

## City of Las Vegas Vulnerability Assessment & Adaptation Plan SOW

July 2016

### Goal

To produce a Vulnerability Assessment and Adaptation Plan for four Key Planning Areas: Stormwater Infrastructure, Water Resources, Emergency Management, and Energy.

### Proposed Completion Date

June 2017

### Summary

The City of Las Vegas identified four Key Planning Areas that are vulnerable to Climate Change and particularly sensitive to three natural phenomena related to it: Drought, Extreme Heat, and Extreme Precipitation patterns. For this reason, the City has begun collaboration with Dr. Ajay Kalra in order to develop a Vulnerability and Climate Adaptation Plan that will be incorporated into the future update of the Las Vegas Master Plan. The Plan will assess the present and future climate-related scenarios in the Southern Nevada regional context, and identify a series of adaptation strategies that the City shall pursue in order to adapt and maintain a high quality level of city operations for residents, businesses, and visitors alike.

The Vulnerability and Adaptation Plan will focus on the following Key Planning Areas identified and categorized in the Climate and Energy Chapter of the STAR Community Rating System Technical Guide, CE-1:

Core Area	Key Planning Area	Climate Change-related Impact
Natural Environment	Water Resources	Drought
Built Environment	Stormwater Infrastructure	Extreme Precipitation Events
Social Environment	Emergency Management	Extreme Heat, Extreme Precipitation Events
Economic Environment	Energy Supply	Drought, Extreme Heat

### Objectives

The document seeks to assess the current vulnerability to Drought, Extreme Heat, and Extreme Precipitation patterns, as well as the current response mechanisms that are already in place within its jurisdiction. Furthermore, the document will analyze a series of scenarios to assess to what extent the vulnerability of each Key Planning Area will change in the long term (30-50 years), what will be the most affected city operations, and what mechanisms the City will need to put into place to adapt to such changes.

### Project Analysis Steps & Leads

- 1) Identify long term (50 year) **population trends** and general current/future (30, 50 & 100 year) **climate scenarios** (Temperature, Precipitation).
  - Lead: **CLV, Dr. Ajay Kalra**
  
- 2) Analyze Key Planning Areas
  - a. **Water Resources**
    - i. Analyze the current Drought impact and the current CLV Vulnerability to Drought
    - ii. Identify the efforts that have already been taken by CLV, NVE, and SNWA to adapt to changing climate conditions.

- iii. Assess how the different climate scenarios and Drought will impact the Water Resources in terms of supply and demand, water resource portfolio, delivery distance, reliance on groundwater, economic impact, and impact on the water infrastructure.
- iv. For this Key Planning Area, recommend policies and measures required to adapt to Drought, based on the different future climate scenarios. The recommendations may include:
  - Creation or modification of special committees
  - Regulatory changes within the jurisdiction
  - Changes within administrative management and practice
  - Capital improvements
  - Education & Outreach
- v. Identify monitoring tools for recommended policies and measures.
- **Key References:** Water Resource Plan 2015 (SNWA), SNWA Annual Reports, SNWA Sustainability Report, SNWA Groundwater Development Project.
- **Lead:** Dr. Ajay Kalra

#### b. Stormwater Infrastructure

- i. Analyze the current Extreme Precipitation Events impact and the current CLV Vulnerability to Extreme Precipitation Events
- ii. Identify the efforts that have already been taken by CLV, CLV OEM, the CCRFCD, and SNWA to adapt to changing climate conditions.
- iii. Assess how the different climate scenarios and Extreme Precipitation Events will impact the stormwater Infrastructure in terms of stress on flood infrastructure, changes to the 100 year flood, capital costs to manage greater flooding events, new land development projects, flood insurance system, property damage, and stormwater infrastructure design guidelines, etc.
- iv. For this Key Planning Area, recommend policies and measures required to adapt to Extreme Precipitation Events, based on the different future climate scenarios. The recommendations may include:
  - Creation or modification of special committees
  - Regulatory changes within the jurisdiction
  - Changes within administrative management and practice
  - Capital improvements
  - Education & Outreach
- v. Identify monitoring tools for recommended policies and measures.
- **Key References:** 2013 CCRFCD Las Vegas Valley Flood Control Master Plan, CCRFCD Ten-Year Construction Improvement Programs, 1999 CCRFCD Hydrologic Criteria & Design Manual.
- **Lead:** Dr. Ajay Kalra

#### c. Emergency Management

- i. Analyze the current Extreme Heat and Extreme Precipitation Events impact and the current CLV Vulnerability to Extreme Heat and Extreme Precipitation Events.
- ii. Identify the efforts that have already been taken by CLV, CLV OEM, the SNHD, NVE, and SNWA to adapt to changing climate conditions.
- iii. Assess how the different climate scenarios and Extreme Precipitation Events will impact Emergency Management response in terms of supply and demand for emergency response, specialized equipment and training, educational efforts, etc.

- iv. For this Key Planning Area, recommend policies and measures required to adapt to Extreme Heat and Extreme Precipitation Events, based on the different future climate scenarios. The recommendations may include:
    - Creation or modification of special committees
    - Regulatory changes within the jurisdiction
    - Changes within administrative management and practice
    - Capital improvements
    - Education & Outreach
  - v. Identify monitoring tools for recommended policies and measures.
  - **Key References:** SNHD 2016 Southern Nevada Community Health Assessment.
  - **Lead:** CLV
- d. Energy**
- i. Analyze the current Drought and Extreme Heat impact and the current CLV Vulnerability to Drought and Extreme Heat.
  - ii. Identify the efforts that have already been taken by CLV, NVE, and SNWA to adapt to changing climate conditions.
  - iii. Assess how the different climate scenarios, Drought, and Extreme Heat will impact the Energy system in terms of energy demand and supply, energy costs, stress on the grid system and need for back-up generators, etc.
  - iv. For this Key Planning Area, recommend policies and measures required to adapt to Drought and Extreme Heat, based on the different future climate scenarios. The recommendations may include:
    - Creation or modification of special committees
    - Regulatory changes within the jurisdiction
    - Changes within administrative management and practice
    - Capital improvements
    - Education & Outreach
  - v. Identify monitoring tools for recommended policies and measures.
  - **Key References:** 2015 NVE Nevada State Energy Reduction Plan, 2014 NV Energy-ISO Energy Imbalance Market Economic Assessment.
  - **Lead:** CLV

3) Summarize the Plan analysis outcomes and the proposed policies and measures.

## Responsibilities

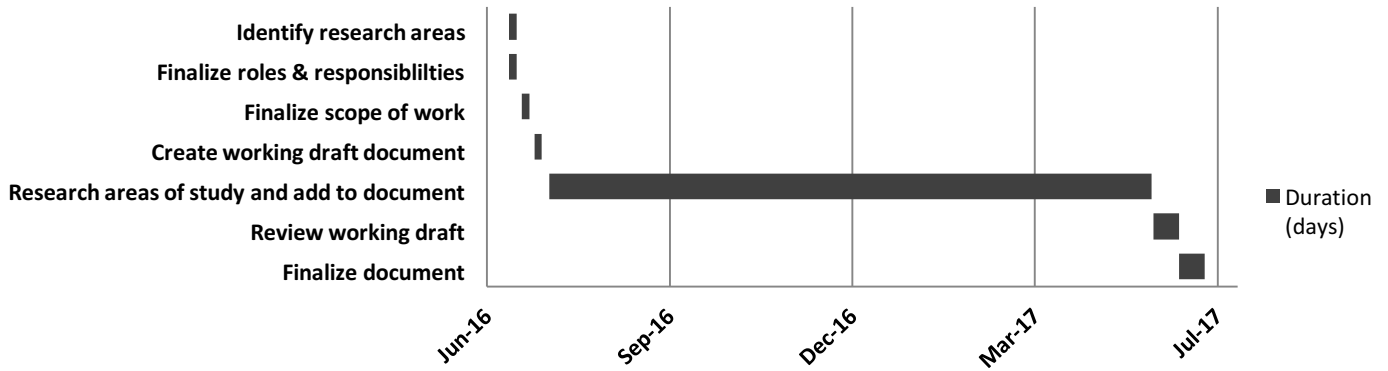
### The City of Las Vegas

- Is responsible for guiding the areas of study and the overall document drafting efforts.
- Will lead the portion of the assessment related to Emergency Management Response and Energy.
- Will facilitate contact and communication with the local and regional stakeholders.
- Will facilitate access to data sources.

### Dr. Ajay Kalra

- Is responsible for assisting the City of Las Vegas in developing a complete vulnerability assessment document.
- Will lead the portion of the assessment related to Water Resources and Stormwater.

## Timeline



## Glossary

CC: Clark County  
CCRFCD: Clark County Regional Flood Control District  
CLV: City of Las Vegas  
CLV OEM: City of Las Vegas Office of Emergency Management  
ICLEI: International Council for Local Environmental Initiatives  
LVCVA: Las Vegas Convention and Visitors Authority  
LVFR: Las Vegas Fire and Rescue  
LVMPD: Las Vegas Metropolitan Police Department  
NDOT: Nevada Department of Transportation  
NDOW: Nevada Department of  
NVE: NV Energy  
NOAA: National Oceanic and Atmospheric Administration  
RTC: Regional Transportation Commission  
SNHD: Southern Nevada Health District  
SNWA: Southern Nevada Water Authority