or other departments

F. Employees with Disabilities

Department ADA Coordinators, in conjunction with DOD and ITA, will ensure that people with disabilities employed by the City are provided assistive devices, software, relay service and other communication devices require to enable essential functions. People with disabilities and others with access and functional needs employed by the City are addressed individually to evaluate their communication technology requirements in order to ensure effective communication.

G. Documentation and Time-Keeping

During an emergency situation or incident, it is important to keep specific records related to staff assignments and costs related to the response to and recovery from the emergency/incident. Each department has their own internal processes for ensuring

proper documentation and record retention of incident specific cost tracking, and personnel time keeping.

In accordance with standard cost accountability practices for unique events, man-made and/or natural disasters, all City Departments are required to document their financial costs of labor, materials and equipment in addressing the event.

Each City department, proprietary and Council controlled, operates their respective accounting operations/practices within the guidelines of the Mayor‘s Executive Directives, the California Natural Disaster Assistance Act and the Federal Code of Regulations Title 44 of the Stafford Act to maximize potential reimbursement eligible costs and minimize ineligible costs.

III. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITY

A. City of Los Angeles

1. Airports, Los Angeles World (LAWA)

a.) Roles and Responsibilities

LAWA owns and operates two airports in the City of Los Angeles: Los Angeles International Airport (LAX) and Van Nuys Airport (VNY). In an emergency, communications between first responders at LAX and VNY are highly complex. As a result, the emergency communications functions are under constant assessment, maintenance, and upgrading. LAX Airport Operations and LAWA Airport Police work closely with the Information Management and Technology Division (IMTG) to ensure the communication infrastructure is maintained and functional during emergencies.

All responding agencies coordinate their emergency communications in order to achieve interoperability, which allows response personnel and their affiliated organizations to communicate via voice, data or video conferencing. The type of communications equipment and procedures used for a specific incident are based upon the hazard(s) impacting the airports.

b.) Coordination

i. Fire Department, Los Angeles (LAFD)
- Metropolitan Fire Communications (MFC)
- Battalion 4
- Engine Company 80
- Engine Company 51
- Engine Company 95

ii. Police Department, Los Angeles (LAPD)
- LAX substation
- Pacific Division Watch Commander

iii. Los Angeles County
- Fire Department (LACoFD)
- Sheriff's Department, Marina Del Rey Harbor
- County Lifeguards

iv. State
- California Highway Patrol (CHP)
- California Department of Transportation (Caltrans)
- California Office of Emergency Services (CAL OES)
- Environmental Services

v. Federal Agencies
- Federal Aviation Administration (FAA)
- National Transportation Safety Board (NTSB)
- Coast Guard, LAX & Long Beach stations
- Transportation Security Administration (TSA)

- Customs and Border Protection (CBP)
- Immigration and Customs Enforcement (ICE)
- Federal Bureau of Investigation (FBI)
- Communicable Disease Control Center (CDC)

c.) Radio

An UHF Digital Trunk Radio System (DTRS) as well as an UHF Analog Conventional Radio System are installed at both LAX and VNY

i. LAX and VNY Digital Trunked Radio System

- Function and capabilities
  - As a primary mode of communication, this system consists of the LAX Simulcast cell which is a six channel system and the VNY four channel stand-alone cell. The VNY sub-system is tied into the LAX system but is not part of the LAX Simulcast Cell.
  - Number
    - 1350 handheld radios
    - 325 mobile radios
    - 12 base radios
    - 7 dispatch consoles
  - Frequency:
    - 450 - 480 MHz (UHF)
  - System is P25 compliant
  - Location
    - LAX and VNY
- Maintenance
  - All radio equipment is maintained by LAWA and private vendors coordinated through LAWA
- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
  - There exists the possibility of losing one of the two radio sites that cover the LAX campus
- Overcome
  - Backup batteries for radios
  - Backup generators for power
  - Hardware redundancies for failing hardware
  - Regular maintenance as preventative care
  - Radio site backup systems and rerouting for downed sites
    - In the event that one of the two radio sites that cover the LAX campus are lost, the other radio site will provide the required coverage to a reasonable extent. The DTRS also has fail-soft

capability which allows limited use of the system (Conventional Operation) in the event of equipment failure.

- LAWA has two radio systems that serve VNY (the Conventional Analog Radio System and the Trunked Digital Radio System). The Conventional Analog Radio System acts as backup to the Trunked Digital Radio System, and vice versa. Further, this Single-Site DTRS has fail-soft capabilities which allow limited use of the system (Conventional Operation) in the event of equipment failure/malfunction.

- Other types of communication exist in the form of landline telephone, mobile telephone, internet access, and data communication.

ii. LAX UHF Analog Conventional Radio System

- Function and capabilities
  - As a primary mode of communication, the LAX analog radio system consists of two conventional UHF channels with integrated/patched-in VHF, 800 MHz, and Mutual Aids channels.
  - Number
    - 290 portable radios
    - 107 mobile radios
    - 10 base radios
  - Frequency – a list of the UHF, VHF, and mutual aid channel frequencies that are setup to be patched to the system, which are available on an as needed basis, are listed in the table below:

Description	Channel	Frequency
PD1 (Police Division 1)	UHF Channel 1	460 MHz Range
Maintenance Division	UHF Channel 2	450 MHz Range
LAPD (Base Station)	Mutual Aid	506 MHz Range
CLEMARS (Base Station)	Mutual Aid	150 MHz Range
FAA (Base Station)	VHF	160 MHz Range
Parking Alarm	VHF	153 MHz Range
Sheriff #1 (Base Station)	UHF	450 MHz Range
Sheriff #2 (Base Station)	UHF	450 MHz Range
CLEMARS (Base Station)	UHF	450 MHz Range

  - System is P25 compliant
  - Location
    - LAX
- Maintenance
  - All radio equipment is maintained by LAWA and private vendors coordinated through LAWA
- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption

- External infrastructure interruption
- Overcome
  - Backup batteries for radios
  - Backup generators for power
  - Hardware redundancies for failing hardware
  - Regular maintenance as preventative care
  - Site backups systems and rerouting for downed sites
    - Two radio systems at LAX (the Conventional Analog Radio System and the Trunked Digital Radio System). To some extent, the Conventional Analog Radio System acts as backup to the multi-site Trunked Digital Radio System, and vice versa.
    - Analog-only radios have "direct" capability which allows direct (simplex) communication between two or more portable radios without going through radio frequency (RF) repeaters. Some radios have the talk-around feature enabled to allow simplex operation when needed when the system repeater becomes unavailable or defective.
  - Other types of communication exist in the form of landline telephone, mobile telephone, internet access, and data communication

iii. VNY UHF Analog Conventional Radio System

- Function & Capabilities
  - As a primary mode of communication, there are four (4) repeaters at Van Nuys, one for each of the four (4) analog LAWA UHF channels. The radio control facility is located at the VNY Administrative Office. Radios are for the support of operations of all non-airport police personnel.
  - Number
    - 25 portable radios
    - 6 mobile radios
  - Frequency – a list of the UHF, VHF, and Mutual Aid channel frequencies that are setup to be patched to the system, which are available on as need basis, are listed in the table below:

Description	Channel	Frequency
PD1 (Police Division 1)	UHF Channel 1	460 MHz Range
Maintenance Division	UHF Channel 2	450 MHz Range
LAPD (Base Station)	Mutual Aid	506 MHz Range
CLEMARS (Base Station)	Mutual Aid	150 MHz Range
FAA (Base Station)	VHF	160 MHz Range
Parking Alarm	VHF	153 MHz Range
Sheriff #1 (Base Station)	UHF	450 MHz Range
Sheriff #2 (Base Station)	UHF	450 MHz Range
Description	Channel	Frequency
Clemars (Base Station)	UHF	450 MHz Range

- P25 compliant
- Location
  - VNY with all non-airport police personnel.

- Maintenance
  - All radio equipment is maintained by LAWA and private vendors coordinated through LAWA
- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - Backup batteries for radios
  - Backup generators for power
  - Hardware redundancies for failing hardware
  - Regular maintenance as preventative care
  - Site backups systems and rerouting for downed sites
  - Two radio systems at VNY (the Conventional Analog Radio System and the Trunked Digital Radio System). The Conventional Analog Radio System acts as backup to the multi-site Trunked Digital Radio System, and vice versa.
  - Analog-only radios have direct capability which allows direct (simplex) communication between two or more portable radios without going through RF repeaters. Some radios have the Talk-around feature enabled to allow simplex operation when needed. This feature is useful when the system repeater becomes unavailable or defective.

d.) Landline Telephone

i. Voice over Internet Protocol (VoIP) – Cisco Call Manager VoIP

- Function and Capabilities
  - This is the primary telephone system used for communications inside and outside LAWA. Its capabilities consist of internal/external calls, extension mobility, conference calls, call transfer, call forwarding, call park, call barging, voice mail, local/remote access of voicemail, telephone tree, corporate directory access, speed dials, desk telephone and overhead paging. Allows the caller to talk to a live operator as well as call a pilot, auto attendants, custom call routing trees, call center, and call center reporting.
  - Number
    - 2,500 telephones
- Maintenance
  - System is owned and maintained by LAWA. LAWA also has maintenance support from private vendors to respond to any issue.
- Vulnerabilities

- Power failure
- Network/provider failure
- Saturation
- External infrastructure interruption
- Internal infrastructure interruption

- Overcome
  - LAWA has 5 Cisco call managers that are high availability and redundancy when 1 system fails. These are spread out on 3 major locations.
  - LAWA on-call staff and vendor support
  - Backup generators

e.) Mobile Telephone

i. Cellular and Satellite telephones

- Function and capabilities
  - Used to support mobile needs and as a secondary mode in emergency communications via voice, text messaging, data, and Internet.
  - Number
    - 500 smart telephones
    - 400 cellular telephones
    - Unknown number – satellite telephones
- Maintenance
  - LAWA and private vendors coordinated through LAWA
- Vulnerabilities
  - Power failure
  - Network failure
  - Hardware failure
  - Service/signal failure
  - Saturation
- Overcome
  - Spare batteries
  - Redundant hardware
  - Contact vendor
  - Other types of communication exist in the form of, landline telephone, Internet access, and data communication

f.) Computer and data network

i. High speed Metro-Ethernet, Optiman, Intranet

- Function and capabilities
  - As a primary mode of communication, this system is used for supporting LAWA and LAWA business, and is utilized for web browsing, interact with social media, downloading and uploading Internet content such as HTML files, data and video streaming, create IPsec/site-to-site VPN tunnel, among others
  - Number of devices utilizing this connection

        - 500 smart telephones
        - 2500 computers
    - Maintenance
        - All Internet/Intranet is owned and maintained by LAWA and vendors. Vendors are coordinated through LAWA.
    - Vulnerabilities
        - Internal infrastructure interruption
        - External infrastructure interruption
        - Cyber-attack – internal and external
        - Hardware failure
    - Overcome
        - The landline and cellular data are backups for each other
        - LAWA on-call staff and vendor support
        - Network cyber security

2. Building and Safety, Los Angeles Department of (LADBS)

a) Roles and Responsibilities

i. LADBS directs Safety Assessment Teams, Safety Assessment Program participants, and employees activated during an emergency. The Department will also coordinate with the Housing and Community Investment Department, Code Enforcement Division, and inspectors.

b) Radio

i. Analog, Conventional

- Function and capabilities
    - Radios are used for emergency management in the field and Department Operations Center (DOC).
    - Radios are used primarily by Safety Assessment Teams and support groups after a major incident. Radios will be used when landlines and cellular telephones are inoperable.
    - Number
        - 150 portable radios
            - 100 - P7300 Harris
            - 50 - P5500Harris
    - Frequency
        - 700-800 MHz
    - Non P25 compliant

ii. Maintenance

- ITA is responsible for maintaining the operability of this system

iii. Vulnerabilities

- Power failure
- Network/service failure
- Internal infrastructure interruption
- External infrastructure interruption

iv. Overcome
- Backup batteries for radios
- Hardware redundancies for failing hardware
- Regular maintenance as preventative care

c) Landline Telephone System
i. Digital Telephone System
- Function and capabilities
  - As a secondary mode of communication, this system is used when there is a requirement for multiline telephones and sites do not support VoIP. Basic and advanced features, such as conference, forwarding, speed calling, intercom and voicemail, are provided by the Private Branch Exchange (PBX) or Central Office.
  - Number
    - 1,000

ii. Refer to ITA section of annex regarding:
- Maintenance
- Vulnerabilities
- Overcome

d) Mobile Telephone System
i. Cellular Telephones
- Function and capabilities
  - As a primary mode of communication, cellular telephones are used daily on the field or away from the office to communicate with staff, management, and clients. Cellular telephones possess voicemail, voice and text messaging, data, internet, and email.
  - Number
    - 630 cellular telephones

ii. Maintenance
- LADBS is responsible for maintaining the operability of this system through private vendors.

iii. Vulnerabilities
- Power failure
- Network failure
- Hardware failure
- Service/signal failure
- Saturation

iv. Overcome
- Spare batteries
- Landlines and email
- Use Internet and email if accessible
- Contact vendor

e) Computer Network
i. OC3 - Optical Carrier

- Function and capabilities
    - As a secondary mode of communication, computer networks are utilized for day-to-day operations that include email, and inspection and plan check functions
    - Number
        - 650 Desktop computers
        - 730 Laptops

ii. Refer to ITA section of annex regarding:
- Maintenance
- Vulnerabilities
- Overcome

f) Data

i. Servers and Intranet
- Function and capabilities
    - As a secondary mode of communication, data systems are used for file access, applications, and inspection and plan check functions.
    - Number
        - 650 desktop computers
        - 730 Laptop

ii. Refer to ITA section of annex regarding:
- Maintenance
- Vulnerabilities
- Overcome

3. Disability, Department on (DOD)

a) Roles and Responsibilities

DOD supports elected officials and departments throughout the City by ensuring communication and information delivered to the public is accessible for people with disabilities and others with access and functional needs.

i. Coordination
- DOD will coordinate through EMD during an incident

b) Radio

i. Non-applicable

c) Landline Telephone System

i. Refer to ITA section of annex regarding:
- Digital telephone system (primary mode of communication)

d) Mobile Telephone System

i. Non applicable

e) Computer Network

i. Refer to ITA section of annex regarding:
- ISDN
- DSL

f) Data
   i. Refer to ITA section of annex regarding:
      - Intranet

4. Emergency Management Department (EMD)

a) Roles and Responsibilities

EMD is responsible for coordinating communication services in the City EOC and maintaining the operational readiness of the communications systems that are used by EOC responders, which include, but are not limited to, telephone, data, radio, and audiovisual systems. EMD maintains a city duty officer program and coordinates communications services for staff that are on call. These systems include, but are not limited to, telephone, data, satellite telephone, and amateur radio.

EMD coordinates with all city EOC response departments as well as the Los Angeles County OA, Cal OES, and FEMA. The coordination of communications services is assigned to EMD Operational Readiness Division. EMD works with ITA on all communication systems. ITA provides technical support for both EOC and day to day EMD operations.

b) Radio
   i. Digital, Conventional
      - Function and Capabilities
        - Used as a secondary mode of communication, if telephone capabilities are offline, radios are used for communication in the EOC.
        - Number
          - 5 mobile radios
          - 6 base radios
        - Frequency
          - 800MHz
        - P25 compliant
        - Located in the EOC for responding departments:
          - POLA
          - Recreation and Parks
          - DOT
          - Power and Water
          - Building and Safety
          - County Wide Emergency Radio System (CWERS)
          - Located with EMD staff
      - Maintenance
        - ITA is responsible for maintaining the radio operations system
      - Vulnerabilities
        - Power failure
        - Network/service failure

        - Internal infrastructure interruption
        - External infrastructure interruption
    - Overcome
        - Backup batteries for radios
        - Backup generators for power
        - Hardware redundancies for failing hardware
        - Regular maintenance as preventative care Contact ITA

c) Landline Telephone System
    i. Analogue Telephone System, Voiceover Internet Protocol, Fax
        - Function and capabilities
            - As a primary mode of communication, landline telephones are used on a daily basis as well as during an activation for internal and external communication. The system possesses a full spectrum of capabilities that include, but are not limited to, voice, conference calls, voicemail, and call forwarding.
        - Number
            - 120 telephones located in the EOC
            - 30 telephones in EMD offices
        - Maintenance
            - ITA and private vendors (via ITA) are responsible for maintaining the operability of the system
        - Vulnerability
            - Power failure
            - Network/provider failure
            - Saturation
            - External infrastructure interruption
            - Internal infrastructure interruption
        - Overcome
            - Backup power
            - Back up communication
            - EOC – VOIP 120 individual backup lines
            - Mobile and satellite telephones
            - Radio
            - Handheld amateur radio
            - Computer network
            - Data communication
            - Contact ITA

d) Mobile Telephone System
    i. Cellular and satellite telephone
        - Function and capabilities
            - Cellular and satellite telephones, respectively, are used on a daily basis as well as during an activation for internal and external communication. Cellular telephones are allocated to EMD staff

members, while satellite telephones are allocated to the Duty Officer and General Manager. Cellular telephones possess full spectrum capabilities that include, but are not limited to, voice, text messaging, and email. Satellite telephones only possess voice capabilities.

- Number
  - 25 cellular telephones
  - 2 satellite telephones

- Maintenance
  - ITA and private vendors (via ITA) are responsible for maintaining the operability of the system
- Vulnerabilities
  - Power failure
  - Network failure
  - Hardware failure
  - Service/signal failure
  - Saturation
- Overcome
  - Spare batteries and chargers
  - Redundant hardware
  - Back up communication
    - EOC – VoIP 120 individual backup lines
    - Landline telephones
    - Radio
    - Handheld Amateur Radio
    - Computer network
    - Data communication

e) Computer Network

i. Wireless internet connection and T1-leased line

- Function and capabilities
  - Computer networks are used to facilitate the various modes of communication capabilities EMD possesses. EMD's computer networks are used on a daily basis as well as during an activation. Capabilities utilized through EMD's computer network, include but are not limited to, email, VoIP, Internet access, video conferencing (Skype, Lynx, and VTC), and WebEOC.
  - Number
    - 200 computers with connectivity
    - 10 mobile hot spots

ii. Maintenance

- ITA and private vendors (via ITA) are responsible for maintaining the operability of the system

iii. Vulnerabilities

- Saturation

- Power failure
- Internal and external Infrastructure interruption
- Deliberate attack

iv. Overcome
- Backup power
- Back up communication
    - EOC – VoIP 120 individual backup lines
    - Fixed telephones
    - Radio
    - Handheld Amateur Radio
    - Computer network
    - Data communication
    - Contact ITA

f) Data

i. Intranet and shared drive/local network
- Function and capabilities
    - Data sharing is used on a daily basis as well as during an activation for internal file sharing and file transfer
    - Number
        - 200 computers utilized this capability

ii. Maintenance
- ITA is responsible for maintaining the operability of the system

iii. Vulnerabilities
- Saturation
- Power failure
- Internal and external Infrastructure interruption
- Cyber attack

iv. Overcome
- ITA backs system data
- Employees back up their own work
- EMD possess generators for backup power
- Systems possess antivirus and firewalls

5. Fire Department, Los Angeles (LAFD)

a) Roles and Responsibilities

Los Angeles Fire Communication Section and Dispatch Support Section is responsible for maintaining all communication (voice/data) aspects of LAFD. LA Metro maintains the communication infrastructure (repeater sites, microwave, etc.), vehicles (engines, trucks, rescue ambulances, command vehicles, etc.), cellular telephones, data devices, and computer devices for the entire Department. All members are on a 4-10 schedule, but are on 24-hour call in case of large scale emergencies.

Fire Communications also coordinates with all City services, including LAPD, ITA, and GSD. All agencies work together during planned and emergency events to set up logistics (command post, communications, video down linking,) for area command.

b) Radio
   i. LAFD Voice Radio System
      - Function and capabilities
        - As a primary mode of communication, the radio system consists of transmitters, receivers, mobile radios, and portable radios. Transmitters and receivers are for radio backbone as repeaters. Mobile and portable radios are for firefighting operations in the field. Mobile radios are in the vehicles such as fire trucks, fire engine, rescue ambulance, and miscellaneous fire apparatus. Portable radios are carried by all personnel in the field, fire prevention, and special duty.
        - Number
          - 168 transmitters
          - 168 receivers
          - 3,000 mobile radios
          - 6,500 portable radios
        - Frequency
          - 800 MHz
        - The radio system is interoperable with 800MHz radio. The system is analog and not P25 compliant.
        - LAFD resources in the field and socialized resources have 800/VHF/UHF-capability and interoperability with other agencies.
        - LAFD voice radio backbone uses 9 main sites and 1 backup site.
      - Maintenance
        - ITA is responsible for maintaining the operability of this system
      - Vulnerabilities
        - Power failure
        - Network/service failure
        - Internal infrastructure interruption
        - External infrastructure interruption
      - Overcome
        - LAFD possesses spare batteries for the portable radios
        - Major radio sites have backup batteries and backup generators
        - Fire stations and some fire facilities have backup generators
        - ITA provides regular maintenance of batteries and backup generators
        - Contact Mount Lee Monitor 24 hours a day and 7 days a week.
      - Security
        - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms

ii. LAFD Mobile Data Network (MDN)
- Function and capabilities
  - The radio system consists of transmitters, receivers, vehicular radio modems (VRM) and laptop computers. The transmitters and receivers are used for the mobile data radio backbone. VRM and laptops are installed in vehicles for firefighting operations in the field. VRM and laptops use car batteries as a power source.
  - Number
    - 24 transmitters
    - 24 receivers
    - 800 VRM
    - 890 laptops / CPUs
  - Frequency
    - 500 MHz
  - Non-interoperable/P25 compliant
  - LAFD mobile data radio system uses six 4-channel radio sites for the backbone
- Maintenance
  - ITA is responsible for maintaining the operability of this system
- Vulnerabilities
  - Power failure
- Overcome
  - Regular maintenance of fire units and batteries
  - Contact Mount Lee Monitor 24/7 for radio backbone problems.
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms.

c) Landline Telephone System
   i. Refer to ITA section of annex regarding:
      - Digital
      - VoIP

d) Mobile telephone
   i. Cellular and Satellite telephones
      - Function and capabilities
        - Mobile telephones possess full spectrum capabilities and are used as a secondary to radio communication by the LAFD for administrative use as well for support in emergency incidents.
        - Number
          - 16 - MSAT telephones
          - 8 - IRIDIUM telephones
          - 300 cellular telephones
      - Maintenance
        - Private vendors

- Vulnerabilities
  - Power failure
  - Network failure
  - Hardware failure
  - Service/signal failure
  - Saturation
- Overcome
  - Spare batteries and cellular phone chargers
  - Redundant hardware
  - Contact service provider

e) Computer Network
   i. Refer to ITA section of annex regarding Metropolitan Ethernet

f) Data
   i. Refer to ITA section of annex regarding Intranet

6. General Services, Department of (GSD)

a) Roles and Responsibilities

GSD coordinates logistics for the City's EOO, serves as the City's Purchasing Agent, maintains City buildings, facilities and vehicles, and assists LAPD with security badging operations for City employees, and coordinates special events.

At the field level, GSD's Maintenance Division and Construction Forces Division utilize the City's 800 MHz radio system and cellular telephones to provide support to City facilities before, during, and after emergencies. GSD Fleet Services uses these systems to track and maintain City vehicles.

GSD also provides responders for the City's EOC Logistics Section where land line phones, cellular phones, City Intranet and Internet systems are used to coordinate ordering; procurement and cost tracking of supplies and equipment; as well as facilities and vehicle maintenance and deployment. GSD provides logistical and procurement support to City Council controlled departments and coordinates logistical mutual aid with the County of Los Angeles and the State of California during declared emergencies. GSD may assist, in collaboration with the Personnel Department, with the coordination of volunteer management and donations management with the EOC BOC.

   i. Communications and Resource Coordination
      - GSD coordinates with every department within the City of Los Angeles and must maintain a degree of interoperability to ensure seamless communications, especially during emergencies.

b) Radio
   i. Digital Trunked
      - Function and capabilities

- Radios are used as secondary mode of communication for day-to-day operations and during an emergency.
- Number
  - base radios
  - 60 portable radios
  - 30 mobile radios
- Frequency
  - 800Mhz

- Refer to ITA section of annex regarding:
  - Maintenance
  - Vulnerabilities
  - Overcome

c) Landline Telephone System

i. Digital Telephone system

- Function and capabilities
  - Landline telephone systems are used as a primary form of communication for day-to-day operations. Landline telephones possess conference calls, voicemail, and call forwarding capabilities.
  - Number
    - Unknown, department-wide number
- Refer to ITA section of annex regarding:
  - Maintenance
  - Vulnerabilities
  - Overcome

d) Mobile Telephone

i. Cellular Telephones with push to talk capabilities

- Function and capabilities
  - Cellular phones are the primary mode of communication for communication with field staff and possess voice, text, and voice messaging capabilities
  - Number
    - 562
- Maintenance
  - Private vendors are responsible for maintaining the operability of this system
- Vulnerabilities
  - Power failure
  - Network failure
  - Hardware failure
  - Service/signal failure
  - Saturation
- Overcome
  - Spare batteries

- Other types of communication exist in the form of, radio, landline telephone, internet access, and data communication
- Contact vendor

e) Computer Network
   i. DSL, T-1 and T-3 Dedicated Leased Lines, and servers
      - Function and capabilities
        - As a primary mode of communication, computer networks are used to organize and share files, print information, send emails, and other pertinent day-today operations
        - Number
          - 65 smart phones
          - Unknown number of computer workstations
      - Maintenance
        - ITA and GSD are both responsible for maintaining the operability of this system
      - Vulnerabilities
        - Internal infrastructure interruption
        - External infrastructure interruption
        - Cyber-attack – internal and external
        - Hardware failure
      - Overcome
        - Broadband wireless cards
        - Network security
        - Contact ITA

f) Data
   i. Intranet, direct connect data lines, wireless data, and microwave data
      - Function and capabilities
        - As a primary mode of communication, data is used to connect to the internet, city networks, and provides support for file transfer and applications that require email, voice mail, and text messaging
      - Maintenance
        - ITA and GSD are both responsible for maintaining the operability of this system
      - Vulnerabilities
        - Internal infrastructure interruption
        - External infrastructure interruption
        - Cyber-attack – internal and external
        - Hardware failure
      - Overcome
        - Network security
        - Contact ITA

7. Port of Los Angeles (POLA)

a) Roles and Responsibilities

The POLA is responsible for managing one of the largest ports in the United States and coordinating with the appropriate agencies when an incident occurs. Primary and backup communications, amateur radio volunteers, Government Emergency Telecommunication Service (GETS) and Wireless Priority Service (WPS) programs, portable Globalstar handheld programs, are all coordinated within the port.

i. Coordinating agencies
   - U.S. Customs & Border Protection
   - U.S. Maritime Administration
   - U.S. Army Corps of Engineers
   - Port of Long Beach Administration
   - Port of Los Angeles Administration
   - Jacobsen Pilots
   - Los Angeles Pilots Service

ii. Additional stakeholders as an incident may dictate
   - Marine Exchange of Southern California
   - Local Advisory Committees (Harbor Safety Committee, Area Committee, etc.)
   - Oil Terminals
   - Container & Break Bulk Terminals
   - Passenger Vessel Terminals
   - Organized Labor
   - Towing Vessel Operators
   - Salvage and Marine Firefighting organizations
   - Utility Companies

iii. During recovery the Harbor may communicate and coordinate with other advisors and subject matter experts, which include various government or industry sources:
   - U.S. Coast Guard Marine Safety Center
   - U.S. Coast Guard National Strike Force
   - U.S. Navy Supervisor of Salvage
   - U.S. National Oceanic & Atmospheric Administration
   - U.S. Department of Fish & Wildlife
   - U.S. Department of Commerce
   - U.S. Environmental Protection Agency
   - U.S. Department of Health & Human Services
   - State of California Department of Fish & Game
   - State of California Department of Transportation
   - Oil Spill Response Organizations
   - Operators of commercial fishing vessels

- Operators of recreational vessels
- Container crane manufacturer or repair technician
- Electrical engineers
- GIS mapping/display specialists

b) Radio
   i. Digital, conventional
      - Function and capabilities
        - As a primary mode of communication, radios are used during daily and emergency operations
        - Number
          - 65 – XTS 5000 radios
          - 4 – Harris 700 Radios
          - 32 – XTL 5000
        - Frequency
          - 400-500MHz
        - Location
          - Handheld radios are issued to Port Police (XTS), sworn and administrative staff (XTS), security guards (Harris), while mobile units are installed on vehicles (XTL)
   ii. Digital Trunked
      - Function and capabilities
        - As a primary mode of communication, radios are used during daily and emergency operations. Radios are installed for emergency use in all Port Police vehicles and vessels part of the 800 MHz City of LA Trunked System.
        - Number
          - 20 – Macom Radios
        - Frequency
          - 800MHz
        - P25 compliant
   iii. Analog, conventional (Handheld amateur radio)
      - Function and capabilities
        - Handheld amateur radios are used as a primary mode of communication between departments
        - Number
          - 22 HAM radios
        - Frequency
          - 144 – 448MHz
        - Location
          - With field units
   iv. Maintenance
      - Radio equipment is maintained through LAPD, Harbor IT, ITA, and private vendors – which are coordinate through Harbor IT

v. Vulnerabilities
- Power failure
- Network/service failure
- Internal infrastructure interruption
- External infrastructure interruption

vi. Overcome
- Multiple redundancies of communications
  - Cellular telephones
  - Satellite telephones
  - 800 Mhz Radios
  - Police Radios
  - VHF Marine Radios
  - Amateur Radios
  - GETS
  - WPS
  - Short Message Service (SMS) messaging – text messaging
- Spare batteries for the XTS 5000 radios and Macom radio

c) Landline Telephone system

i. Analog and VoIP
- Function and capabilities
  - The Harbor department relies primarily on VoIP solution for its day to day telephonic voice communications and traditional POTS telephone system is for emergency backup and is located in only a few areas. However, both VoIP and the POTS system are used on day-to-day basis. Each has full spectrum capabilities.
  - Number
    - 1500

ii. Maintenance
- The Harbor has its own Information Technology Division responsible for maintenance and coordination with vendors

iii. Vulnerabilities
- Power failure
- Network/provider failure
- Saturation
- External infrastructure interruption
- Internal infrastructure interruption

iv. Overcome
- Hardware redundancies
- Contacting internal IT division
- Our 911 has a traditional telephone system for backup

d) Mobile Telephone system

i. Cellular Telephones
- Function and capabilities

- Cellular telephones are used for daily business communications while satellite telephones are for emergency use only. Cellular telephones are use primary when individuals are out of the office or for employees working in the field. Satellite telephones again are for backup purposes only. Depending on the telephones that were issued out, most of the smart telephones have all capabilities. Field crews usually only have voice communications and text messaging.

- Number
  - 400 cellular telephones
  - Satellite telephones
    - 4 – Globalstar telephones
    - 7–Globalstar inactivated (owned and activated in emergency)
    - 5 – Iridium telephones
    - 3–InMarSat activated and capable of doing both voice and data

ii. Maintenance
- Cellular telephone service is maintained by the Harbor IT division and the various carriers.
  - Satellite telephones are maintained by Port Police.

iii. Vulnerabilities
- Power failure
- Network failure
- Hardware failure
- Service/signal failure
- Saturation

iv. Overcome
- Subscribers have WPS capabilities
- Text messaging capabilities
- Satellite Telephone Capabilities
- 20-800 MHz trunked radios
- Amateur Radio Operators
- Spare batteries

e) Computer network

i. Wireless Internet Connections, T-1 Lines – Leased Line, Bonded T-1, T-3 Lines – Dedicated Leased Line, OC3 - Optical Carrier, Internet over Satellite
- Function and capabilities
  - Used as a primary mode of communication for email, day-to-day business communications, and access to other city departments and possess full spectrum capabilities
  - Number
    - 1000 computers

ii. Maintenance
- Harbor IT and private vendors coordinated through Harbor IT

iii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Saturation
- Power failure
- Cyber-attack – internal and external

iv. Overcome
- Contact ITA
- Contact vendor
- Redundant hardware
- Network security

f) Data

i. Intranet, direct connect data lines, wireless data, microwave data, internal servers
- Function and capabilities
  - All are used for day-to-day business. Microwave data is used by the security video system to view harbor security. Harbor contacts and informs employees regarding the business functions of the port via intranet.
  - Number
    - 1000 computers

ii. Maintenance
- Harbor IT and ITA
- Harbor maintains its own Secure File Transfer Protocol system

iii. Vulnerabilities
- Internal infrastructure interruption
- External infrastructure interruption
- Cyber-attack – internal and external
- Hardware failure

iv. Overcome
- Backup files
- Contact Harbor IT
- Network security

8. Information Technology Agency (ITA)

a) Roles and Responsibilities

i. ITA provides various support services to all City departments who need their communication systems managed by ITA in addition to operational management/status monitoring, problem response, coordination with City departments in the event of support needs, and the use of available ITA staff and resources to meet city communication service needs.

ii. ITA coordinates with private vendors and maintains over 40 city departments which include:
- Vendors

        - AT&T
        - Cisco
        - Motorola
        - QUEST/CenturyLink
        - TWC
        - Verizon
    - City Departments maintained by ITA (specific to this annex):
        - Building and Safety, Department of (LADBS)
        - Bureau of Sanitation, Department of Public Works
        - Disability, Department on (DOD)
        - Fire Department, Los Angeles (LAFD)
        - General Services, Department of (GSD)
        - Police Department, Los Angeles (LAPD)
        - Public Works, Department of (DPW)
        - Transportation, Department of (DOT)
    - Departments with limited interaction with ITA
        - Airports, Los Angeles World
        - Port of Los Angeles (POLA)
        - Water and Power, Department of (DWP)

b) Radio Types Maintained by ITA
    i. Analog, conventional
        - ITA supports a simulcast analog conventional radio system with 18 voice channels in the 800 MHz band for the LAFD (LAFD Voice Radio System).
    ii. Analog, trunked
        - ITA supports an analog trunked radio system (800 MHz Simulcast Trunked Radio System or STRS) with 41 channels used by 20 city departments and elected offices.
    iii. Digital, conventional
        - ITA supports a simulcast digital conventional radio system with 60 voice channels in the UHF band for the LAPD (LAPD Voice Radio System).
    iv. Digital, trunked
        - ITA maintains a simulcast digital trunked radio system with 41 channels.
    v. Other
        - ITA supports the LAPD Mobile Data Radio System with 10 channels in the 800 MHz band.
        - ITA supports the LAFD Mobile Data Radio System with 4 channels in the UHF band.

c) City Radio Systems Maintained by ITA
    i. LAPD Voice Radio System
        - Function and Capabilities
            - This radio system consists of transmitters, receivers, mobile radios, and portable radios. Transmitters and receivers are for radio backbone as repeaters. Mobile and portable radios are for police

operations in the field. Mobile radios are installed in patrol vehicles. Portable radios are carried by police officers.

- Number
  - 247 transmitters
  - 466 receivers
  - 3,500 mobile radios
  - 12,500 portable radios
- Frequency
  - 450- 512 MHz
- P25 compliant
- The LAPD voice radio system uses 24 radio sites

- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - LAPD possesses spare batteries for the portable radios
  - All police stations and some police facilities have backup generators
  - Major radio sites have backup batteries and/or backup generators
  - Hardware redundancies for failing hardware
  - ITA provides regular maintenance of batteries and backup generators
  - Site backups systems and rerouting for downed sites
  - Contact Mount Lee Monitor 24 hours a day and 7 days a week for radio backbone problems
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms

ii. LAPD Mobile Data Radio System

- Function and capabilities
  - This radio system consists of transmitters, receivers, VRM, and laptop computers. The transmitters and receivers are used for the mobile data radio backbone. The VRM and laptops are used for police operations in the field. VRM and laptops are installed in patrol vehicles and use vehicle batteries for power. LAPD uses the Sprint cellular network as its primary mobile data. LAPD uses the mobile data radio system as a backup when the Sprint network goes down.
  - Number
    - 24 transmitters
    - 24 receivers
    - Unknown number of VRM
    - 1,600 laptops
  - Frequency

        - 800 MHz
    - LAPD mobile data radio system uses 10 radio sites.
- Vulnerabilities
    - Power failure
    - Network/service failure
    - Internal infrastructure interruption
    - External infrastructure interruption
- Overcome
    - LAPD possesses spare batteries for the portable radios
    - All police stations and some police facilities have backup generators
    - Major radio sites have backup batteries and/or backup generators
    - Hardware redundancies for failing hardware
    - ITA provides regular maintenance of batteries and backup generators
    - Site backups systems and rerouting for downed sites
    - Contact Mount Lee Monitor 24/7 days a week for radio backbone problems
- Security
    - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms.

iii. LAFD Voice Radio System

- Function and capabilities
    - This radio system consists of transmitters, receivers, mobile radios, and portable radios. Transmitters and receivers are for radio backbone as repeaters. Mobile and portable radios are for firefighting operations in the field. Mobile radios are in the vehicles such as fire trucks, fire engines, rescue ambulances, and miscellaneous fire apparatuses. Portable radios are carried by the firefighters.
    - Number
        - 168 transmitters
        - 168 receivers
        - 3,000 mobile radios
        - 6,500 portable radios
    - Frequency
        - 800 MHz
    - The radio system is interoperable with 800MHz radio. The system is analog FM and non P25 compliant.
        - LAFD voice radio backbone uses 9 main sites and 1 backup site.
- Vulnerabilities
    - Power failure
    - Network/service failure
    - Internal infrastructure interruption
    - External infrastructure interruption
-

- Overcome
  - LAFD possesses spare batteries for the portable radios
  - Major radio sites have backup batteries and backup generators
  - Fire stations and some fire facilities have backup generators
  - ITA provides regular maintenance of batteries and backup generators
  - Contact Mount Lee Monitor 24/7 days a week at for radio backbone problems
- Security
  - All radio sites have chain-link fence, bullet-proof walls and doors, as well as intrusion alarms.

iv. LAFD Mobile Radio System

- Function and capabilities
  - As a primary mode of communication, this radio system consists of transmitters, receivers, VRM and laptop computers. The transmitters and receivers are used for the mobile data radio backbone. VRM and laptops are installed in vehicles for firefighting operations in the field. VRM and laptops use car batteries as a power source.
  - Number
    - 24 transmitters
    - 24 receivers
    - 800 VRM
    - 890 laptops
  - Frequency
    - 500 MHz
  - LAFD mobile data radio system uses 6 radio sites for the backbone.
- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - Hardware redundancies for failing hardware
  - Regular maintenance of fire units and batteries
  - Contact Mount Lee Monitor 24/7 for radio backbone problems
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms.

v. 800MHz Simulcast Trunked Radio System (STRS)

- Function and capabilities
  - This radio system consists of transmitters, receivers, mobile radios, and portable radios. Transmitters and receivers are for radio backbone repeaters. Mobile and portable radios are for daily and emergency operations of various departments. Mobile radios are

installed in various city vehicles referred to in this Annex. Portable radios are carried by personnel from various departments.

- Number
  - 246 transmitters
  - 246 receivers
  - 2,500 mobile radios
  - 5,000 portable radios
- Frequency
  - 800 MHz
- The radio system is interoperable and P25 compliant.
- The 800 MHz Simulcast Trunked Radio System (STRS) uses 6 radio sites.

- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - Departments possess spare batteries for portable radios
  - Major radio sites have backup batteries and backup generators
  - Depending on the department, there are backup generators
  - ITA provides regular maintenance of batteries and backup generators
  - Contact Mount Lee Monitor 24/7 days a week at for radio backbone problems
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms

d) City Landline Telephone Systems Maintained by ITA

i. Analog

- Function and capabilities
  - This system is used for fax, modems, alarms, monitoring devices, and voice. It is used when the required device will not interface with the other forms. Basic and advanced features provided by the PBX or Central Office such as conference, forwarding, speed calling, intercom and voicemail are available.
  - Number
    - 3000 - Telco telephones
    - 4581 - PBX telephones
- Vulnerabilities
  - Power failure
  - Network/provider failure
  - Saturation
  - External infrastructure interruption

- Internal infrastructure interruption
- Overcome
  - Other analog devices
  - Other forms of communication such as radio, mobile telephone, and computer based communications
  - Battery or generator backup
  - Contact vendor
- Maintenance
  - ITA, AT&T, or Verizon
  - Verizon contractors help maintain the city-owned PBX equipment which supports analog, digital, hybrid and VOIP telephone lines.
  - AT&T technicians and Verizon technicians support the C.O. based Centrex, Measured Business (MB) and Centranet lines which are either analog or digital telephone lines.

ii. Digital

- Function and capabilities
  - As a secondary mode of communication, this system is used for multiline telephones and is utilized when there is a requirement for multiline telephones and the site does not support VoIP. Basic and advanced features provided by the PBX or Central Office such as conference, forwarding, speed calling, intercom and voicemail are available.
  - Number
    - 8600 - AT&T EBS Sets
- Maintenance
  - ITA, AT&T, or Verizon
  - Verizon Contractors help maintain the city-owned PBX equipment which supports analog, digital, hybrid and VOIP telephone lines.
  - AT&T technicians and Verizon technicians support the C.O. based Centrex, Measured Business (MB) and Centranet lines which are either analog or digital telephone lines.
- Vulnerabilities
  - Power failure
  - Network/provider failure
  - Saturation
  - External infrastructure interruption
  - Internal infrastructure interruption
- Overcome
  - Other forms of communication such as radio, mobile telephone, and computer based communications
  - Battery or generator backup
  - Contact vendor

iii. Hybrid
- Function and capabilities
  - This system is used at locations that require analog, digital and VoIP telephones. Basic and advanced features provided by the PBX or Central Office such as conference, forwarding, speed calling, intercom and voicemail are available.
  - Number
    - 13,308 - PBX Digital
- Maintenance
  - ITA, AT&T, or Verizon
  - Verizon contractors help maintain the city-owned PBX equipment which supports analog, digital, hybrid and VoIP telephone lines.
  - AT&T technicians and Verizon technicians support the C.O. based Centrex, Measured Business (MB) and Centranet lines which are either analog or digital telephone lines.
- Vulnerabilities
  - Power failures
  - Hardware failures
  - Outside cable failures
- Overcome
  - Cellular telephones or power fail lines
  - Other forms of communication such as radio, mobile telephone, and computer based communications
  - Battery or generator backup
  - Contact vendor

iv. Voice over Internet Protocol (VoIP)
- Function and capabilities
  - This system is used at newer locations or sites that require technology upgrades and multiline telephones. Basic and advanced features provided by the PBX or Central Office such as conference, forwarding, speed calling, intercom and voicemail are available.
  - Number
    - 8,733 - VoIP telephones
- Maintenance
  - ITA, AT&T, or Verizon
  - Verizon Contractors help maintain the city-owned PBX equipment which supports analog, digital, hybrid and VOIP telephone lines.
  - AT&T technicians and Verizon technicians support the C.O. based Centrex, Measured Business (MB) and Centranet lines which are either analog or digital telephone lines.
- Vulnerabilities
  - Power failure
  - Network/provider failure

- Saturation
- External infrastructure interruption
- Internal infrastructure interruption

- Overcome
  - Cellular Telephones or power fail lines
  - Other forms of communication such as radio, mobile telephone, and computer based communications
  - Battery or generator backup
  - Contact vendor

e) City Computer Networks Maintained by ITA

i. Function and capabilities

- Each connection type meets requirements that are determined based on the communication needs of the department or facility that is using that connection. There are hundreds of locations and various Internet connections to meet the City Internet communication needs that include, but are not limited to:
  - Voice over Internet Protocol
  - Video conferencing
  - Chat/messaging
  - Email
  - Internal data management (file servers)
  - Application access
  - Connection to the Internet.
- Networks
  - ISDN - Integrated Services Digital Network
  - DSL – Digital Subscriber Line
  - Cable - Broadband Internet Connection
  - Wireless Internet Connections
  - T-1 Lines – Leased Line
  - T-3 Lines – Dedicated Leased Line
  - OC3 - Optical Carrier
  - Metropolitan Ethernet Internet connection

ii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Saturation
- Power failure
- Cyber-attack – internal and external

iii. Overcome

- Network security
- Redundant hardware
- The Los Angeles Citywide Network has three major Metropolitan Ethernet Internet connections with two different providers. This provides

alternate paths to access the Internet should any one of the three paths fail.

f) City Data Communication Maintained by ITA

i. Function and capabilities

- This system is used for internal city business functions and interfacing with the public and possesses:
  - Intranet
  - Servers
  - Direct connect data lines
  - Wireless data
  - Microwave data

ii. Maintenance

- ITA maintains private systems
- Wireless providers maintain cellular networks

iii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Cyber-attack – internal and external
- Hardware failure

iv. Overcome

- Network security
- Redundant hardware
- ITA possesses hundreds of its own servers

9. Police Department, Los Angeles (LAPD)

a) Roles and Responsibilities

The roles and responsibilities of the Department, as they pertain to communication, are to exchange information via data, voice, and video to complete the City's missions. LAPD must have interoperable and seamless communications to manage emergency response, establish command and control, maintain situational awareness, and function under a common operating picture, for a broad scale of incidents. Emergency communications consists of three primary responsibilities:

- Operability–the ability for the department to establish and sustain communications in support of mission operations.
- Interoperability—the ability for the department to communicate among jurisdictions, disciplines, and levels of government, using a variety of frequency bands, as needed and as authorized. System operability is required for system interoperability.
- Continuity of Communications—the ability of the department to maintain communications in the event of damage to or destruction of the primary infrastructure.

i. Coordination

- LAFD
- Los Angeles County Fire Department (LACoFD)
- Other local Law Enforcement Agencies
- State Law Enforcement Agencies
- Federal Law Enforcement Agencies

b) Radio

i. LAPD Voice Radio System

- Function and capabilities
  - As a primary mode of communication, the radio system consists of transmitters, receivers, mobile radios, and portable radios. Transmitters and receivers are for radio backbone as repeaters. Mobile and portable radios are for police operations in the field. Mobile radios are installed in patrol vehicles. Portable radios are carried by police officers.
  - Number
    - 247 transmitters
    - 466 receivers
    - 3,500 mobile radios
    - 12,500 portable radios
  - Frequency
    - 450, 480 and 500 MHz
  - P25 Compliant
  - The LAPD voice radio system uses 24 radio sites.
- Maintenance
  - ITA is responsible for maintaining the operability of this system
- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - LAPD possesses spare batteries for the portable radios
  - All the police stations and some police facilities have backup generators
  - Major radio sites have backup batteries and/or backup generators
  - ITA provides regular maintenance of batteries and backup generators
  - Contact Mount Lee Monitor 24/7 days a week for radio backbone problems
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms

ii. LAPD Mobile Data Radio System

- Function and capabilities

- As a secondary mode of communication, this radio system consists of transmitters, receivers, VRM and laptop computers. The transmitters and receivers are used for the mobile data radio backbone. The VRM and laptops are used for police operations in the field. VRM and laptops are installed in patrol vehicles and use vehicle batteries for power. LAPD uses the Sprint cellular network as its primary mobile data. LAPD uses the mobile data radio system as a backup when the Sprint network goes down.
- Number
  - 24 transmitters
  - 24 receivers
  - Unknown number of VRM
  - 1,600 laptops
- Frequency
  - 800 MHz
  - LAPD mobile data radio system uses 10 radio sites

- Vulnerabilities
  - Power failure
  - Network/service failure
  - Internal infrastructure interruption
  - External infrastructure interruption
- Overcome
  - Backup batteries for radios
  - Backup generators for power
  - Hardware redundancies for failing hardware
  - Regular maintenance of patrol units and batteries
  - Regular maintenance as preventative care
  - Site backups systems and rerouting for downed sites
  - Contact Mount Lee Monitor 24/7 for radio backbone problems.
- Security
  - All radio sites have chain-link fence, bullet-resistant walls and doors, as well as intrusion alarms

c) Landline Telephone System
   i. Refer to ITA section of annex regarding:
      - Digital
      - Hybrid
      - VoIP
      - Analog

d) Mobile Telephone System
   i. Cellular telephone
      - Function and capabilities
        - As a secondary form of communication, the cellular telephone system is used by LAPD personnel for notifications, command and control

during tactical situations, and to provide internal data to remote users' Full spectrum capabilities including, but not limited to, voice, text, internet, intranet, and email.
    - Number
        - 2600 Cellular Telephones
- Maintenance
    - Verizon and AT&T via LAPD
- Vulnerabilities
    - Power failure
    - Network failure
    - Hardware failure
    - Service/signal failure
    - Saturation
- Overcome
    - Spare batteries
    - Redundant hardware
    - Contact vendors

e) Computer Network
   i. Refer to ITA section of annex regarding:
      - T-3 line – Dedicated leased line

f) Data
   i. Refer to ITA section of annex regarding:
      - Intranet

10. Transportation, Los Angeles Department of (LADOT)

a) Roles and Responsibilities

LADOT has developed a strategic plan that guides the organization as it works to manage transportation in the City of Los Angeles in the areas of planning, design, construction, and operations of transportation systems. LADOT also partners with sister agencies to improve transportation service and infrastructure in the city and the region.

   i. Coordination
      - LAPD
      - LAFD
      - DPW
      - Elected Officials
      - GSD
      - Community Planning and Development
      - LAWA

b) Radio
   i. Digital, trunked
      - Function and capabilities

- Radios are used as a primary mode of communication amongst field personnel during emergencies and daily operations.
- Number
  - 900 portable radios
- Frequency
  - 800MHz

ii. Refer to ITA section of annex regarding:
- Maintenance
- Vulnerabilities
- Overcome

c) Landline Telephone System

i. Digital Telephone system
- Function and capabilities
  - Landline telephone systems are used as a primary form of communication for day-to-day operations. Landline telephones possess conference calls, voicemail, and call forwarding.
  - Number
    - Unknown, department-wide number

ii. Refer to ITA section of annex regarding:
- Maintenance
- Vulnerabilities
- Overcome

d) Mobile Telephone System

i. Cellular Telephones
- Function and capabilities
  - As a secondary mode of communication in the field and at special events, cellular telephones are used by supervisors and field personnel. They possess voice, text messaging, data, and Internet capabilities.
  - Number
    - 206

ii. Maintenance
- Private vendors are responsible for maintaining the operability of this system.

iii. Vulnerabilities
- Power failure
- Network failure
- Hardware failure
- Service/signal failure
- Saturation

iv. Overcome
- Car chargers

- Other types of communication exist in the form of, radio, landline telephone, internet access, and data communication.
- Contact vendor

e) Computer Network
   i. Metropolitan Ethernet
      - Function and capabilities
      - Used for brief communications, convenience, and distribution of material to personnel. Computers on this mode of communication utilize email, web access and chat/messaging.
        - Number
          - 550 desktop computers
          - 20 tablet computers
   ii. Refer to ITA section of annex regarding:
      - Maintenance
      - Vulnerabilities
      - Overcome

f) Data
   i. Intranet, direct connect data lines, wireless data
      - Function and capabilities
        - Used as a secondary form of communication, data is used to facilitate email, web access, and file access.
        - Number
          - 550 desktop computers
          - 50 servers
          - 50 servers
   ii. Maintenance
      - ITA and LADOT are both responsible for maintaining the operability of this system
   iii. Vulnerabilities
      - Internal infrastructure interruption
      - External infrastructure interruption
      - Cyber-attack – internal and external
      - Hardware failure
   iv. Overcome
      - Network security
      - Redundant lines
      - Contact ITA

11. Bureau of Sanitation, Department of Public Works

a) Roles and Responsibilities

During an emergency, the Bureau of Sanitation is responsible for responding to sewer emergencies and storm drain emergencies. Emergencies include line breaks, blockages, surcharges and flooding. Sanitation's role in communications

is to receive calls from customers and to affect a coordinated response. Sanitation may also coordinate with DWP, LADOT, Street Services and Engineering.

The Bureau of Sanitation has a written communication plan that includes communication modes and hierarchy, a description of the emergency rosters, 800 MHz radio and other communication protocols, and radio call sign directories for all divisions using radios.

b) Radio
   i. Digital trunked
      - Function and capabilities
        - The Bureau of Sanitation primarily uses the city provided 800 MHz trunked radio system for daily operations
        - Number
          - 11 base radios
          - 100 mobile radios
        - Frequency
          - 800MHz
   ii. Analog, conventional
      - Function and capabilities
        - Radios are used to manage operations and maintenance in the Hyperion Treatment plant and are the primary mode of communication
        - Number
          - 185 Handy Talkie (HT) radios
        - Frequency
          - 450 MHz
   iii. Maintenance
      - Digital, trunked, radios are maintained by ITA
      - Analog, conventional, radios are maintained by the Bureau of Sanitation Operations Section; and programmed and repaired by a private vendors
   iv. Vulnerabilities
      - Power failure
      - Network/service failure
      - Internal infrastructure interruption
      - External infrastructure interruption
   v. Overcome
      - Hardware redundancies for failing hardware
      - Regular maintenance as preventative care
      - Contact ITA
      - Contact vendor
      - Other types of communication exist in the form of landline telephone, mobile telephone, internet access, and data communication

c) Landline Telephone System
    i. Nortel digital system and VoIP
    - Function and capabilities
        - The Bureau of Sanitation's Wastewater Treatment Plants have a digital telephone system used for daily business with standard capabilities. It is the primary mode of communication along with radios, cellular telephones and pagers.
        - Number
        - 2000 telephones

    ii. Maintenance
    - Maintained by the Department of Sanitation Communication Electricians.
    - All wastewater collection yards and the refuse collection districts refer to ITA for maintenance

    iii. Vulnerabilities
    - Power failure
    - Network/provider failure
    - Saturation
    - External infrastructure interruption
    - Internal infrastructure interruption

    iv. Overcome
    - Contact ITA
    - Contact Bureau of Sanitation IT
    - Contact vendor
    - Other types of communication exist in the form of mobile telephone, internet access, and data communication

d) Mobile Telephone System
    i. Cellular telephones and push to talk capabilities, satellite telephones
    - Function and capabilities
        - Cellular and PTT telephones are used for daily operations and management of city business. Cellular and PTT telephones are the primary mode of communication when supervisors or managers are in the field away from their office; alternative modes would be landlines and email. The cellular telephones all feature voicemail and text, but some include email and data. Satellite telephones are used for emergency and disaster operations and management. It is only used if no other communication is available. Voice only capabilities.
        - Number
        - 15 satellite telephones
        - Unknown number cellular telephones
    - Maintenance
        - The Sanitation Emergency Preparedness Section and private vendors are responsible for maintaining this system

- Vulnerabilities
    - Power failure
    - Network failure
    - Hardware failure
    - Service/signal failure
    - Saturation
- Overcome
    - Other types of communication exist in the form of radio, landline telephone, internet access, and data communication
    - Contact private vendor
    - Contact Sanitation and Emergency Preparedness Section

e) Computer network

i. T-3 Lines – Dedicated leased line

- Function and capabilities
    - As a primary mode of communication, the computer network supports city email, general internet use, chat, and messaging.
    - Number
        - 2000 desktop computers
        - 200 servers

ii. Maintenance

- The bureau of sanitation is responsible for maintaining this mode of communication

iii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Saturation
- Power failure
- Cyber-attack – internal and external

iv. Overcome

- Redundant lines
- Contact Vendor
- Redundant hardware
- Network security

f) Data

i. Intranet and direct connect data line

- Function and capabilities
    - Communication of various types of information for office and operations staff that includes policies, procedures, descriptive information, reports, events, control systems, and training/ instruction.
    - Number

- 2000 desktop computers
- 200 servers

ii. Maintenance
  - The Sanitation Emergency Preparedness Section and private vendors are responsible for maintaining this system

iii. Vulnerabilities
- Internal infrastructure interruption
- External infrastructure interruption
- Cyber-attack – internal and external
- Hardware failure

iv. Overcome
- Redundant lines
- Network security
- Alternate forms of communication such as radio, landline telephone, mobile telephone, and computer network

12. Bureau of Street Services, Department of Public Works

a) Roles and Responsibilities

The Bureau of Street Services is committed to providing quality street services in a timely and efficient manner. In times of emergency, there is a need for communication at all levels which include: the flow of information from field incident command posts (ICP) to plants, yards, the Bureau Operations Center (BOC), offices, and the Emergency Operations Center (EOC). There is also a need to coordinate efforts and communicate with other agencies and from the BOC to the city EOC. All divisions must be able to communicate to the BOC. The BOC must be able to communicate at all times with:

- Divisions, plants, headquarters, and Incident Command Posts (ICP)
- Field units at incident locations
- City EOC
- Board of Public Works
- Other Public Works Department Bureau Operations Centers
- Coordination
- Emergency Management Department (EMD)
- LAPD
- LAFD
- Transportation, Department of (DOT)
- LA County Public Works
- All other city Department Operation Centers as needed.

b) Radio

i. Analog, Conventional and Digital, Trunked
- Function and capabilities

As a primary mode of communication, radios are used for field operations and emergency response calls. Non-operational staff use radios as an optional means to communicate base units are located in area offices and asphalt plants. Mobile units are in fleet vehicles for bureau operations (heavy trucks, street sweepers, crane trucks, pickup trucks, utility vehicles). Portable units are assigned to division supervisors, investigators, area superintendents, bureau managers and directors and for bureau operations center.

- Number
- 10 base radios (digital)
- 295 mobile radios (digital)
- 100 Portable radios (analog)
- Frequency
- 800MHz
- P25 compliant
- Refer to ITA section of annex regarding
- Maintenance
- Vulnerabilities
- Overcome

c) Landline Telephone System

i. Analog telephone system, digital telephone system, and VoIP

- Function and capabilities
    - As a primary mode of communication for daily operations and city business, this system possesses full spectrum capabilities which include, but are not limited to, voice, call forwarding, multiline use, and conference calls
    - Number
    - Unknown number

ii. Refer to ITA section of annex regarding:

- Maintenance
- Vulnerabilities
- Overcome

d) Mobile Telephone System

i. Cellular telephones and satellite telephones

- Function and capabilities
    - This system is used as a primary mode of communication when landlines are not accessible. Most units only possess voice capabilities unless special requests for data and Internet (Management) are made.
    - Number

- 364 cellular telephones
- 1 satellite telephone

ii. Maintenance

- The Bureau of Street Services IT and private vendors are responsible for maintaining the operability of this system. Vendors are coordinated by Bureau of Street Services.

iii. Vulnerabilities

- Power failure
- Network failure
- Hardware failure
- Service/signal failure
- Saturation

iv. Overcome

- Spare batteries
- Redundant hardware
- Other types of communication exist in the form of radio, landline telephone, internet access, and data communication

e) Computer Network

i. Wireless Internet Connections and T-1 Lines

- Function and capabilities
    - As a primary mode of communication for processing daily operations, processing service requests, and data processing, this system possesses full spectrum Voice over IP, video conferencing, chat/messaging, and email capabilities
    - Number
    - 500 desktop computers
    - 50 laptops

ii. Refer to ITA section of annex regarding

- Maintenance
- Vulnerabilities
- Overcome

f) Data

i. Refer to ITA section of document regarding:

- Intranet
- Wireless data

13. Water and Power, Department of (LADWP)

a) Roles and Responsibilities

LADWP is responsible for maintaining the City of Los Angeles's water and power systems and coordinating with major city departments. Responsibilities also include operation and maintenance of LADWP communication systems.

b) Radio

i. Analog, conventional and P-25 trunked

- Function and capabilities
  - Used as a primary mode of communication the radio system is used for communication between field personnel during day-to-day operation and during an emergency
  - Number
  - 3,404 mobile radios
  - 6,410 portable radios
  - Base stations/radio stations: 118 units of P-25 repeater stations
  - Operation/Frequency
  - LA Basin Generation Stations – Limited coverage, for in-plant use – VHF (173 MHz) – Base and repeater operation
  - Aqueduct and Hydro Electric Generation Plants – Limited coverage – for in-plant use – UHF (450 MHz range), Base and repeater operation, approx. radius of 75 km about Mojave, CA
  - Microwave digital and IP based 6 and 11 Ghz covering four states
  - Transmission Line Maintenance & Hydro Electric Generation stations – VHF (47-48 MHz) – Base and repeater operation – System wide
  - LA Basin and Owens Valley Operations – UHF (900 Mhz) – Trunked Radio System
  - 460 MHz UHF
  - LA Basin – Ham Repeater – VHF (150) – Repeater operation

ii. Maintenance

- LADWP is responsible for maintaining the operability of this system

iii. Vulnerabilities

- Power failure
- Network/service failure
- Internal infrastructure interruption
- External infrastructure interruption

iv. Overcome

- Backup batteries for radios
- Backup generators for power
- Hardware redundancies for failing hardware
- Regular maintenance as preventative care
- Site backups systems and rerouting for downed sites
- Mountain top and base units
- Voice Operations Center

v. Security

- Site security includes door and motion detectors, fencing, and other security protocols

c) Landline Telephone System

i. Analog telephone system and Voice over Internet Protocol

- Function and capabilities
    - This mode of communication is used for internal and external communications, as well as day-to-day and emergency operations. Telephones possess full spectrum capabilities.
    - Number
    - 136,000 telephones (4,800 analogs and 8,800 VOIP)

ii. Maintenance

- LADWP is responsible for maintaining the operability of this system

iii. Vulnerabilities

- Power failure
- Network/provider failure
- Saturation
- External infrastructure interruption
- Internal infrastructure interruption

iv. Overcome

- UPS System
- Rerouting
- Radios
- Other types of communication exist in the form of, mobile telephone, internet access, and data communication
- Contact vendors

d) Mobile Telephone System

i. Cellular telephones with direct connect/push to talk (PTT) and satellite telephones

- Function and capabilities
    - Used as a secondary form of communication, mobile telephones are used by field personnel for day-to-day operation as well as during an emergency. Cellular telephones possess voice and text messaging capabilities.
    - Number
    - 3,900 cellular telephones
        - 1,400 smartphones
        - 2,500 flip phones or other
    - 158 satellite telephones

ii. Maintenance

- Cellular telephones are supported and maintained by a private vendor

iii. Vulnerabilities

- Power failure
- Network failure
- Hardware failure

- Service/signal failure
- Saturation
- Voice Operations Center

iv. Overcome

- Spare batteries
- Redundant hardware
- Other types of communication exist in the form of radio, landline telephone, internet access, and data communication

e) Computer Network

i. Analog: Dial-up Internet Access, cable - broadband internet connection, Wireless Internet Connections, T-1 Lines – leased line, and Two OC 48 Cisco and JMux rings, 16 JMux sub rings, 5 Osirus OC3 optional carriers

- Function and capabilities
    - Systems are used as a primary mode of communication for business operations. Capabilities consist of data transfer, business database, email, transfer, storage.
    - Number
    - 10, 000 desktop/laptop computers
    - @1,800 servers (both physical and virtual)

ii. Maintenance

- LADWP is responsible for maintaining the operability of this system

iii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Saturation
- Power failure
- Cyber-attack – internal and external

iv. Overcome

- Redundant hardware
- Network security
- Leased lines

f) Data

i. Intranet, direct connect data lines, wireless data, microwave data, and servers

- Function and capabilities
    - These systems are all used as a primary mode of communication for data transfer and storage, business processes, and supervisory control and data acquisition.
    - Number
    - 1000 desktop/laptop computers
    - @1,800 servers

ii. Maintenance

- LADWP is responsible for maintaining the operability of this system

iii. Vulnerabilities

- Internal infrastructure interruption
- External infrastructure interruption
- Cyber-attack – internal and external
- Hardware failure

iv. Overcome

- Network security
- Backup system data
- Employees backup their own work

IV. DIRECTION, CONTROL, AND COORDINATION

The Communications Annex may be activated when the Mayor proclaims a local emergency, or if the EMD Duty Officer, after consulting with the EMD General Manager or Assistant General Manager, determines the situation warrants a Level I, II, or III EOC activation and the implementation of the Appendix's policies and procedures.

Some portions of this Annex go into effect immediately following an event requiring communication. The remainder of this Annex is only activated when the incident grows in scope to a point where activation of the Emergency Operations Center (EOC) is warranted. Activation of the EOC is not necessarily automatic or necessary with all incidents.

In advance of or simultaneous with the city plan activation, city departments and agencies including the police department, fire department, department of transportation, department of recreation and parks and POLA will also activate their departmental communication plans.

V. ADMINISTRATION, FINANCE, AND LOGISTICS

Each department is required to have documented internal administrative procedures in place to track financial costs related specifically to the response and/or recovery of an incident. These procedures must include tracking all expenditures specifically related to the incident, including personnel costs such as straight and overtime payroll costs related specifically to the incident. Departments are also required to document internal administrative procedures for requesting, fulfilling and tracking internal, department to department (DOC-to-DOC), field to department (field-to-DOC), and department to EOC (DOC-to-EOC) resource requests. Each department is responsible for the tracking of their own resources, including the tracking of personnel.

If an incident meets designated thresholds for Proclamation or Declaration of a State and/or Federal Emergency or Disaster, the CAO, acting as the City's Authorized Agent, will develop a method for collecting financial documentation from departments as needed for submission as part of the City's reimbursement application process.

VI. AGREEMENTS AND UNDERSTANDINGS

Currently, there are no Contracts, Memoranda of Agreements or Understandings for this Annex.

VI. AUTHORITIES AND REFERENCES

A. Authorities

1. Federal
   a) The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended. https://www.fema.gov/robert-t-stafford-disaster-relief-and-emergency-assistance-act-public-law-93-288-amended

   b) Homeland Security Presidential Directive-5 (HSPD-5). http://www.gpo.gov/fdsys/pkg/PPP-2003-book1/pdf/PPP-2003-book1-doc-pg229.pdf

   c) National Incident Management System. Department of Homeland Security. December 2008. http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf

   d) National Response Framework. Department of Homeland Security. January 2008. http://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf

   e) Americans with Disabilities Act of 1990, as amended. http://www.ada.gov/pubs/ada.htm

2. State of California
   a) California Constitution. http://law.justia.com/california/constitution/

   b) California Emergency Services Act, 2015. http://www.caloes.ca.gov/LegalAffairsSite/Documents/Cal%20OES%20Yellow%20Book.pdf

   c) California Code of Regulations, Title 19, Chapters 1 through 6, including:
      i. Chapter 1, Standardized Emergency Management **System**. http://www.caloes.ca.gov/PlanningPreparednessSite/Documents/12%20SEMS%20Guidelines%20Complete.pdf
      ii. Chapter 6, Disaster Assistance Act Regulations. http://www.caloes.ca.gov/PlanningPreparednessSite/Documents/02%20California%20Code%20of%20Regulations%202900q.pdf

   d) California Code of Regulations. Title 19, Public Safety Division 2, Office of Emergency Services. Chapter 6. Disaster Services Act. Code of Regulations. http://www.kintera.org/atf/cf/%7BE475D1A4-FB9C-4135-AE8B-9310119C7F19%7D/CHAPTER%206%20%20CDAA.pdf

   e) California State Emergency Plan. http://caloes.ca.gov/PlanningPreparednessSite/Documents/2017%20SEP%20Executive%20Summary.pdf

3. County of Los Angeles
   a) Operational Area Emergency Response Plan http://lacoa.org/oaerp.htm

4. City of Los Angeles
   a) City Emergency Operations Plan

B. References

1. Los Angeles Department of Public Health, “Adult Disability in Los Angeles County.” LA Health. Sept. 2006.

2. Kailes, J. and Enders, A. in “Moving Beyond ‘Special Needs’ A Function-Based Framework for Emergency Management Planning,” Journal of Disability Policy Studies, Vol./No. 44/207, pp. 230-237.

ATTACHMENT A: ACRONYMS

Acronym	Full Name
ADA	Americans With Disabilities Act
BOC	Business Operations Center, Emergency Operations Center
Cal OES	California Governor's Office of Emergency Services
Caltrans	California Department of Transportation
CBP	Customs and Border Protection
CDC	Communicable Disease Control Center
CHP	California Highway Patrol
CPG	Comprehensive Preparedness Guide
CWERS	County Wide Emergency Radio System
DOC	Department Operations Center
DoD	Department on Disability
DPW	Los Angeles Department of Public Works
DSL	Digital Subscriber Line
DTRS	Digital Trunk Radio System
EMC	Emergency Management Committee
EMD	Emergency Management Department
EOB	City of Los Angeles Emergency Operations Board
EOC	Emergency Operations Center
EOO	Emergency Operations Organization
EOP	Emergency Operations Plan
ESF	Emergency Support Function
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FCC	Federal Communication Commission
FEMA	Federal Emergency Management Agency
FNSS	Functional Needs Support Services
FM	Frequency Modulation
GETS	Government Emergency Telecommunication Service
GHz	Gigahertz
GSD	Department of General Services
HF	High Frequency
HT	Handy Talkie
Hz	Hertz
ICE	Immigration and Customs Enforcement
ICP	Incident Command Post
ICS	Incident Command Structure

ITA	Information Technology Agency
IMTG	Information Management and Technology Division
ISDN	Integrated Services Digital Network
kHz	Kilohertz
LACoFD	Los Angeles County Fire Department
LADBS	Los Angeles Department of Building and Safety
LADOT	Los Angeles Department of Transportation
LADWP	Los Angeles Department of Water and Power
LAFD	Los Angeles Fire Department
LAPD	Los Angeles Police Department
LAWA	Los Angeles World Airports
LAX	Los Angeles International Airport
MB	Measured Business
MFC	Metropolitan Fire Communications
MHz	Megahertz
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NIMS	National Incident Management System
NTSB	National Transportation Safety Board
OA	Los Angeles Operational Area
PBX	Private Branch Exchange
PCM	Pulse Code Modulation
PIO	Public Information Officer
POLA	Port of Los Angeles
POTS	Plain Old Telephone Service
PSTN	Public Switched Telephone Network
PTT	Push to Talk
RF	Radio Frequency
SEMS	Standardized Emergency Management System
SOP	Standard Operating Procedure
SMS	Short Message Service
STRS	Simulcast Trunked Radio System
TDM	Time-Division Multiplexing
TSA	Transportation Security Administration
UHF	Ultra High Frequency
VHF	Very High Frequency
VNY	Van Nuys Airport
VoIP	Voice over Internet Protocol
VRM	Vehicular Radio Modems

WLAN	Wireless Local Area Network
WPS	Wireless Priority Service
WWAN	Wireless Wide Area Network