JOHNSON COUNTY
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Hazard Mitigation Action Plan

Johnson County, Texas

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Chapter One: Multi-jurisdictional Planning Process

Johnson County Hazard Mitigation Action Plan Planning Process The Johnson County Hazard Mitigation Action Plan (HazMAP) was created in order comply with current federal and state hazard mitigation plan regulations in compliance with the following rules and regulations:

> Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)
> Federal Emergency Management Administration's Interim Final Rule, published in the Federal Register on February 26, 2002, at 44 CFR Part 201.

The Johnson County HazMAP is comprised of the following participating jurisdictions:

- Unincorporated Johnson County
- Alvarado
- Burleson
- Cleburne
- Godley
- Joshua
- Keene

Each jurisdiction participated by having a Hazard Mitigation Team (HMT). Each HMT participated in the Hazard Mitigation Action Plan. The NCTCOG Emergency Preparedness Department participated in the HazMAP to assist in compiling the jurisdictional information and prepare the plan for submission. Johnson County Hazard Mitigation Action Plan Meetings were held on June 7, 2012, June 20, 2012, November 16, 2012, December 11, 2012, July 23, 2013, and August 28, 2013.

HazMAP Planning Process Point of Contact The following are the points of contacts during the HazMAP planning process from June 2012 – September 2013:

Unincorporated Johnson County
Emergency Management Coordinator
Alvarado
Emergency Management Coordinator/Fire Chief
Burleson
Emergency Management Coordinator
Cleburne
Emergency Management Coordinator
Godley
Mayor
Joshua
Emergency Management Coordinator
Keene
Emergency Management Coordinator

Participating Jurisdiction Population Profiles

Jurisdiction	2010 Population	2012 Population
Unincorporated County	150,934	153,060
Alvarado	3,785	3,800
Burleson	36,690	38,130
Cleburne	29,337	29,180
Godley	1,009	1,010
Joshua	5,910	5,950

Source: North Central Texas Council of Governments Research and Information Services 2013 current population estimates, United States Census Bureau

Johnson County Hazard Mitigation Action Plan Organization The Johnson County Hazard Mitigation Action Plan is organized into six chapters which satisfy the mitigation requirements in 44 CFR Part 201.

Chapter One: Multi-Jurisdictional Planning Process

Describes the process and organization of the County Hazard Mitigation Action Plan (Johnson County Hazard Mitigation Action Plan)

Chapter Two: Planning Process

Describes the individual planning process and organization for each participating jurisdiction satisfying requirements 201.6(c)(1), 201.6(b)(2), 201.6(b)(1), 201.6(b)(3), 201.6(c)(4)(iii), 201.6(c)(4)(i).

Chapter Three: Hazard Analysis

Describes the hazards identified, known national extent scales, location of hazards, previous events, and jurisdictional profiles satisfying requirements 201.6(c)(2)(i), 201.6(c)(2)(ii).

Chapter Four: Mitigation Goals and Actions

Describes the county-wide goals established by the Johnson County Hazard Mitigation Action Plan and the Mitigation Action Items for each jurisdiction satisfying requirements 201.6(c)(3), 201.6(c)(3)(i), 201.6(c)(3)(ii), 201.6(c)(3)(iii), 201.6(c)(4)(ii).

Chapter Five: Maintenance Process

Describes the monitoring, evaluating, updating, plan incorporation, and future public updates for each participating jurisdiction satisfying requirements 201.6(c)(4)(i), 201.6(c)(4)(ii), 201.6(c)(4)(iii).

Appendix A: Documentation from Planning and Public Meetings

Johnson County Hazard Mitigation Strategy Maintenance Process The Johnson County Hazard Mitigation Action Plan planning team will continue to collaborate as a planning group in coordination with all currently participating jurisdictions and any other who choose to join. The North Central Texas Council of Governments (NCTCOG) will continue to be available as a resource. Johnson County will lead the plan maintenance and update processes by:

- Assisting jurisdictional Hazard Mitigation Teams in updating their individual contributions to the Johnson County HazMAP
- Assisting interested jurisdiction in Johnson County who would like to begin their mitigation planning process
- Facilitating Johnson County HazMAP meetings and disseminating information
- Collaborating data for the county-wide sections
- Requesting updates and status-reports on planning mechanisms
- Requesting updates and status reports on mitigation action projects
- Assisting jurisdictions in mitigation grants
- Assisting jurisdictions in implementing mitigation goals and action projects
- Providing mitigation training opportunities
- Maintaining documentation of local adoption resolutions for the Johnson County Hazard Mitigation Action Plan

Johnson County Hazard Mitigation Action Plan Adoption Once the Johnson County Hazard Mitigation Action Plan has received FEMA “Approved Pending Local Adoption”, each participating jurisdiction will take the Johnson County HazMAP to their Commissioner’s Court or City Councils for final public comment and local adoption. A copy of the resolution will be inserted into the Johnson County HazMAP and held on file at the North Central Texas Council of Governments.

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Chapter Two:
Planning Process
(In compliance with 201.6(c)(5))

Chapter Two of the Johnson County Hazard Mitigation Action Plan (HazMAP) describes the comprehensive planning and open public process utilized by the participating jurisdictions within Johnson County during the plan development and through to plan completion. Each of the jurisdictions involved developed an integrated approach specific to their jurisdiction that provided for not only hazard mitigation teams and management input, but also an opportunity for the public to comment on the plan. The development of the Hazard Mitigation Action Plan was orchestrated to provide an opportunity for all stakeholders to participate in the planning process. This planning process also included review and incorporation of other existing plans, documents, and studies related to reducing the effects of natural disasters, so as to avoid duplication and streamline hazard mitigation efforts. The following outlines the planning process:

2.1 Johnson County Unincorporated Area

Planning Process Johnson County has been and continues to be proactive in an effort to provide a comprehensive hazard mitigation program. Preparation and use of the Hazard Mitigation Action Plan is expected to bring an even higher level of cohesion and direction to emergency preparation in Johnson County.

As a contributor to the Johnson County Hazard Mitigation Action Plan, Johnson County began a local jurisdiction plan. Emergency management staff assessed a readiness to plan, secured political support from elected officials, and began to engage the communities in the process of emergency planning. 9 members were selected and invited to become a part of the Hazard Mitigation Team.

Development and Review Team
City of Godley Mayor
Johnson County Emergency Management Coordinator
Johnson County Floodplain Manager
Johnson County Inspector
City of Alvarado Mayor
City of Burleson Fire Chief
City of Burleson Battalion Chief
City of Burleson Public Works Director
City of Cleburne Emergency Management Coordinator
City of Cleburne Engineer
City of Cleburne Director of Public Works
City of Godley Mayor
City of Keene Fire Chief
City of Keene Emergency Management Coordinator
City of Joshua Fire Chief

Meetings and participation in a Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Johnson County Mitigation Strategy Working Group Meeting - June 7, 2012
- Johnson County Mitigation Strategy Working Group Meeting - June 20, 2012
- Johnson County Hazard Analysis Working Group Meeting – November 16, 2012
- Johnson County Hazard Analysis Working Group Meeting – December 11, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. Johnson County worked to increase public response to the plan by holding a public meeting on August 23, 2013 and posting notices on the county and city websites. A copy of the draft plan was also posted to the county and city websites.

The HazMAP planning process provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation The Emergency Management office made efforts for a comprehensive mitigation plan by incorporating other city plans and creating layers of data. These layers were useful in determining vulnerabilities and susceptible neighborhoods. This information was used when creating current risk assessment data. City and County Appraisal Data (2012), Regional Hazard Assessment Tool (1950-present), Texas Forest Service and Texas Wildfire Risk Assessment Summary Report (2012) and flood plain, dam and reservoir mapping were also incorporated. Other sources listed were also used for the mitigation action plan.

- Special Needs: Nursing homes, retirement communities, disabled, hospitals
- Critical Facilities / Locations: Federal and state buildings, city and county buildings
- Infrastructure and Pipelines: Railways, underground pipelines, water treatment plants
- Schools: Public schools, private schools, universities, community colleges, day schools.
- Other Facilities: Hazardous materials sites, tier II locations, large churches
- As well as other city plans including the Capital Improvement Plan, building codes, National Flood Insurance Program, and zoning codes

By reviewing the above plans and documents the Hazard Mitigation Team was able to take pertinent information and congeal it into the Hazard Mitigation Action Plan.

2.2 City of Alvarado

Planning Process The Hazard Mitigation Team for the City of Alvarado incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Alvarado and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- City Mayor
- City Manager
- Fire Chief/EMC
- Code Enforcement Officer
- Director of Public Works
- City Secretary

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Alvarado. He has designated the Fire Department and EMS as the agency with primary responsibility for hazard mitigation. The Fire Chief/Emergency Management Coordinator has been designated as the Hazard Mitigation Coordinator.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Alvarado Hazard Mitigation Team Meeting – June 18, 2012
- Alvarado Hazard Analysis Meeting – September 12, 2012
- Alvarado Hazard Analysis Meeting – November 16, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Alvarado worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Alvarado Building Codes and Fire Codes
City of Alvarado Capital Improvement Projects
City of Alvarado Appraisal Data
City of Alvarado Fire Risk Summary Report
City of Alvarado Flood Plain Map

2.3 City of Burleson

Planning Process The Hazard Mitigation Team for the City of Burleson incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Burleson and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- Fire Chief
- Battalion Chief
- Police Department Commander
- Assistant Director of Public Works

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Burleson. He has designated the Fire Department as the agency with primary responsibility for hazard mitigation. The Fire Chief has been designated as the Hazard Mitigation Coordinator.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Johnson County Mitigation Strategy Working Group Meeting - June 7, 2012
- Burleson Hazard Mitigation Team Meeting – June 24, 2012
- Burleson Hazard Analysis Meeting – November 16, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Burleson worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Burleson Building Codes and Fire Codes
City of Burleson Capital Improvement Projects
City of Burleson Appraisal Data
City of Burleson Fire Risk Summary Report
City of Burleson Flood Plain and Grass Fires

2.4 City of Cleburne

Planning Process The Hazard Mitigation Team for the City of Cleburne incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Cleburne and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- Emergency Management Coordinator
- Administrative Coordinator
- Building Official
- Health Inspector
- City Operations Manager
- City Engineer

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Cleburne. He has designated the Fire Department as the agency with primary responsibility for hazard mitigation. The Emergency Management Coordinator has been designated as the Hazard Mitigation Coordinator.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Johnson County Mitigation Strategy Working Group Meeting - June 7, 2012
- Cleburne Hazard Mitigation Team Meeting – July 31, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Cleburne worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Cleburne Building Codes and Fire Codes
City of Cleburne Capital Improvement Projects
City of Cleburne Appraisal Data
City of Cleburne Fire Risk Summary Report

2.5 City of Godley

Planning Process The Hazard Mitigation Team for the City of Godley incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Godley and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- City Mayor

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Godley.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Johnson County Mitigation Strategy Working Group Meeting - June 7, 2012
- Godley Hazard Analysis Meeting – November 19, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Godley worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Godley Building Codes and Fire Codes
City of Godley Capital Improvement Projects
City of Godley Appraisal Data
City of Godley Fire Risk Summary Report
City of Godley Fire Data

2.6 City of Joshua

Planning Process The Hazard Mitigation Team for the City of Joshua incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Joshua and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- City Mayor
- Fire Chief
- Director of Operations/EMC

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Joshua. He has designated City Administration as the agency with primary responsibility for hazard mitigation. The Director of Operations/Emergency Management Coordinator has been designated as the Hazard Mitigation Coordinator.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Joshua Hazard Mitigation Team Meeting – July 31, 2012
- Joshua Hazard Analysis Meeting – November 16, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Joshua worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Joshua Building Codes and Fire Codes
City of Joshua Capital Improvement Projects
City of Joshua Appraisal Data
City of Joshua Fire Risk Summary Report
City of Joshua Flooding and Wildfire Report

2.7 City of Keene

Planning Process The Hazard Mitigation Team for the City of Keene incorporated members of existing planning functions within the city to develop a comprehensive approach to the Hazard Mitigation Action Plan. Members from the City of Keene and Johnson County along with several others provided the input needed to develop this plan.

Our planning team members:

- City Mayor
- Fire Chief
- Fire Lieutenant/Paramedic
- City Administrator
- Economic Development

Hazard Mitigation Coordinator: The Mayor, as the Emergency Management Director, has overall responsibility for the Emergency Management Program at the City of Keene. He has designated the Fire Department as the agency with primary responsibility for hazard mitigation. The Fire Chief has been designated as the Hazard Mitigation Coordinator.

Meetings and participation in the Johnson County Hazard Mitigation Action Plan have taken place over the past year. HMT meetings have been held on the following dates:

- Keene Hazard Mitigation Team Meeting – July 5, 2012
- Keene Hazard Mitigation Team Meeting - July 25, 2012

Public Involvement The Hazard Mitigation Team knows that the participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. The City of Keene worked to increase public response to the plan by holding public meetings and posting notices on the county and city websites. The first public meeting was held on August 23, 2013. A copy of the draft plan was also posted to the county and city websites.

The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

There were no comments received from the citizens, non-profits, businesses, academia, or interested parties. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

Plan Incorporation As part of the planning process for the Hazard Mitigation Action Plan, the planning committee reviewed several existing documents and incorporated them where applicable. Those documents included:

Johnson County Emergency Operations Plan
City of Keene Building Codes and Fire Codes
City of Keene Capital Improvement Projects
City of Keene Appraisal Data
City of Keene Fire Risk Summary Report

Chapter Three: Hazard Analysis

(In compliance with 201.6(c)(2)(i), 201.6(c)(2)(ii), 201.6(c)(2)(ii)(A), 201.6(c)(2)(ii)(B), 201.6(c)(2)(ii)(C), & 201.6(c)(2)(iii))

Chapter Three of the Johnson County Hazard Mitigation Action Plan (HazMAP) is a risk assessment that provides the factual basis for the action items described in Chapter Four. This information serves to enable the participating jurisdictions to identify and prioritize the appropriate mitigation action items to reduce losses from the identified hazards. Hazards are identified and profiled, to include location and extent of each hazard as well as detailed previous occurrence and probability of future events data.

3.1 Introduction to Hazard Analysis

The Hazard Mitigation Action Plan for Johnson County is a tool to assist in the identification and documentation of all the hazards faced in the region.

The Johnson County profile is one of many developed by the North Central Texas Council of Governments (NCTCOG) under the FEMA Hazard Mitigation program. These plans are created by compiling data from the NCTCOG regional natural hazards risk assessments, damage assessments, hazard profiling and identification as well as historical data and geographic information

Hazards Addressed Johnson County Hazard Mitigation Action Plan has identified the following natural hazards as having the potential to cause damage in the county. Wildland fire, flooding, and dam failure are the only hazards recognized to have predictable vulnerable areas. All other hazards are equally likely to occur throughout the Johnson County jurisdictions.

Tornado A tornado is a violently rotating column of air, in contact with the ground, both pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel. Tornadoes may affect the entire planning area equally.

Hail Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. Hail may affect the entire planning area equally.

High Winds Wind is defined as the motion of air relative to the earth's surface. The horizontal component of the three-dimensional flow and the near-surface wind phenomenon are the most significant aspects of the hazard. Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds may affect the entire planning area equally.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. Winter storms affect the entire planning area equally. Cold snaps in which temperatures fall below the freezing point of 32° Fahrenheit do happen on an annual basis in the planning area and can lead to issues with infrastructure, especially frozen roads and bridges.

Extreme Heat Extreme heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Summer heat affects the entire planning area equally.

Drought Drought can be defined as a water shortage caused by the natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. It can be aggravated by other factors such as high temperatures, and may affect the entire planning area equally.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuring seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. seismic waves are referred to as P waves, S waves, and surface waves. Due to the risk being associated to a distant quake, earthquakes may affect the entire planning area equally.

Expansive Soils Expansive soils are soils that contain large percentages of swelling clays that may experience volume changes of up to 40% in the absence or presence of water. This type of plastic deformation is common in the North Central Texas region. Over time, expansive soils can be hazardous to buildings and other infrastructure, with the most extensive damage occurring to highways, streets, and building foundations. Expansive soils may affect the entire planning area equally.

Hurricane/Tropical Storm Hurricanes and tropical storms are classified as cyclones and are developed by counter-clockwise circulation of winds around a low-pressure center in the Northern Hemisphere. Latent heat from condensation of warm water is the key energy source for these storm. The ingredients for a hurricane and tropical storm to form include a pre-existing weather disturbance such as warm tropical oceans, moisture, and relatively light winds aloft. If these conditions persist long enough, they can combine to produce the violent winds, waves, torrential rains, and floods, all of which are more thoroughly addressed as separate hazards within this section. Hurricanes were identified as one of the hazards that threaten the state of Texas as a whole. Since hurricanes currently pose no risk to Johnson County, they will not be discussed further in this plan, but their risk potential will be re-evaluated as needed.

Coastal Erosion Coastal erosion is the wearing away land and the resultant loss of beach, shoreline or dune material along a coastline. The hazard can be assessed by the rate of change in the horizontal displacement of position of a shoreline over a period of time. Hurricanes and storm surges, windstorms and flooding hazards can cause short-term erosion. The damage can be intensified by human activity, for example boat wakes, removal of dune and vegetative buffers, dredging and shoreline hardening. Multi-year impacts such as wave action, sea level rise, sediment loss, subsidence, and climate change can cause long-term erosion. An above average number of storms and high tides or the long-term effects of changes in sea level can cause increased episodic erosion events. As a response, this will cause a beach from naturally accumulating sediment, starting the erosion process.

Further damage to coastal and upland property can occur if a beach and dune system does not recover either naturally or by human action. Natural recovery can take years to decades. Human action for recovery can include beach nourishment, dune stabilization and shoreline protecting structures (sea walls, groins, jetties, etc.). These actions can mitigate the hazard but may also intensify it under some conditions.

Coastal erosion can cause enough damage to destroy buildings and infrastructure. This poses a threat to local economies of coastal communities dependent on the profits from recreational beaches. Coastal Flooding was identified as one of the hazards that threatens the state of Texas as a whole. Since coastal flooding currently poses no risk to Johnson County, it will not be discussed further in this plan, but its risk potential will be re-evaluated as needed.

Land Subsidence According to the State of Texas Mitigation Plan, land subsidence is defined as the loss of surface elevation due to the removal of subsurface support. It can range from broad, regional lowering of the land surface, to localized collapses. Land subsidence extent is measured by the number of feet of land loss, or sinks.

Land subsidence occurs when large amounts of ground water have been withdrawn from certain types of rocks, such as fine-grained sediments. The water is partly responsible for holding the ground up, therefore the rock gets compacted. When the water is withdrawn, the rocks fall in on themselves. Land Subsidence was identified as one of the hazards that threatens the state of Texas as whole. However since land subsidence currently poses no risk to Johnson County, it will not be discussed further in this plan, but its risk potential will be re-evaluated as needed.

Wildland Fire A wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildland fires are fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted.

Unincorporated Johnson County 72% of the county's population is located in the Wildland Urban Interface according to the Texas Forest Service (TFS) Risk Assessment Summary. See section 3.2, maps D.1 and E.1. Portions of the county are more susceptible to wildfire due to their inaccessibility and terrain, such as the Retreat area in the southwestern portion of the county.

City of Alvarado According to the Texas Forest Service Wildfire Risk Assessment Summary Report, 87% of Alvarado's population is located within the Wildland Urban Interface. Areas more susceptible to wildfires include Quail Haven, Stonegate, Alvarado Hill, and the area south of Davis St and east of Baugh. Alot of open land is located in each of the identified areas. For a visual reference, see maps D.2 and E.2 in section 3.2

City of Burleson According to the Texas Forest Service Wildfire Risk Assessment Summary Report, 69% of Burleson's population is located within the Wildland Urban Interface. The following locations are more susceptible to wildfire: Tanterra Estates, Ranchway Estates, Southwest Hulen, East Renfro, South I-35, Houston Road, and FM 1902. The TFS map is viewable in section 3.2, maps D.3 and E.3.

City of Cleburne According to the Texas Forest Service Wildfire Risk Summary Report for Cleburne, 52% of Cleburne's population is located within the Wildland Urban Interface. In general, the entire City of Cleburne is surrounded by rural land. Joshua city limits are to the north and Keene City limits are to the east. All other boundaries are rural. Particular neighborhoods which interface with wildland areas include: Winchester Addition, south of Country Club Rd, Belle Meadows Addition west of S. Nolan River Rd in the southwest quadrant, Lakeshore Dr. and Lakecrest Ct. area east of Lake Pat Cleburne Brookhaven Addition northwest of N. Nolan River Rd in the west quadrant, and East Cleburne along Old Mansfield Rd. between E. Henderson St. and E. Kilpatrick St in the northwest quadrant. The TFS map is viewable in section 3.2, maps D.4 and E.4.

City of Godley According to the Texas Forest Service Wildfire Risk Summary Report for Godley, 98% of Godley's population is located in Wildland Urban Interface. The entire city is encircled by open prairie lands which are susceptible to grass fires. The TFS map is viewable in section 3.2, maps D.5 and E.5

City of Joshua According to the Texas Forest Service Wildfire Risk Summary Report for Joshua, 94% of Joshua's population is located with the Wildland Urban Interface based on the Texas Forest Service Wildland Fire Risk Assessment Summary Report. One area prone to wildland fire is the south end in Joshua Meadows that has a high population that is surrounded by wildland. The TFS map is viewable in section 3.2, maps D.6 and E.6

City of Keene According to the Texas Forest Service Wildfire Risk Summary Report for Keene, 86% of Keene's population is located within the Wildland Urban Interface. See maps D.7, and E.7 in section 3.2 for a visual reference.

Flooding Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like "25-year storm" and "100-year flood" can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding.

Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, "floodplain" most often refers to an area that is subject to inundation by a flood that has a one percent chance of occurring in any given year (commonly and incorrectly referred to as the 100-year floodplain). Common flooding hazards within the planning area include flood hazards from flash flooding and from new development.

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains, hurricanes, and tropical storms. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges.
These are a list of specific areas in each jurisdiction that are prone to flooding.

Unincorporated Johnson County The following areas are susceptible to flooding: County Road (CR) 907 0.2 miles west of 1006-new LWC, CR 913 near 1002 (has gates but floods by culverts), CR 1008 doesn't not have gates and floods, CR 1106 from SH174 to 1208 and 1223 to 1222, CR 1112 (Old Foamy) approximately 0.75 miles from SH174, CR 1116 near US 67, CR 1123 (Woodward) from US 67 to 1121-bridge, CR 1126- one water crossing and one bridge on each end of SH171, and CR 1205 from FM 916 to 1107.

City of Alvarado The worst of the flooding issues are in the North portion of the city along HWY 67 to I-35 to the Quail Haven Addition where water starts collecting north of town and flows through the city. There are also several manufactured homes in the area that are in the flood plain, usually resulting in homes being evacuated and rescued. Two manufactured home parks are on Atchley and Parkway, the other is located on College Street and Parkway. Drainage that crosses HWY 67 into Baugh Street, and Maple Street also flood due to drainage.

City of Burleson The following areas are susceptible to flooding: the Tarrant Low Water Crossing at the intersection of Tarrant and Miller, South Dobson Road between Miller and Village Creek, Southwest Hulen under the railroad bridge, Johnson at Town Creek Bridge, County Road 714 at Village Creek, Warren at Town Creek, Dobson Road at Town Creek, Thomas at Town Creek, Lorna at HWY 174, Hillary at HWY 174, and King at HWY 174.

City of Cleburne Several areas of Cleburne fall within the FEMA Q3 100 year flood zone.

City of Godley The following areas are susceptible to flooding: Sky Road/ County Road 1003, areas between County Road 1004 and Grande Vista Way on the eastern portion of ETJ., County Road 913 west FM 1902, County Road 1126 southern, County Road 1228 southern, and County Road 1217 southern.

City of Joshua Several areas of Joshua fall within the FEMA Q3 100 year flood zone.

City of Keene Keene experiences flooding in the following locations: around the City's floodgate located at FM 317 at the Exit 67 a quarter mile down, County Road 700- bridge crossing Buffalo Creek, County Road 701-Buffalo Creek, County Road 801C, County Road 704C, Springcreek and Shelly Drive, Westward loop of 67 between Exit for 2280 and County Road 801B, SPUR 102 between 1st and 2nd Street, 67 at 317 at the east end of the city limits, 67 at 318 at the east end of the city limits, Lockett Branch runs along the westside of 317 through town, Turkey Creek in the ETJ, and Shady Lakes Ranch at 414 and 316C.

Dam Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding.

Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations.

Unincorporated Johnson County The following dams are considered high hazard in Johnson County. Cleburne State Park Lake Dam, TX 03591, Chambers Watershed Site FRS 30, FRS 31, FRS 32, FRS 33, FRS 36, FRS 37, FRS 58, FRS 59, FRS 61, and FRS 62. Please refer to the Johnson County DFIRMS maps in section 3.2 for specific flooding analysis.

City of Alvarado In the event of a dam failure, Conservation Lake, located north of Alvarado, would flow directly through town causing drastic impact on the citizens and homes. Also, Lake Alvarado is located along the city limits and if dam failure were to occur there would be an impact on the ETJ of the city.

City of Burleson Burleson is not vulnerable to dam failure.

City of Cleburne The City of Cleburne owns and operates two high hazard dams: Lake Pat Cleburne Dam on the Nolan River which is a tributary of the Brazos River. Lake Pat is the primary water supply for Cleburne. Marti Lake Dam on the West Fork Buffalo Creek. The primary purpose is flood control.

City of Godley Godley is not vulnerable to dam failure.

City of Joshua Joshua is not vulnerable to dam failure

City of Keene Keene is not vulnerable to dam failure.

3.2 Location of Hazards

The following maps illustrate the location of the hazards in Johnson County. Maps concerning tornado and hail incidents are in reverence to previous events as they have the potential to occur equally throughout the county. Winter storms, summer heat, and drought have the potential to occur equally throughout the county and their previous events data is not represented by a map. Likewise, it is assumed that those hazard listed as having the potential to occur equally throughout the HazMAP planning area will affect the area as described in each city's land use maps H.1-H.7, in section 3.6.

Map Series A **Tornado Incidents**

Map A.1 Johnson County Tornado Incidents
Map A.2 City of Alvarado Tornado Incidents
Map A.3 City of Burleson Tornado Incidents
Map A.4 City of Cleburne Tornado Incidents
Map A.5 City of Godley Tornado Incidents
Map A.6 City of Joshua Tornado Incidents
Map A.7 City of Keene Tornado Incidents

Map Series B **Hail Incidents**

Map B.1 Johnson County Hail Incidents
Map B.2 City of Alvarado Hail Incidents
Map B.3 City of Burleson Hail Incidents
Map B.4 City of Cleburne Hail Incidents
Map B.5 City of Godley Hail Incidents
Map B.6 City of Joshua Hail Incidents
Map B.7 City of Keene Hail Incidents

Map Series C **Earthquake Incidents**

Map C.1 Johnson County Earthquake Incidents
Map C.2 City of Alvarado Earthquake Incidents
Map C.3 City of Burleson Earthquake Incidents
Map C.4 City of Cleburne Earthquake Incidents
Map C.5 City of Godley Earthquake Incidents
Map C.6 City of Joshua Earthquake Incidents
Map C.7 City of Keene Earthquake Incidents

Map Series D **Wildland Urban Interface**

Map D.1 Johnson County Wildland Urban Interface
Map D.2 City of Alvarado Wildland Urban Interface
Map D.3 City of Burleson Wildland Urban Interface
Map D.4 City of Cleburne Wildland Urban Interface
Map D.5 City of Godley Wildland Urban Interface
Map D.6 City of Joshua Wildland Urban Interface
Map D.7 City of Keene Wildland Urban Interface

Map Series E Wildfire Risk Assessment

Map E.1 Johnson County Wildfire Risk Assessment
Map E.2 City of Alvarado Wildfire Risk Assessment
Map E.3 City of Burleson Wildfire Risk Assessment
Map E.4 City of Cleburne Wildfire Risk Assessment
Map E.5 City of Godley Wildfire Risk Assessment
Map E.6 City of Joshua Wildfire Risk Assessment
Map E.7 City of Keene Wildfire Risk Assessment

Map Series F Flood Zones

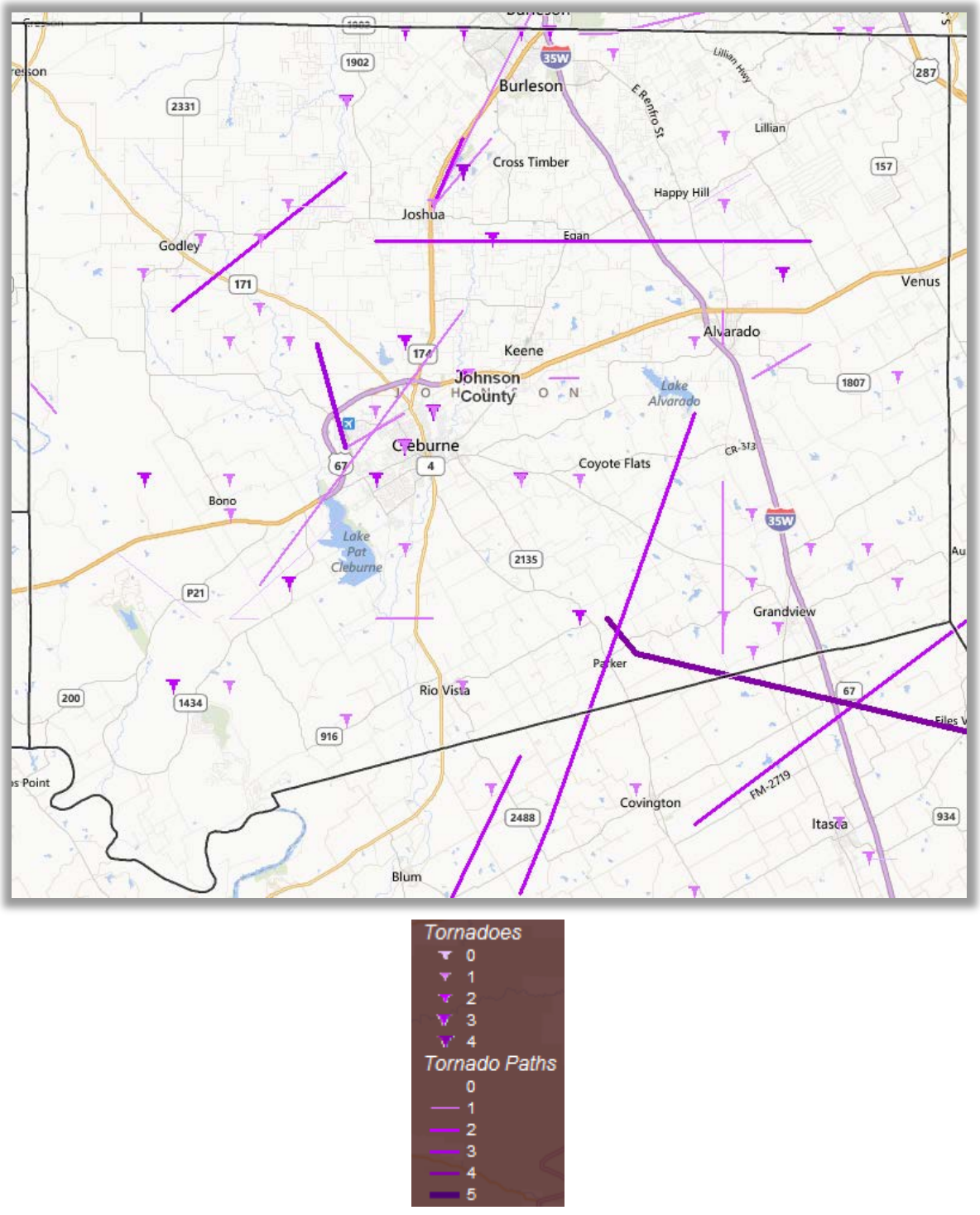
Map F.1 Johnson County Flood Zones
Map F.2 City of Alvarado Flood Zones
Map F.3 City of Burleson Flood Zones
Map F.4 City of Cleburne Flood Zones
Map F.5 City of Godley Flood Zones
Map F.6 City of Joshua Flood Zones
Map F.7 City of Keene Flood Zones

Map Series G Dams

Map G.1 Johnson County Dams
Map G.2 City of Alvarado Dams
Map G.3 City of Burleson Dams
Map G.4 City of Cleburne Dams
Map G.5 City of Godley Dams
Map G.6 City of Joshua Dams
Map G.7 City of Keene Dams

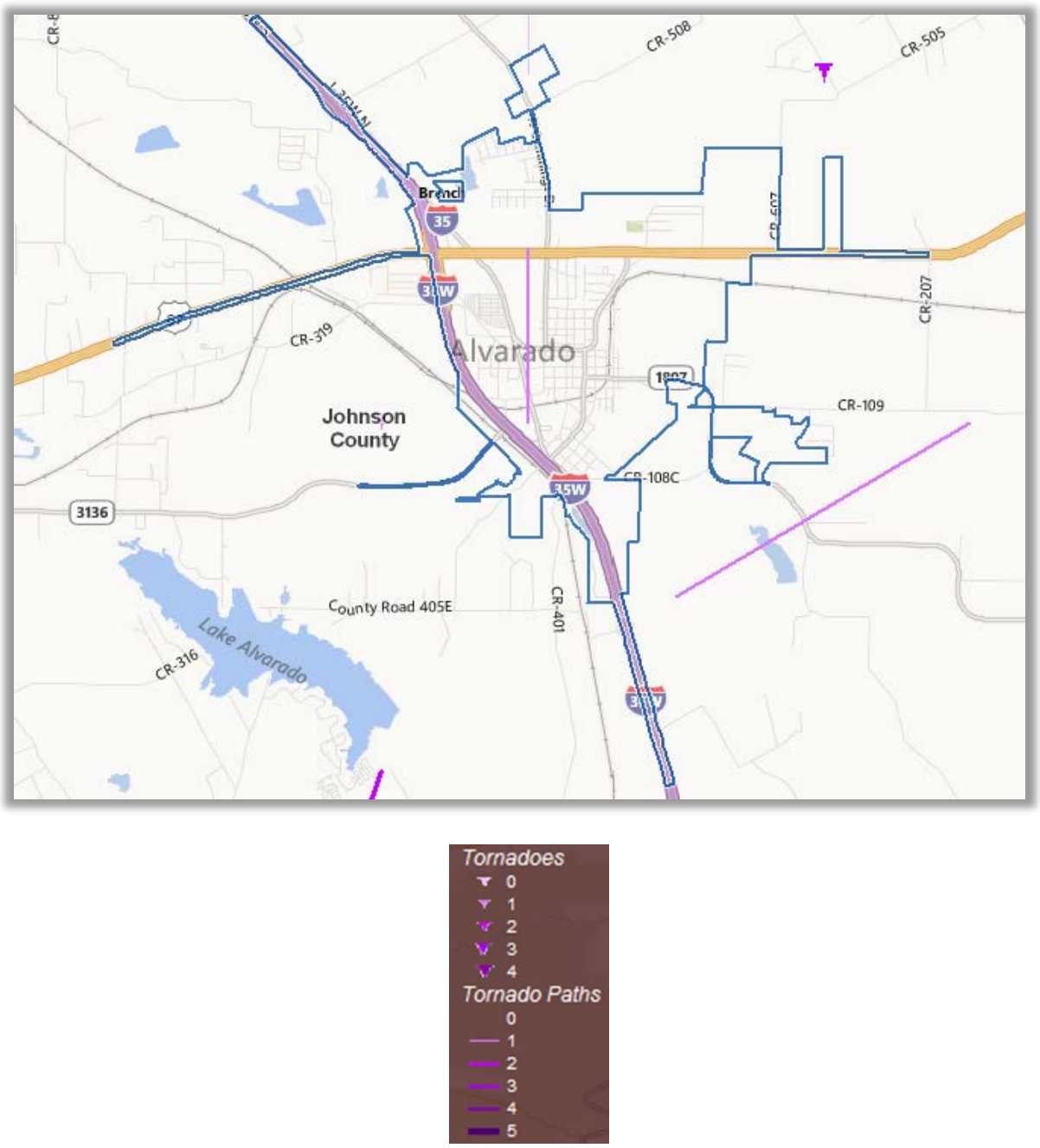
Map Series A – Tornado Incidents

Map A.1- Johnson County Tornado Incidents



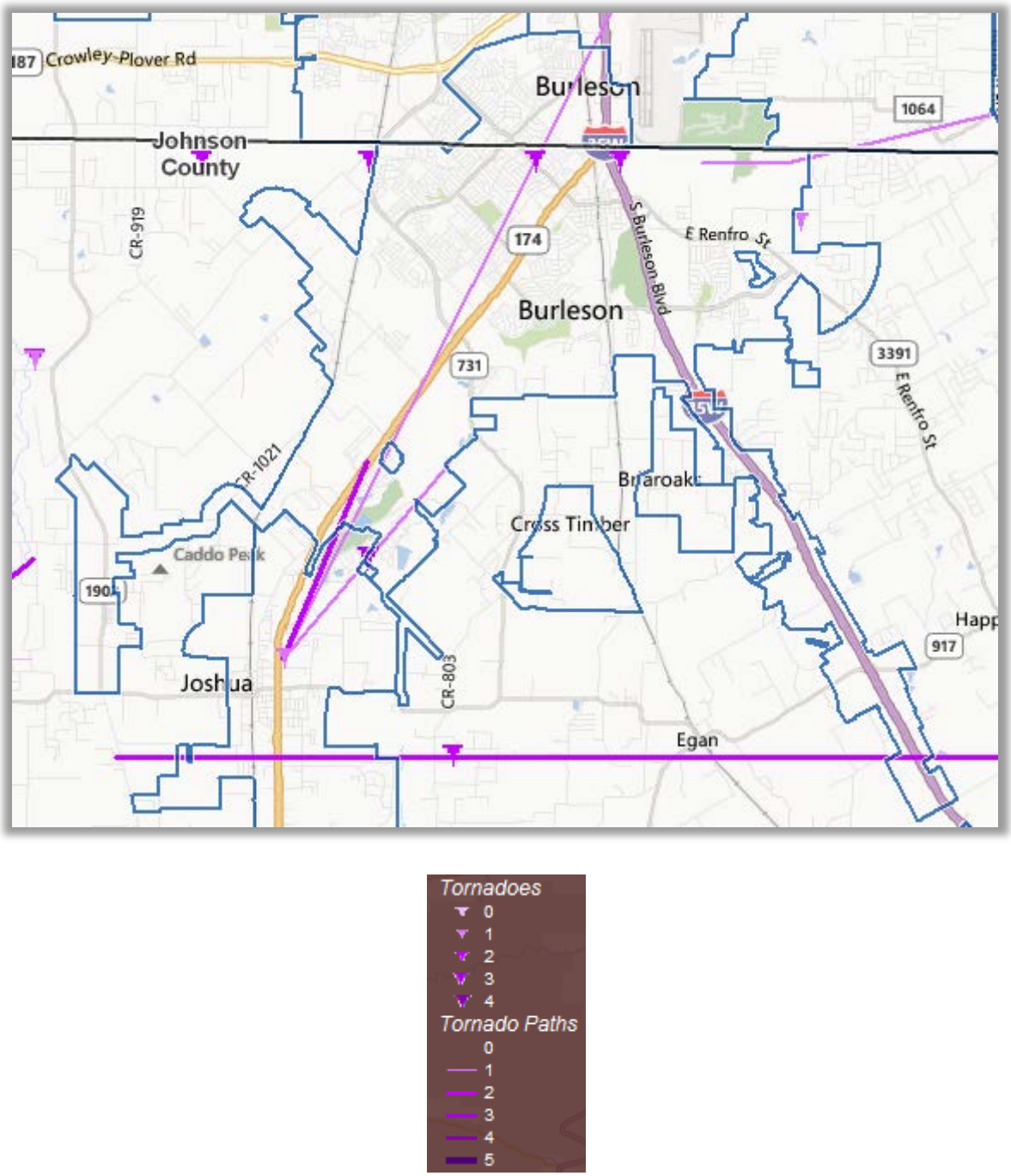
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map A.2 – Alvarado Tornado Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map A.3 – Burleson Tornado Incidents

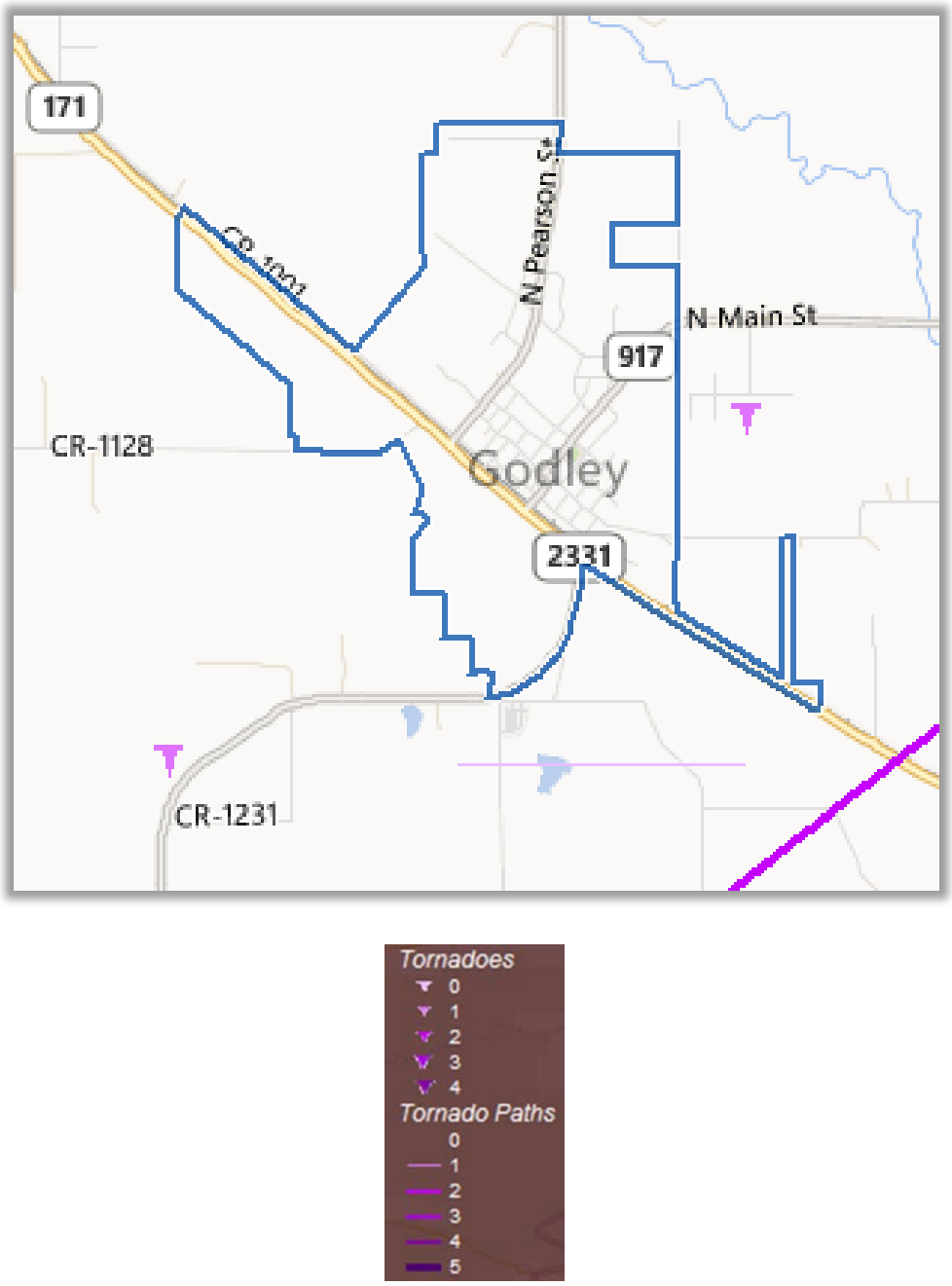


Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map A.4 – Cleburne Tornado Incidents

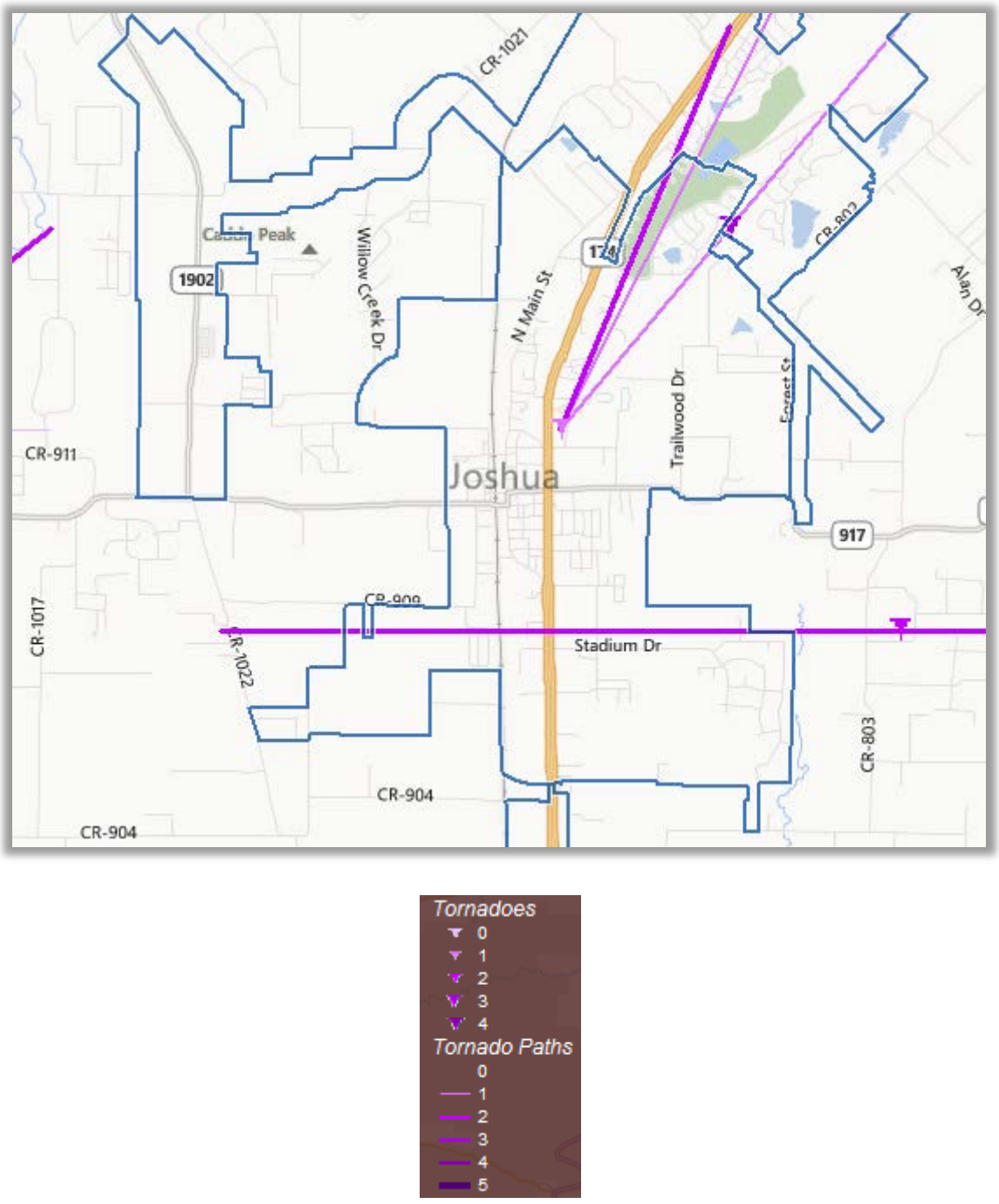
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map A.5 – Godley Tornado Incidents



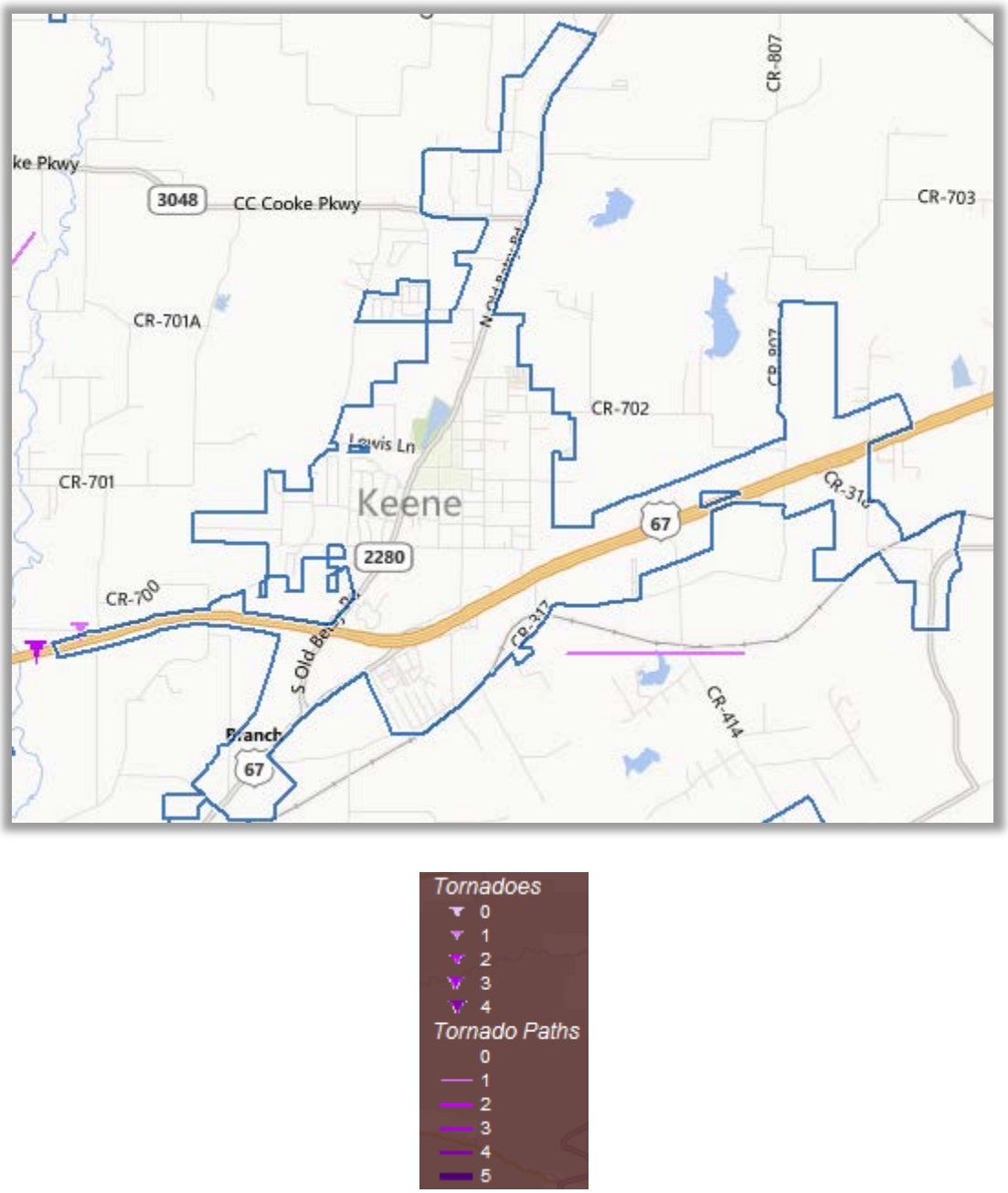
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map A.6 – Joshua Tornado Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

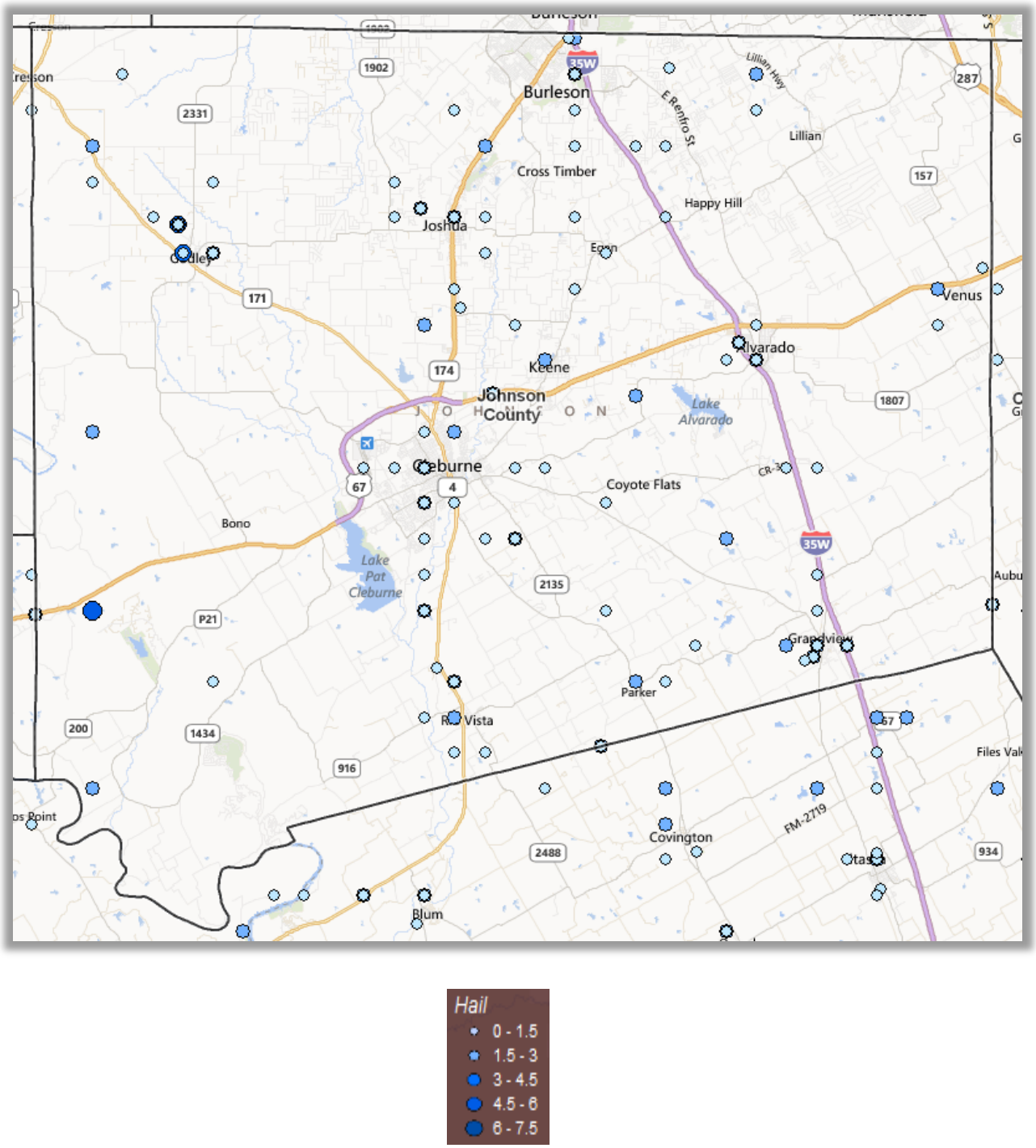
Map A.7 – Keene Tornado Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

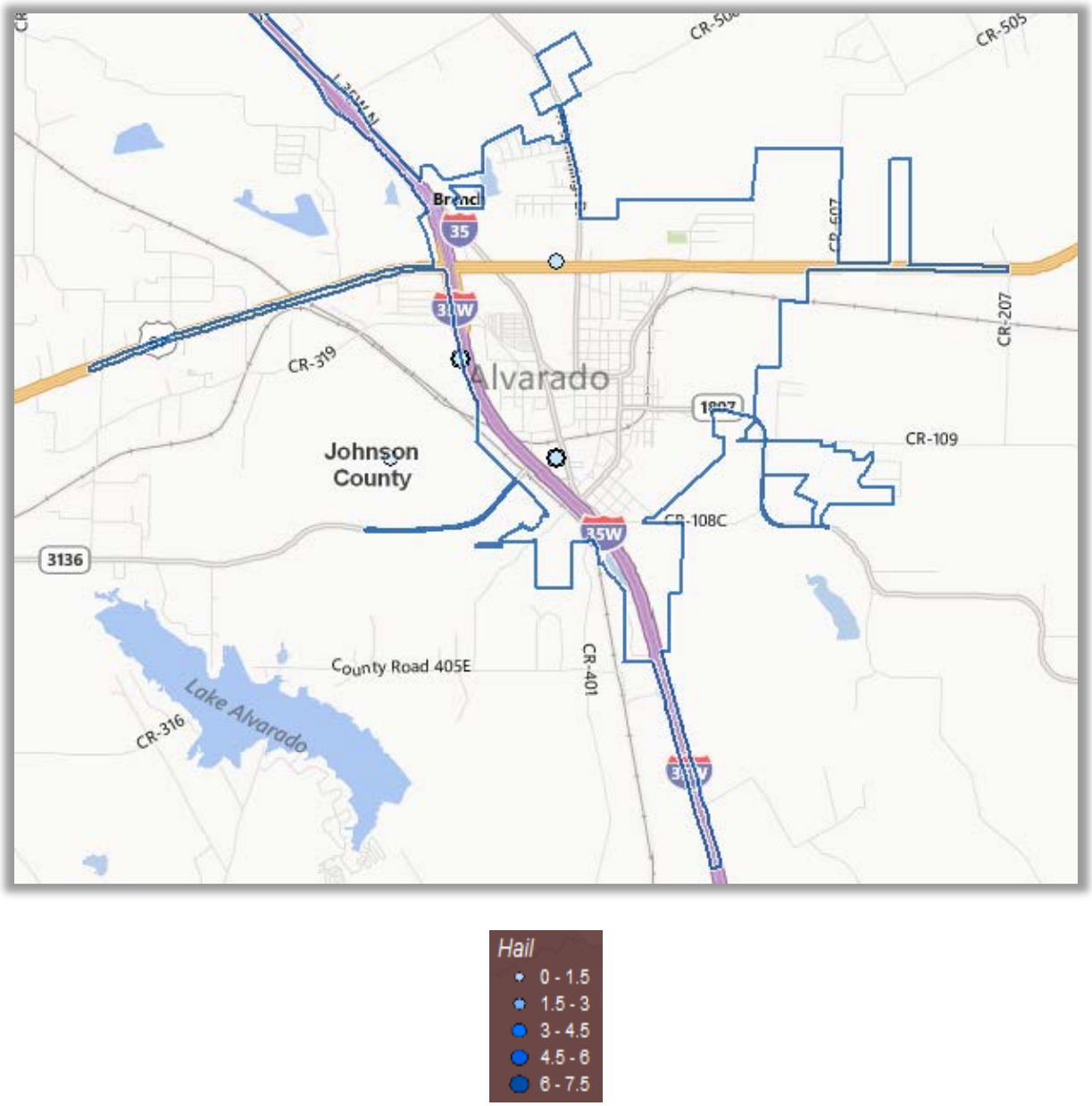
Map Series B – Hail Incidents

Map B.1 - Johnson County Hail Incidents



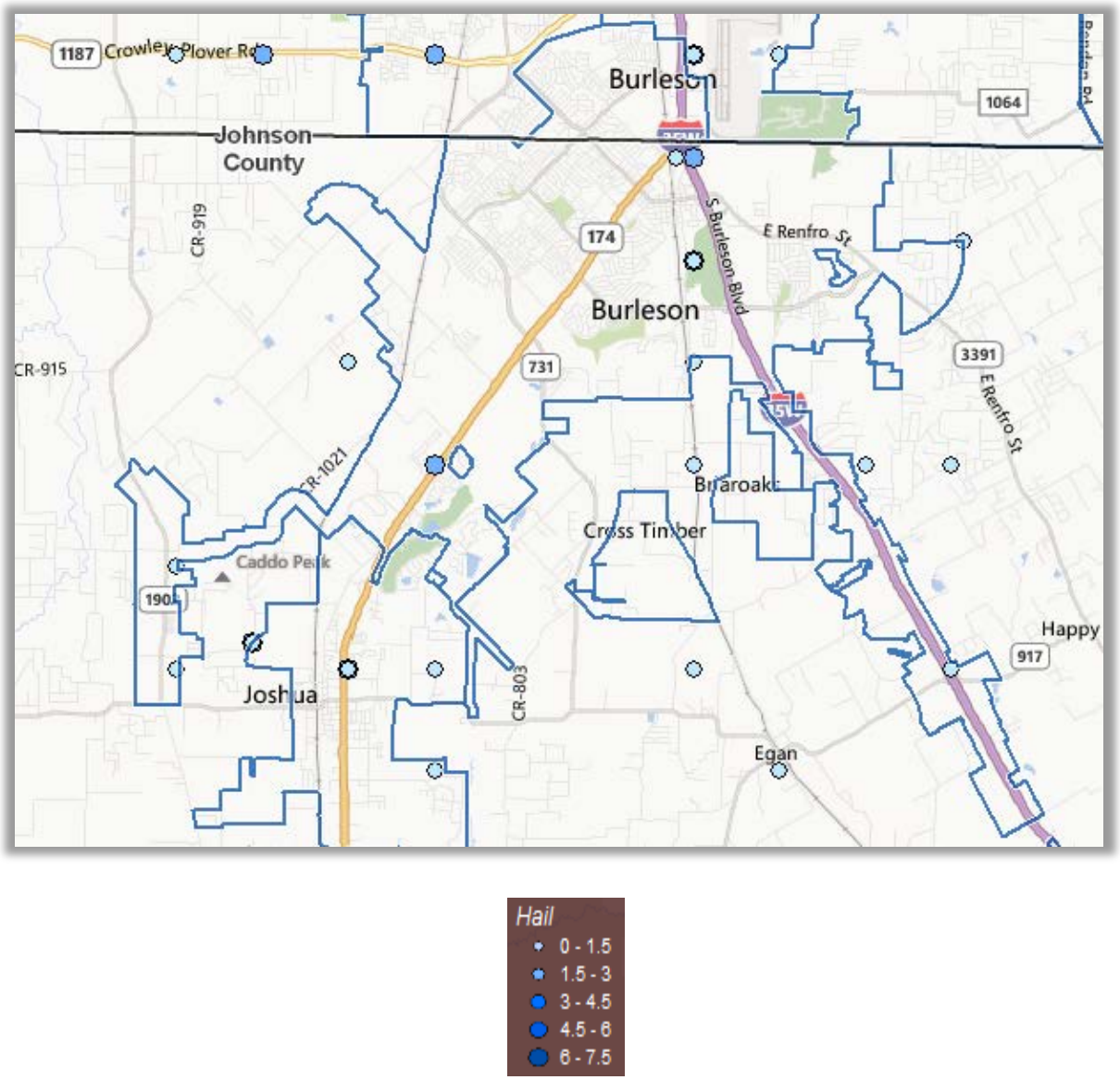
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map B.2 - Alvarado Hail Incidents



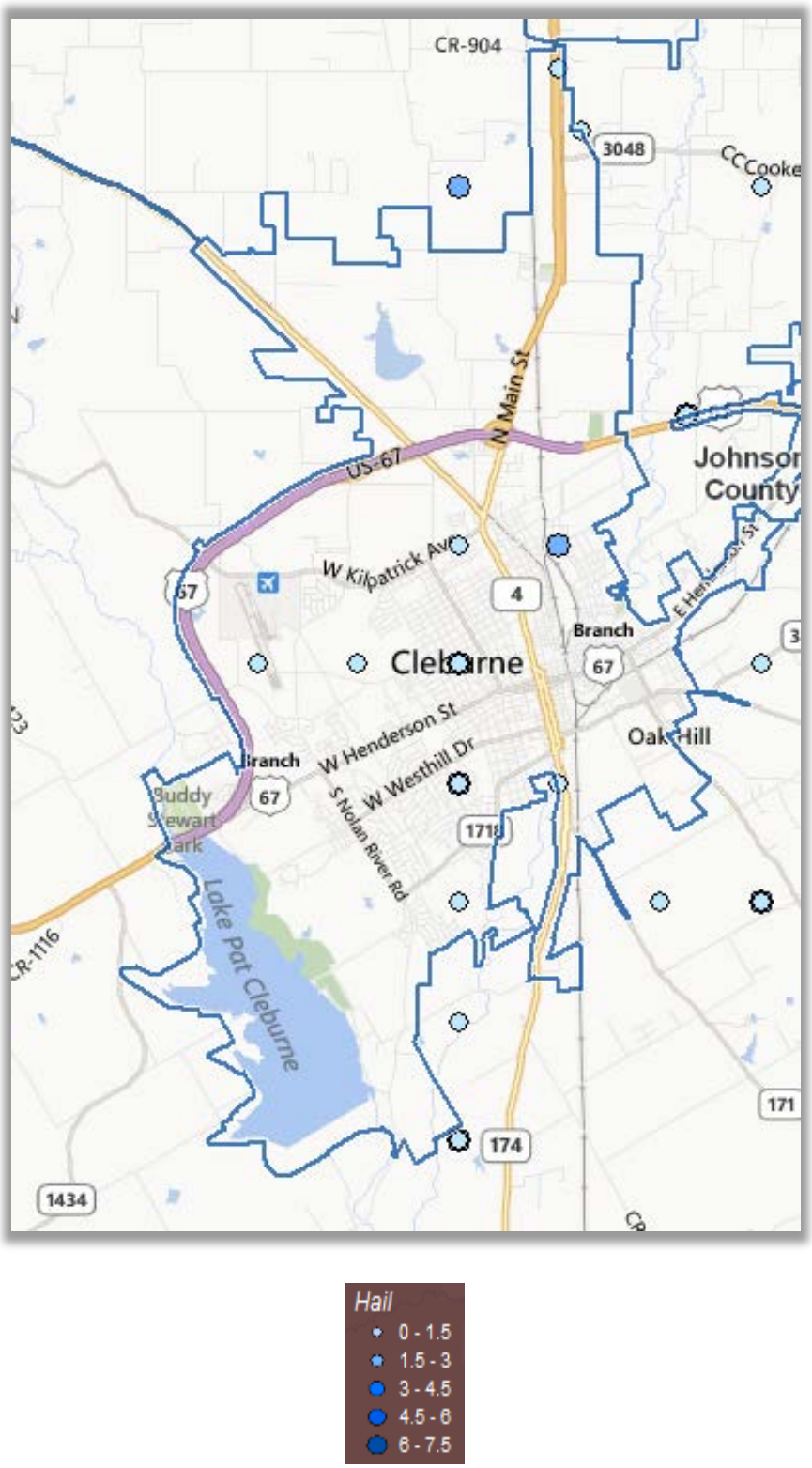
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map B.3 - Burleson Hail Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map B.4 - Cleburne Hail Incidents

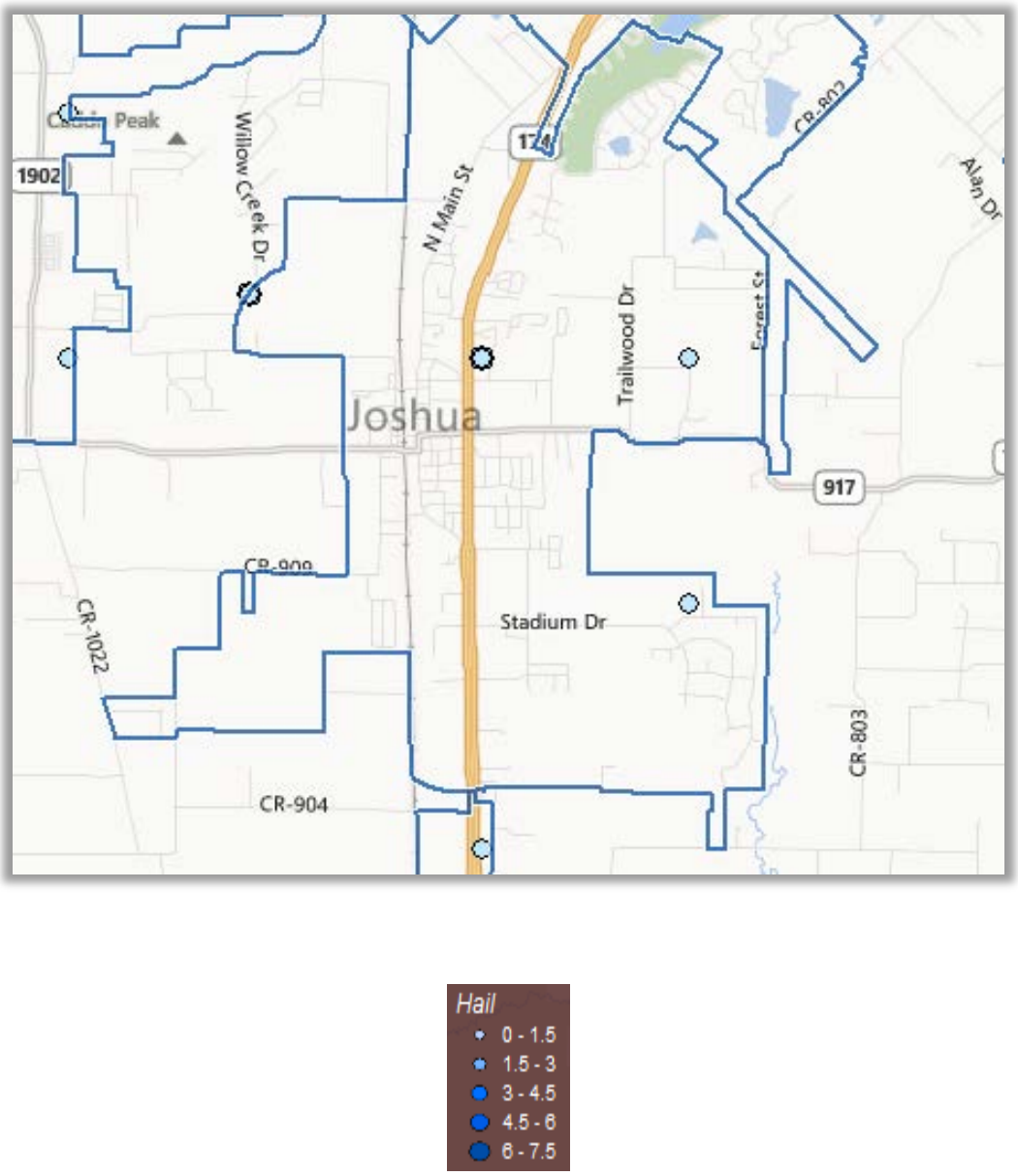


Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map B.5 - Godley Hail Incidents

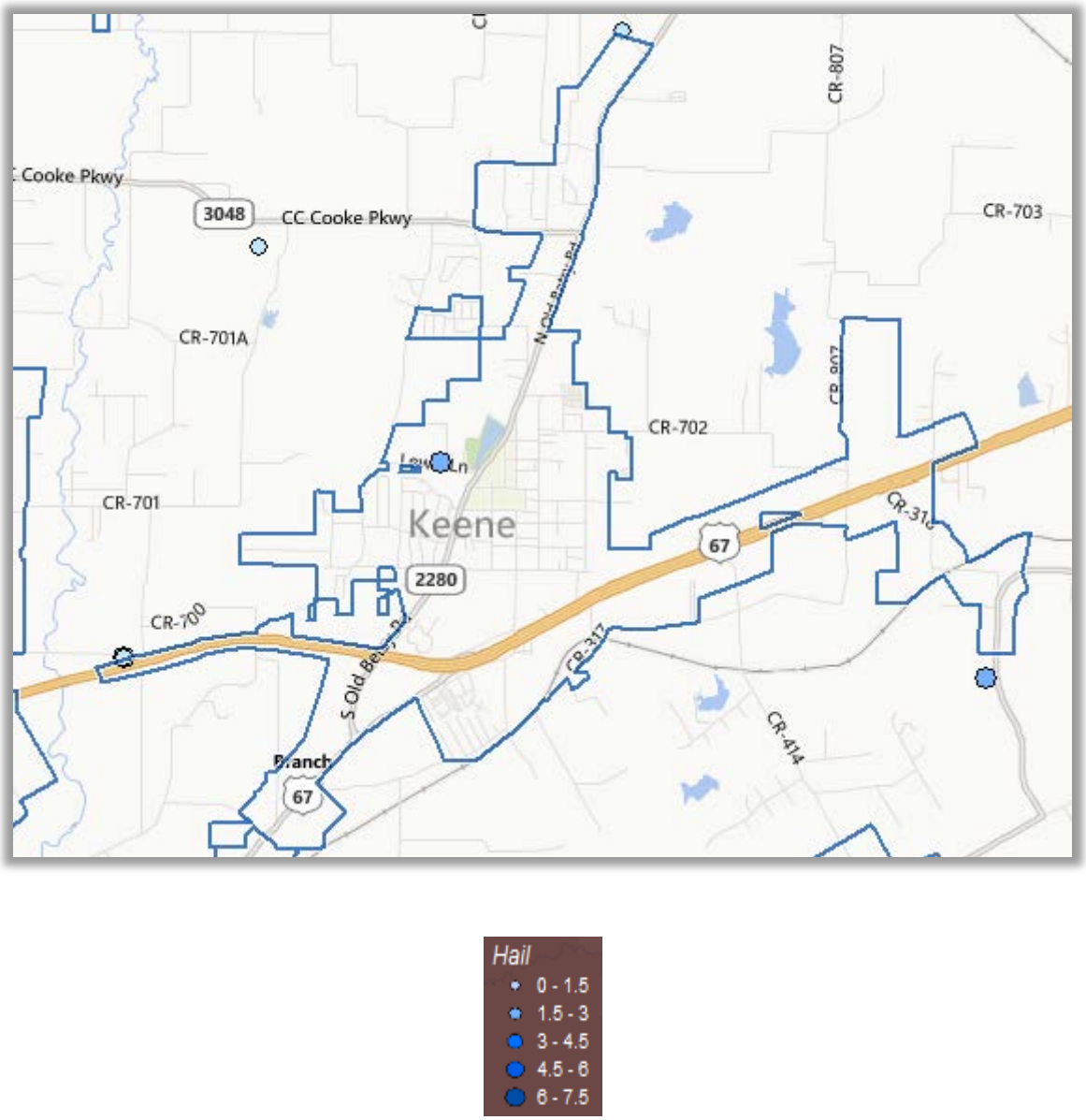
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map B.6 - Joshua Hail Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

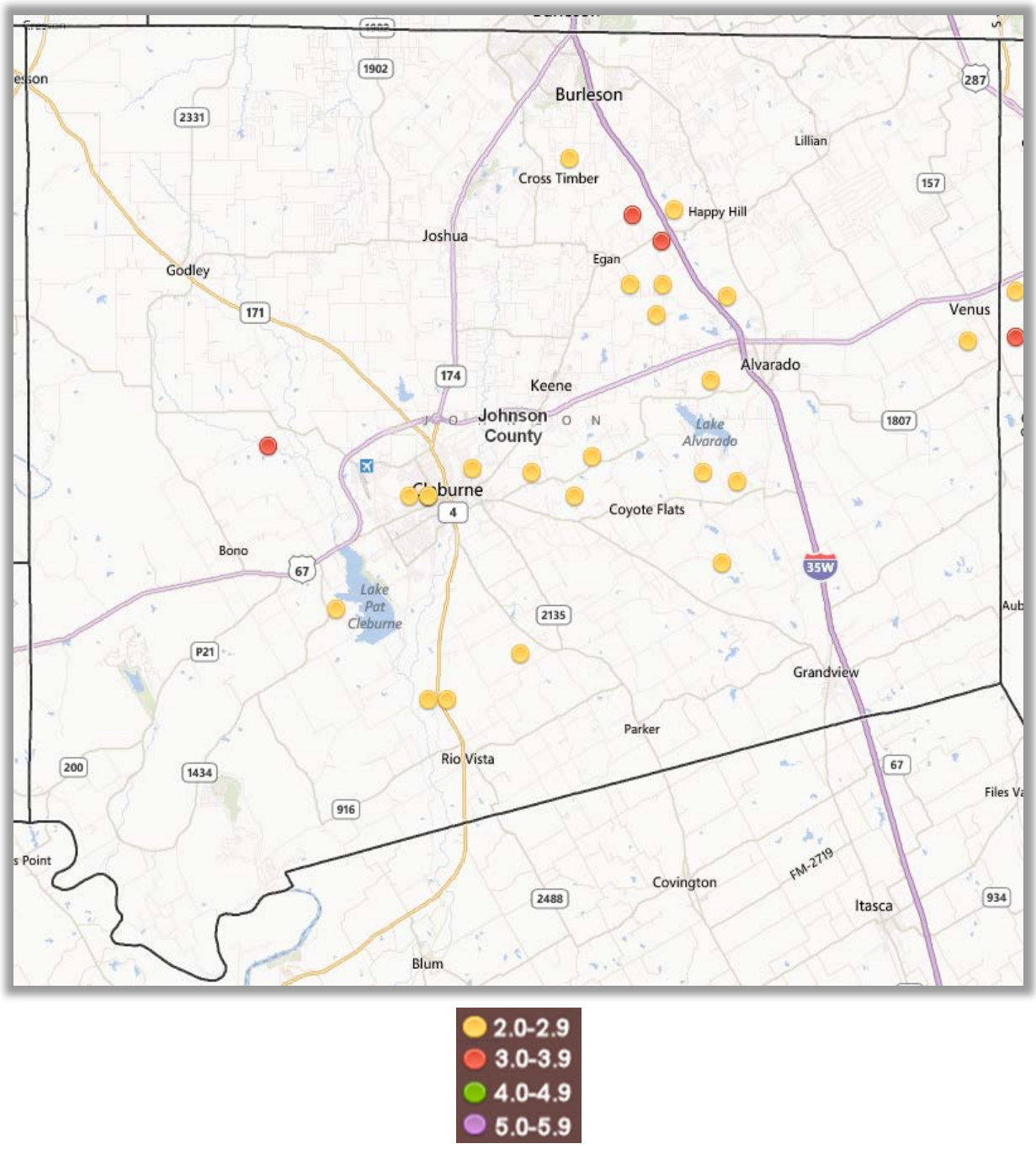
Map B.7 - Keene Hail Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

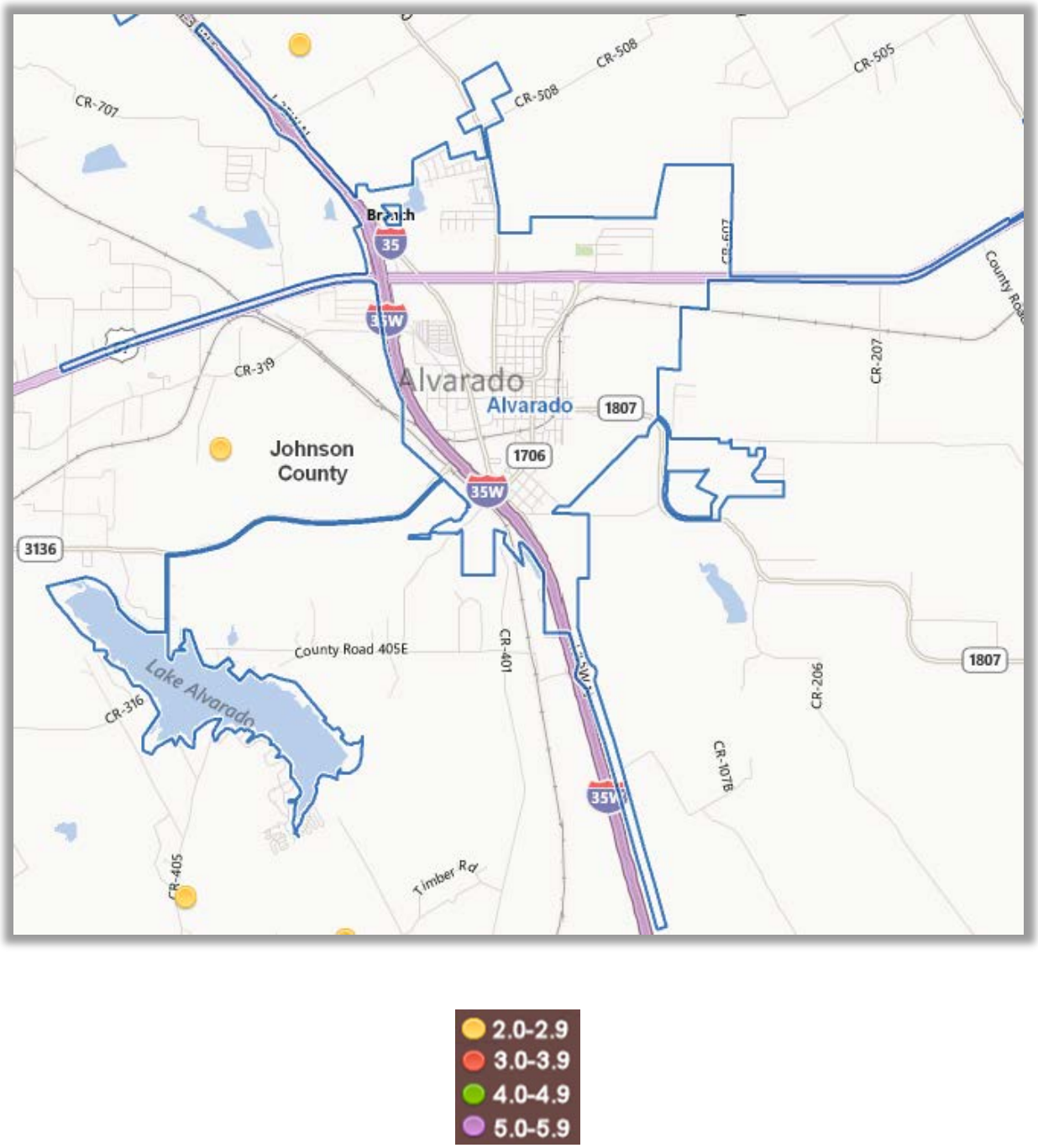
Map Series C – Earthquake Maps

Map C.1 – Johnson County Earthquake Incidents



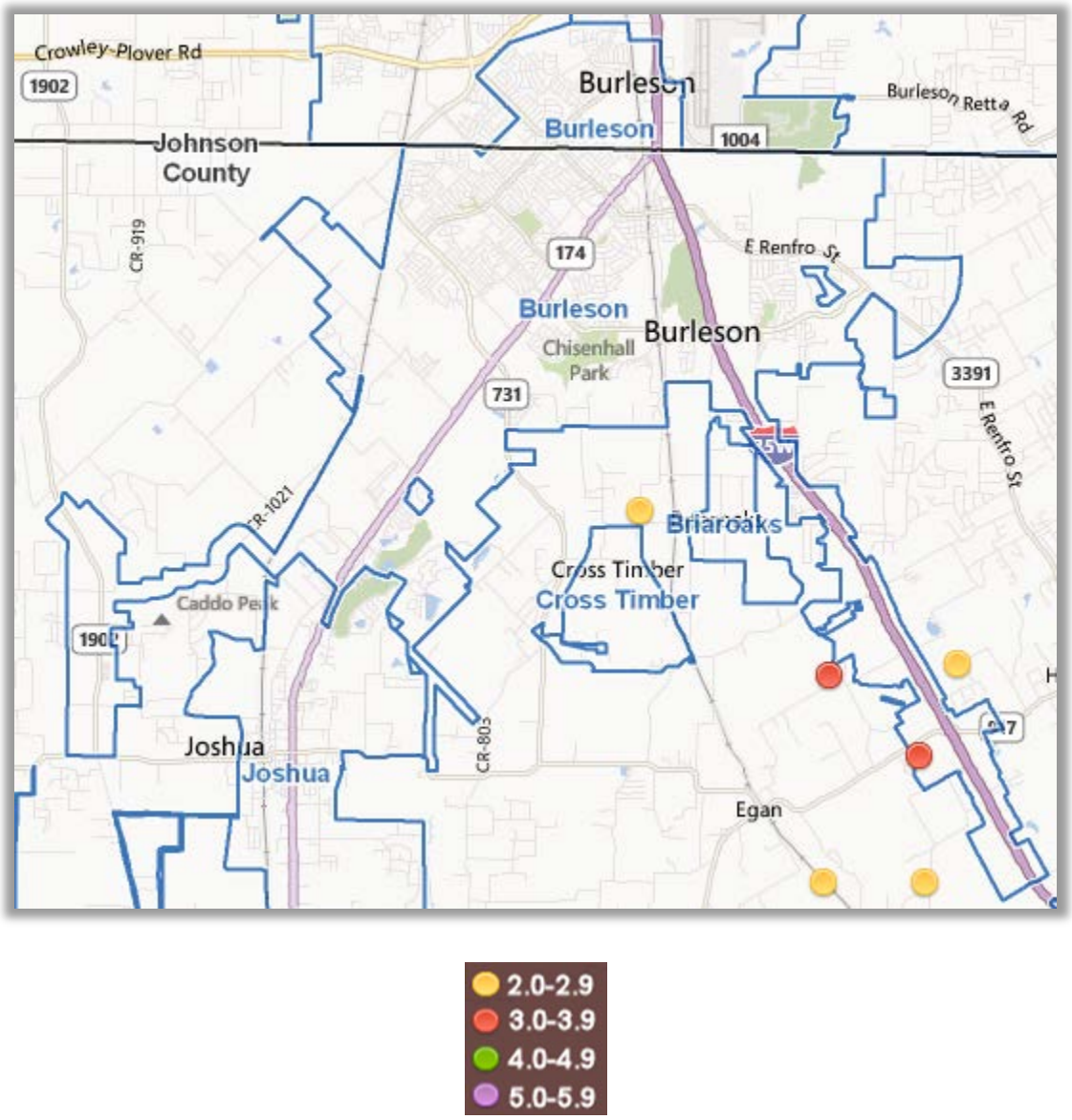
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map C.2 – Alvarado Earthquake Incidents



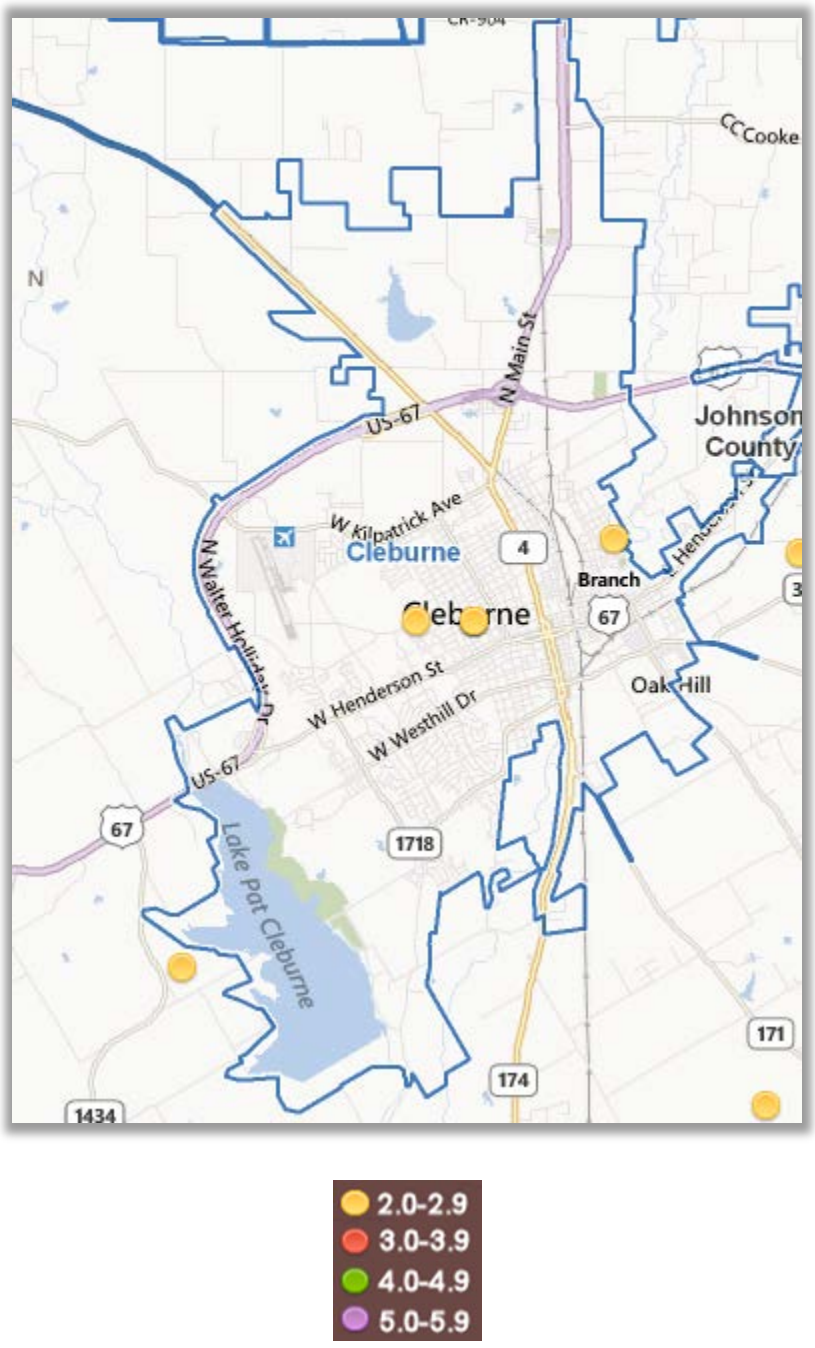
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map C.3 – Burleson Earthquake Incidents



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map C.4 – Cleburne Earthquake Incidents



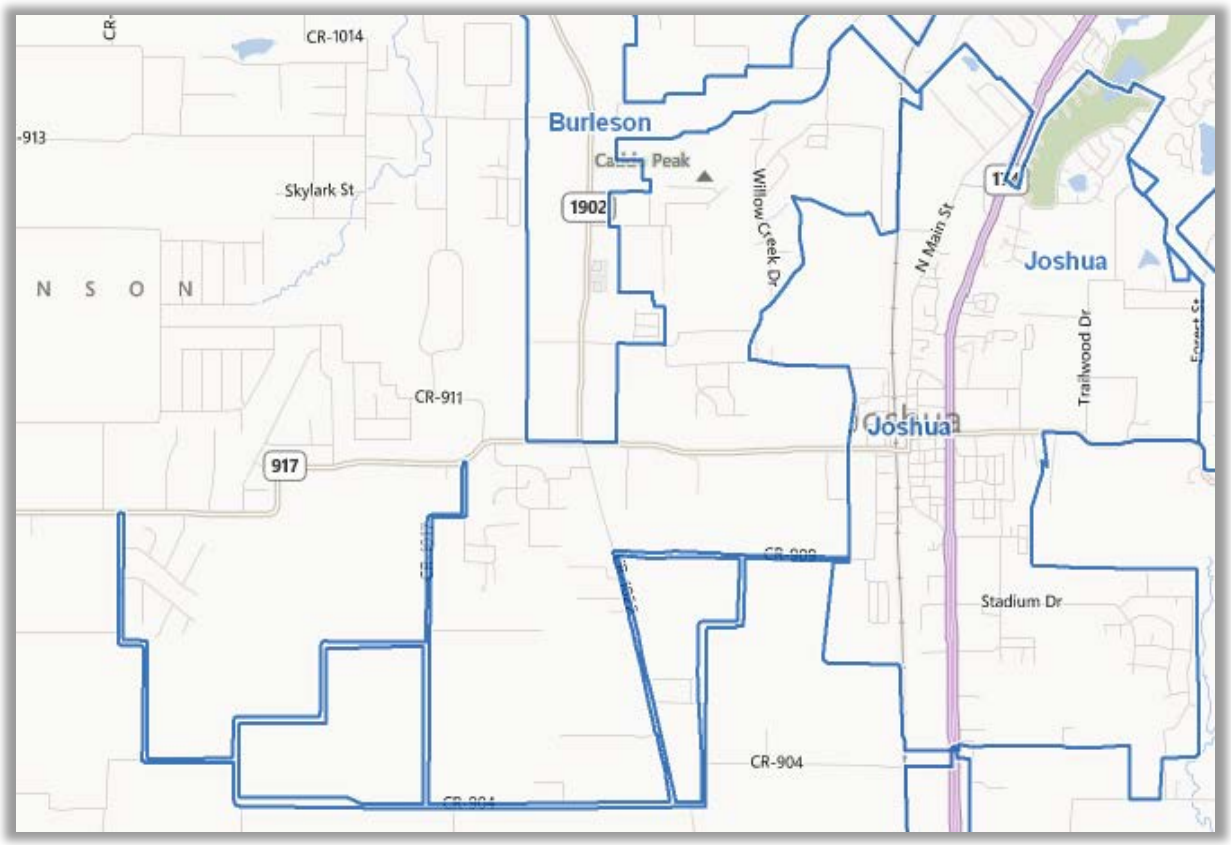
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map C.5 – Godley Earthquake Incidents

No earthquakes have been recorded in this jurisdiction.

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

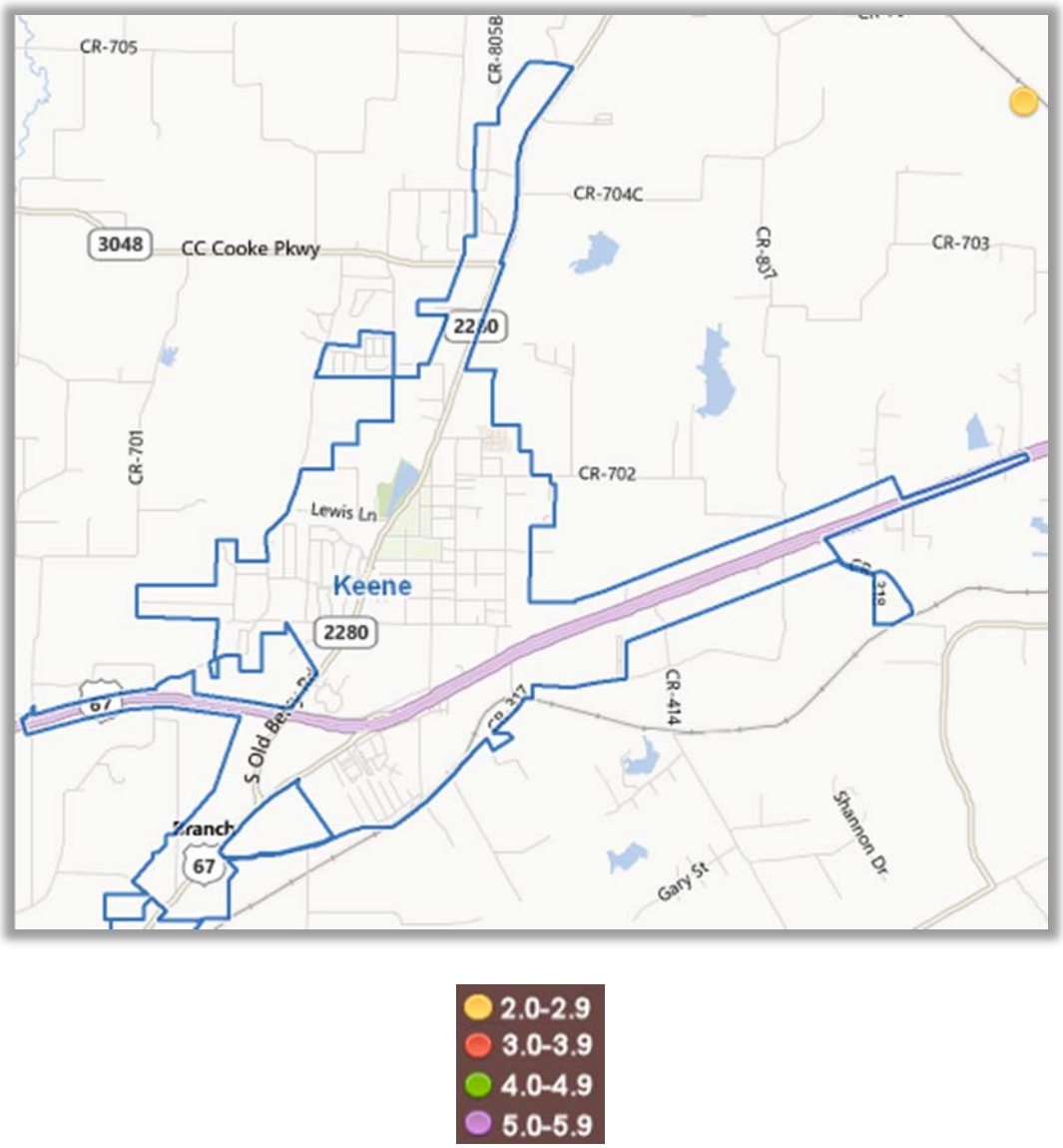
Map C.6 – Joshua Earthquake Incidents



No earthquakes have been recorded in this jurisdiction.

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

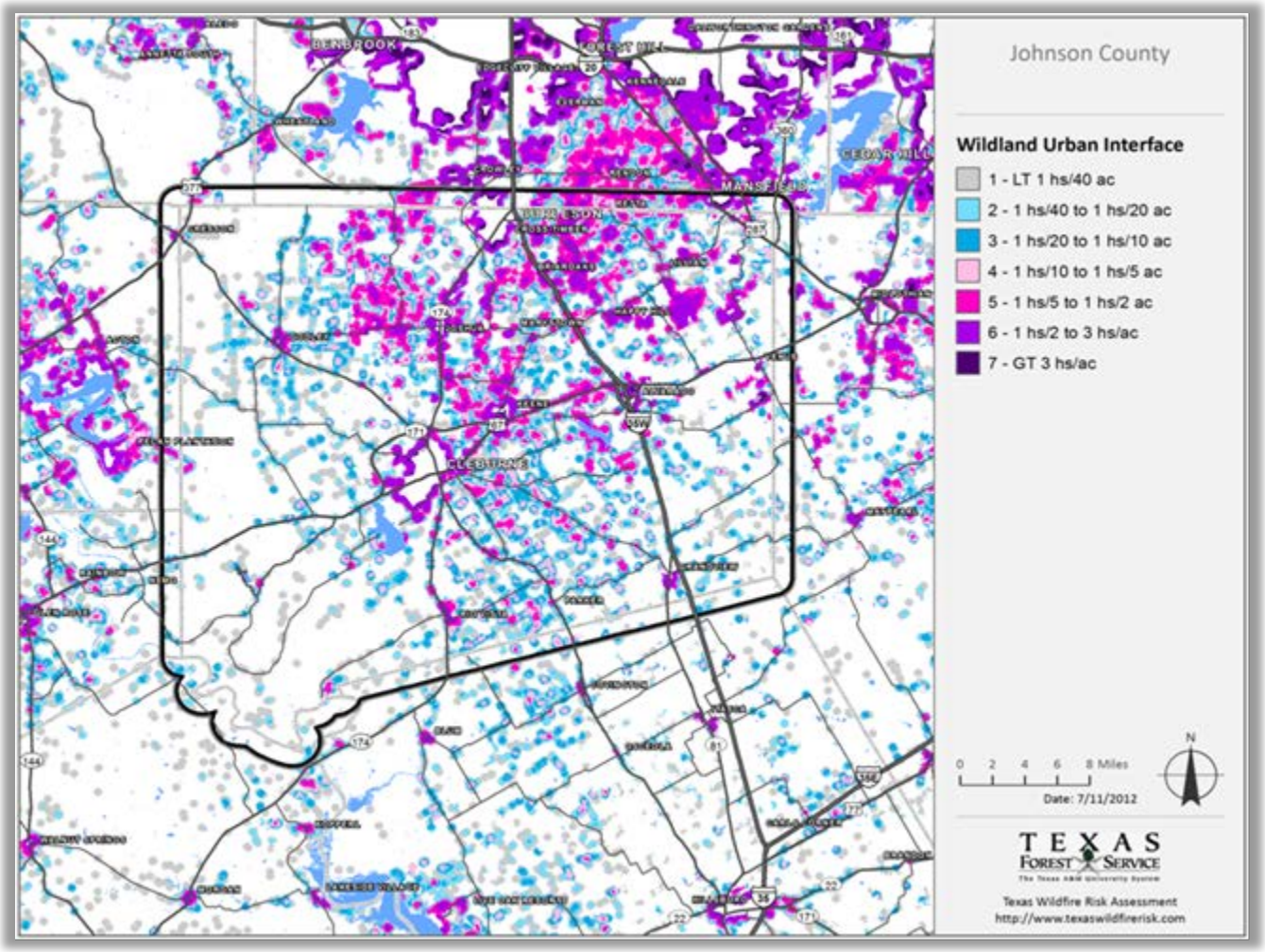
Map C.7 – Keene Earthquake Incidents



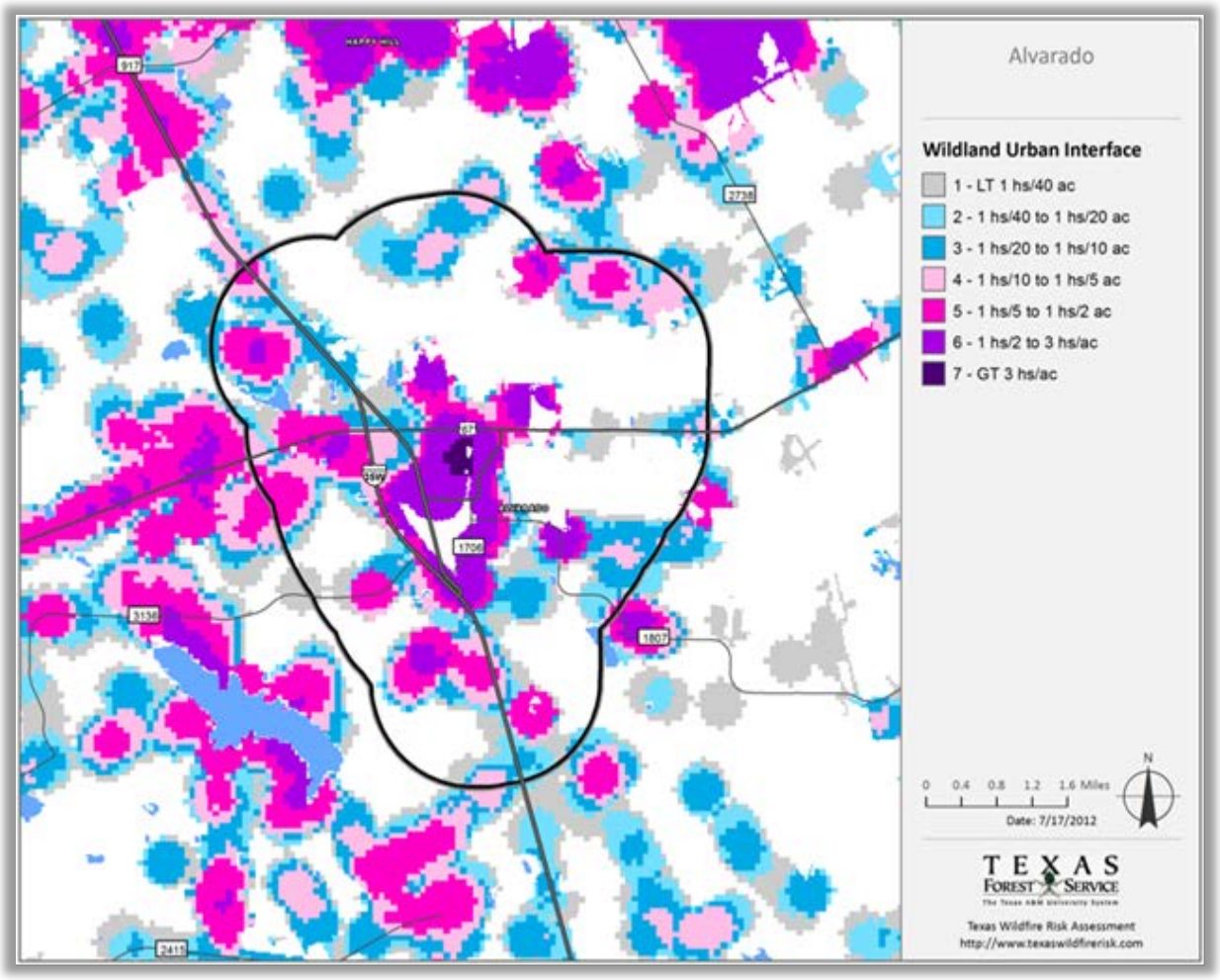
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map Series D - Wildland/Urban Interface (WUI)

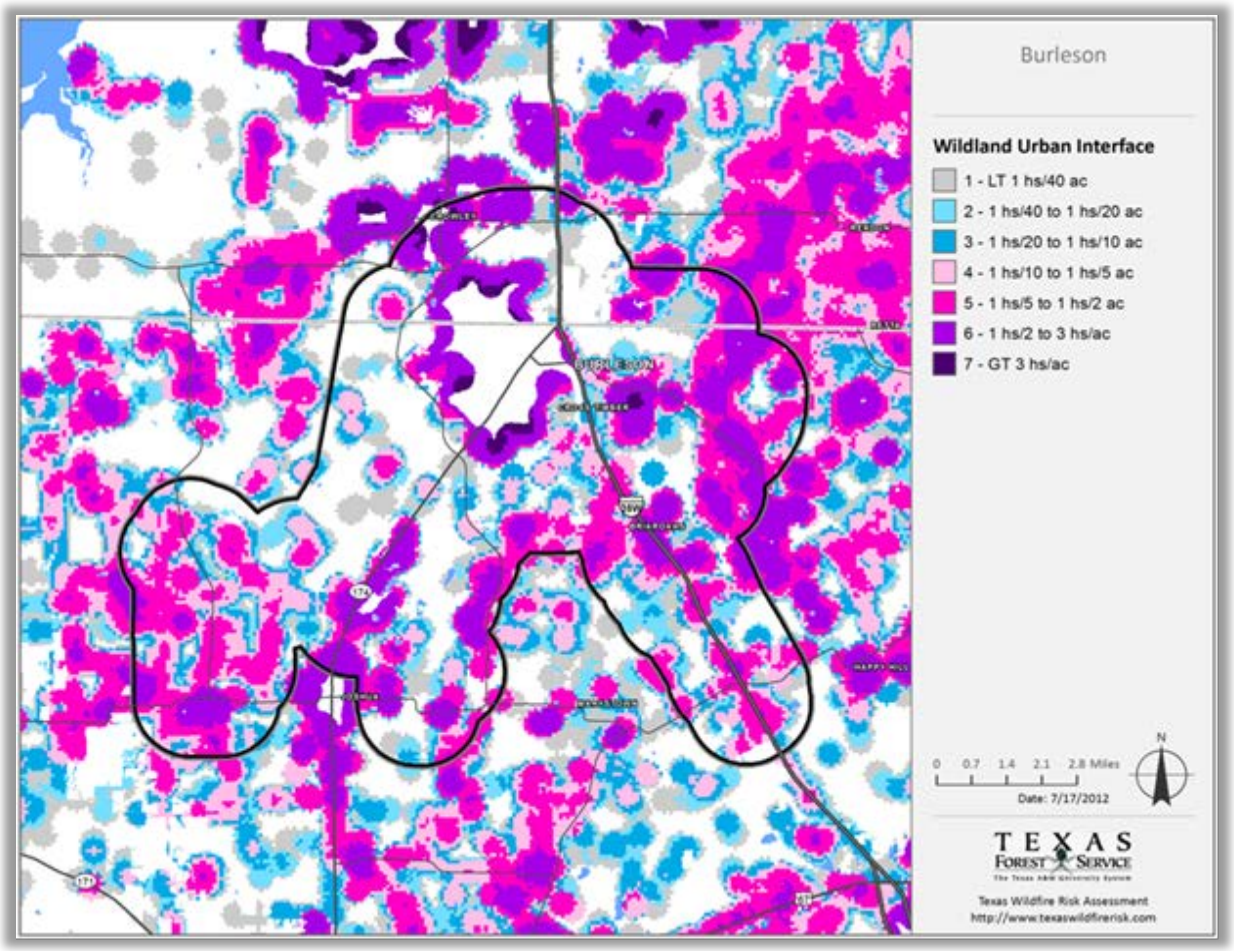
Map D.1 – Johnson County WUI



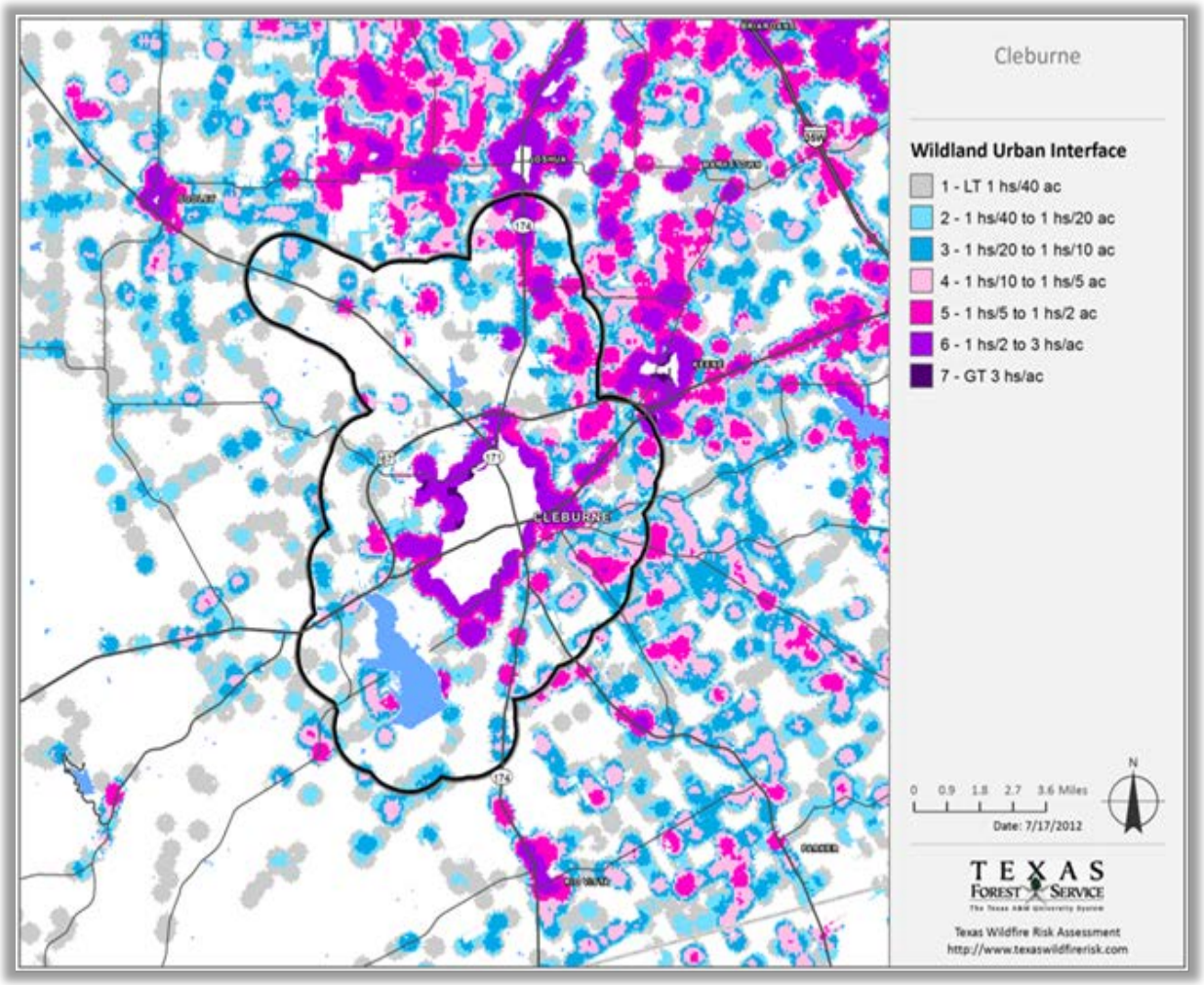
Map D.2 – Alvarado WUI



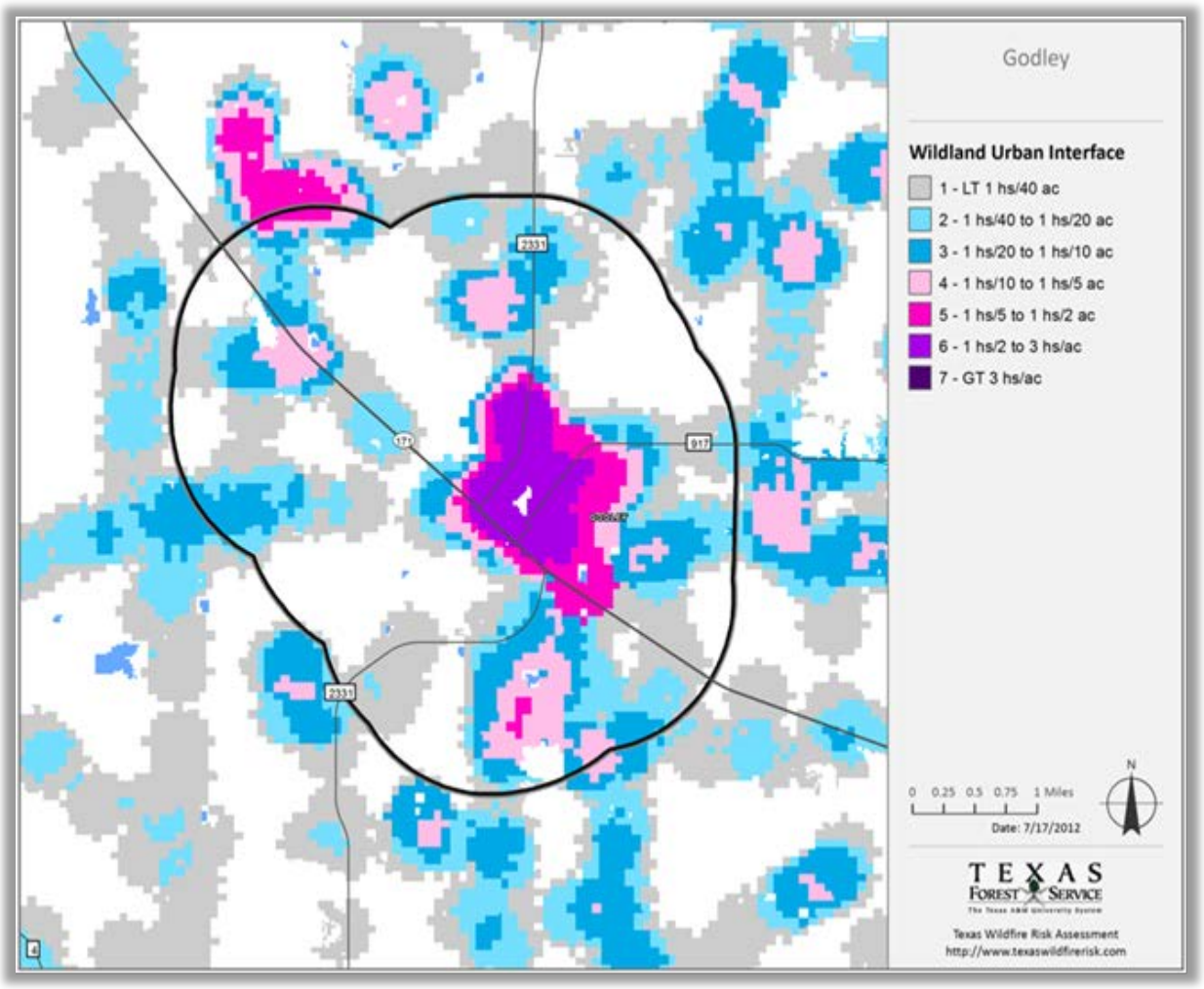
Map D.3 – Burleson WUI



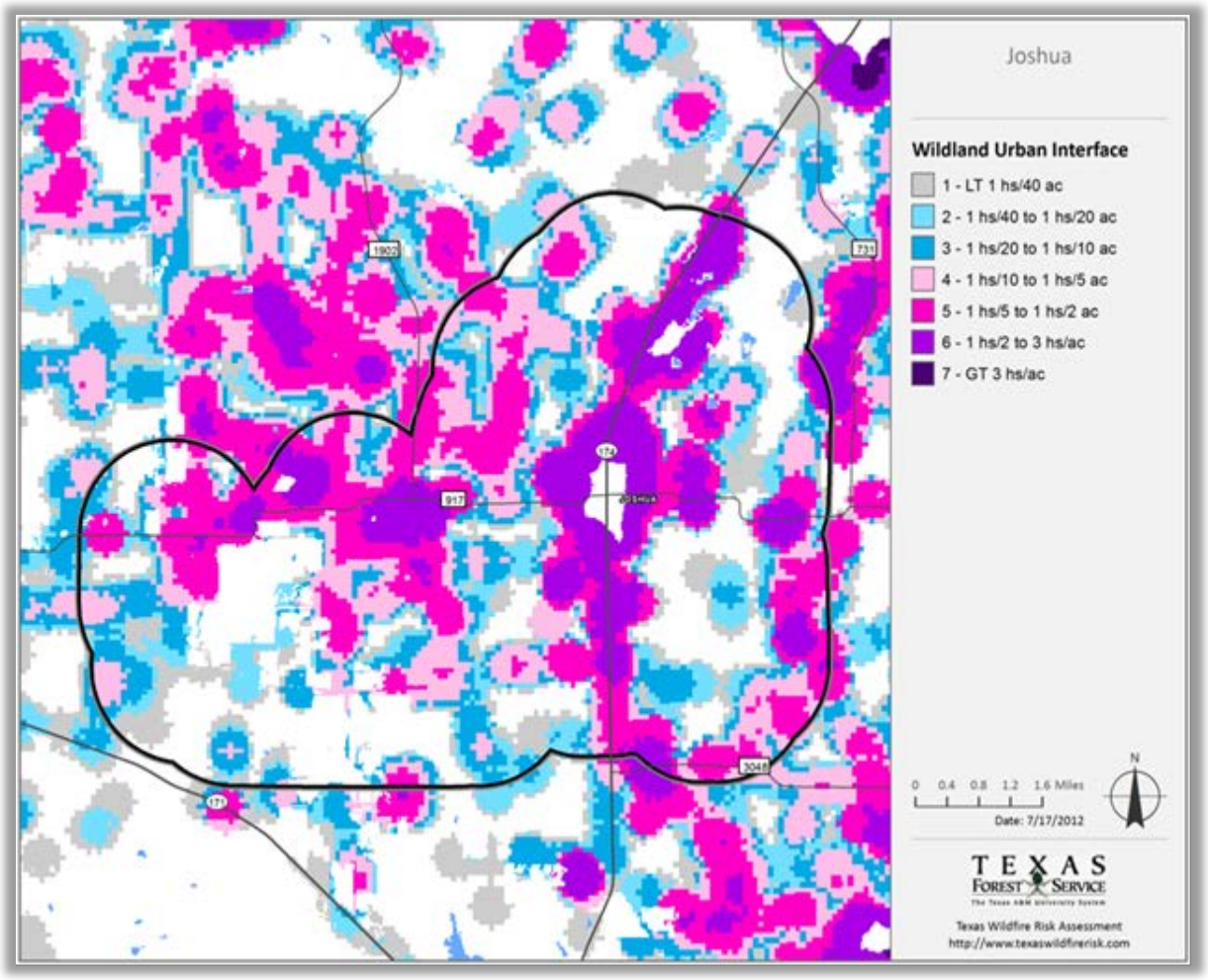
Map D.4 – Cleburne WUI



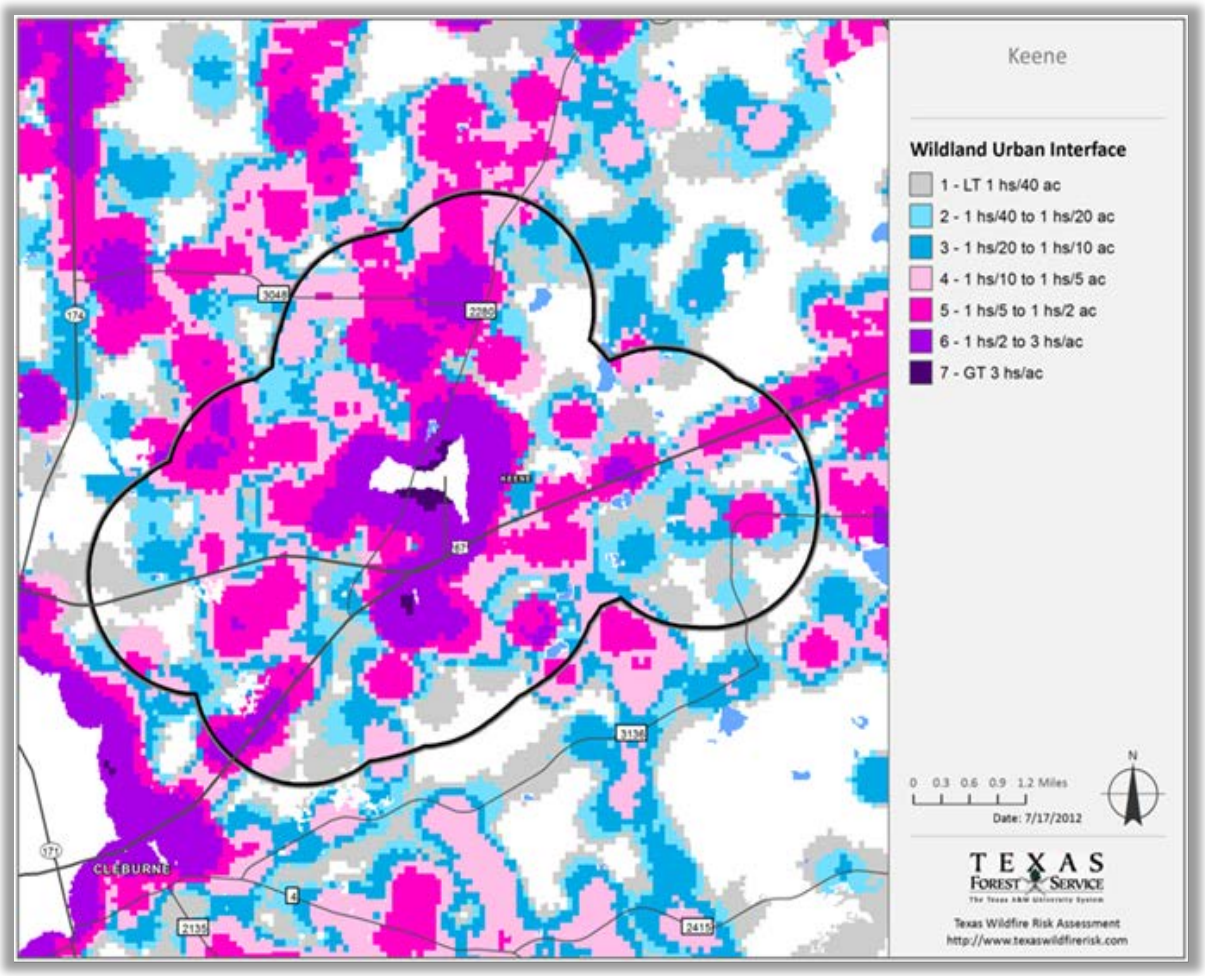
Map D.5 – Godley WUI



Map D.6 – Joshua WUI

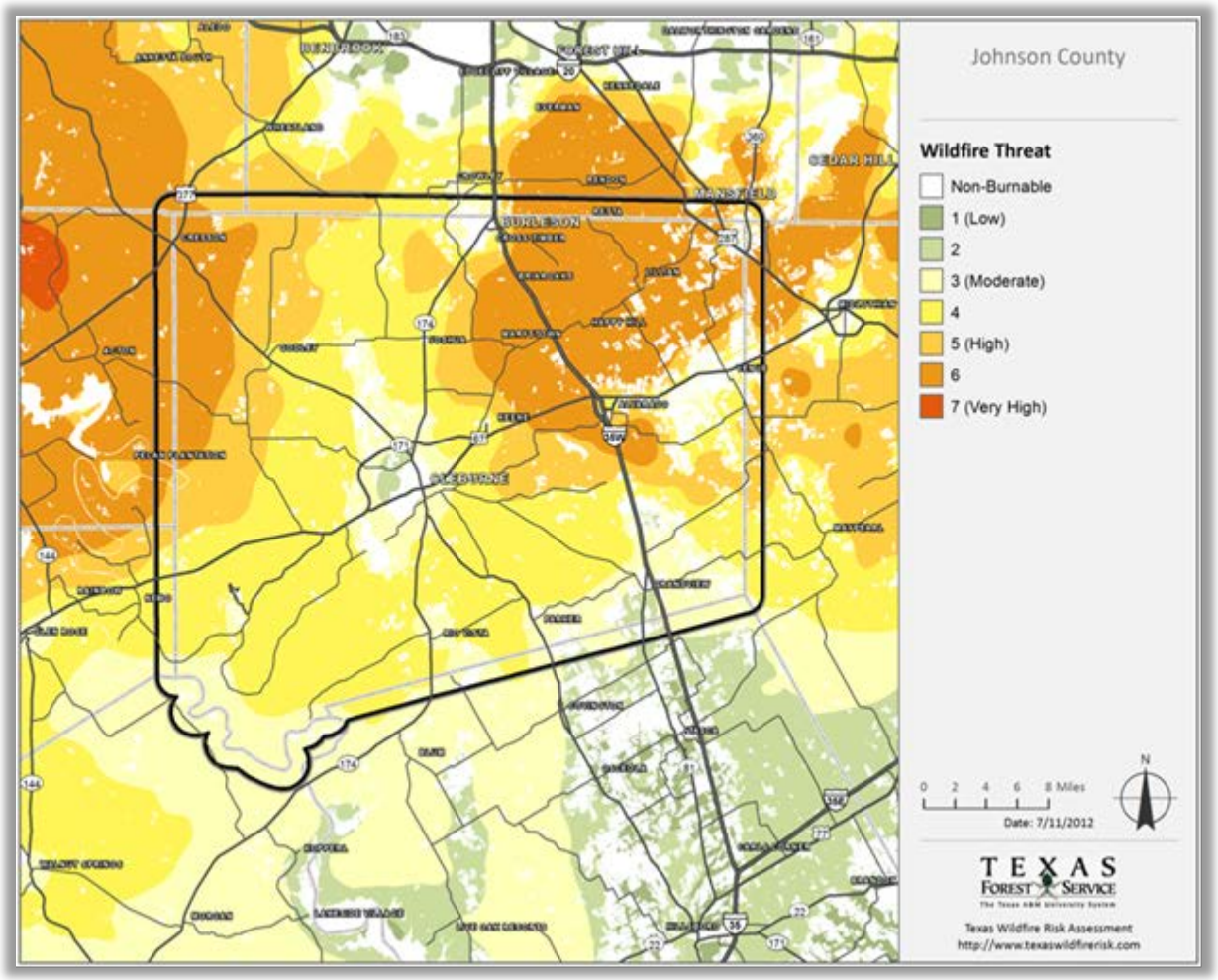


Map D.7 – Keene WUI

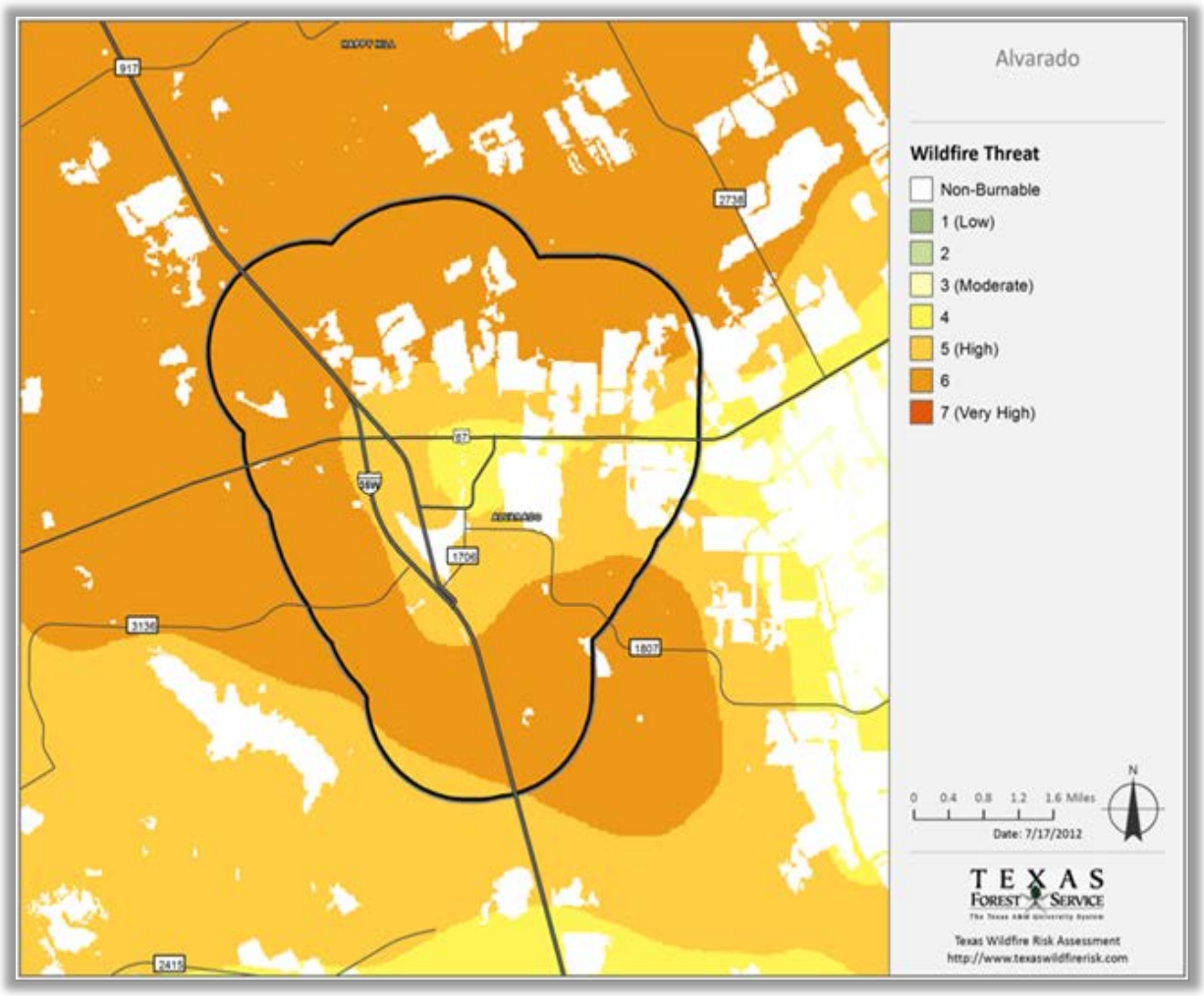


Map Series E – Wildfire Risk

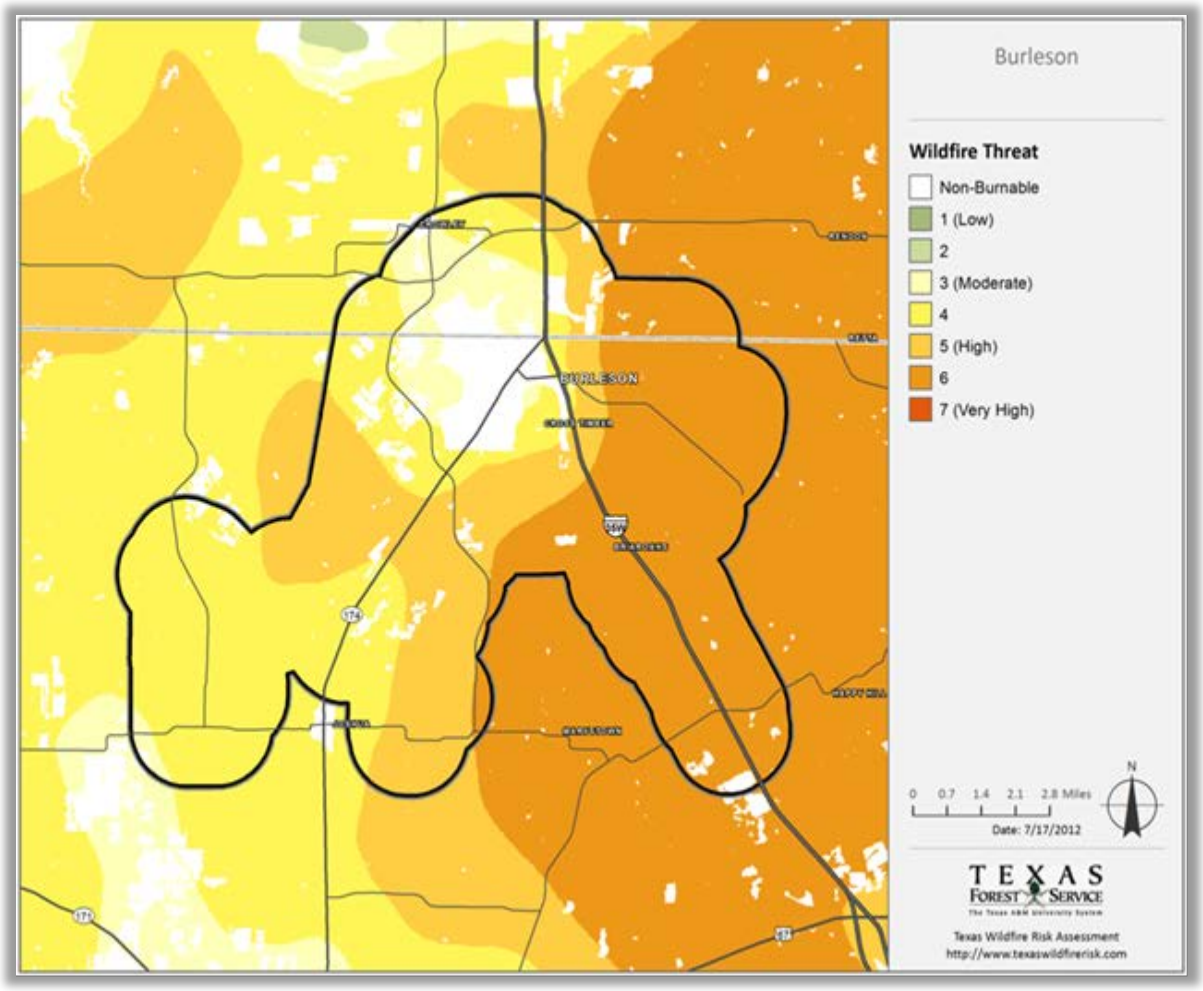
Map E.1 – Johnson County Wildfire Risk



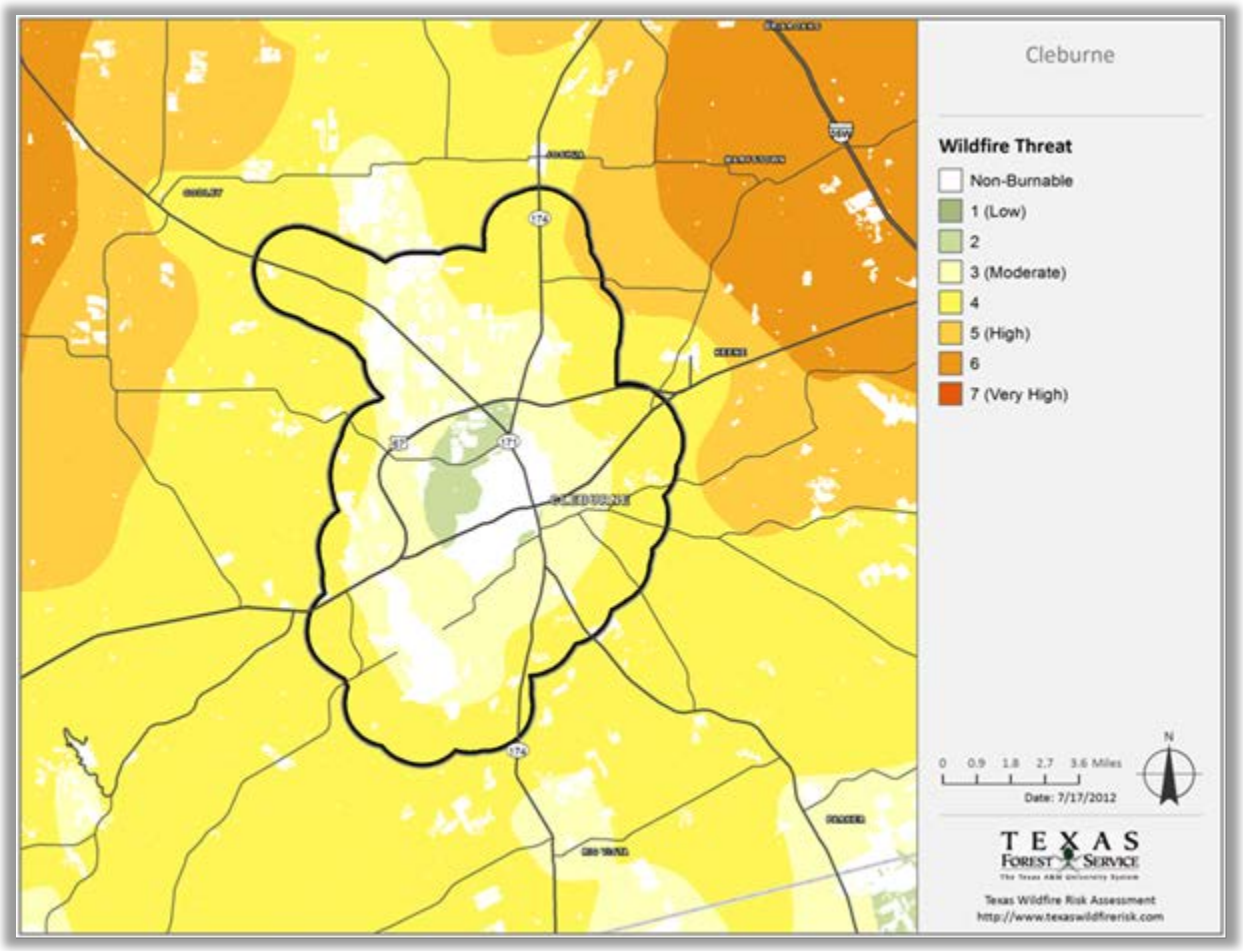
Map E.2 – Alvarado Wildfire Risk



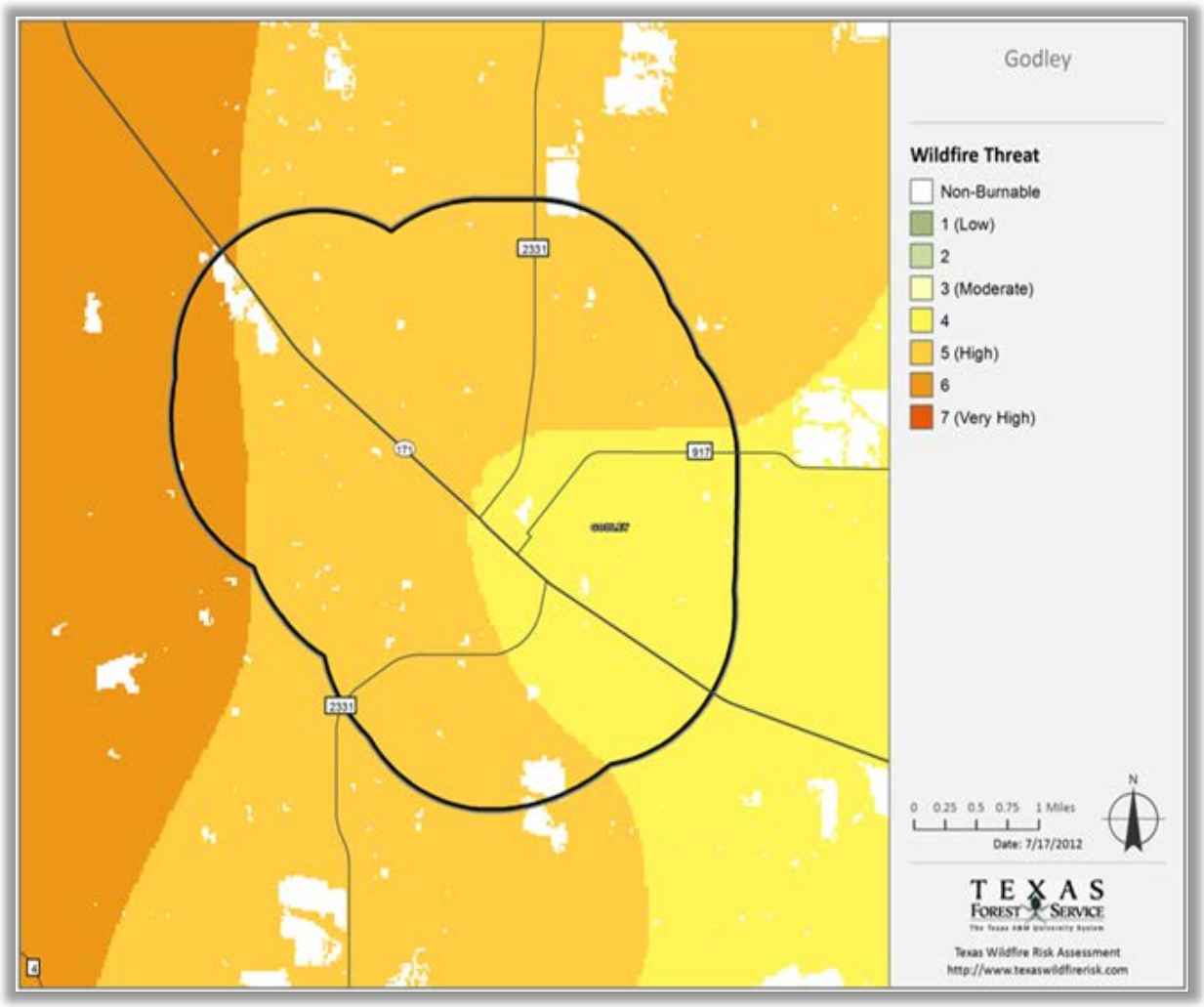
Map E.3 – Burleson Wildfire Risk



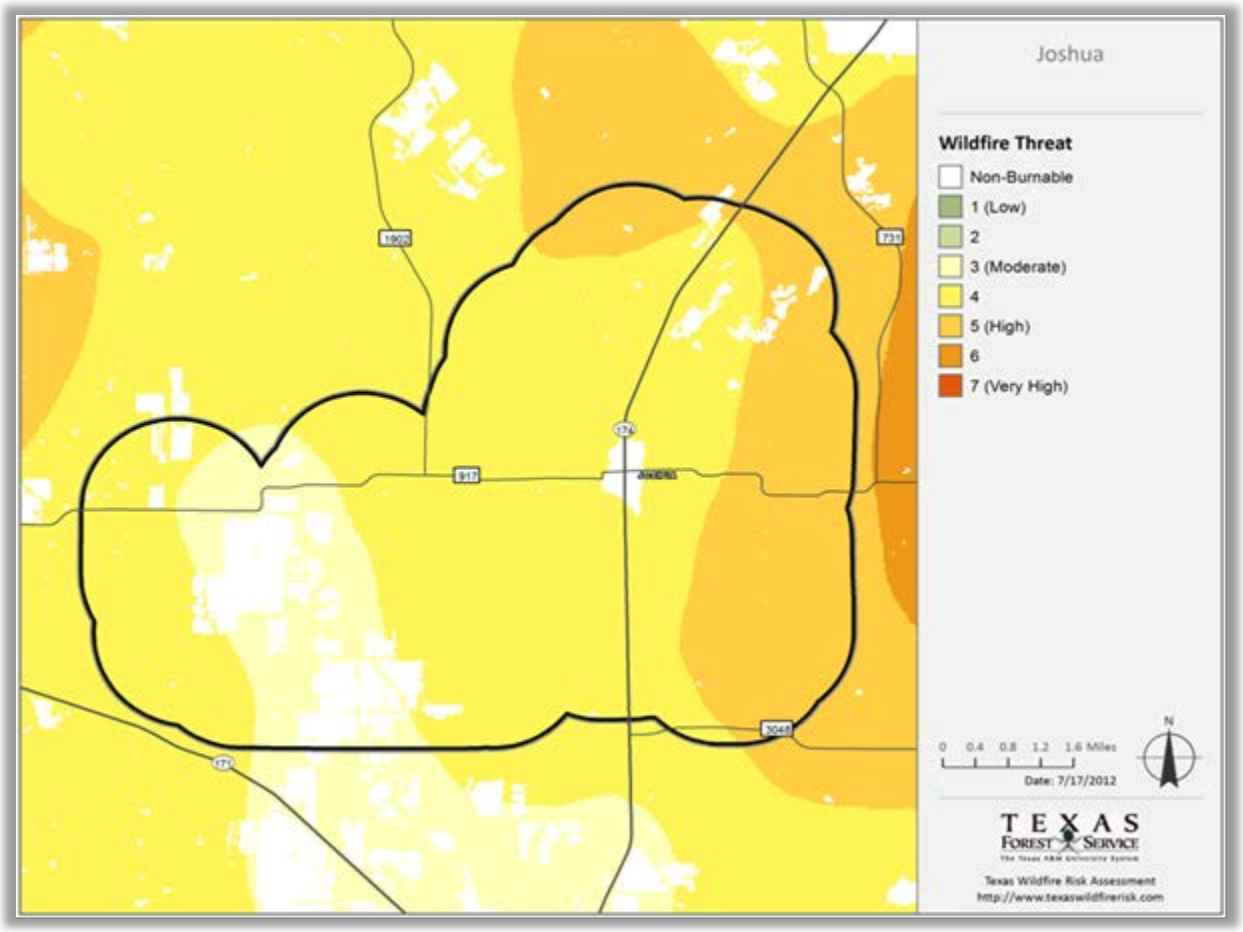
Map E.4 – Cleburne Wildfire Risk



Map E.5 – Godley Wildfire Risk



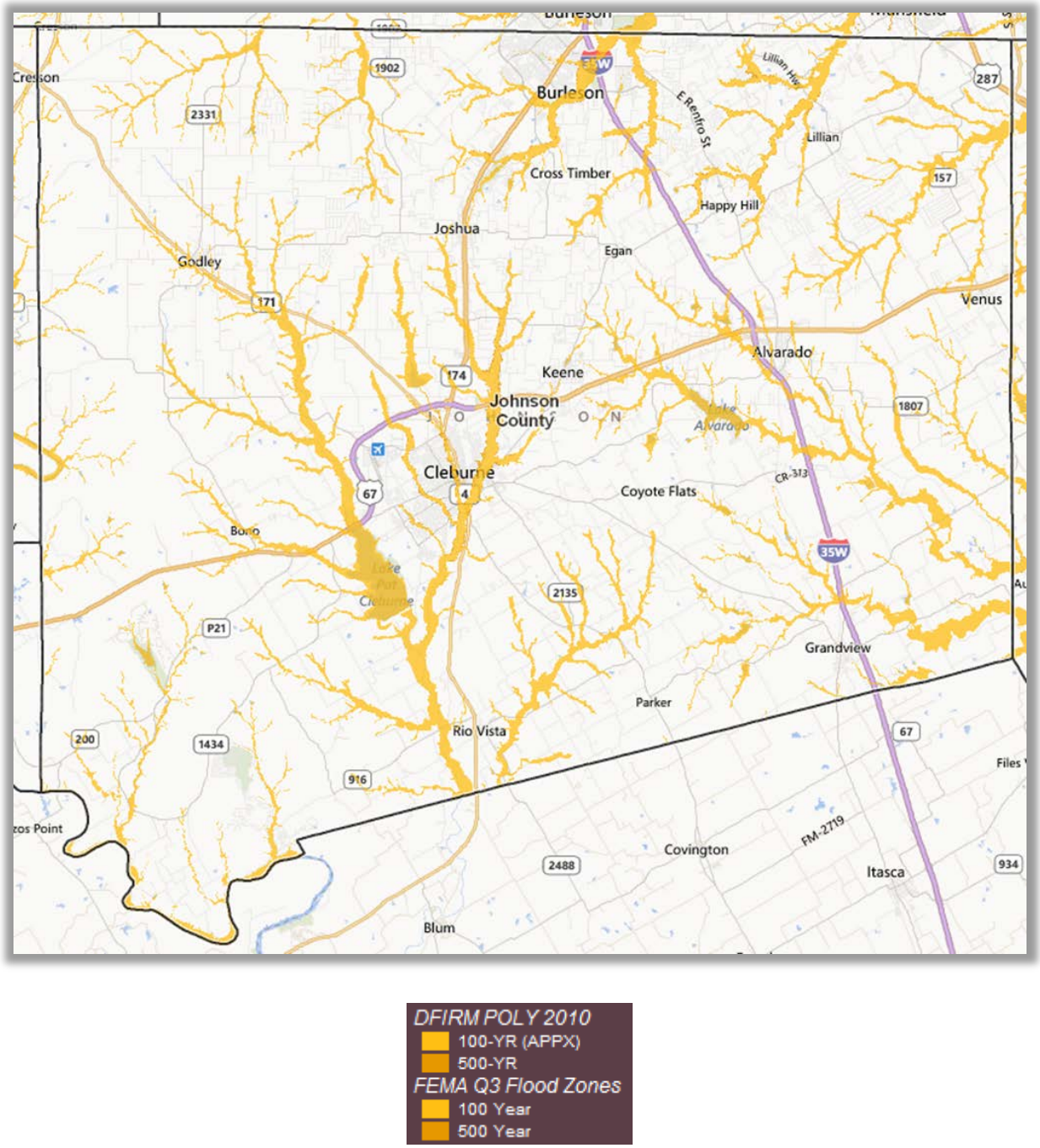
Map E.6 – Joshua Wildfire Risk



Map E.7 – Keene Wildfire Risk

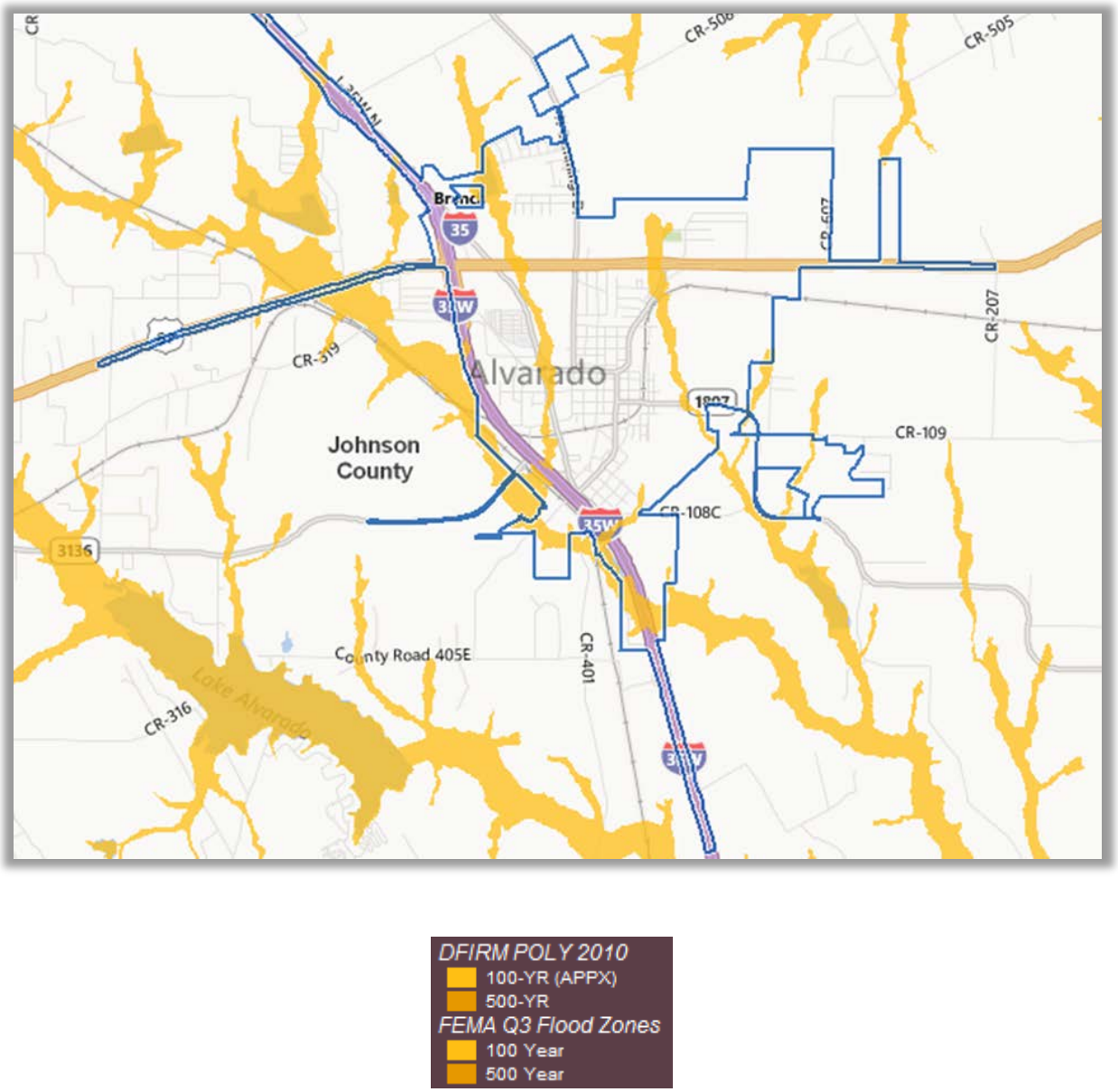
Map Series F – Flood Zones

Map F.1 - Johnson County Flood Zones



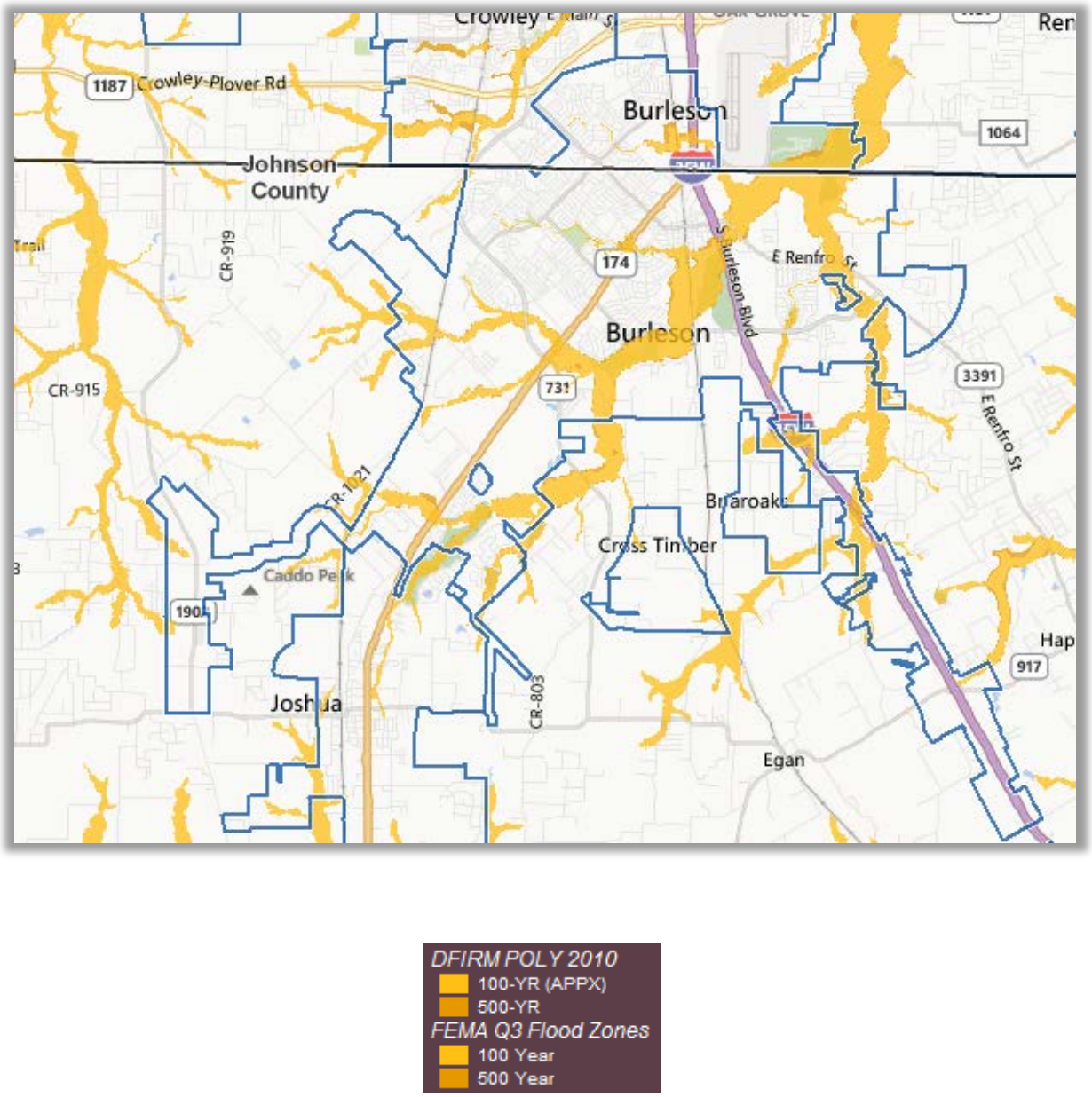
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map F.2 - Alvarado Flood Zones



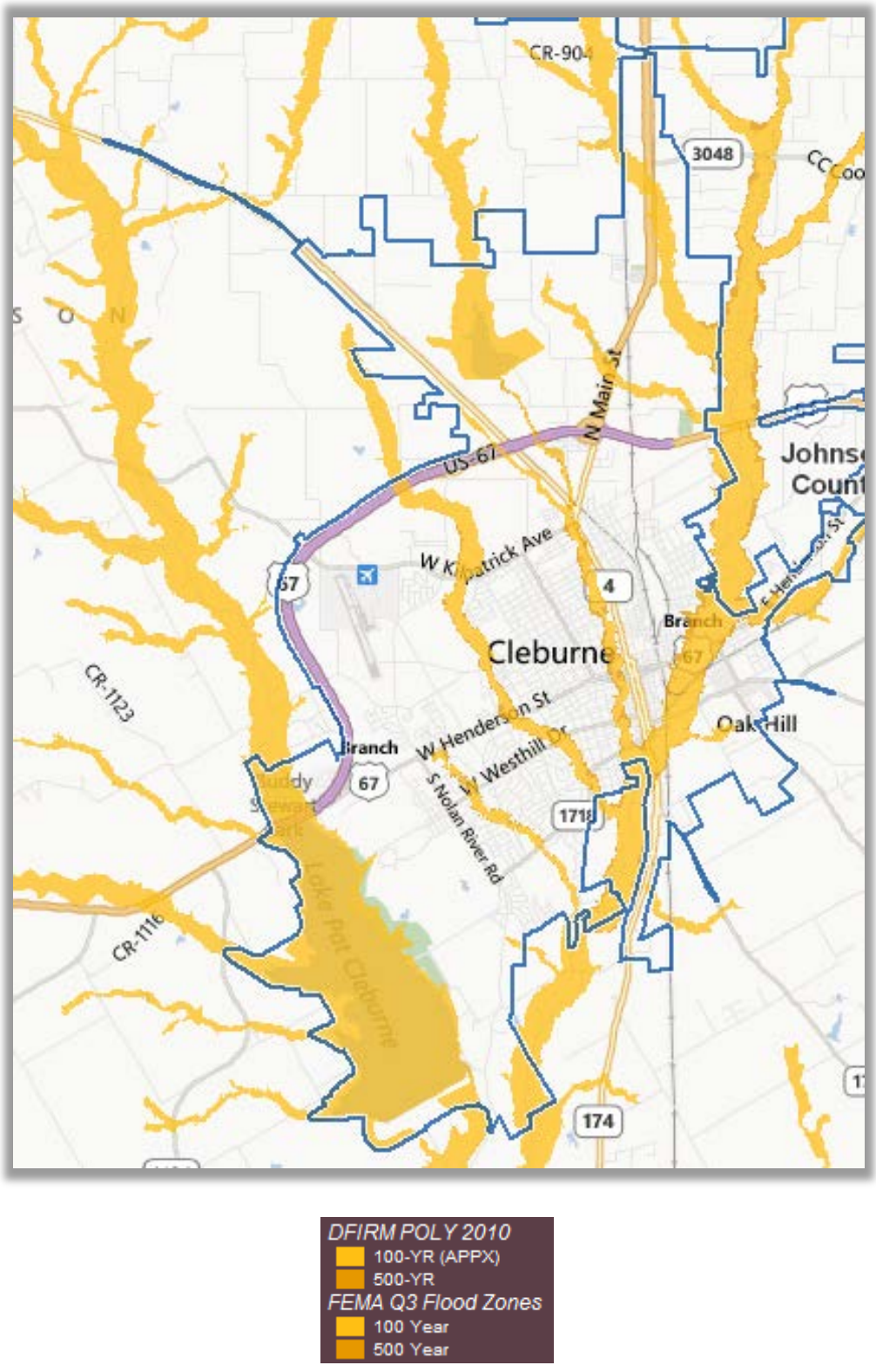
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map F.3 - Burleson Flood Zones



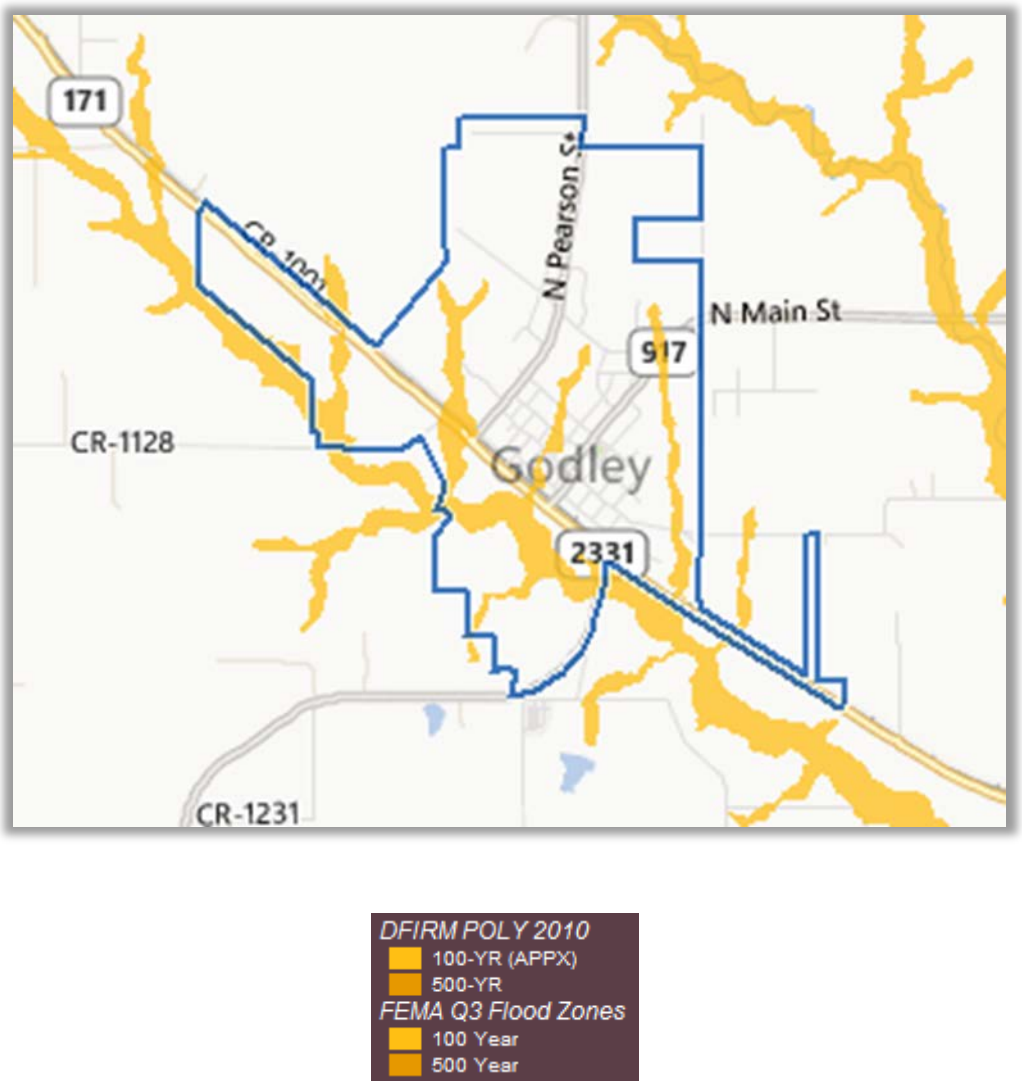
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map F.4 - Cleburne Flood Zones



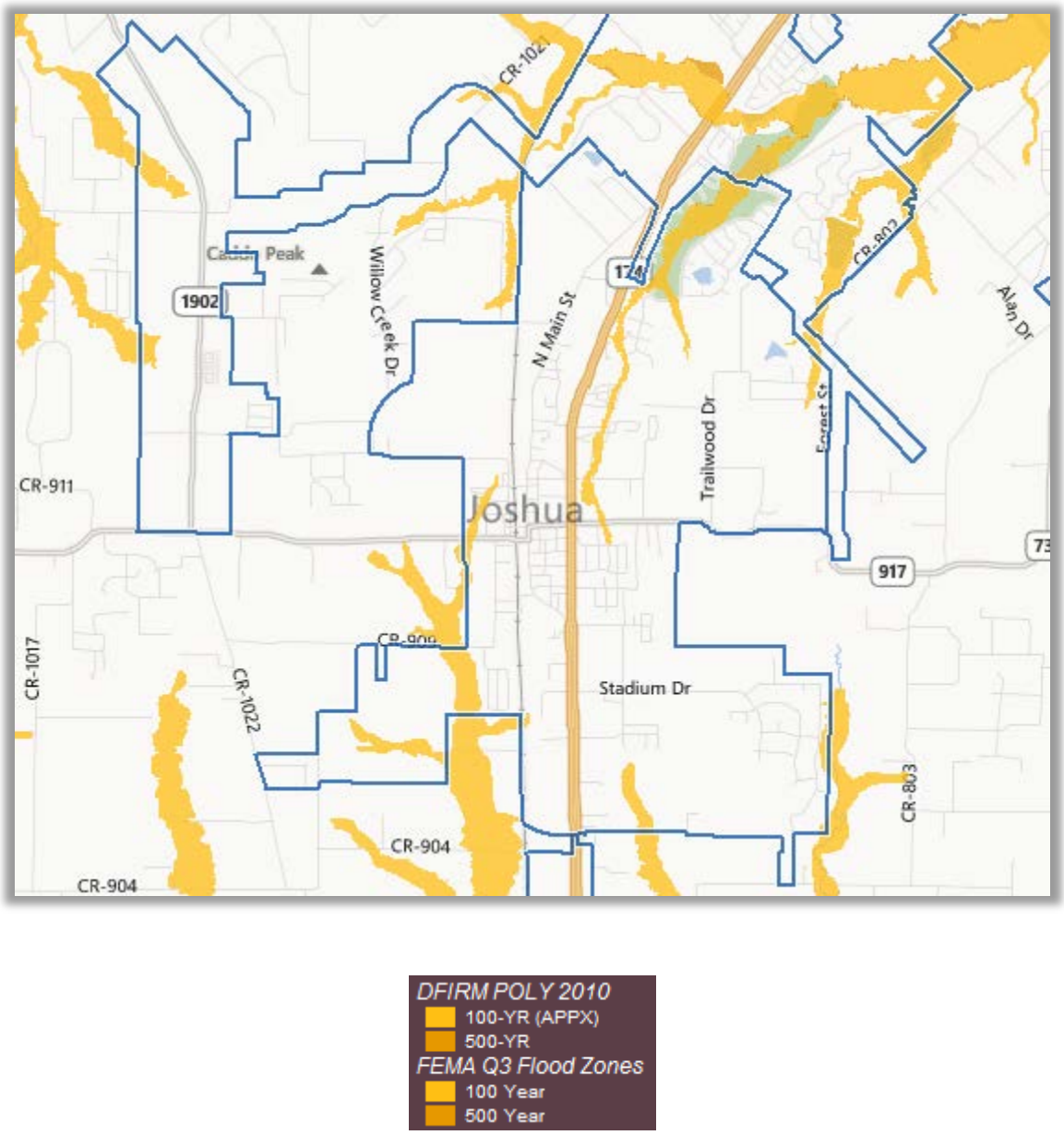
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map F.5 - Godley Flood Zones



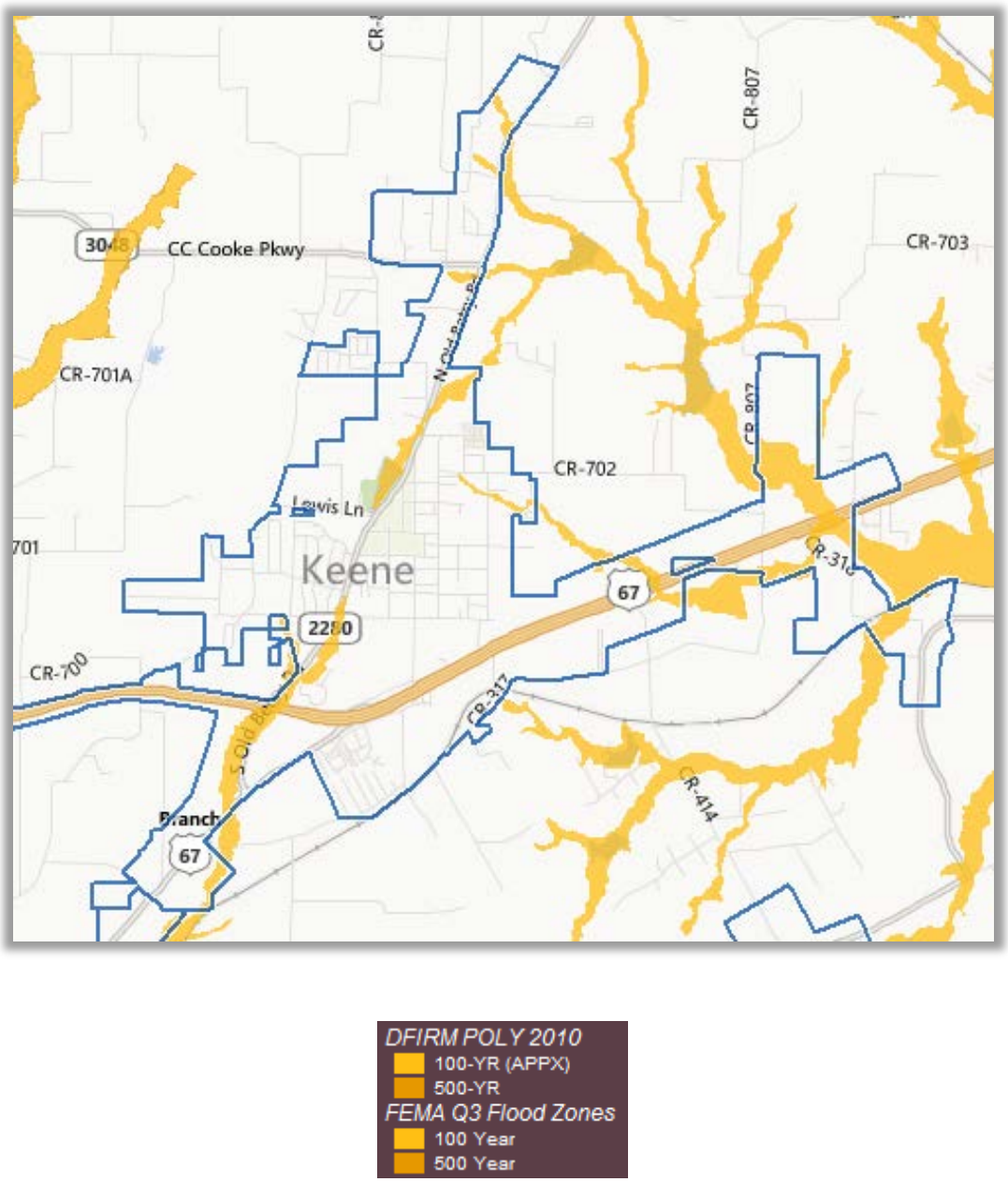
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map F.6 - Joshua Flood Zones



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

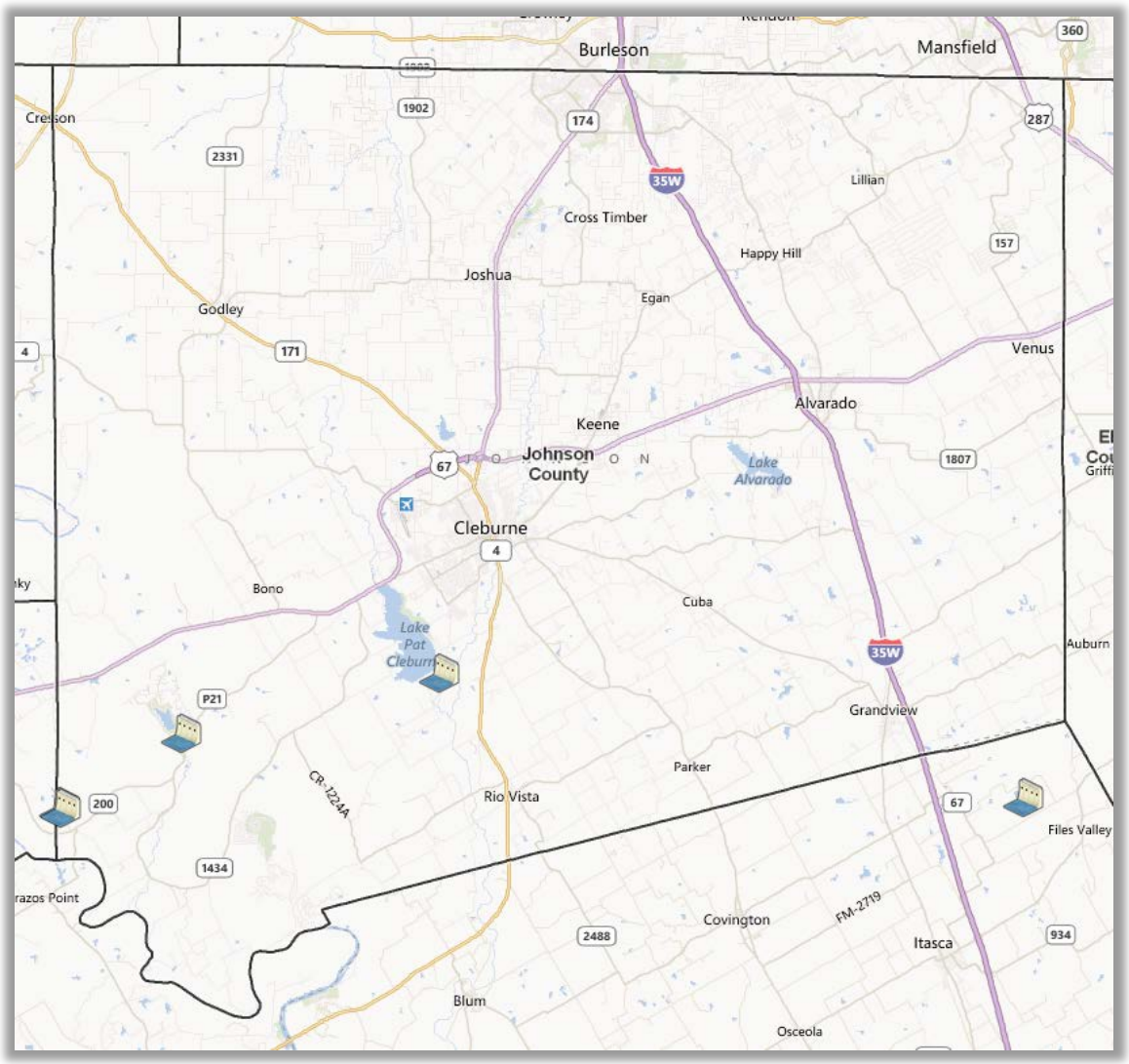
Map F.7 - Keene Flood Zones



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map Series G – Dam Maps

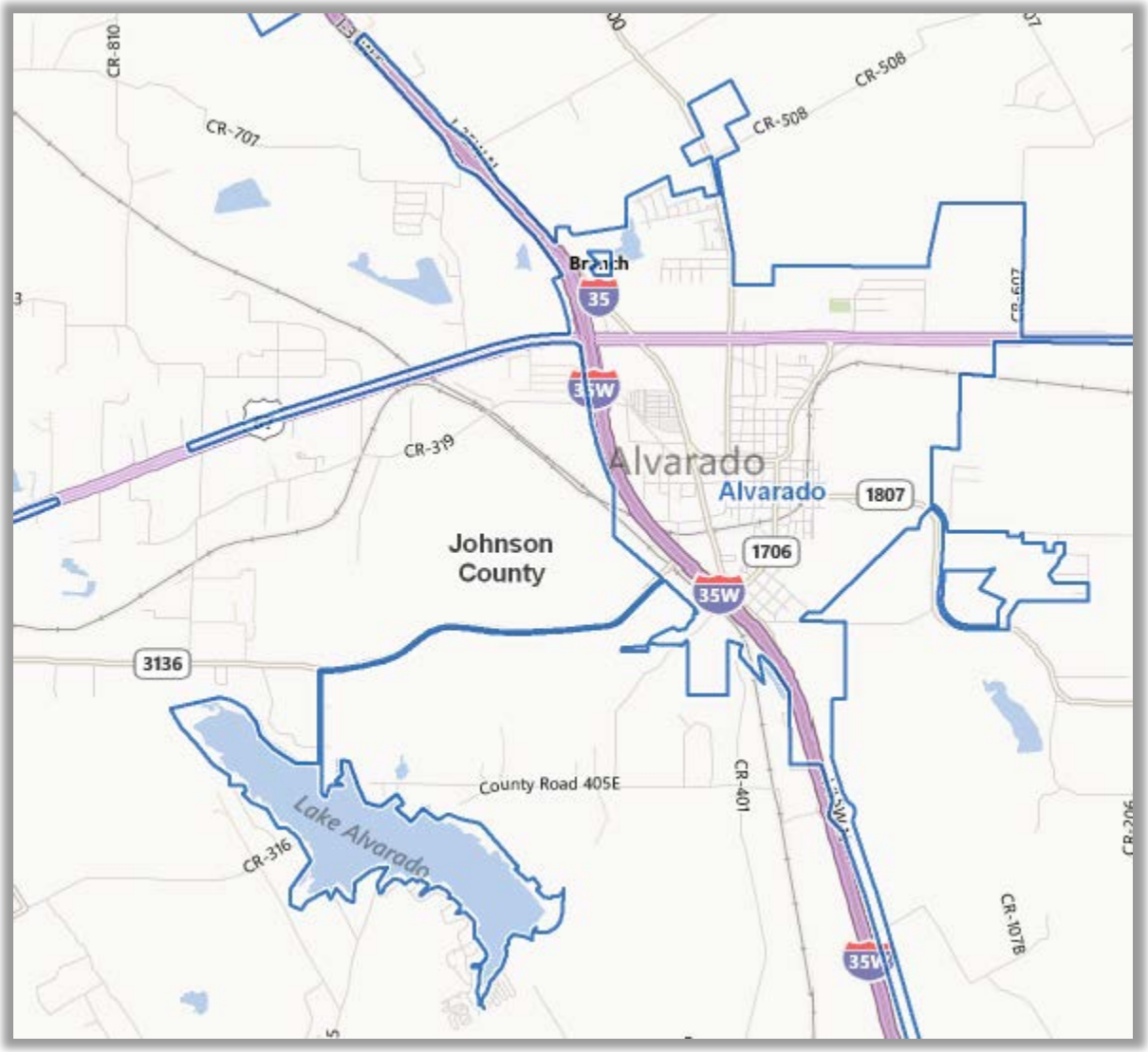
Map G.1 – Johnson County Dams



- Indicates Presence of Dam

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.2 – Alvarado Dams

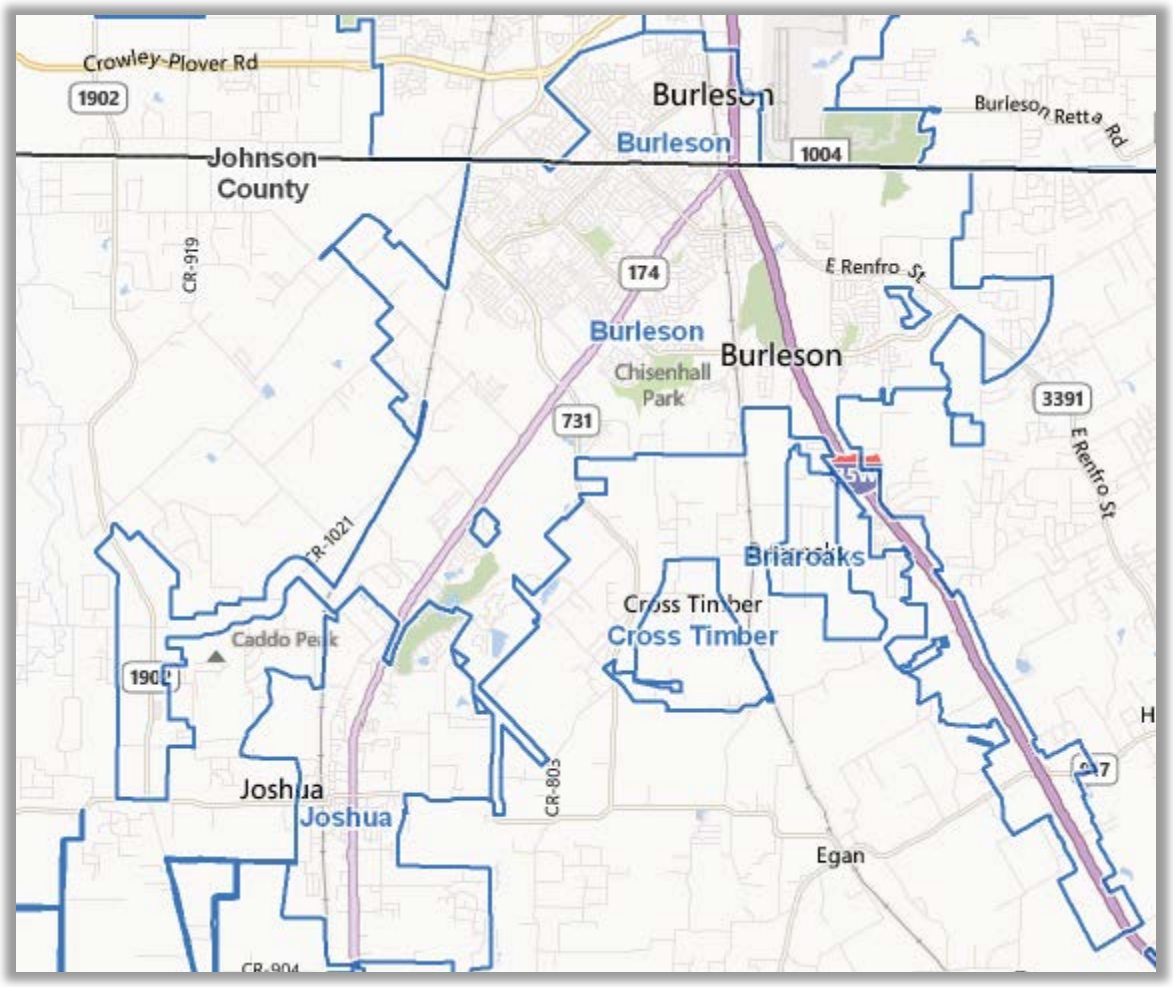


- **Indicates Presence of Dam***

*No dams present in jurisdiction

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.3 – Burleson Dams

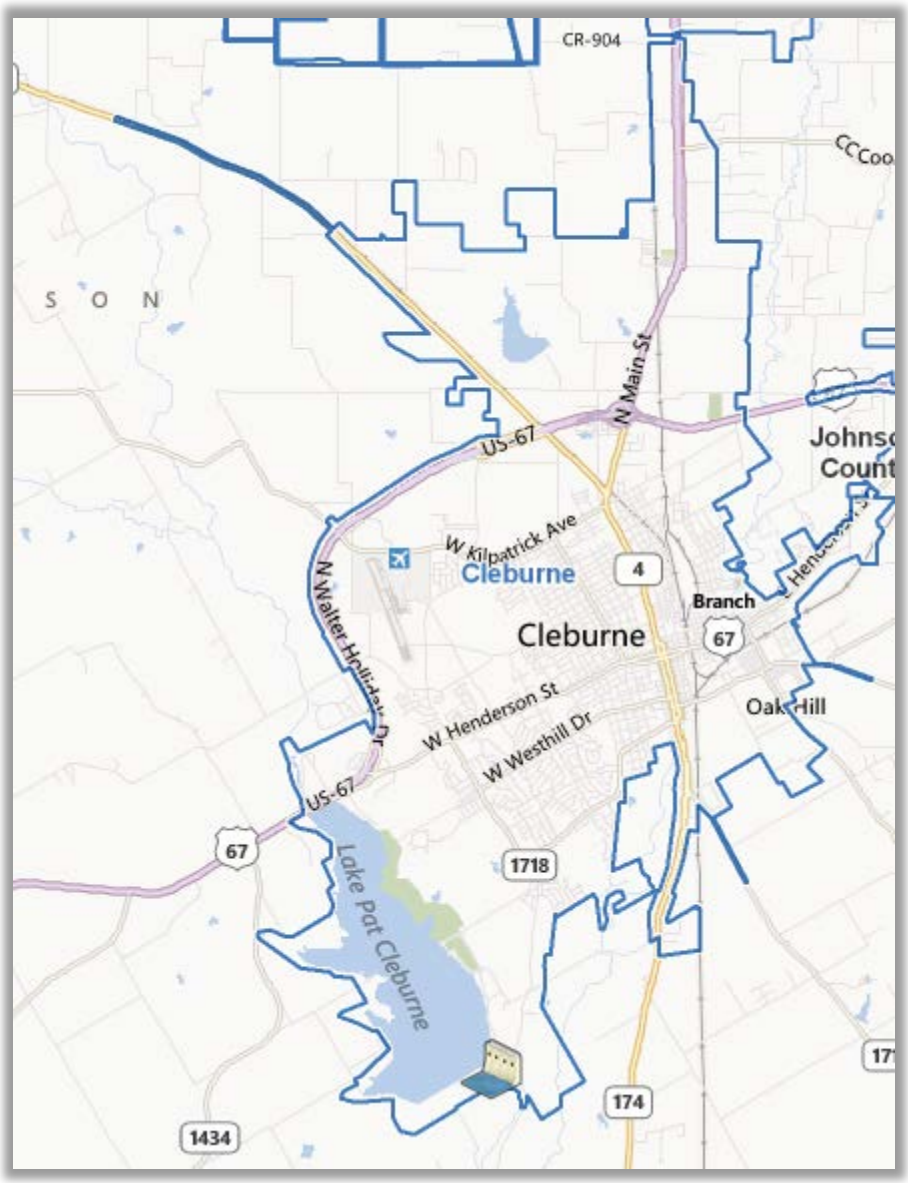


- Indicates Presence of Dam*

*No dams present in jurisdiction

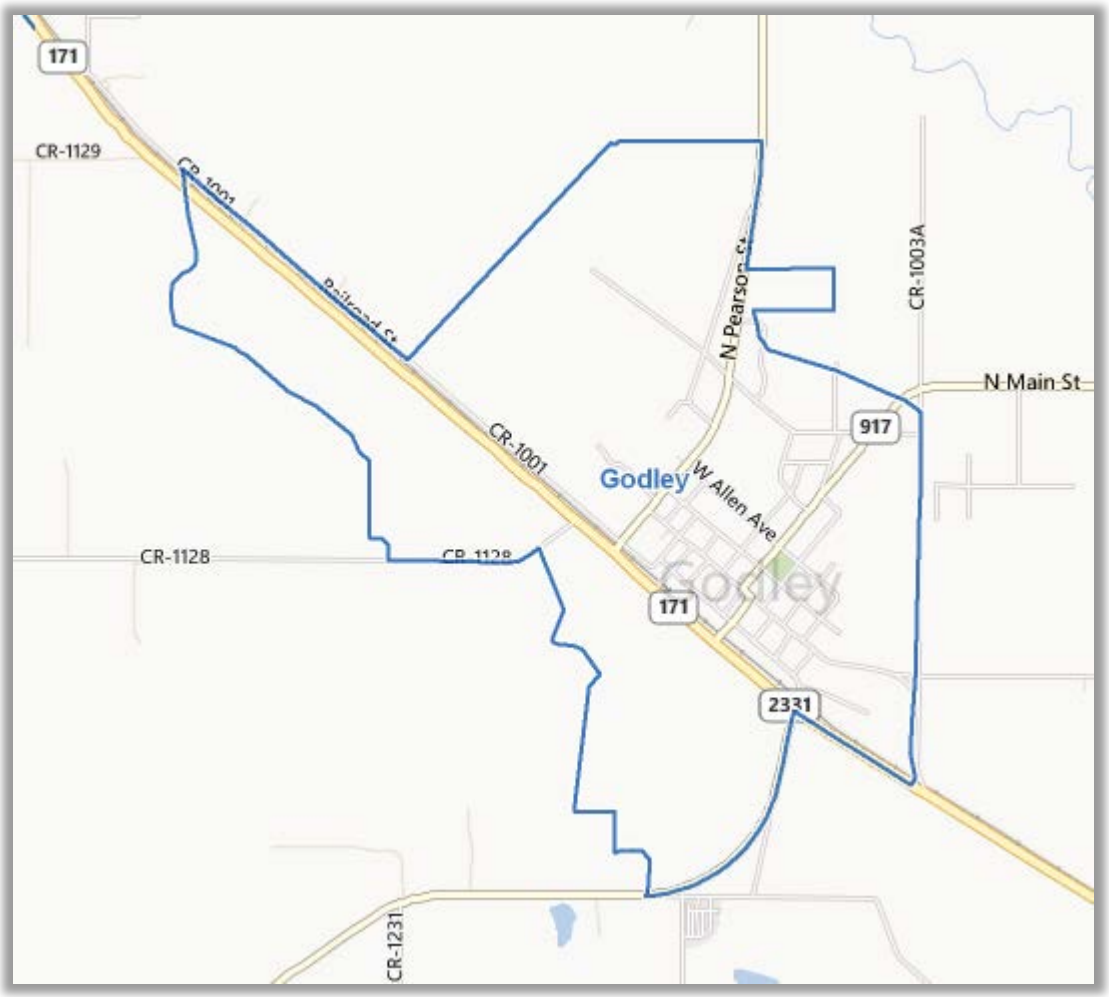
Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.4 – Cleburne Dams



Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.5 – Godley Dams

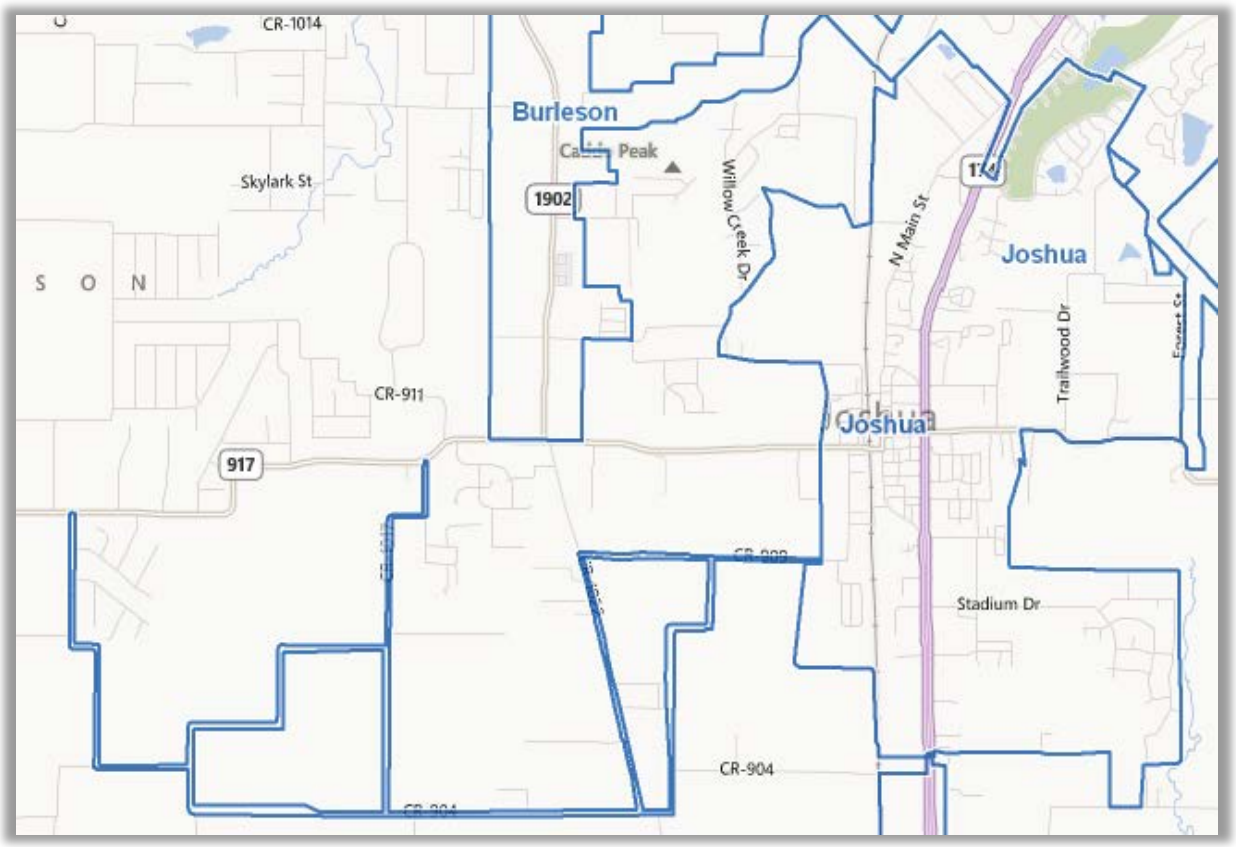


- Indicates Presence of Dam*

*No dams present in jurisdiction

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.6 – Joshua Dams

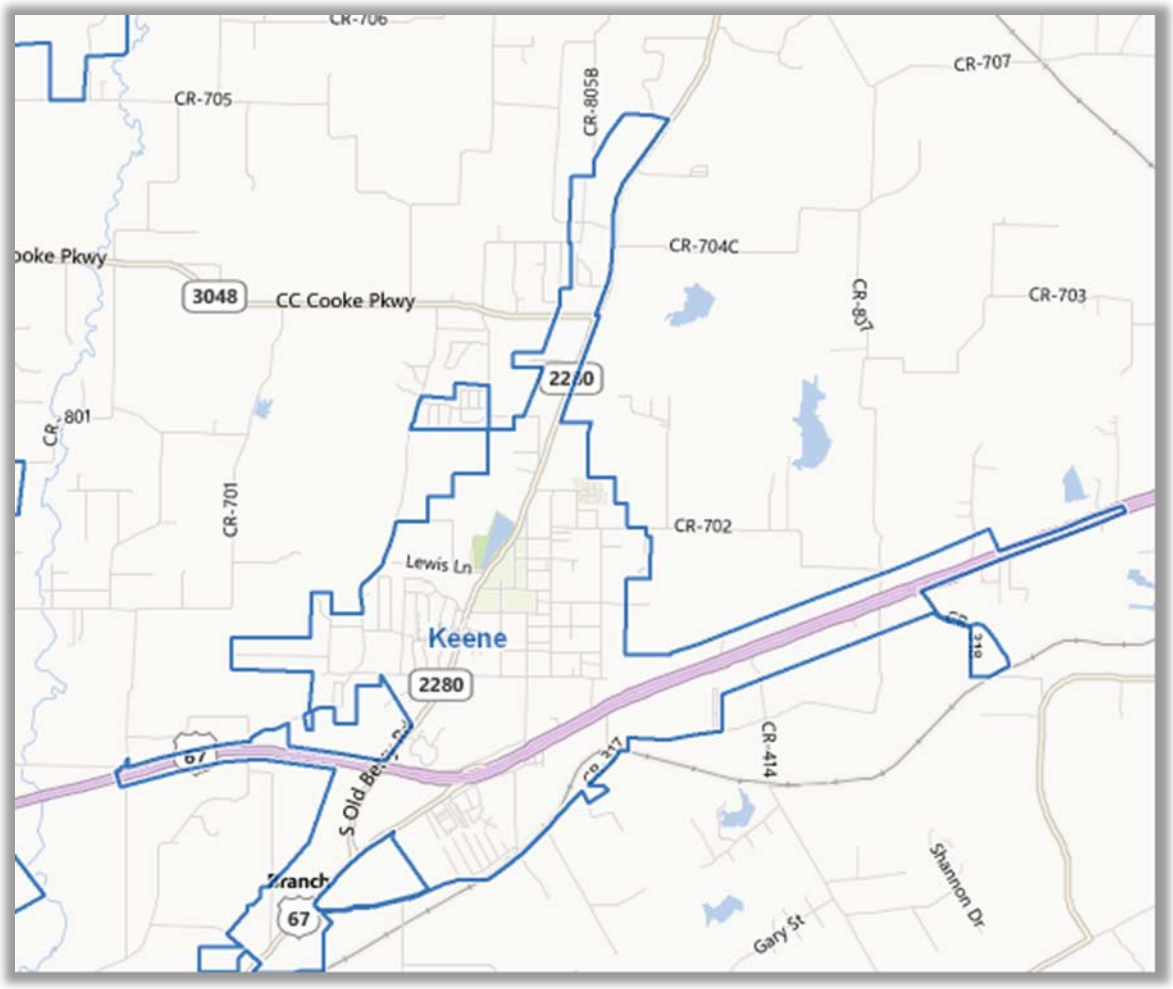


- Indicates Presence of Dam*

*No dams present in jurisdiction

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

Map G.7 – Keene Dams



- Indicates Presence of Dam*

*No dams present in jurisdiction

Source: North Central Texas Council of Government's Regional Hazard Assessment Tool (RHAT)

3.3 Extent

Natural Hazards are judged on specific extent scales. The following are the known extent scales for the natural hazard tornadoes as addressed in the Johnson County HazMAP.

Fujita Scale

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; manufactured homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; manufactured homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

Source: http://tornadoproject.com/fscale/fscale.htm

On February 1, 2007, the Fujita scale was decommissioned in favor of the more accurate Enhanced Fujita Scale, which replaced it. None of the tornadoes recorded on or before January 31, 2007 will be re-categorized. Therefore maintaining the Fujita scale will be necessary when referring to previous events.

Enhanced Fujita Scale

Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; manufactured homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; manufactured homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation;

Source: http://www.spc.noaa.gov/efscale/

The Enhanced Fujita Scale is representative of the damage from tornadoes this community has faced in the past and will no doubt face in the future. The Enhanced Fujita Scale allows planners to prepare and mitigate future potential damage by assessing the historical nature of tornadoes in the planning community. For example, according to the National Climatic Data Center, in 2012 an EF1 tornado occurred at the Joshua Airport. The tornado caused $600,000 worth of property damage.

Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

The Hailstorm Intensity Scale is representative of the damage from hail storms this community has experienced in the past and will likely experience in the future. The Hailstorm Intensity Scale allows planners to gauge past damage and mitigate for future expected damage. For example according to the National Climatic Data Center according to the National Climatic Data Center, there have been at least four storms in the planning area since 2002, at the H7 ranking. In 2012, 1.75 inch* (H5/golf ball size) hail caused $850,000 of property damage in the City of Cleburne.

Beaufort Wind Scale

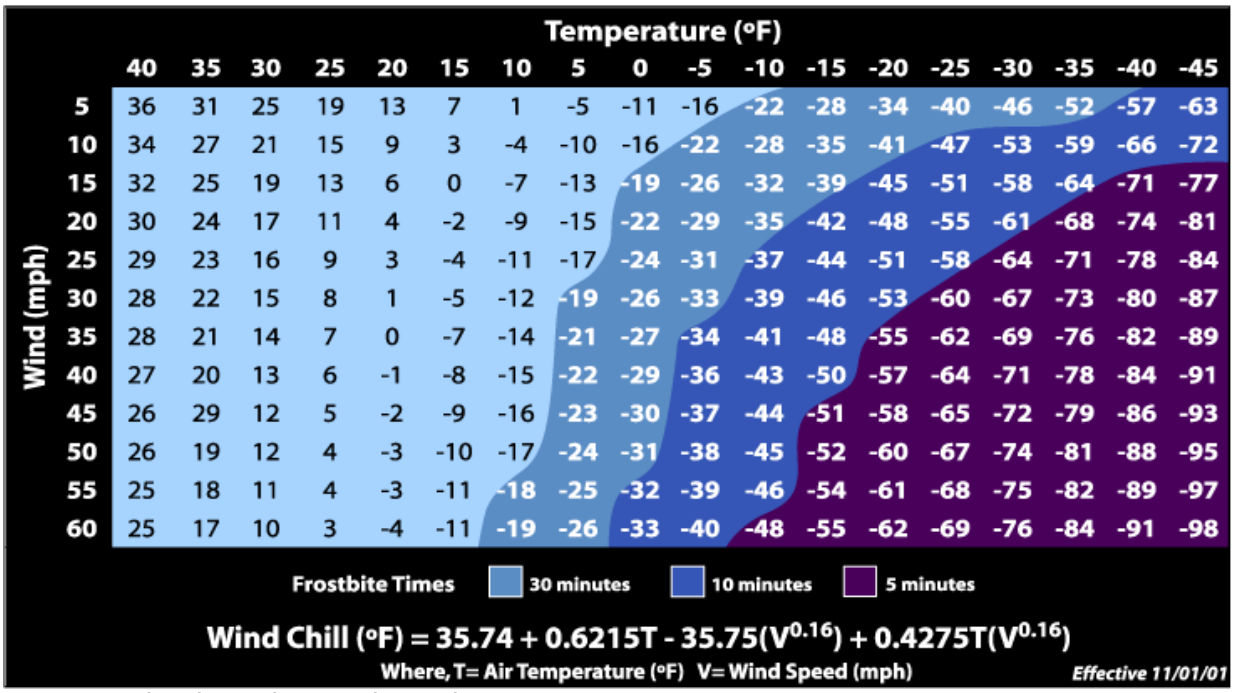
Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Source: http://www.spc.noaa.gov/faq/tornado/beaufort.html

The Beaufort Wind Scale is representative of the damage from high winds this community may endure. The Beaufort Wind Scale allows planners in the community to assess historical data and mitigate for future high wind storms. For example, according to the National Climatic Data Center in 2011 the City of Rio Vista experienced Force 10 (55 knot) winds that blew down trees and fences and caused $250,000 worth of damage.

Wind Chill

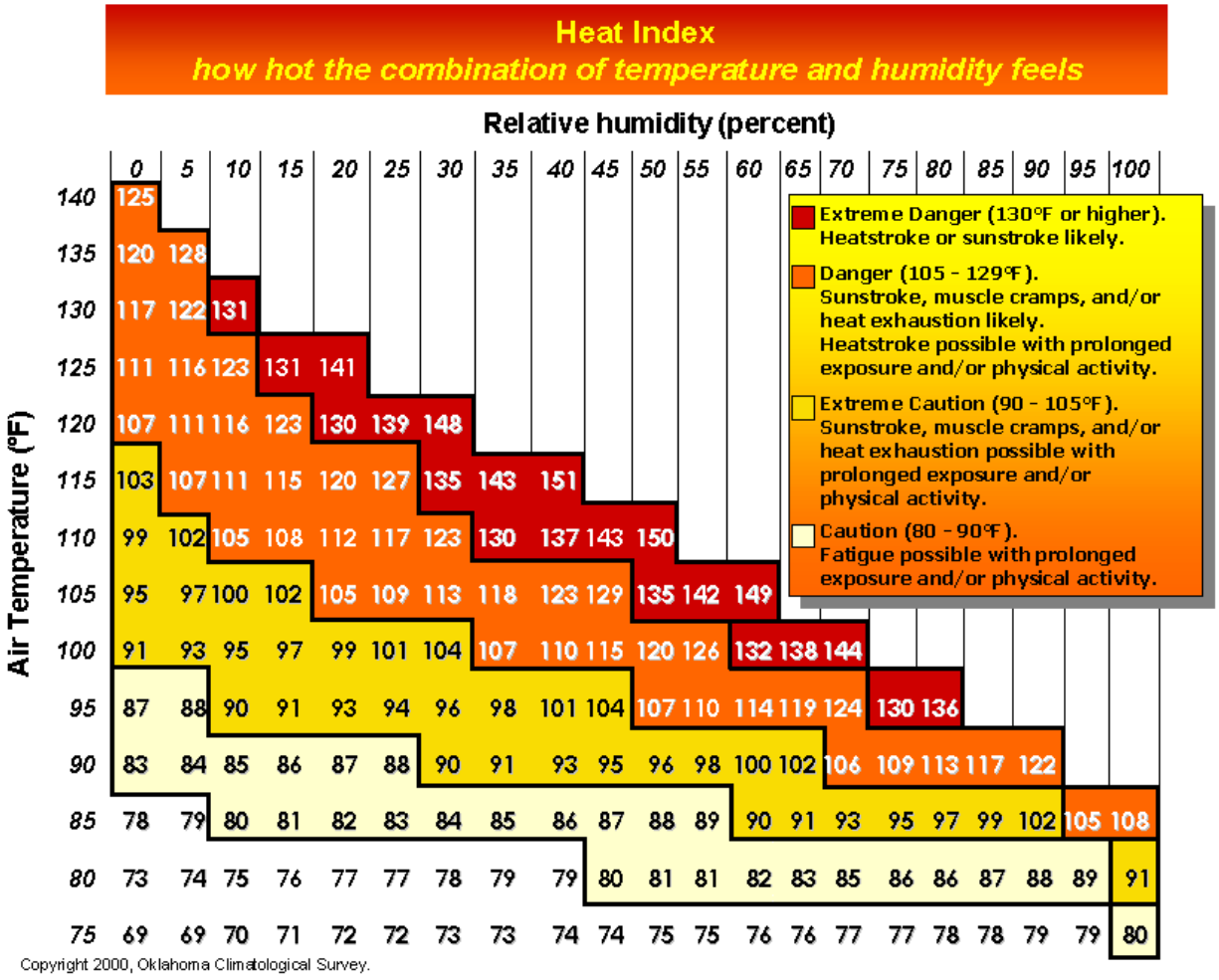
Wind Chill temperature is simply a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. The index was created in 1870, and on November 1, 2001, the National Weather Service released a more scientifically accurate equation, which we use today. Below is a chart for calculating wind chill. (Please note that it is not applicable in calm winds or when the temperature is over 50°.)



Source: National Weather Service and NOAA

The Wind Chill Chart displays the frostbite times in regards to temperature and wind. This chart allows the communities to prepare for severe winter storm or an ice event. These events are infrequent but can cause damage. The primary areas of concern are on bridges and roadways. For example, according to the National Climatic Data Center in 2010, heavy snowfall was recorded county-wide in Johnson County. The heavy snow caused $400,000 in property damage.

Extreme Heat / Heat Index



Source: http://www.ima.army.mil/southwest/sites/divisions/Safety/Heat%20Index.gif

The Heat Index chart displays the relative danger in regards to air temperature and relative humidity. Extreme heat is a hazard this community faces on an annual basis during the summer season. A combination of high temperatures and high humidity prompt heat advisories. This chart allows communities to assess the citizen's danger in regards to heat index. For example, according to the National Climatic Data Center two heat events were recorded in Johnson County in 2011. One of these heat events resulted in a fatality.

Drought

In 1965, Palmer developed an index to "measure the departure of the moisture supply". Palmer based his index on the supply-and-demand concept of the water balance equation, taking into account more than only the precipitation deficit at specific locations. The objective of the Palmer Drought Severity Index (PDSI), as this index is now called, was to provide a measurement of moisture conditions that were "standardized" so that comparisons using the index could be made between locations and between months.

The Palmer Drought Index is based on precipitation and temperature. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

The Palmer Index varies roughly between -4.0 and +4.0. Weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are on the World Wide Web from the Climate Prediction Center.

PDSI Classifications for Dry and Wet Periods	
4.00 or more	Extremely wet
3.00 to 3.99	Very wet
2.00 to 2.99	Moderately wet
1.00 to 1.99	Slightly wet
0.50 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.50 to -0.99	Incipient dry spell
-1.00 to -1.99	Mild drought
-2.00 to -2.99	Moderate drought
-3.00 to -3.99	Severe drought
-4.00 or less	Extreme drought

Source: http://drought.unl.edu/whatis/indices.htm

Drought conditions occur in this community. The PDSI Classification allows community planners to anticipate the effects of Drought and plan preparedness and mitigation activities for future events as they will likely occur. The last event of widespread drought in Johnson County was in 2012.

Earthquake: Mercalli & Richter Scale Comparison

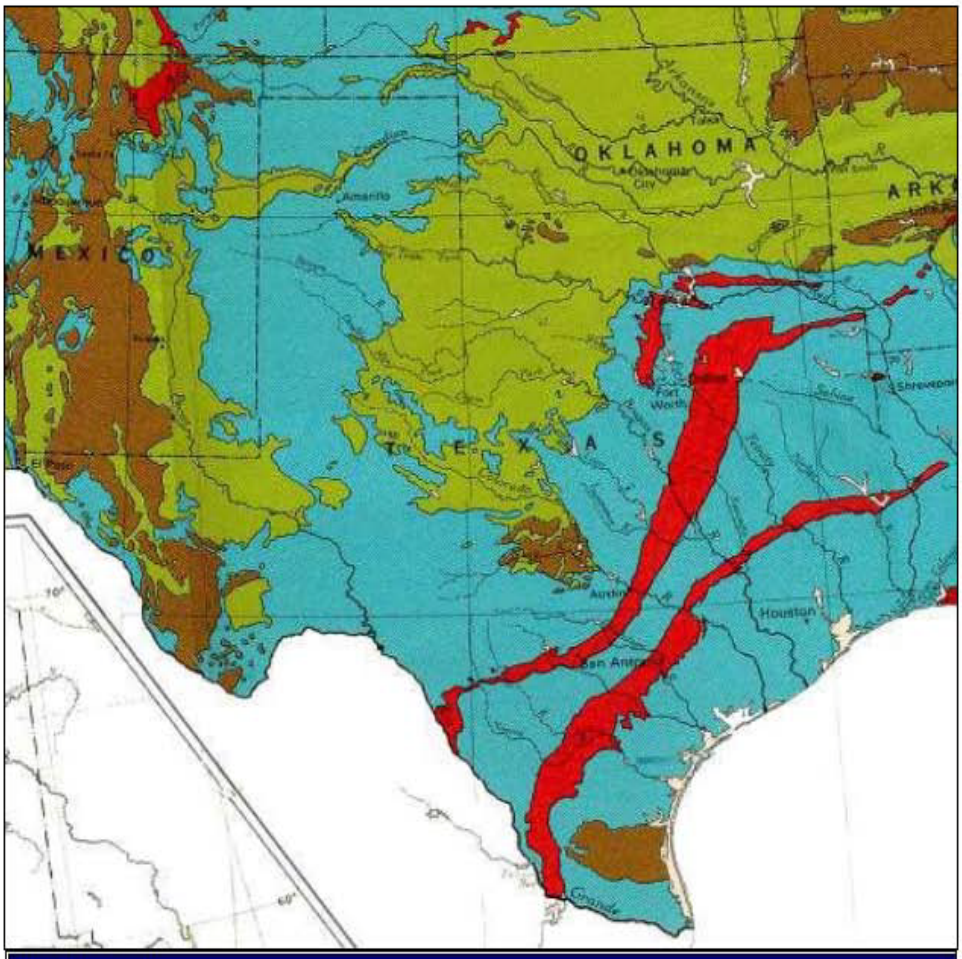
Mercalli Scale	Richter Scale	
I.	0 – 1.9	Not felt. Marginal and long period effects of large earthquakes.
II.	2.0 -2.9	Felt by persons at rest, on upper floors, or favorably placed.
III.	3.0 – 3.9	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV.	4.0 - 4.3	Hanging objects swing. Vibration like passing of heavy trucks. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink the upper range of IV, wooden walls and frame creak.
V.	4.4 - 4.8	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Pendulum clocks stop, start.
VI.	4.9 - 5.4	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Books, etc., off shelves. Pictures off walls. Furniture moved. Weak plaster and masonry D cracked. Small bells ring. Trees, bushes shaken.
VII.	5.5 - 6.1	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Waves on ponds. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII.	6.2 - 6.5	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX.	6.6 - 6.9	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X.	7.0 - 7.3	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI.	.7.4 - 8.1	Rails bent greatly. Underground pipelines completely out of service.
XII.	> 8.1	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.
Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.
Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.
Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Source: http://www.abag.ca.gov/bayarea/eqmaps/doc/mmigif/m10.html

The Mercalli and Richter Scales allow planners to assess the impact Earthquakes have. For example, a magnitude 3.5 earthquake occurred in North Central Johnson County in 2012 and was felt by residents in the neighboring counties.

Expansive Soils



Map Legend	
	Unit contains abundant clay having high swelling potential
	Part of unit (generally less than 50%) consists of clay having high swelling potential
	Unit contains abundant clay having slight to moderate swelling potential
	Part of unit (generally less than 50%) consists of clay having slight to moderate swelling potential
	Unit contains little or no swelling clay
	Data insufficient to indicate clay content of unit and/or swelling potential of clay (Shown in western most states only)

Swelling Clays Map

Source: U.S. Geological Survey; Swelling Clays Map of the Conterminous U.S.

The U.S. Geological Survey map above shows the varying types of expansive soils found in Texas. The type of soil that is predominate in Johnson County is generally comprised of less than 50% of clay that has a high swelling potential. There are some pockets of soil in the eastern part of Johnson County that contain an abundance of clay that has a high swelling potential.

Wildfire

Keetch-Byram Drought Index

KBDI	Fire Potential
0-200	Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of spring dormant season following winter precipitation.
200-400	Typical of late spring, early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity
400-600	Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.
600-800	Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

Source: http://www.tamu.edu/ticc/KBDI%20Fact%20Sheet.pdf

The index scale ranges from 0 to 800 and represents moisture deficiency in hundredths of an inch. By looking at indicators of moisture deficiency in the soil in this chart, communities are able to assess when they are at a heightened danger for a wildfire. According to the National Climatic Data Center there have been 7 wildland fire events in Johnson County since 2002. In 2011 a wildfire caused $500,000 in property damage.

Fire Danger

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) COLOR CODE: Green	fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) COLOR CODE: Blue	fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
CLASS 3: High Danger (H) COLOR CODE: Yellow	fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) COLOR CODE: Orange	fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) COLOR CODE: Red	fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

Source: http://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32/class-rating-fire-potential-danger-51?task=view

Flood Zones

Zone A	The 100-year or Base Floodplain. There are six types of A zones:	
	A	The base floodplains mapped by approximate methods, i.e., BFEs are not determined. This is often called an unnumbered A zone or an approximate A zone.
	A1-30	These are known as numbered A zones (e.g., A7 or A14). This is the base floodplain where the firm shows a BFE (old format).
	AE	The base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.
	AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
	AH	Shallow flooding base floodplain. BFE's are provided.
	A99	Area to be protected from base flood by levees or Federal flood protection systems under construction. BFEs are not determined.
	AR	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection
Zone V and VE	**V**	The coastal area subject to velocity hazard (wave action) where BFEs are not determined on the FIRM.
	VE	The coastal area subject to velocity hazard (wave action) where BFEs are provided on the FIRM.
Zone B and Zone X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and the 500-year floods. B zones are also used to designate base floodplains or lesser hazards, such as areas protected by levees from the 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.	
Zone C and Zone X (unshaded)	Area of minimal flood hazard, usually depiction FIRMs as exceeding the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood.	
Zone D	Area of undetermined but possible flood hazards.	

Source: http://www.fema.gov/floodplain-management/flood-zones

Flood hazard areas are identified as a Special Flood Hazard Area (SFHA). SFHAs are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone V, and Zone VE. Moderate flood hazard areas, labeled Zone B or Zone X, are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are defined as Zone C or Zone X. These flood zone identifications allow planners to determine appropriate land use in designated zones.

The planning communities are participants in the National Flood Insurance Program and actively take measures to plan land use. The communities are subject to flash flooding hazards such as the event in 2004 that affected all of Johnson County. According to the National Climatic Data Center the flash flood event resulted in $100,000 worth of property damage.

Local Extent Having identified the extent scales by which hazards are ranked, the participating jurisdictions have utilized the following definitions to determine the expected extent/severity for their planning area.

	High	Medium	Low
Tornado	• EF3-EF5 • There will be a range of severe damage from well-constructed houses being destroyed to houses being swept away	• EF1-EF2 • There will be a range of moderate to considerate damage. Roofs will be severely stripped, manufactured homes overturned, and cars lifted off of the ground	• EF0 • There will be light damage. Roofs will be peeled off, gutters damaged, and branches broken
Hail	• H7-H10, 2.4”->4” • There will be severe damage. Including roof and structural damage and risk of serious injuries to fatalities.	• H5-H6, 1.6”-2.4” • There will be a range of severe damage from well-constructed houses being destroyed to houses being swept away.	• H0-H4, 0”-1.6” • There will be a variance of destruction to vegetation and slight damage to glass.
High Winds	• Force: 8-12 • Knots: 28-64+ • Whole trees moving to considerable structure damage.	• Force: 4-6 • Knots: 11-27 • Dust, leaves, and loose paper lifted. Small to Large branches moving.	• Force: 0-3 • Knots: <1-10 • Calm, leaves rustle, light flags extended
Winter Storms	• Temperatures 15F- -45F • Wind Chill 7F- -98F • At wind chill of -19 frostbite will occur in 30 minutes increasing in severity to occurrence in 5 minutes.	• Temperatures 30F- 20F • Wind Chill 25F--4F • Bridges and roadways are at risk to ice	• Temperatures 40F- 35F • Wind Chill 36F-17F • Vulnerable populations and agriculture at risk to lower temperatures and wind chill.
Extreme Heat	• Heat Index >130F • Heatstroke or sunstroke likely	• Heat Index 105F-129F • Sunstroke, muscle cramps, and/pr heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.	• Heat Index 80F-105F • Fatigue possible with prolonged exposure and/or physical activity, Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Drought	• PDSI -3.00- -4.00 or less • Severe to extreme drought conditions	• PDSI -1.00- -2.99 • Mild to moderate drought conditions	• PDSI 4.00 or more - -0.99 • Extremely wet to incipient dry spells.
Earthquake	• Mercalli Scale: VIII-XII • Richter Scale: 6.2->8.1 • Driving will be difficult, increase in damage to infrastructures and objects can be thrown	• Mercalli Scale: VI-VII • Richter Scale: 4.9-6.1 • All will feel the event, walking will be difficult, glassware will break, irrigation ditches damaged	• Mercalli Scale: I-V • Richter Scale: 0-4.8 • Range of feeling the event is cannot be felt to being felt outdoors. Doors may swing close and liquids may be disturbed.

	High	Medium	Low
Expansive Soils	• EI Expansion Potential: 91-130 (High) • EI Expansion Potential: >130 (Very High)	• EI Expansion Potential: 51-90 (Medium)	• EI Expansion Potential: 21-50 (Low) • EI Expansion Potential: 0-21 (Very Low)
Wildland Fire	• KBDI 600-800 • Associated with severe drought. Intense, deep-burning fires with significant downwind spotting.	• KBDI 200-400 • Ranges from lower litter and duff layers are drying and beginning to contribute to fire intensity to them causing the fire to burn actively.	• KBDI 0-200 • Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity.
Flooding	• 100yr Flood Zone, Zone A • The extent of severity in the 100yr Flood Zone will be dependent on the structures and livestock located in the identified area.	• 500yr Flood Zone, Zone B • The extent of severity in the 500yr Flood Zone will be dependent on the structures and livestock located in the identified area.	• Outside of100yr and 500yr Flood Zones, Zone C, F, X • Potential for flooding due to local drainage problems
Dam Failure	• Greater than 50% of city structures are in the inundation zone. • Greater than 50% of the city's critical infrastructure in the identified inundation zone	• 20%-50% of city structures are in the inundation zone. • 20%-50% of the city's critical infrastructure in the inundation zone	• Less than 20% of city structures are in the inundation zone. • Less than 20% of the city's critical infrastructure in the inundation zone

The following are the High, Medium, Low rankings for each of the related extent scales.

	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Earthquake	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Occasional	Highly Likely	Highly Likely
Tornado	Highly Likely	Likely	Likely	Likely	Likely	Likely	Likely
Hail	Highly Likely	Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
High Winds	Highly Likely	Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
Winter Storms	Likely	Occasional	Likely	Highly Likely	Occasional	Likely	Highly Likely
Summer Heat	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
Drought	Highly Likely	Likely	Likely	Likely	Likely	Likely	Likely
Flooding	Likely	Likely	Likely	Likely	Occasional	Likely	Likely
Dam Failure	Likely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Wildland Fire	Highly Likely	Occasional	Unlikely	Highly Likely	Highly Likely	Highly Likely	Highly Likely

3.4 Occurrence

The following tables list the previous events data according to the National Climatic Data Center reported in Johnson County, Texas. For those hazards which have the potential to affect the county equally, all data provided by the National Climatic Data Center has been included. The belief is that hazards do not stay within jurisdictional boundaries and thus it is important to be aware of occurrences that have impacted neighboring jurisdictions to further assess the Johnson County HazMAP participating jurisdictions' risks.

All previous events data was gathered from the National Climatic Data Center at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Expansive Soils There is no recorded information of damages caused by previous occurrences of expansive soils within Johnson County.

Dam Failure There is no recorded information or known history of previous occurrence/history of dam failure within Johnson County.

16 Tornado events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
BURLESON	4/3/2012	12:08	TORNADO	EF0	0	0	0	2K
JOSHUA ARPT	4/3/2012	11:41	TORNADO	EF1	0	0	600K	0
LAKE PAT CLEBURNE	4/25/2011	14:15	TORNADO	EF0	0	0	0	0
CLEBURNE MUNI ARPT	4/25/2011	14:10	TORNADO	EF0	0	0	0	0
ALVARADO	4/11/2011	0:22	TORNADO	EF1	0	2	100K	0
LAKE PAT CLEBURNE	4/11/2011	0:09	TORNADO	EF1	0	0	150K	0
LILLIAN	4/10/2008	2:30	TORNADO	EF1	0	0	25M	0
GODLEY	3/31/2008	14:10	TORNADO	EF0	0	0	75K	0
GODLEY	3/31/2008	14:05	TORNADO	EF0	0	0	35K	0
VENUS	6/26/2007	17:40	TORNADO	EF0	0	0	15K	0
CLEBURNE	5/2/2007	16:11	TORNADO	EF0	0	0	0	0
ALVARADO	4/25/2005	15:25	TORNADO	F0	0	0	0	0
GRANDVIEW	4/16/2002	18:14	TORNADO	F0	0	0	0	0
GRANDVIEW	4/16/2002	18:11	TORNADO	F0	0	0	0	0
GRANDVIEW	4/16/2002	18:07	TORNADO	F0	0	0	0	0
GRANDVIEW	4/16/2002	17:56	TORNADO	F0	0	0	0	0
				TOTALS:	0	2	25.975M	2K

68 Hail events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
GRANDVIEW	6/12/2012	14:05	HAIL	0.88 in.	0	0	0	0
JOSHUA	6/6/2012	15:15	HAIL	1.00 in.	0	0	0	0
CLEBURNE	5/30/2012	6:00	HAIL	1.75 in.	0	0	12K	0
BURLESON	4/3/2012	12:00	HAIL	1.50 in.	0	0	15K	0
CLEBURNE	4/3/2012	13:15	HAIL	1.75 in.	0	0	850K	0
GRANDVIEW	4/3/2012	13:52	HAIL	0.75 in.	0	0	0	0
GODLEY	5/24/2011	21:12	HAIL	0.88 in.	0	0	0	0
KEENE	5/24/2011	21:40	HAIL	1.00 in.	0	0	0	0
CLEBURNE	5/24/2011	21:40	HAIL	1.50 in.	0	0	2K	0
BURLESON	5/1/2011	2:55	HAIL	1.00 in.	0	0	0	0
JOSHUA	5/1/2011	3:00	HAIL	1.00 in.	0	0	0	0
BURLESON	5/1/2011	22:58	HAIL	1.00 in.	0	0	0	0
GRANDVIEW	4/26/2011	14:08	HAIL	1.00 in.	0	0	0	0
BONO	4/26/2011	15:15	HAIL	1.75 in.	0	0	10K	0
ALVARADO HARDGRAVE A	4/26/2011	15:27	HAIL	1.00 in.	0	0	0	0
VENUS	4/26/2011	15:32	HAIL	0.88 in.	0	0	0	0
VENUS	4/26/2011	15:34	HAIL	1.00 in.	0	0	0	0
RIO VISTA	4/25/2011	14:40	HAIL	0.75 in.	0	0	0	0
GRANDVIEW	4/25/2011	15:48	HAIL	1.00 in.	0	0	0	0
GODLEY	4/19/2011	17:22	HAIL	1.75 in.	0	0	20K	0
BURLESON	4/19/2011	17:23	HAIL	1.00 in.	0	0	0	0
JOSHUA	4/19/2011	17:43	HAIL	1.75 in.	0	0	20K	0
CLEBURNE	4/19/2011	18:06	HAIL	2.75 in.	0	0	80K	0
PARKER	4/19/2011	18:28	HAIL	1.25 in.	0	0	0	0
PARKER	4/19/2011	18:30	HAIL	1.75 in.	0	0	20K	0
RIO VISTA	4/19/2011	18:40	HAIL	1.00 in.	0	0	0	0
VENUS	4/4/2011	3:33	HAIL	0.88 in.	0	0	0	0
VENUS	4/4/2011	3:49	HAIL	1.00 in.	0	0	0	0
BONO	3/10/2010	11:36	HAIL	0.75 in.	0	0	0	0
PARKER	3/10/2010	11:42	HAIL	0.75 in.	0	0	0	0
GODLEY	6/12/2009	19:08	HAIL	1.75 in.	0	0	5K	0
GODLEY	5/26/2009	19:11	HAIL	1.00 in.	0	0	0	0
ALVARADO	5/13/2008	12:35	HAIL	0.75 in.	0	0	0	0
LAKE PAT CLEBURNE	4/23/2008	19:43	HAIL	0.75 in.	0	0	0	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
BURLESON	4/17/2008	19:28	HAIL	1.25 in.	0	0	0	0
GRANDVIEW	4/4/2008	4:40	HAIL	0.88 in.	0	0	0	0
BURLESON	3/31/2008	14:26	HAIL	1.50 in.	0	0	0	0
CLEBURNE	10/14/2007	20:20	HAIL	1.75 in.	0	0	5K	0
JOSHUA	4/17/2007	17:50	HAIL	1.50 in.	0	0	5K	0
BURLESON	3/13/2007	16:00	HAIL	0.75 in.	0	0	0	0
JOSHUA	4/6/2006	15:22	HAIL	0.88 in.	0	0	0	0
GODLEY	4/25/2005	14:57	HAIL	1.00 in.	0	0	0	0
JOSHUA	4/25/2005	15:08	HAIL	0.75 in.	0	0	0	0
CLEBURNE	4/25/2005	15:16	HAIL	1.00 in.	0	0	0	0
KEENE	4/25/2005	15:20	HAIL	2.75 in.	0	0	25K	0
ALVARADO	4/25/2005	15:30	HAIL	1.00 in.	0	0	25K	0
VENUS	4/25/2005	15:40	HAIL	1.75 in.	0	0	5K	0
ALVARADO	4/25/2005	15:45	HAIL	1.00 in.	0	0	0	0
BURLESON	6/1/2004	20:40	HAIL	1.00 in.	0	0	0	0
BURLESON	6/1/2004	20:42	HAIL	1.00 in.	0	0	0	0
RIO VISTA	5/31/2004	17:28	HAIL	1.00 in.	0	0	0	0
CLEBURNE	8/11/2003	19:28	HAIL	2.75 in.	0	0	0	0
CLEBURNE	5/14/2003	23:25	HAIL	2.75 in.	0	0	0	0
CLEBURNE	5/1/2003	15:57	HAIL	1.00 in.	0	0	0	0
BONO	5/1/2003	16:44	HAIL	1.75 in.	0	0	0	0
CLEBURNE	4/23/2003	19:55	HAIL	1.75 in.	0	0	0	0
ALVARADO	4/23/2003	20:10	HAIL	1.75 in.	0	0	0	0
CLEBURNE	8/14/2002	15:25	HAIL	1.75 in.	0	0	0	0
JOSHUA	5/9/2002	22:28	HAIL	1.00 in.	0	0	0	0
JOSHUA	4/16/2002	16:00	HAIL	0.88 in.	0	0	0	0
CLEBURNE	4/16/2002	17:07	HAIL	1.00 in.	0	0	0	0
RIO VISTA	4/16/2002	17:10	HAIL	1.00 in.	0	0	0	0
ALVARADO	4/16/2002	17:15	HAIL	0.75 in.	0	0	0	0
ALVARADO	4/16/2002	18:07	HAIL	0.75 in.	0	0	0	0
CLEBURNE	4/7/2002	18:55	HAIL	0.75 in.	0	0	0	0
CLEBURNE	4/7/2002	18:58	HAIL	0.75 in.	0	0	0	0
CLEBURNE	3/30/2002	17:52	HAIL	1.00 in.	0	0	0	0
BURLESON	3/30/2002	18:09	HAIL	1.25 in.	0	0	0	0
				TOTALS:	0	0	1.099M	0

99 High Wind/T-Storm & Lightning events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
RETTA	8/12/2012	18:47	T-STORM WIND	55 kts. EG	0	0	10K	0
VENUS	8/12/2012	19:03	T-STORM WIND	55 kts. EG	0	0	5K	0
ALVARADO	8/12/2012	19:15	T-STORM WIND	52 kts. EG	0	0	10K	0
CLEBURNE	5/4/2012	19:28	T-STORM WIND	50 kts. MG	0	0	3K	0
CLEBURNE	5/4/2012	19:35	T-STORM WIND	52 kts. EG	0	0	5K	0
ALVARADO	5/4/2012	19:47	T-STORM WIND	52 kts. EG	0	0	5K	0
CLEBURNE	9/29/2011	21:15	T-STORM WIND	52 kts. EG	0	0	0	0
GRANDVIEW MCELROY AR	9/29/2011	21:25	T-STORM WIND	52 kts. EG	0	0	0	0
BURLESON	5/1/2011	2:55	T-STORM WIND	56 kts. EG	0	0	0	0
GODLEY	4/11/2011	0:00	T-STORM WIND	65 kts. EG	0	0	7K	0
WEATHERFORD JCT	4/11/2011	0:06	T-STORM WIND	75 kts. EG	0	0	35K	0
RIO VISTA	4/11/2011	0:12	T-STORM WIND	70 kts. EG	0	0	250K	0
CLEBURNE	4/11/2011	0:15	T-STORM WIND	75 kts. EG	0	0	10K	0
BURLESON	4/11/2011	0:23	T-STORM WIND	61 kts. MG	0	0	0	0
ALVARADO	4/11/2011	0:23	T-STORM WIND	70 kts. EG	0	0	300K	0
PARKER	4/11/2011	0:26	T-STORM WIND	58 kts. MG	0	0	0	0
VENUS	4/11/2011	0:30	T-STORM WIND	70 kts. EG	0	0	40K	0
GRANDVIEW	4/11/2011	0:30	T-STORM WIND	70 kts. EG	0	0	150K	0
VENUS	4/11/2011	0:30	T-STORM WIND	70 kts. EG	0	0	90K	0
VENUS	4/11/2011	0:32	T-STORM WIND	70 kts. EG	0	0	20K	0
VENUS	4/11/2011	0:35	T-STORM WIND	65 kts. EG	0	0	0	0
ALVARADO	4/11/2011	0:36	T-STORM WIND	71 kts. MG	0	0	0	0
LAKE PAT CLEBURNE	4/4/2011	4:15	T-STORM WIND	39 kts. EG	0	0	7K	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
VENUS	4/4/2011	5:05	T-STORM WIND	52 kts. EG	0	0	4K	0
BURLESON	5/30/2010	14:00	T-STORM WIND	55 kts. EG	0	0	10K	0
WEATHERFORD JCT	1/28/2010	15:18	T-STORM WIND	54 kts. MG	0	0	0	0
BURLESON	10/1/2009	16:50	T-STORM WIND	70 kts. EG	0	0	7K	0
GODLEY	9/21/2009	19:10	LIGHTNING	N/A	0	0	100K	0
GODLEY	9/21/2009	18:40	T-STORM WIND	83 kts. EG	0	0	800K	0
BURLESON	9/21/2009	18:59	T-STORM WIND	52 kts. EG	0	0	1K	0
WEATHERFORD JCT	9/21/2009	19:00	T-STORM WIND	52 kts. EG	0	0	0.2K	0
EGAN	9/21/2009	19:00	T-STORM WIND	52 kts. EG	0	0	0.5K	0
BURLESON	9/21/2009	19:10	T-STORM WIND	56 kts. EG	0	0	1K	0
MANSFIELD	9/21/2009	19:14	T-STORM WIND	58 kts. MG	0	0	0.5K	0
KEENE	9/21/2009	19:15	T-STORM WIND	56 kts. MG	0	0	0.5K	0
GRANDVIEW	9/21/2009	20:00	T-STORM WIND	52 kts. EG	0	0	5K	0
KEENE	9/3/2009	20:30	LIGHTNING	N/A	0	0	20K	0
BURLESON	8/27/2009	18:50	T-STORM WIND	61 kts. EG	0	0	20K	0
ALVARADO	8/27/2009	19:21	T-STORM WIND	50 kts. EG	0	0	20K	0
ALVARADO	8/27/2009	19:21	T-STORM WIND	56 kts. EG	0	0	20K	0
BURLESON	8/21/2009	6:30	T-STORM WIND	61 kts. EG	0	0	15K	0
LILLIAN	7/31/2009	19:00	T-STORM WIND	56 kts. EG	0	0	25K	0
RIO VISTA	6/12/2009	19:55	T-STORM WIND	61 kts. EG	0	0	2K	0
GRANDVIEW	6/10/2009	18:25	T-STORM WIND	56 kts. EG	0	0	2K	0
CLEBURNE	5/26/2009	20:01	T-STORM WIND	52 kts. EG	0	0	3K	0
JOSHUA ARPT	5/26/2009	20:06	T-STORM WIND	61 kts. EG	0	0	10K	0
GRANDVIEW	5/26/2009	22:10	T-STORM WIND	52 kts. EG	0	0	2K	0
CLEBURNE	4/23/2008	18:12	LIGHTNING	N/A	0	0	10K	0
CLEBURNE	4/23/2008	19:40	T-STORM WIND	56 kts. EG	0	0	20K	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
MANSFIELD	4/23/2008	19:47	T-STORM WIND	50 kts. EG	0	0	1K	0
BONO	4/23/2008	19:57	T-STORM WIND	52 kts. EG	0	0	0	0
VENUS	4/23/2008	20:10	T-STORM WIND	61 kts. EG	0	0	0	0
CLEBURNE	4/17/2008	20:09	T-STORM WIND	52 kts. EG	0	0	0	0
CLEBURNE	4/10/2008	2:25	T-STORM WIND	56 kts. EG	0	0	120K	0
LILLIAN	4/10/2008	2:40	T-STORM WIND	74 kts. EG	0	1	30K	0
LAKE PAT CLEBURNE	7/8/2007	14:45	T-STORM WIND	50 kts. EG	0	0	0	0
BURLESON	5/30/2007	9:19	T-STORM WIND	50 kts. EG	0	0	0	0
BURLESON	5/2/2007	17:45	LIGHTNING	N/A	0	0	220K	0
GODLEY	5/2/2007	16:48	T-STORM WIND	70 kts. EG	0	0	0	0
ALVARADO	5/2/2007	17:00	T-STORM WIND	61 kts. EG	0	0	200K	0
CLEBURNE	5/2/2007	17:05	T-STORM WIND	70 kts. EG	0	0	5K	0
BURLESON	5/2/2007	17:15	T-STORM WIND	50 kts. EG	0	0	15K	0
CLEBURNE	5/2/2007	17:25	T-STORM WIND	52 kts. MG	0	0	0	0
GRANDVIEW	5/2/2007	17:30	T-STORM WIND	50 kts. EG	0	0	20K	0
ALVARADO	5/2/2007	17:35	T-STORM WIND	50 kts. EG	0	0	15K	0
GRANDVIEW	5/2/2007	17:40	T-STORM WIND	56 kts. EG	0	0	40K	0
GODLEY	4/24/2007	12:52	T-STORM WIND	50 kts. EG	0	0	10K	0
GRANDVIEW	4/24/2007	20:45	T-STORM WIND	50 kts. EG	0	0	1K	0
VENUS	4/17/2007	18:15	T-STORM WIND	52 kts. EG	0	0	0	0
JOHNSON (ZONE)	4/28/2006	23:00	HIGH WIND	50 kts. ES	0	0	0	0
CLEBURNE	10/31/2005	11:30	LIGHTNING	N/A	0	0	15K	0
KEENE	7/15/2005	18:30	T-STORM WIND	50 kts. ES	0	0	5K	0
CLEBURNE	7/14/2005	19:00	T-STORM WIND	50 kts. ES	0	0	20K	0
JOSHUA	7/1/2005	12:02	T-STORM WIND	50 kts. ES	0	0	10K	0
JOSHUA	12/6/2004	16:28	T-STORM WIND	52 kts. ES	0	0	5K	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
CLEBURNE	12/6/2004	16:38	T-STORM WIND	52 kts. ES	0	0	25K	0
GRANDVIEW	12/6/2004	16:55	T-STORM WIND	52 kts. ES	0	0	10K	0
BURLESON	6/1/2004	20:30	T-STORM WIND	56 kts. ES	0	0	0	0
BURLESON	6/1/2004	20:32	T-STORM WIND	61 kts. ES	0	0	100K	0
BURLESON	6/1/2004	20:40	T-STORM WIND	56 kts. ES	0	0	15K	0
LILLIAN	6/1/2004	20:45	T-STORM WIND	61 kts. ES	0	2	50K	0
CLEBURNE	6/1/2004	20:45	T-STORM WIND	61 kts. ES	0	0	60K	0
ALVARADO	6/1/2004	21:00	T-STORM WIND	61 kts. ES	0	0	50K	0
ALVARADO	5/27/2004	18:30	T-STORM WIND	65 kts. ES	0	1	80K	0
BURLESON	5/27/2004	18:38	T-STORM WIND	52 kts. ES	0	0	0K	0
CLEBURNE	3/4/2004	14:30	T-STORM WIND	60 kts. ES	0	0	15K	0
CLEBURNE	8/11/2003	19:28	T-STORM WIND	61 kts. ES	0	0	200K	0
CLEBURNE	8/9/2003	22:00	T-STORM WIND	52 kts. ES	0	0	2K	0
CLEBURNE	4/23/2003	19:52	T-STORM WIND	61 kts. MS	0	0	0	0
CLEBURNE	4/23/2003	19:52	T-STORM WIND	52 kts. ES	0	0	1K	0
KEENE	4/23/2003	20:00	T-STORM WIND	52 kts. MS	0	0	0	0
LILLIAN	4/23/2003	20:20	T-STORM WIND	96 kts. ES	0	0	4M	0
BURLESON	6/15/2002	23:40	T-STORM WIND	52 kts. E	0	0	0	0
ALVARADO	6/15/2002	23:50	T-STORM WIND	69 kts. E	0	0	0	0
BONO	5/27/2002	15:06	T-STORM WIND	N/A	0	0	8K	0
RIO VISTA	5/27/2002	16:40	T-STORM WIND	52 kts. E	0	0	0	0
LAKE PAT CLEBURNE	5/3/2002	5:00	T-STORM WIND	N/A	0	0	10K	0
GRANDVIEW	5/3/2002	5:14	T-STORM WIND	66 kts. E	0	0	25K	0
RIO VISTA	4/7/2002	18:55	T-STORM WIND	52 kts. E	0	0	0	0
				TOTALS:	0	4	7.969M	0

11 Winter Storm events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	2/1/2011	4:00	ICE STORM	N/A	0	0	75K	0
JOHNSON COUNTY	2/11/2010	5:00	HEAVY SNOW	N/A	0	0	400K	0
JOHNSON COUNTY	1/7/2010	3:00	WINTER WEATHER	N/A	0	0	50K	0
JOHNSON COUNTY	12/24/2009	12:30	WINTER WEATHER	N/A	0	0	50K	0
JOHNSON COUNTY	1/27/2009	8:00	ICE STORM	N/A	0	0	60K	0
JOHNSON COUNTY	1/5/2009	8:00	WINTER WEATHER	N/A	0	0	7K	0
JOHNSON COUNTY	12/15/2008	18:00	WINTER WEATHER	N/A	0	0	0	0
JOHNSON COUNTY	1/14/2007	4:00	ICE STORM	N/A	0	0	40K	0
JOHNSON COUNTY	12/7/2005	9:00	WINTER STORM	N/A	0	0	0	0
JOHNSON COUNTY	2/24/2003	11:20	WINTER STORM	N/A	0	0	0	0
JOHNSON COUNTY	2/5/2002	10:00	WINTER STORM	N/A	0	0	0	0
				TOTALS:	0	0	682K	0

2 Extreme Temperature events reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	8/1/2011	6:00	EXCESSIVE HEAT	N/A	0	0	0	0
JOHNSON COUNTY	7/1/2011	0:00	HEAT	N/A	1	0	0	0
				TOTALS:	1	0	0	0

27 Drought events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	12/1/2012	0:00	DROUGHT	N/A	0	0	0	1K
JOHNSON COUNTY	11/13/2012	0:00	DROUGHT	N/A	0	0	0	2K
JOHNSON COUNTY	9/25/2012	0:00	DROUGHT	N/A	0	0	0	2K
JOHNSON COUNTY	1/1/2012	0:00	DROUGHT	N/A	0	0	0	4K
JOHNSON COUNTY	12/1/2011	0:00	DROUGHT	N/A	0	0	0	5K
JOHNSON COUNTY	11/1/2011	0:00	DROUGHT	N/A	0	0	0	5K
JOHNSON COUNTY	10/1/2011	0:00	DROUGHT	N/A	0	0	0	10K
JOHNSON COUNTY	9/1/2011	0:00	DROUGHT	N/A	0	0	0	30K
JOHNSON COUNTY	8/1/2011	0:00	DROUGHT	N/A	0	0	0	50K
JOHNSON COUNTY	7/1/2011	0:00	DROUGHT	N/A	0	0	0	17K
JOHNSON COUNTY	6/7/2011	0:00	DROUGHT	N/A	0	0	4K	0
JOHNSON COUNTY	4/17/2011	0:00	DROUGHT	N/A	0	0	0	15K
JOHNSON COUNTY	9/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	8/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	7/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	6/6/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	5/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	4/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	3/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	2/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	1/1/2006	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	12/1/2005	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	11/1/2005	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	10/1/2005	0:00	DROUGHT	N/A	0	0	0	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	9/1/2005	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	8/1/2005	0:00	DROUGHT	N/A	0	0	0	0
JOHNSON COUNTY	7/1/2005	0:00	DROUGHT	N/A	0	0	0	0
				TOTALS:	0	0	4K	141K

26 Earthquake events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	7/28/2012	2:32	EARTHQUAKE	2.2	0	0	0	0
JOHNSON COUNTY	7/13/2012	12:27	EARTHQUAKE	2.7	0	0	0	0
JOHNSON COUNTY	7/11/2012	1:57	EARTHQUAKE	2.1	0	0	0	0
JOHNSON COUNTY	7/10/2012	2:22	EARTHQUAKE	2.4	0	0	0	0
JOHNSON COUNTY	7/10/2012	16:46	EARTHQUAKE	2.8	0	0	0	0
JOHNSON COUNTY	7/6/2012	8:26	EARTHQUAKE	2.7	0	0	0	0
JOHNSON COUNTY	6/29/2012	18:27	EARTHQUAKE	2.3	0	0	0	0
JOHNSON COUNTY	6/26/2012	4:03	EARTHQUAKE	2.5	0	0	0	0
JOHNSON COUNTY	6/25/2012	5:59	EARTHQUAKE	2.3	0	0	0	0
JOHNSON COUNTY	6/24/2012	17:46	EARTHQUAKE	3.5	0	0	0	0
JOHNSON COUNTY	6/23/2012	5:44	EARTHQUAKE	2.1	0	0	0	0
JOHNSON COUNTY	6/15/2012	7:02	EARTHQUAKE	3.3	0	0	0	0
JOHNSON COUNTY	6/4/2012	4:37	EARTHQUAKE	2.3	0	0	0	0
JOHNSON COUNTY	1/18/2012	22:30	EARTHQUAKE	3.3	0	0	0	0
JOHNSON COUNTY	12/7/2011	22:54	EARTHQUAKE	2.7	0	0	0	0
JOHNSON COUNTY	11/12/2010	9:03	EARTHQUAKE	2.1	0	0	0	0
JOHNSON COUNTY	11/8/2010	4:05	EARTHQUAKE	2.5	0	0	0	0
JOHNSON COUNTY	10/1/2009	11:56	EARTHQUAKE	2.3	0	0	0	0
JOHNSON COUNTY	9/30/2009	9:43	EARTHQUAKE	2.4	0	0	0	0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	7/10/2009	11:58	EARTHQUAKE	2	0	0	0	0
JOHNSON COUNTY	6/27/2009	3:30	EARTHQUAKE	2.4	0	0	0	0
JOHNSON COUNTY	6/9/2009	22:10	EARTHQUAKE	2.3	0	0	0	0
JOHNSON COUNTY	6/9/2009	23:19	EARTHQUAKE	2	0	0	0	0
JOHNSON COUNTY	6/8/2009	13:02	EARTHQUAKE	2.4	0	0	0	0
JOHNSON COUNTY	6/7/2009	22:56	EARTHQUAKE	2.6	0	0	0	0
JOHNSON COUNTY	6/2/2009	20:06	EARTHQUAKE	2.8	0	0	0	0
				TOTALS:	0	0	0	0

7 Wildfire events were reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
JOHNSON COUNTY	8/2/2012	13:30	WILDFIRE	N/A	0	0	15K	0
JOHNSON COUNTY	8/18/2011	13:30	WILDFIRE	N/A	0	0	0K	2.5K
JOHNSON COUNTY	8/18/2011	14:14	WILDFIRE	N/A	0	0	500K	0
JOHNSON COUNTY	7/13/2011	17:00	WILDFIRE	N/A	0	0	72K	0
JOHNSON COUNTY	7/3/2011	14:00	WILDFIRE	N/A	0	0	2K	0
JOHNSON COUNTY	1/1/2008	11:00	WILDFIRE	N/A	0	0	10K	0
JOHNSON COUNTY	11/27/2005	18:05	WILDFIRE	N/A	0	0	850K	0
				TOTALS:	0	0	1.449M	2.5K

25 Flood events reported in Johnson County, Texas between 01/01/2002 and 12/31/2012

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
MANSFIELD	9/8/2010	9:00	FLASH FLOOD	N/A	1	0	400K	0
GODLEY	9/8/2010	13:00	FLOOD	N/A	0	0	0	0
LAKE PAT CLEBURNE	10/25/2009	21:57	FLASH FLOOD	N/A	0	0	1K	0
MANSFIELD	10/22/2009	7:00	FLOOD	N/A	0	0	5K	0
MANSFIELD	10/21/2009	22:15	FLASH FLOOD	N/A	0	0	2K	0
CUBA	9/21/2009	19:56	FLASH FLOOD	N/A	0	0	0	0
WEATHERFORD JCT	9/21/2009	20:15	FLASH FLOOD	N/A	0	0	0	0
MANSFIELD	9/13/2009	2:51	FLASH FLOOD	N/A	0	0	75K	0
BURLESON	4/23/2008	20:14	FLASH FLOOD	N/A	0	0	0	0
BURLESON	9/9/2007	15:00	FLASH FLOOD	N/A	0	0	0	0
VENUS	9/5/2007	4:45	FLASH FLOOD	N/A	0	0	50K	0
BURLESON	8/2/2007	5:00	FLASH FLOOD	N/A	0	0	1K	0
CLEBURNE	7/8/2007	16:00	FLASH FLOOD	N/A	0	0	0	0
GODLEY	5/29/2007	16:00	FLASH FLOOD	N/A	0	0	15K	0
GODLEY	5/29/2007	18:00	FLOOD	N/A	0	0	0	0
CLEBURNE	5/2/2007	18:00	FLASH FLOOD	N/A	0	0	15K	0
CLEBURNE	3/30/2007	19:30	FLASH FLOOD	N/A	0	0	15K	0
BURLESON	3/19/2006	13:30	FLASH FLOOD	N/A	0	0	0	0
COUNTYWIDE	3/19/2006	17:45	FLASH FLOOD	N/A	0	0	0	0
GRANDVIEW	8/19/2004	13:00	FLASH FLOOD	N/A	0	0	0	0
COUNTYWIDE	7/29/2004	2:30	FLASH FLOOD	N/A	0	0	100K	0
CLEBURNE	6/29/2004	19:30	FLASH FLOOD	N/A	0	0	0	0
BURLESON	6/9/2004	14:50	FLASH FLOOD	N/A	0	0	0	0
CLEBURNE	4/7/2002	18:55	FLASH FLOOD	N/A	0	0	0	0
CLEBURNE	3/19/2002	20:00	FLASH FLOOD	N/A	0	0	0	0
				TOTALS:	1	0	679K	0

Occurrence Based on the previous events data, participating jurisdictions have analyzed the expected occurrence of the assessed hazards to be the following:

Highly Likely	Event probable in the next year
Likely	Event probable in the next 3 years
Occasional	Event possible in the next 5 years
Unlikely	Event possible in the next 10 years

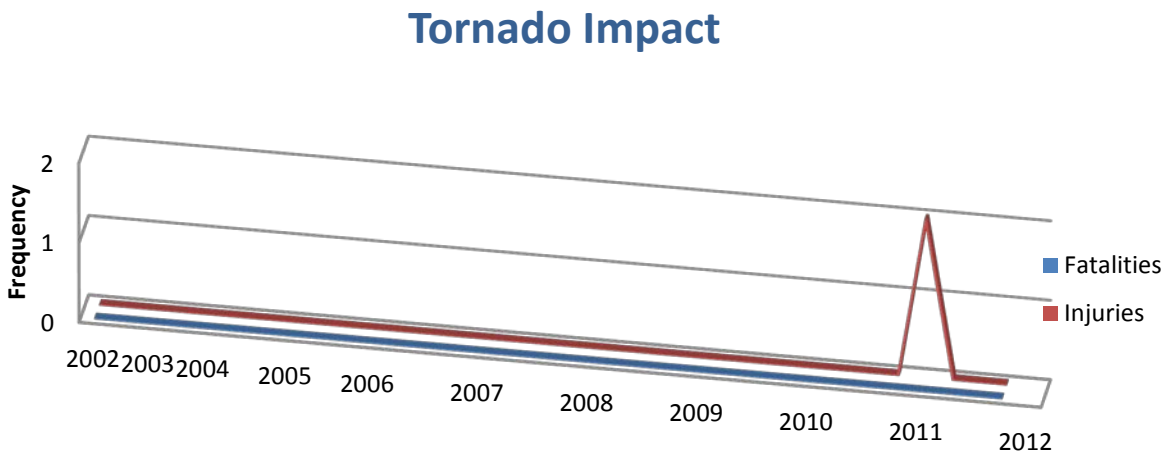
	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Tornado	Highly Likely	Likely	Likely	Likely	Likely	Likely	Likely
Hail	Highly Likely	Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
High Winds	Highly Likely	Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
Winter Storms	Likely	Occasional	Likely	Highly Likely	Occasional	Likely	Highly Likely
Extreme Heat	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
Drought	Highly Likely	Likely	Likely	Likely	Likely	Likely	Likely
Earthquake	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Occasional	Highly Likely	Highly Likely
Expansive Soils	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Wildland Fire	Highly Likely	Occasional	Unlikely	Highly Likely	Highly Likely	Highly Likely	Highly Likely
Flooding	Likely	Likely	Likely	Likely	Occasional	Likely	Likely
Dam Failure	Likely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely

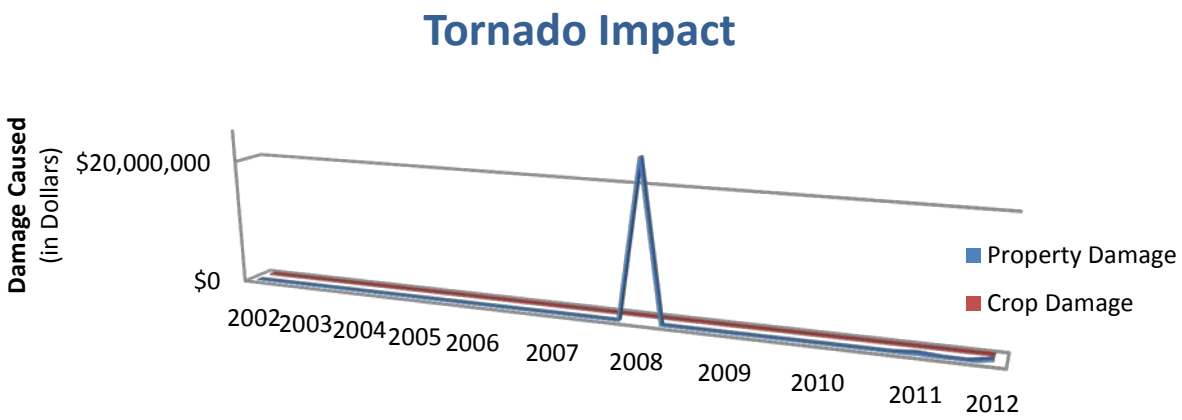
3.5 Impact

Impact has been assessed utilizing the previous events data, maps, assessments, and the following definitions:

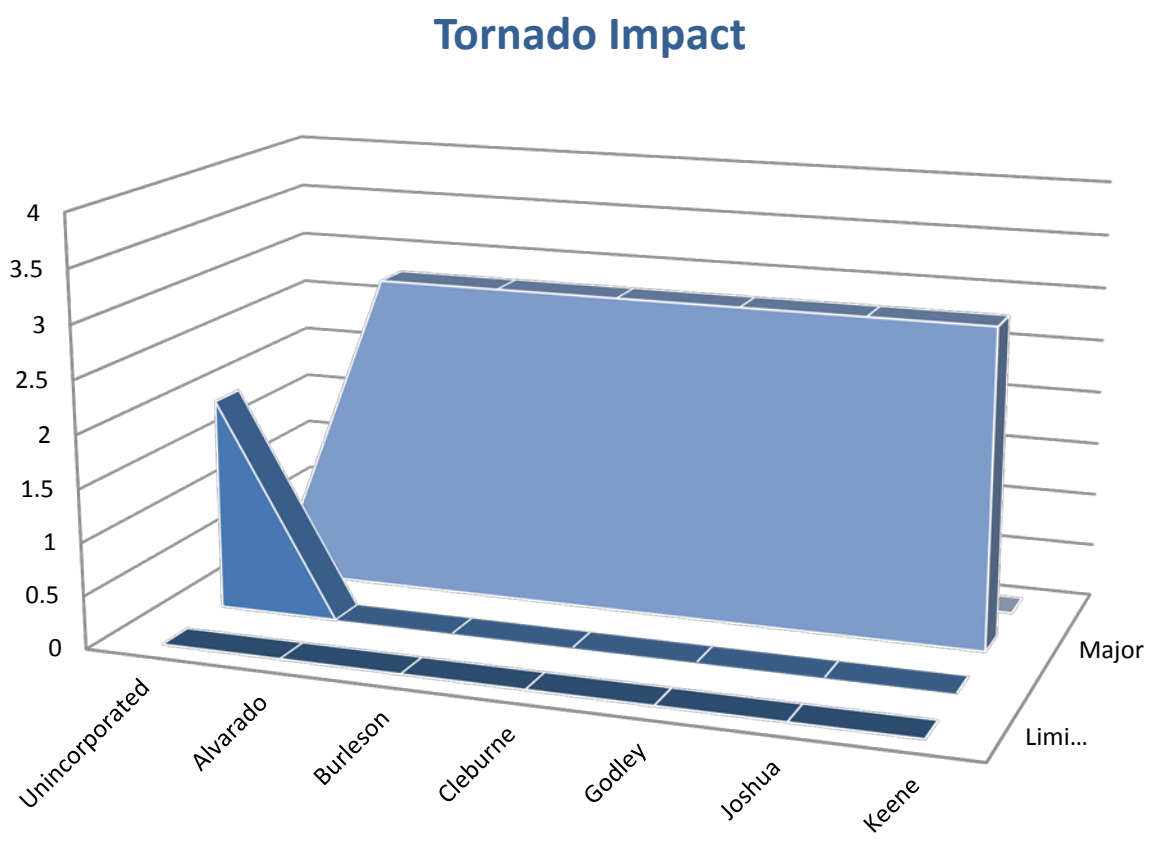
Substantial (4):	Multiple Fatalities Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major (3):	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25% of property destroyed or with major damage.
Minor (2):	Injuries or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than a week. More than 10% of property destroyed or with major damage.
Limited(0/1):	Injuries and illnesses are treatable with first aid. Minor quality of life lost. Shut down of critical facilities and services for 24 hours or less. Less than 10% of property destroyed or with major damage.

Tornado According to the historical data recorded by the National Climatic Data Center, there have been 16 tornado events during 01/01/2002-12/31/2012 in Johnson County. These events have caused a recorded total of 2 injuries, $25,975,000 in property damage, and $2,000 in crop damage. Using these historical values over a time span of 11 years, the average per year is 1.45 events, .18 injuries, $2,361,363 in property damage, and $182 in crop damage.



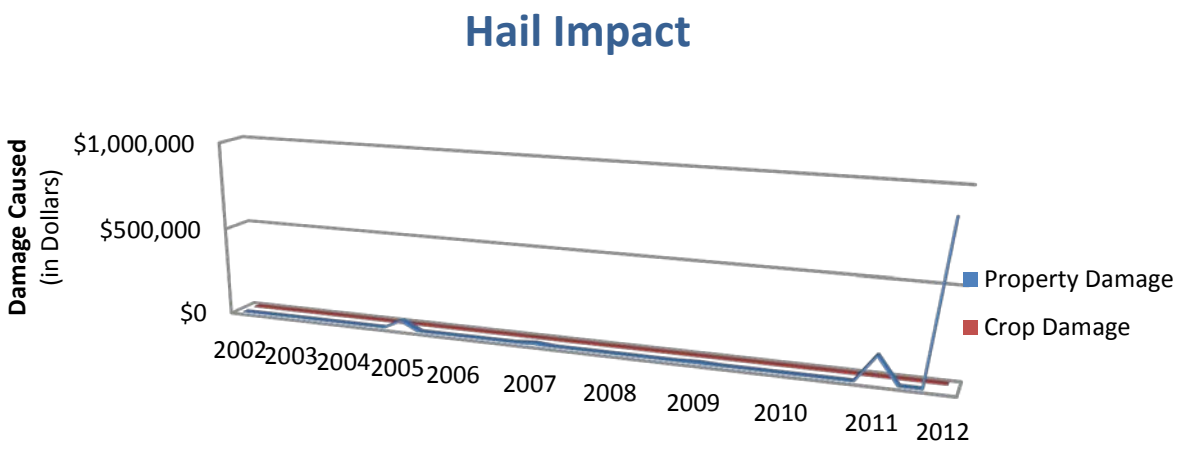


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of tornado events to be as follows:

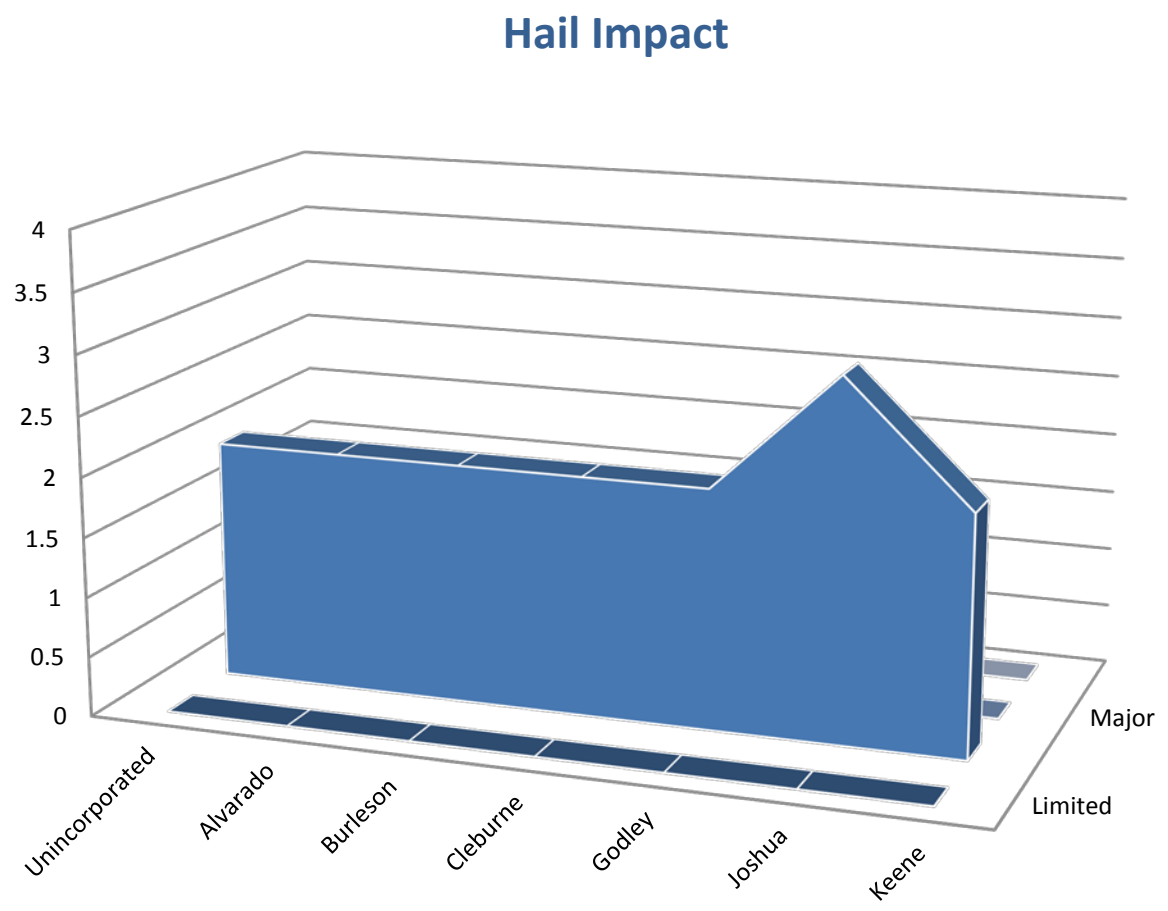


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited							
Minor	2						
Major		3	3	3	3	3	3
Substantial							

Hail According to historical data recorded by the National Climatic Data Center, there have been 68 hail events during 01/01/2002-12/31/2012 in Johnson County. These events have caused a recorded total of $1,099,000 in property damage. Using these historical values over the time span of 11 years, the average per year is 6.18 events and $99,909 in property damage. (According to the National Climatic Data Center there have been no recorded injuries or fatalities due to hail events.)

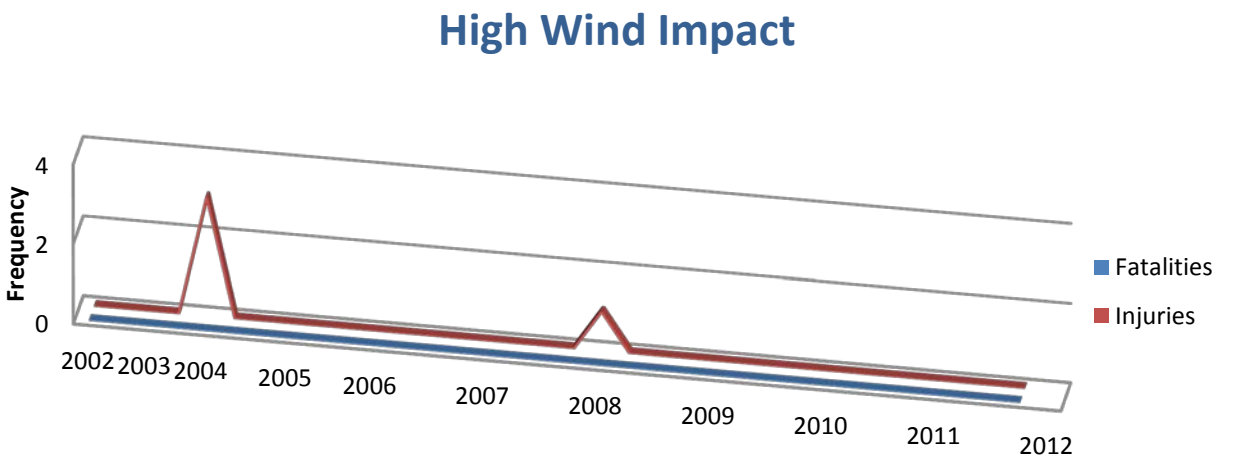


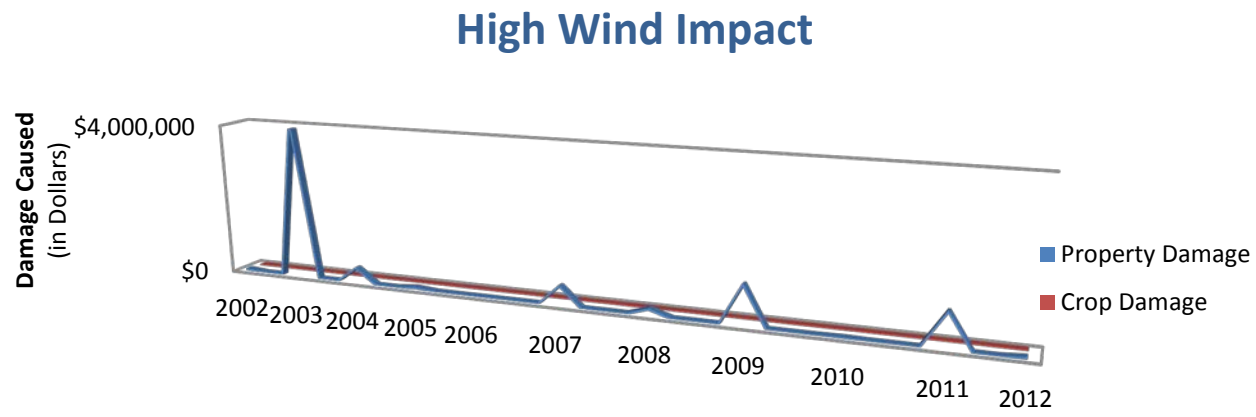
Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of hail events to be as follows:



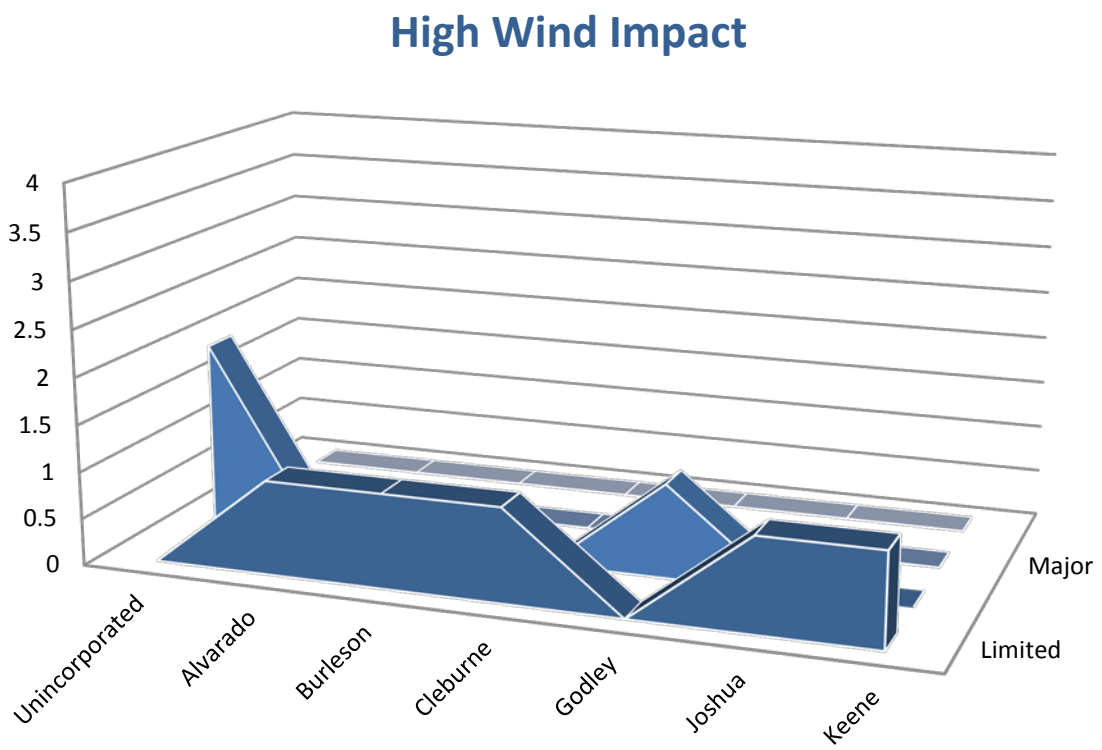
	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited							
Minor	2	2	2	2	2	3	2
Major							
Substantial							

High Wind According to historical data recorded by the National Climatic Data Center, there have been 99 high/t-storm wind and lightning events during 01/01/2002-12/31/2012. These events have caused a recorded total of 4 injuries, and $7,969,000 in property damage. Using the historical values over the time span of 11 years, the average per year is 9 events, .36 injuries and $724,455 in property damage.



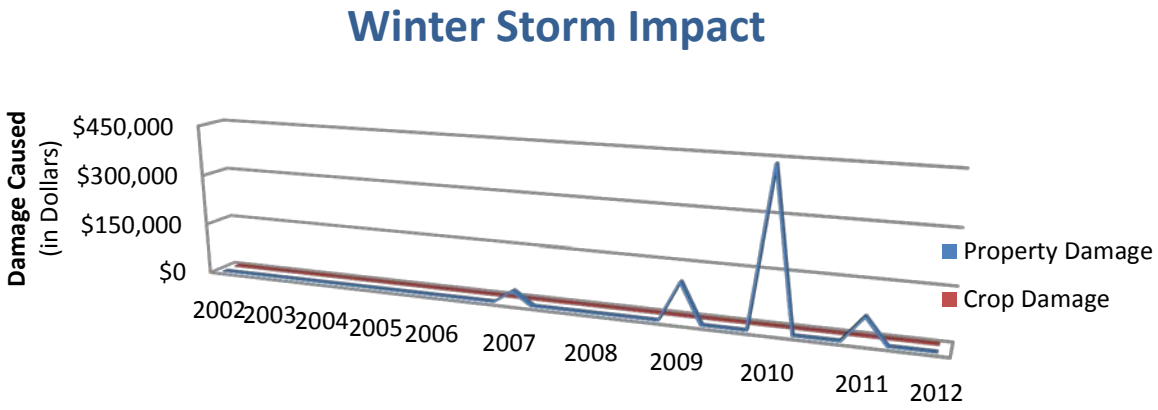


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of high wind events to be as follows:

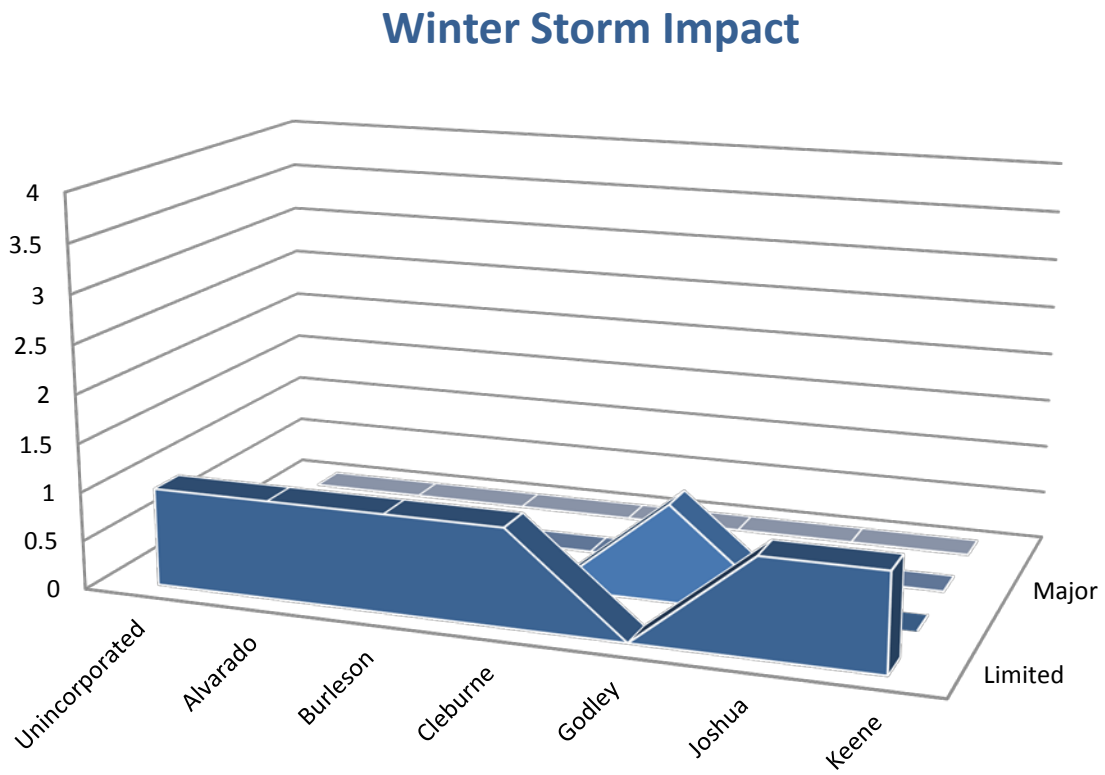


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited		1	1	1		1	1
Minor	2				1		
Major							
Substantial							

Winter Storm According to historical data recorded by the National Climatic Data Center there have been 11 winter storm events during 01/01/2002-12/31/2012 in Johnson County. These events have caused a recorded total of $682,000 in property damage. Using these historical values over the time span of 11 years, the average per year is 1 event and $62,000 in property damage. (According to the National Climatic Data Center there have been no recorded injuries or fatalities due to winter storm events.)

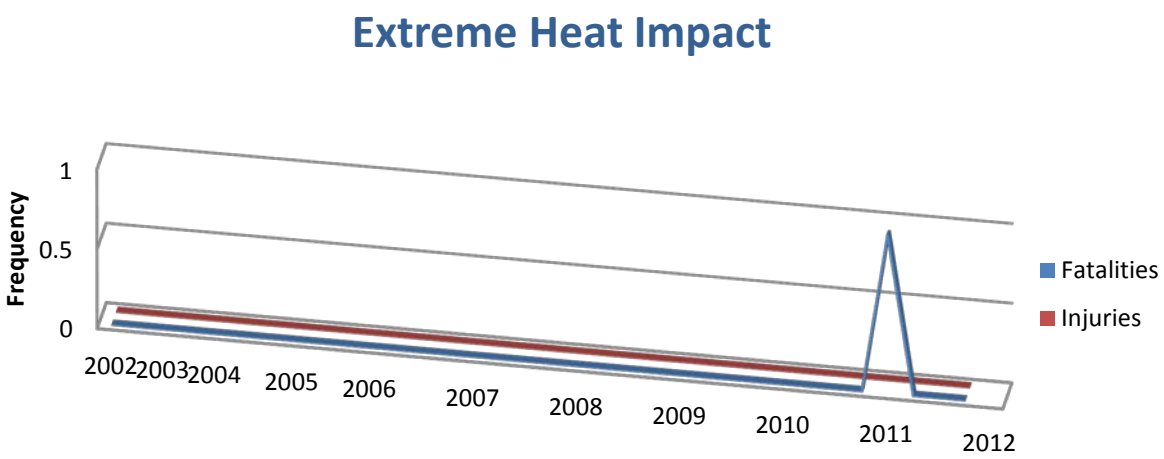


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of winter storm events to be as follows:

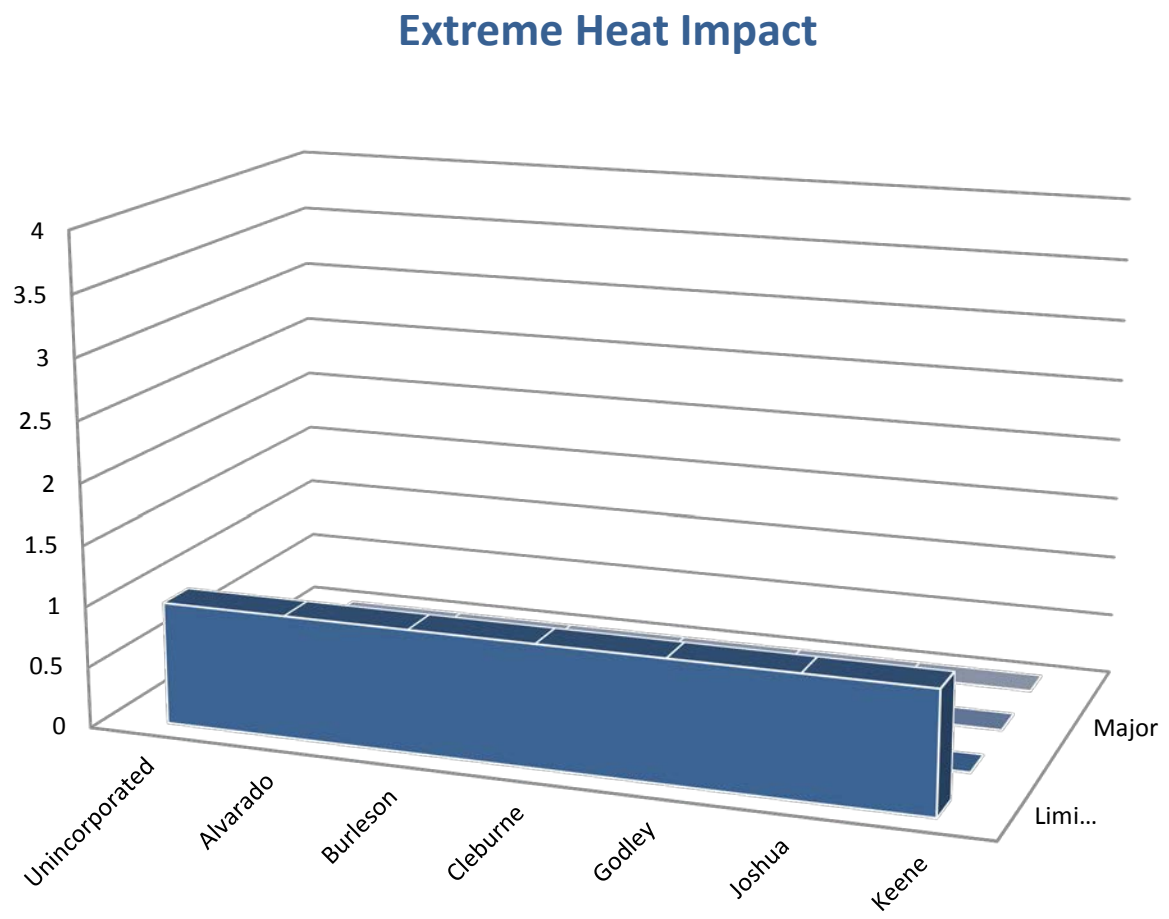


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited	1	1	1	1		1	1
Minor					1		
Major							
Substantial							

Extreme Heat According to this historical data recorded by the National Climatic Data Center, there have been 2 extreme heat events during 01/01/2002-12/31/2012 in Johnson County. These events caused a recorded total of one fatality. Using these historical values over the time span of 11 years, the average per year .18 events and .09 fatalities. (According to the National Climatic Data Center there have been no recorded property damage or crop damage due to extreme heat events.)

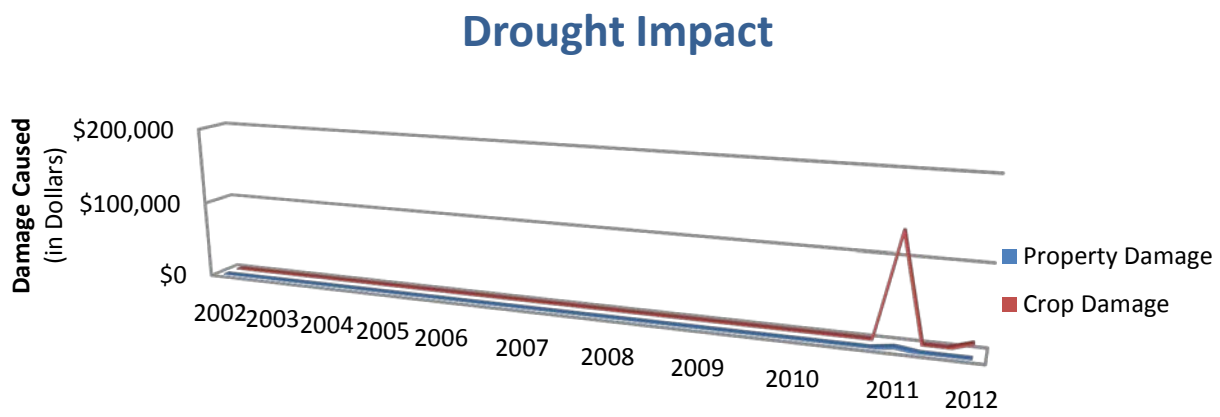


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of extreme heat events to be as follows:

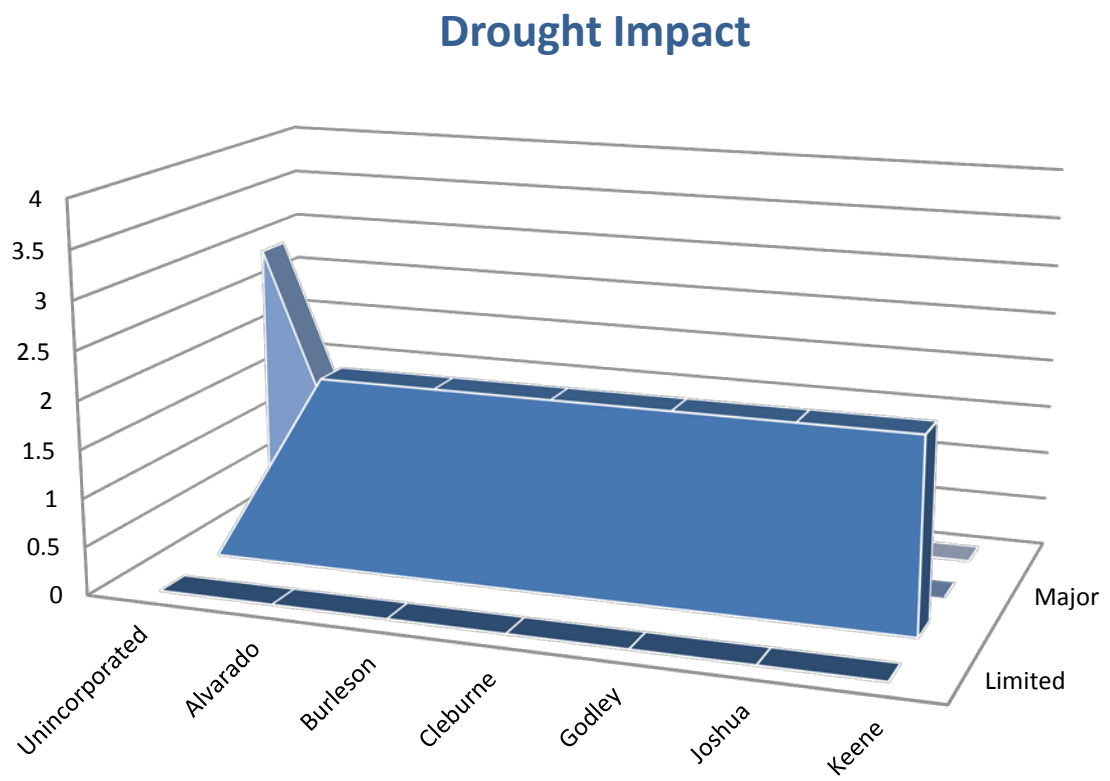


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited	1	1	1	1	1	1	1
Minor							
Major							
Substantial							

Drought According to the historical data recorded by the National Climatic Data Center, there have been 27 drought events recorded during 01/01/2002-12/31/2012. These events have caused a recorded total of $4,000 in property damage and $141,000 in crop damage. Using these historical values over the time span of 11 years, the average per year is 2.45 events, $363 in property damage, and $12,818 in crop damage. (According to the National Climatic Data Center, there have been no recorded injuries or fatalities or due to drought events.)

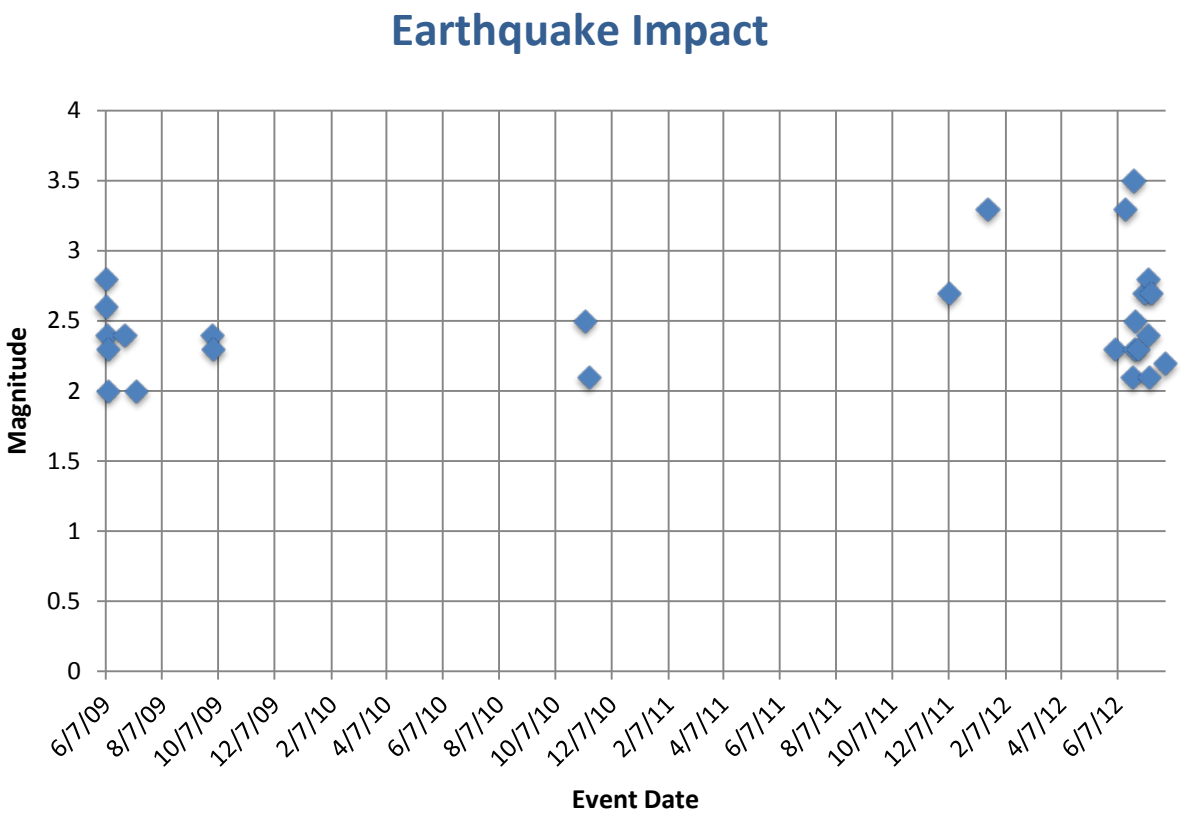


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of drought events to be as follows:

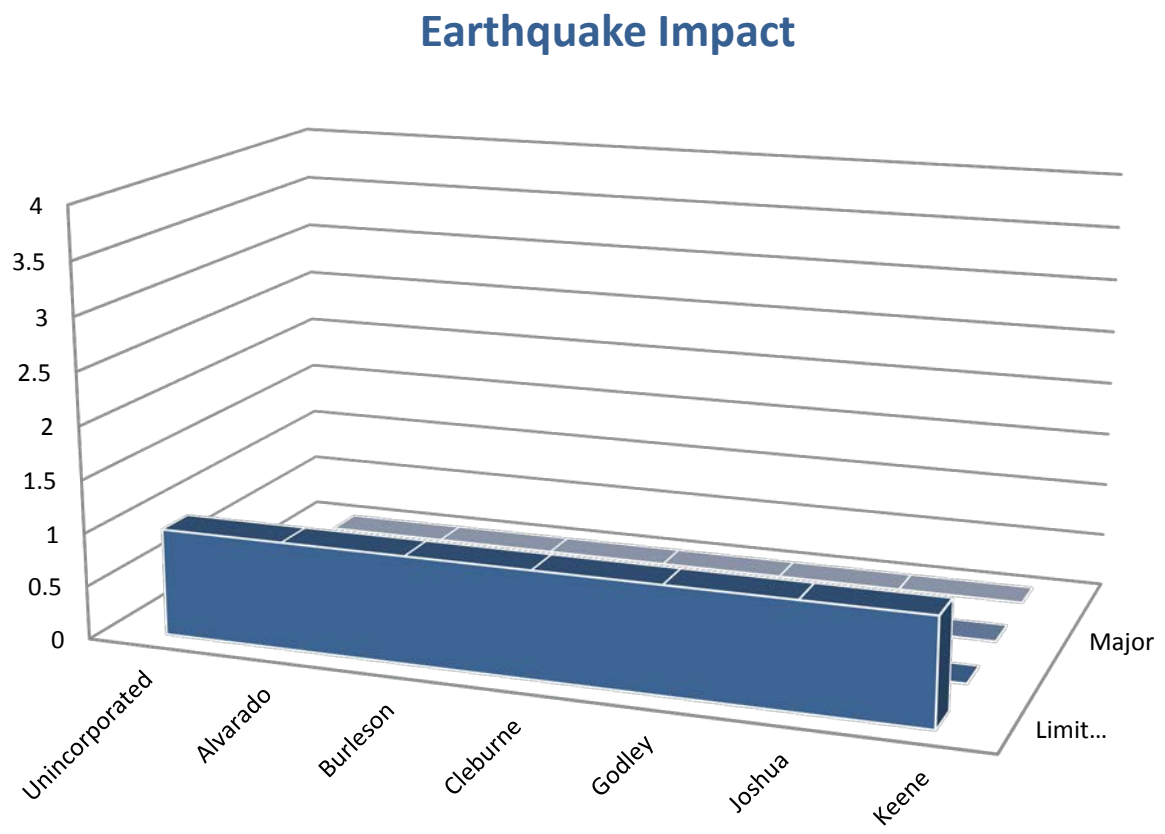


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited							
Minor		2	2	2	2	2	2
Major	3						
Substantial							

Earthquake According to the North Central Texas Regional Hazard Assessment Tool, there have been 26 earthquake events during 01/01/2002 and 12/31/2012 in Johnson County. There is no record of these events causing any damages, injuries, or fatalities.



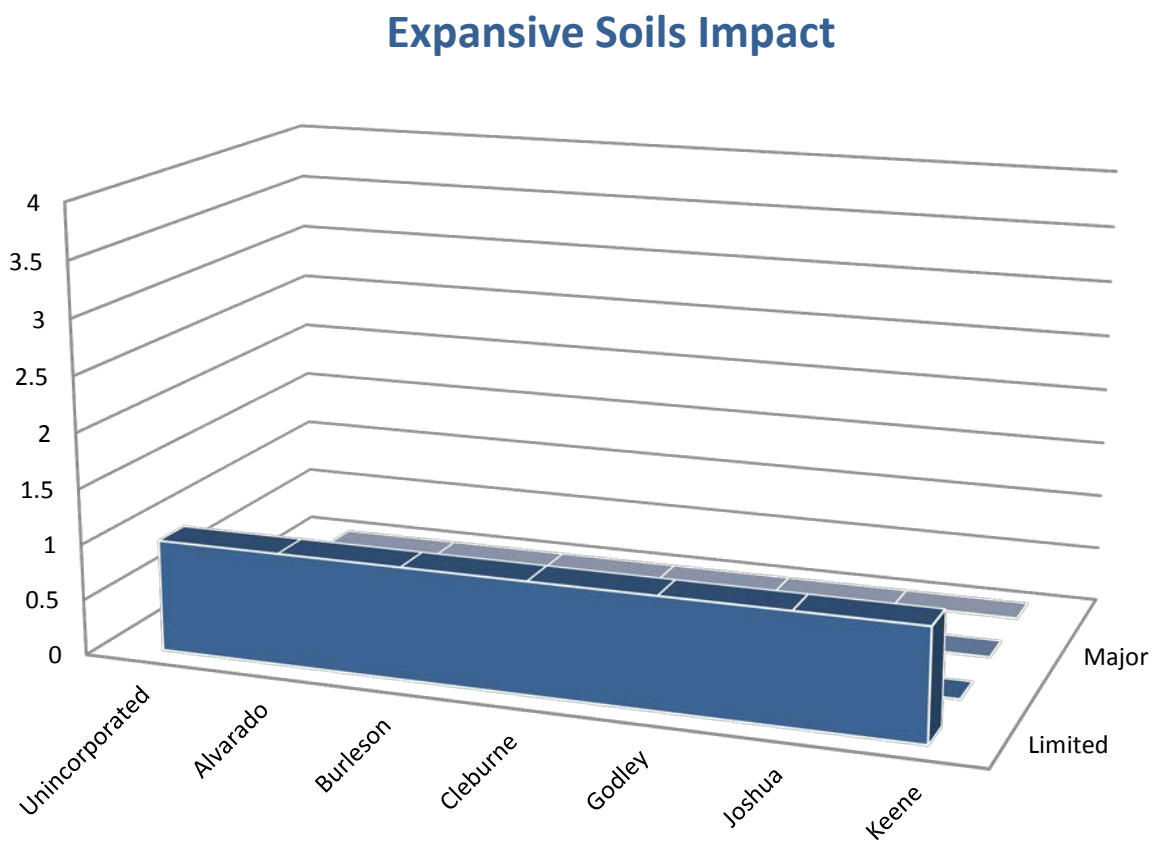
Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of earthquake events to be as follows:



	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited	1	1	1	1	1	1	1
Minor							
Major							
Substantial							

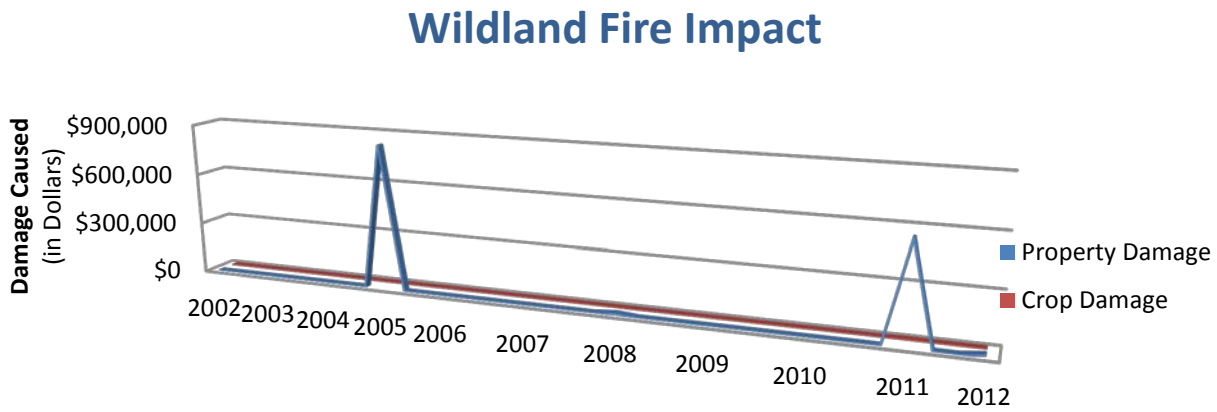
Expansive Soils There is no event history for expansive soils in Johnson County. There have been no reported effects of expansive soils on any Johnson County structures. However, there is potential for future damage.

Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of earthquake events to be as follows:

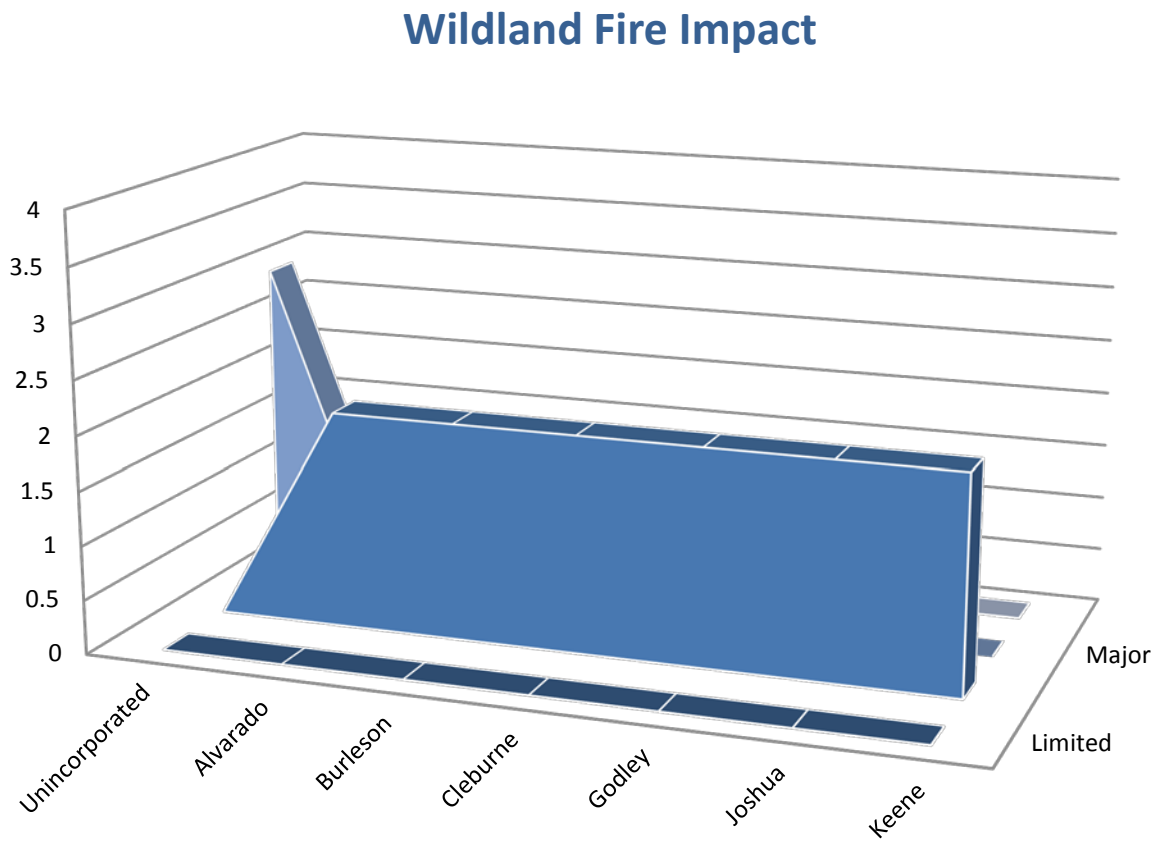


	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited	1	1	1	1	1	1	1
Minor							
Major							
Substantial							

Wildland Fire According to historical data recorded by the National Climatic Data Center, there have been 7 wildland fire events during 01/01/2002-12/31/2012 in Johnson County. These events have caused a recorded total of $1,449,000 in property damage and $2,500 in crop damage. Using these historical values over the time span of 11 years, the average per year is .64 events, $131,727 in property damage, and $227 in crop damage. (According to the National Climatic Data Center, there have been no recorded injuries or fatalities due to wildland fire events.)

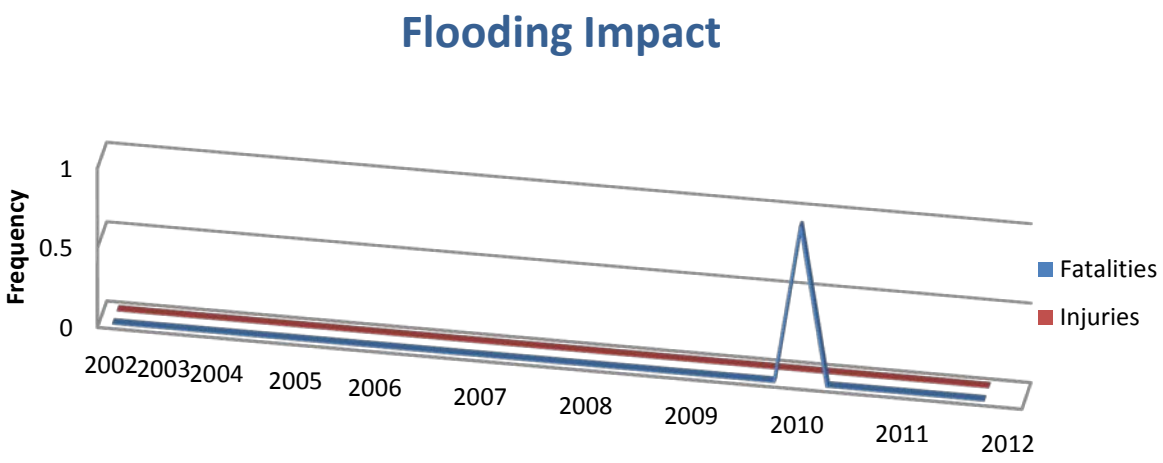


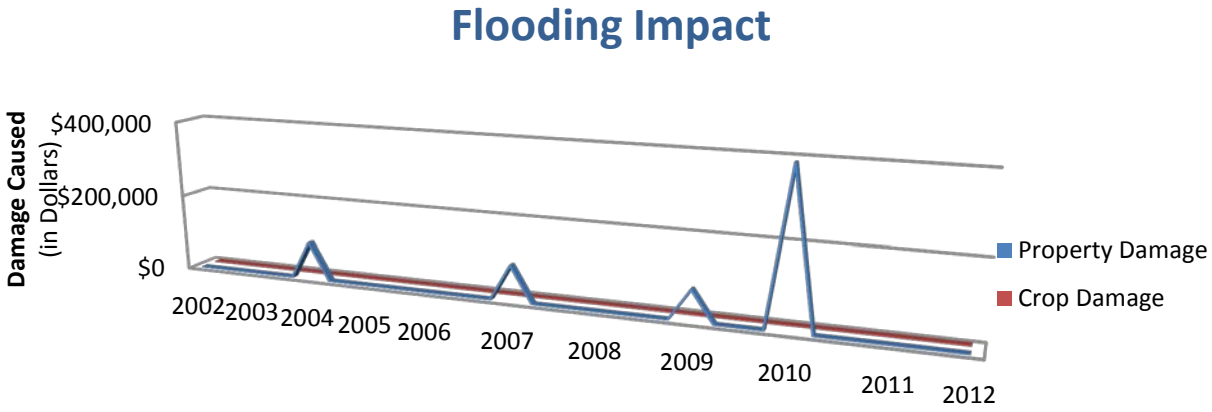
Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of wildland fire events to be as follows:



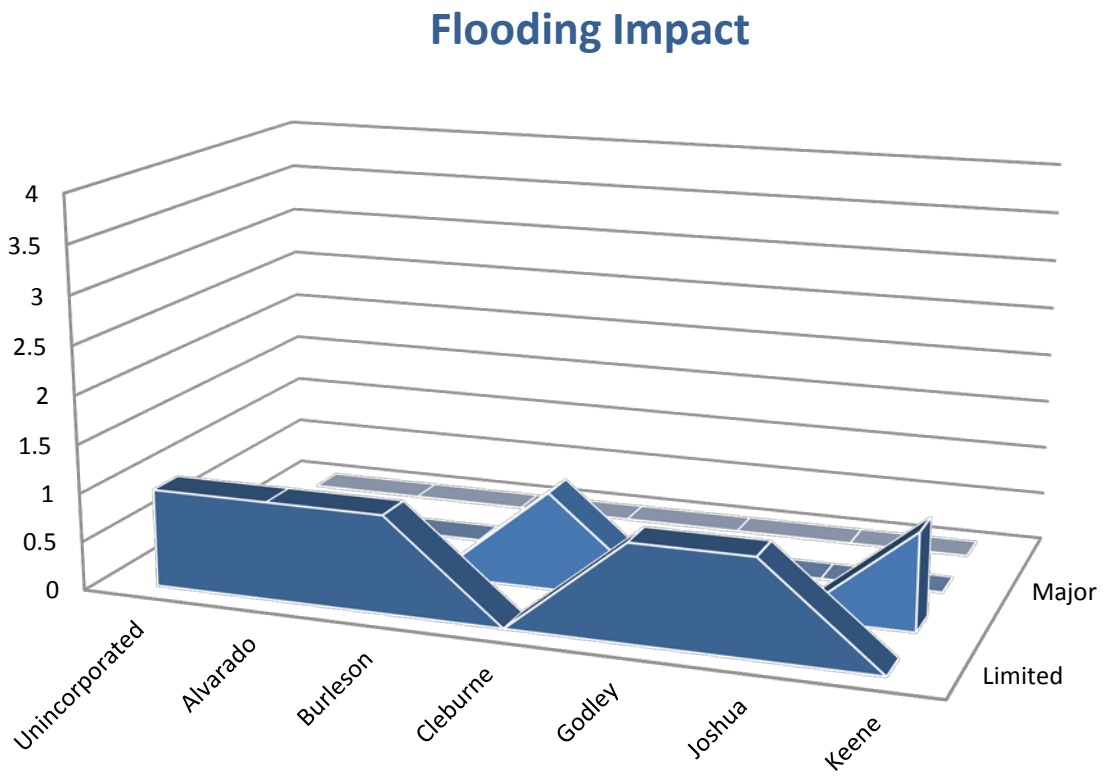
	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited							
Minor		2	2	2	2	2	2
Major	3						
Substantial							

Flooding According to the historical data recorded by the National Climatic Data Center there have been 25 flash flood and flood events during 01/01/2002-12/31/2012. These events have caused a recorded total of 1 fatality and $679,000 in property damage. Using these historical values over the time span of 11 years, the average per year is 2.27 events, .09 fatalities, and $61,727 in property damage.



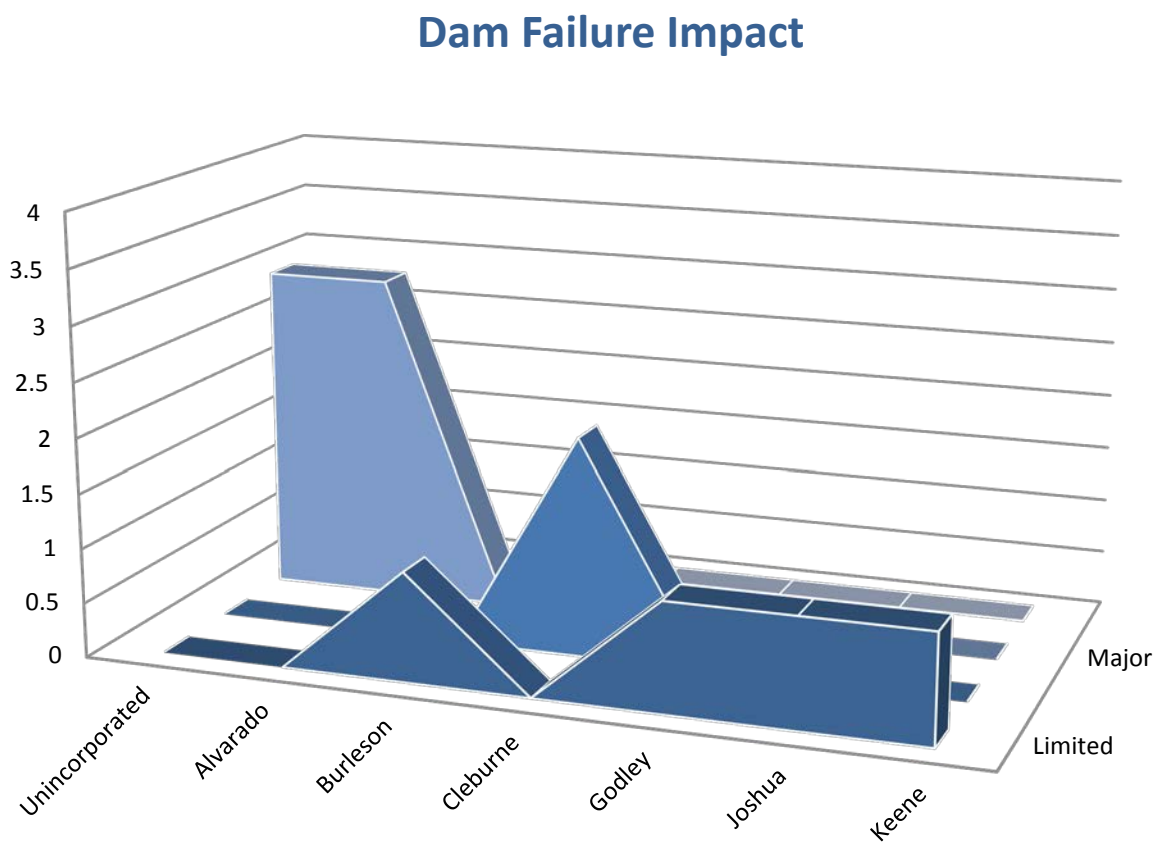


Utilizing the provided definitions, as well as land use maps, the participating jurisdictions have assessed the impact of flooding events to be as follows:



	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited	1	1	1		1	1	
Minor				1			1
Major							
Substantial							

Dam Failure There is no historical data on dam failure in Johnson County, or in the state of Texas. However, there are 4 “high hazard” dams in the participating jurisdictions or at the responsibility of participating jurisdictions. Dams are located near residential areas and unincorporated areas. It is expected that a dam failure would cause a significant cascading effect of flooding through inundation zones, water supply disruption, and critical infrastructure failure.



	Unincorporated	Alvarado	Burleson	Cleburne	Godley	Joshua	Keene
Limited			1		1	1	1
Minor				2			
Major	3	3					
Substantial							

3.6 Structures, Losses, and Trends

In order to better understand and mitigate vulnerabilities to natural hazards an overview assessment of the types of structures in the planning areas has been conducted. This overview shows those structures which are either in a greater vulnerability area (i.e. 100 yr flood zone) or those who are traditionally known to not withstand natural hazards, which incorporate severe weather elements such as strong wind, hail, severe rains, and lightning. This section details vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the planning area, and estimates the potential dollar losses to those vulnerable structures.

Planning Methodology for Structure Vulnerability Assessment. To determine structure vulnerability, in terms of types and numbers, parcel data was used from the Johnson County Appraisal District to determine the total land and structure values. This was then broken out into the categories and sub-categories of residential, commercial and utilities, and infrastructure to differentiate between the types of structures and the different vulnerabilities each type presented. The parcel data was mapped using GIS layers and overlays consisting of FEMA DFIRMS, critical infrastructure, and land use maps to provide information regarding targeted hazard vulnerabilities.

For planning purposes, the parcel data used represents the average number of specific types of structures within those parcels. The value for each of the types of structures represented within the specific parcel is aggregated structure value for the specific structure type based on Appraisal District Data. Parcels which intersect the floodplain are considered to have a vulnerability assessment of impacted, regardless of whether the entire parcel was encompassed by the floodplain.

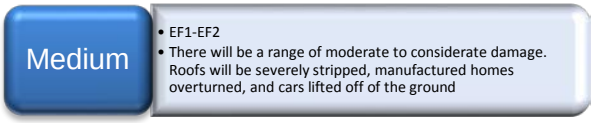
The chart below shows the total number of parcels and their values for each jurisdiction, as well as the overall totals.

	Total Parcels	Est. Value
County	38,188	$1,025,939,409
Alvarado	1,903	$52,524,272
Burleson	12,162	$377,674,445
Cleburne	493	$11,028,836
Godley	2,585	$75,980,393
Joshua	2,094	$48,953,218
Keene	12,846	$451,666,620
Total	**70,271**	**$2,043,767,193**

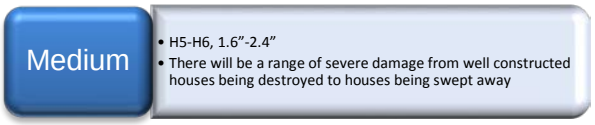
Hazard Specific Structure Vulnerability The hazards identified within the Johnson County Hazard Mitigation Action Plan affect structures to different extents based on previous occurrence and event data and forecast for the future, as well as extent and impact forecasted for future events. Hazards that affect the entire planning area and those structures throughout the planning area are detailed below.

As in section 3.1 hazards will continue to be divided by those which have the potential to affect the entire planning area equally and those which occur in geographical specific locations.

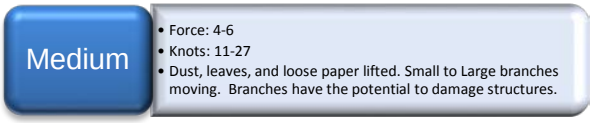
The following hazards affect the entire planning area equally thus will rely on the structure value chart from page 3-110.



Tornado Based on the historical data for the 16 tornado events in Johnson Country that caused a total of $25,975,000 in structure damage and $2,000 in crop damage; previous events occurrence forecast ranging from likely to highly likely; and that the extent of a tornado hazard in the planning area has been assessed as overall medium; the estimated damage to structures with in the planning area is an average per year of $2,361,363 in structure damage, affecting all structure types. Residential structures, especially manufactured and single family homes, are particularly vulnerable to the effects of tornadoes.



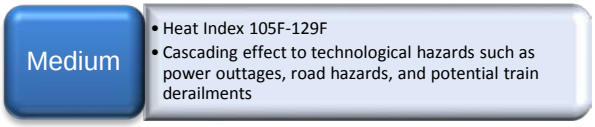
Hail Based on the previous 68 recorded hail events in Johnson County that caused a total of $1,099,000 in structure damage; previous events occurrence forecast ranging from likely to highly likely; and that the extent of hail in the planning area has been assessed overall as medium; the estimated damage to structures within the planning area is an average per year is $99,909 in structure damage, affecting all structure types, especially manufactured and single family homes.



High Winds Based on the historical data for the 94 wind events in Johnson County that caused a total of $7,604,000 in structure damage; previous events occurrence forecast ranging from likely to highly likely; and that the extent of high winds in the planning area has been assessed as overall medium; the estimated damage to structures within the planning area is an average per year of $691,272 in structure damage, affecting all structure types. Residential structures, especially manufactured and single family homes, are particularly vulnerable to the effects of high wind. In addition, there were five lighting events recorded that resulted in $365,000 in structural damage.

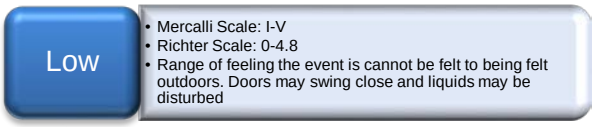
Winter Storm Based on the historical data for the 11 winter storm events in Johnson County that caused a total $682,000 in structure and property damage; previous events occurrence forecast as occasional; the extent of winter storms hazard in the planning area has been assessed as low; the estimated damage per year being $62,000 in property damage, affecting all structure types. Residential structures, especially manufactured and single-family homes, are particularly vulnerable to winter storms. Due to the rarity of winter storm events, roughly one per year, many homeowners do not have sufficient tree limb maintenance plans in place.

Extreme Heat Extreme heat would have the same effect as drought. However, if both were occur in conjunction, the effect would be magnified and would cause greater damage.

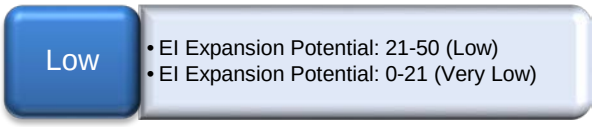


Drought Based on the historical data of the 27 drought events in Johnson County that caused a total of $141,000 in crop damage; the previous events occurrence ranging from likely to highly likely; and that the extent of drought has been overall medium. The structure types most vulnerable to drought are infrastructure and all types of buildings (commercial, residential, and utilities). Based on the assessment, the next drought event is projected to occur in the next 1-3 years.

Earthquake Based on the 26 previous earthquakes in Johnson County, with the largest rated at a 3.5 on the Richter Scale; previous events occurrence forecast of occasional to highly likely; and that the extent of an earthquake in the planning area has been assessed as overall low; the estimated damage to structures within the planning area is relatively low. An assessed rating of low, as depicted in the extent section, determines that the effect on structures would be relatively minor. As stated in 3.1, all structures are equally vulnerable to the possibility of the New Madrid Fault.

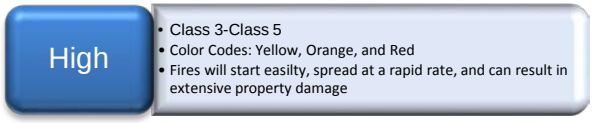


Expansive Soils Based on having no previous record of damage from expansive soils within the boundaries in Johnson County; a previous events occurrence of unlikely; and that the extent of expansive soils in the planning area has been assessed as low; the estimated damage to structures in the area is also low.

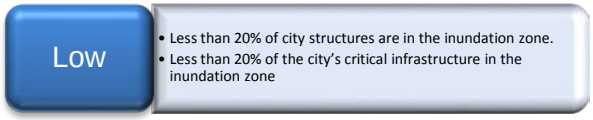


The following hazards are considered to be geographically defined. These hazards only affect certain areas within the planning area and those structures in that geographically defined area are detailed below. There are three hazards which are evaluated as geographically specific. Wildland Fire, Dam Failure, and Flooding. For Wildland Fire and Dam Failure the following charts may be used to estimate structure values which could be vulnerable. Further discussion is provided in the following hazard descriptions.

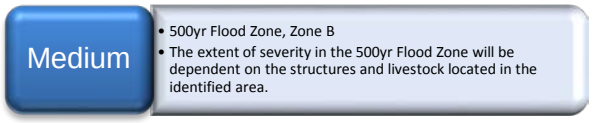
Wildland Fire Based on the historical data for the 7 wildland fire events in Johnson County that have caused a total of $1,449,000 in structure damage; previous events occurrence forecast ranging from unlikely to highly likely; and that the extent of a wildland fire event in the planning area has been assessed as overall high; the estimated damage to structures within the planning area is minimal. Based on the Fire Danger chart description of High, or Code Red/Class 3, potential fires are likely to become serious and control is difficult. This is especially true if the fire is started in a wildland or open space area. Wildland fire danger becomes a higher vulnerability when combined with the high wind hazard and would be much more likely to move into areas where it would affect residential structures, especially manufactured and single family homes if not prevented or stopped in time. The estimated damage to structures within the planning area is an average per year of $131,727 in structure damage, affecting all structure types.



Dam Failure Based on the fact that there is no historical data in Johnson County of a dam failure or in the State of Texas the future occurrence prediction is unlikely. However, there are 4 identified high hazard dams in participating jurisdictions or at the responsibility of the participating jurisdictions. Dams are located within residential areas and unincorporated areas. It is expected that a significant dam failure would cause a cascading effect of flooding through inundation zones, water supply disruption, and critical infrastructures. The overall anticipated average for extent is low meaning that less than 20% of the structures are in the inundation zone. Thus the structures have been identified in values of 5%, 10%, and 15% for planning purposes.



Flooding Based on the historical data for the 25 flood events in Johnson County that caused a total of $679,000 in structure damage; previous events occurrence forecast ranging from occasional to likely; and that the extent of flooding in the planning area has been assessed as overall medium; the estimated damage to structures within the planning area is an average per year of $61,727 in structure damage, affecting all structure types.



The following charts are an estimate based off the 2012 Johnson County Appraisal District parcel data depicting the types of structures and their costs which are within the 100 year and 500 year zones.

Single Family Homes This section details vulnerability in terms of types and numbers located in the planning area, and estimates the potential dollar losses to those vulnerable structures within each jurisdiction of the Johnson County HazMAP

Johnson County Flood Vulnerability: Single Family Homes

	Single Family Homes	Est. Value
County	1,638	$263,463,938
Alvarado	39	$1,383,414
Burleson	429	$55,072,174
Cleburne	771	$66,893,143
Godley	39	$1,048,954
Joshua	143	$18,820,354
Keene	35	$3,431,923
Total	3,094	$410,113,900

Manufactured Homes This section details vulnerability in terms of the types and numbers located in the planning area, and estimates the potential dollar losses to those vulnerable structures within each jurisdiction of the Johnson County HazMAP.

Johnson County Flood Vulnerability: Manufactured Homes

	Manufactured Homes	Est. Value
County	874	$58,283,043
Alvarado	7	$206,637
Burleson	26	$1,836,875
Cleburne	13	$659,572
Godley	6	$77,375
Joshua	18	$1,004,028
Keene	6	$681,266
Total	950	$62,748,796

Multi-Family Homes This section details vulnerability in terms of the types and numbers located in the planning area, and estimates the potential dollar losses to those vulnerable structures within each jurisdiction of the Johnson County HazMAP

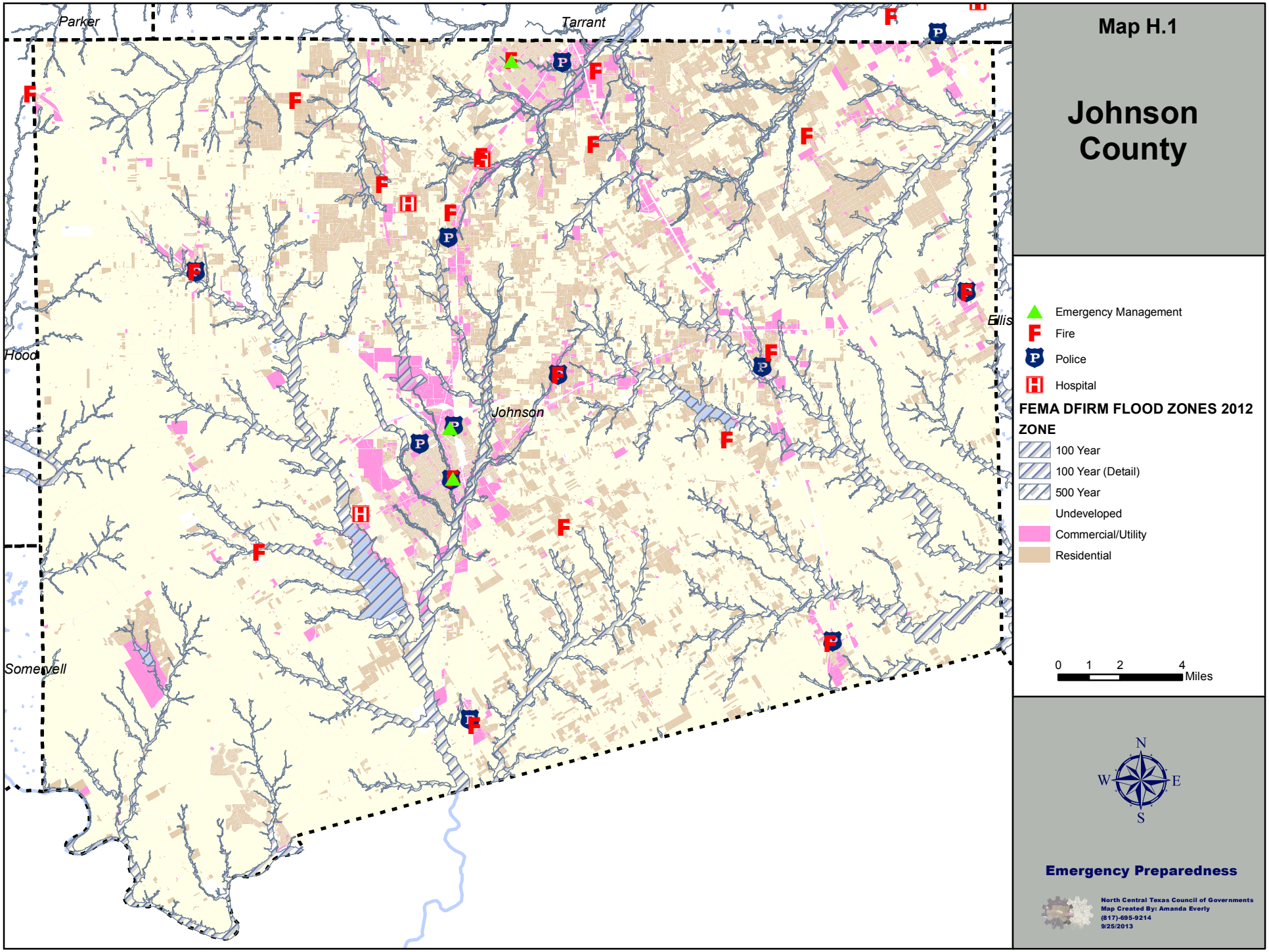
Johnson County Flood Vulnerability: Multi-Family Homes		
	Multi-Family Homes	Est. Value
County	7	$925,142
Alvarado	1	$73,181
Burleson	24	$8,797,792
Cleburne	37	$12,576,435
Godley	3	$850,758
Joshua	0	$0
Keene	17	$2,559,962
Total	89	$25,783,270

Commercial and Utilities Facilities This section details vulnerability in terms of the types and numbers located in the planning area, and estimates the potential dollar losses to those vulnerable structures within each jurisdiction of the Johnson County HazMAP

Johnson County Flood Vulnerability: Commercial & Utilities Facilities		
	Commercial & Utilities Facilities	Est. Value
County	151	$89,928,039
Alvarado	36	$2,378,071
Burleson	175	$279,240,136
Cleburne	305	$130,311,891
Godley	20	$1,455,050
Joshua	29	$7,235,612
Keene	31	$20,010,423
Total	747	$530,559,222

Development Trends Map Series H provides a detailed overview of the locations of critical infrastructure, residential, commercial, and undeveloped land as well as fire stations, police stations, emergency operations centers, and hospitals. The Johnson County Hazard Mitigation Action Plan has city zoning ordinances which establish a land development trend of building outside of the flood plains. Mitigation measures and the Johnson County Hazard Mitigation Action Plan will continue to be used and assessed in future city plan development.

Map Series H	Development Trends
	Map H.1 Johnson County
	Map H.2 City of Alvarado
	Map H.3 City of Burleson
	Map H.4 City of Cleburne
	Map H.5 City of Godley
	Map H.6 City of Joshua
	Map H.7 City of Keene


Parker
Tarrant
Hood
Johnson
Ellis
Somervell
Map H.1
Johnson County
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
0 1 2 4
Miles
N
W
E
S
Emergency Preparedness
North Central Texas Council of Governments
Map Created By: Amanda Everly
(817)-695-9214
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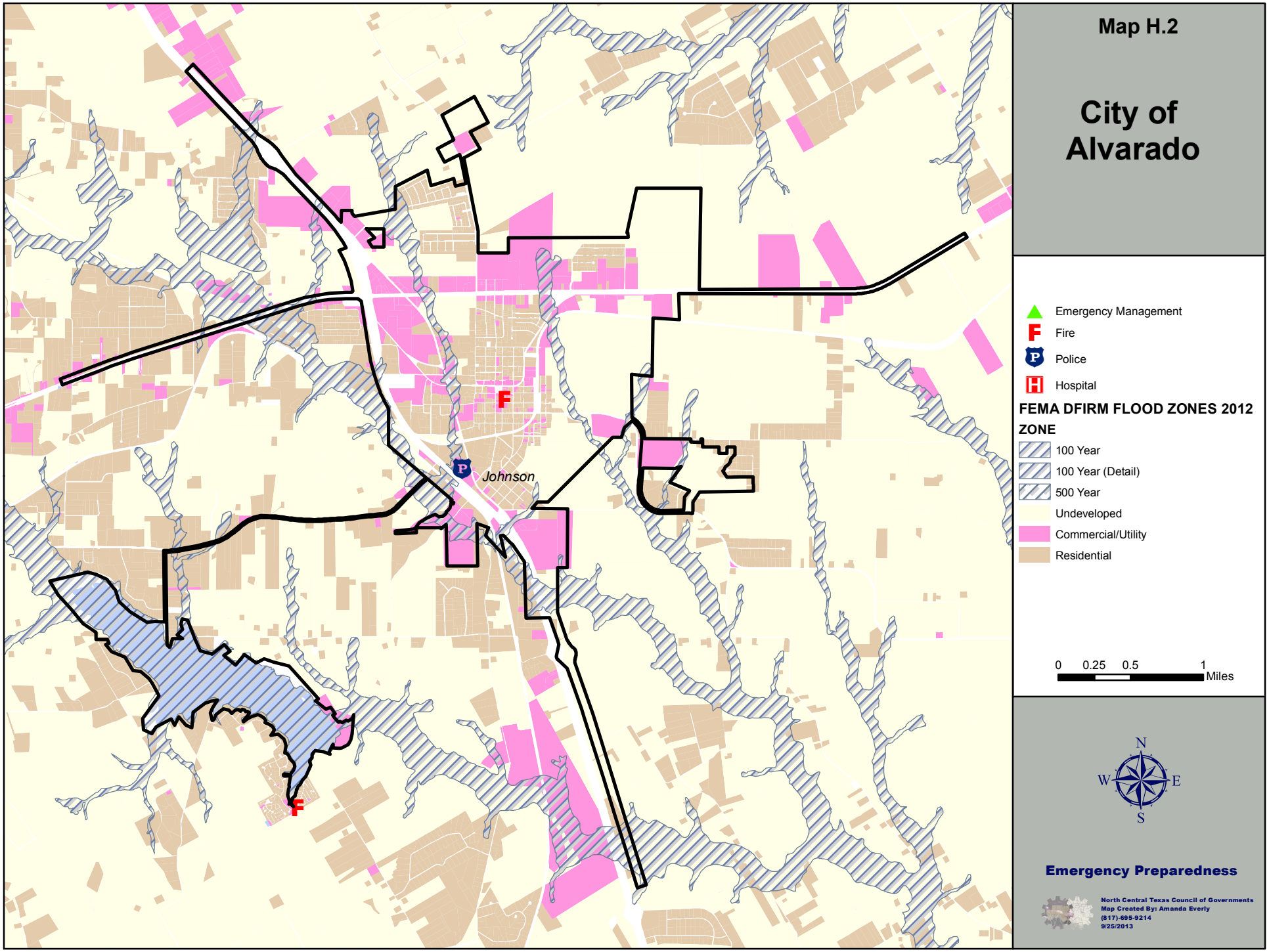
Map H.2
City of Alvarado
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
0 0.25 0.5 1
Miles
Johnson
N
W
E
S
Emergency Preparedness
North Central Texas Council of Governments
Map Created By: Amanda Everly
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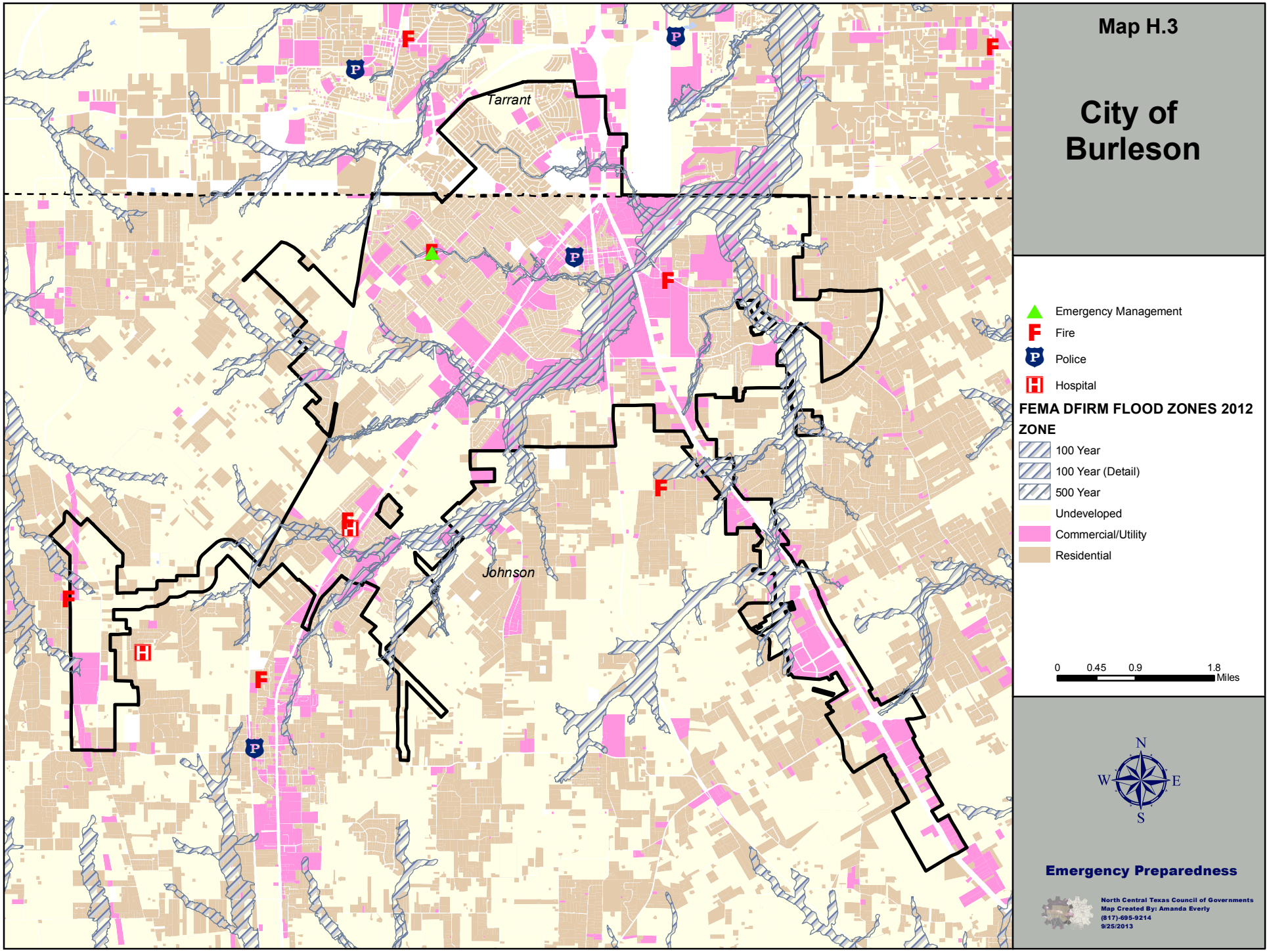
Tarrant
Johnson
Map H.3
City of Burleson
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
0 0.45 0.9 1.8
Miles
N
W
E
S
Emergency Preparedness
North Central Texas Council of Governments
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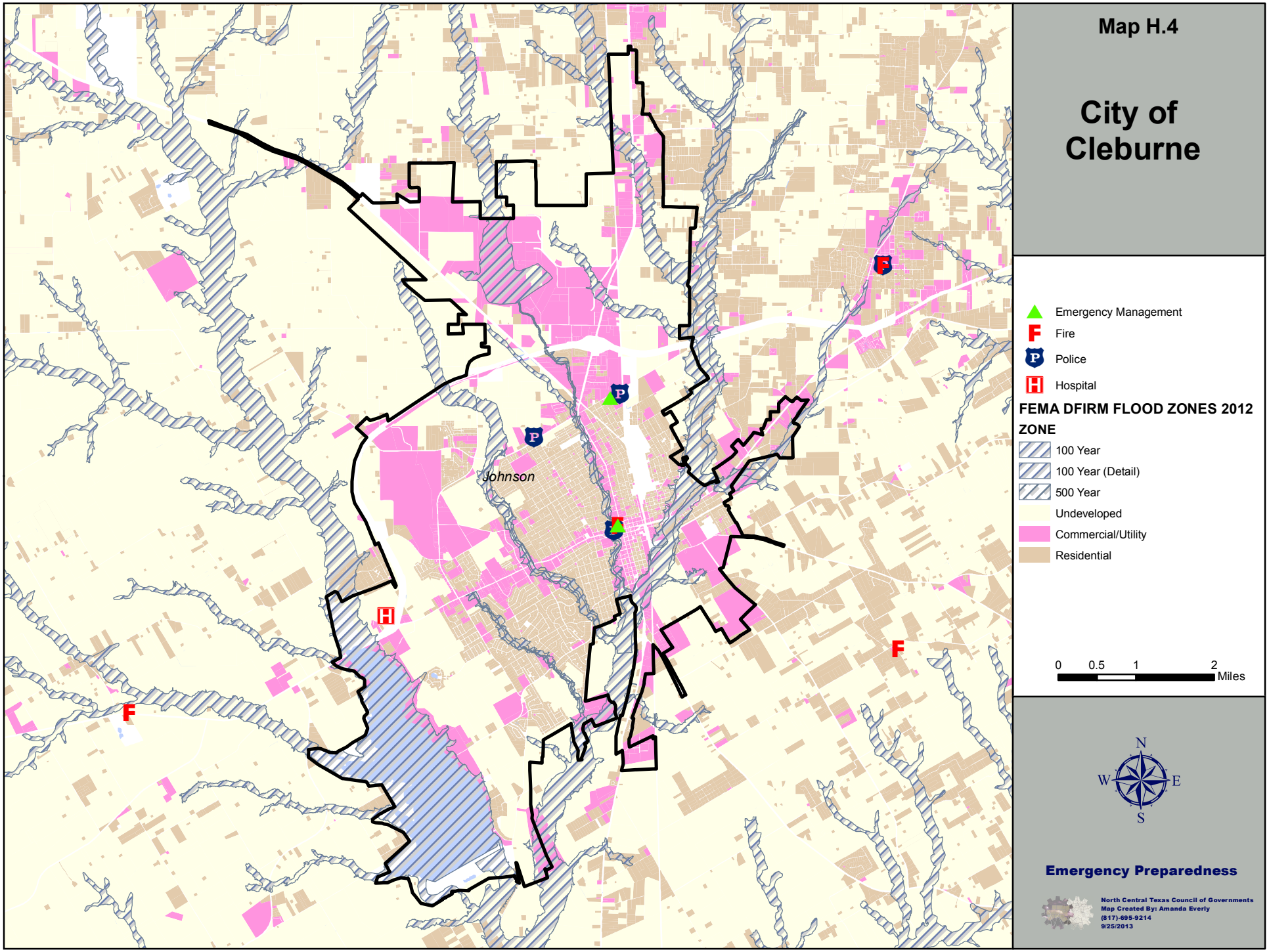
Map H.4
City of Cleburne
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
0 0.5 1 2
Miles
N
W E
S
Johnson
Emergency Preparedness
North Central Texas Council of Governments
Map Created By: Amanda Everly
(817)-695-9214
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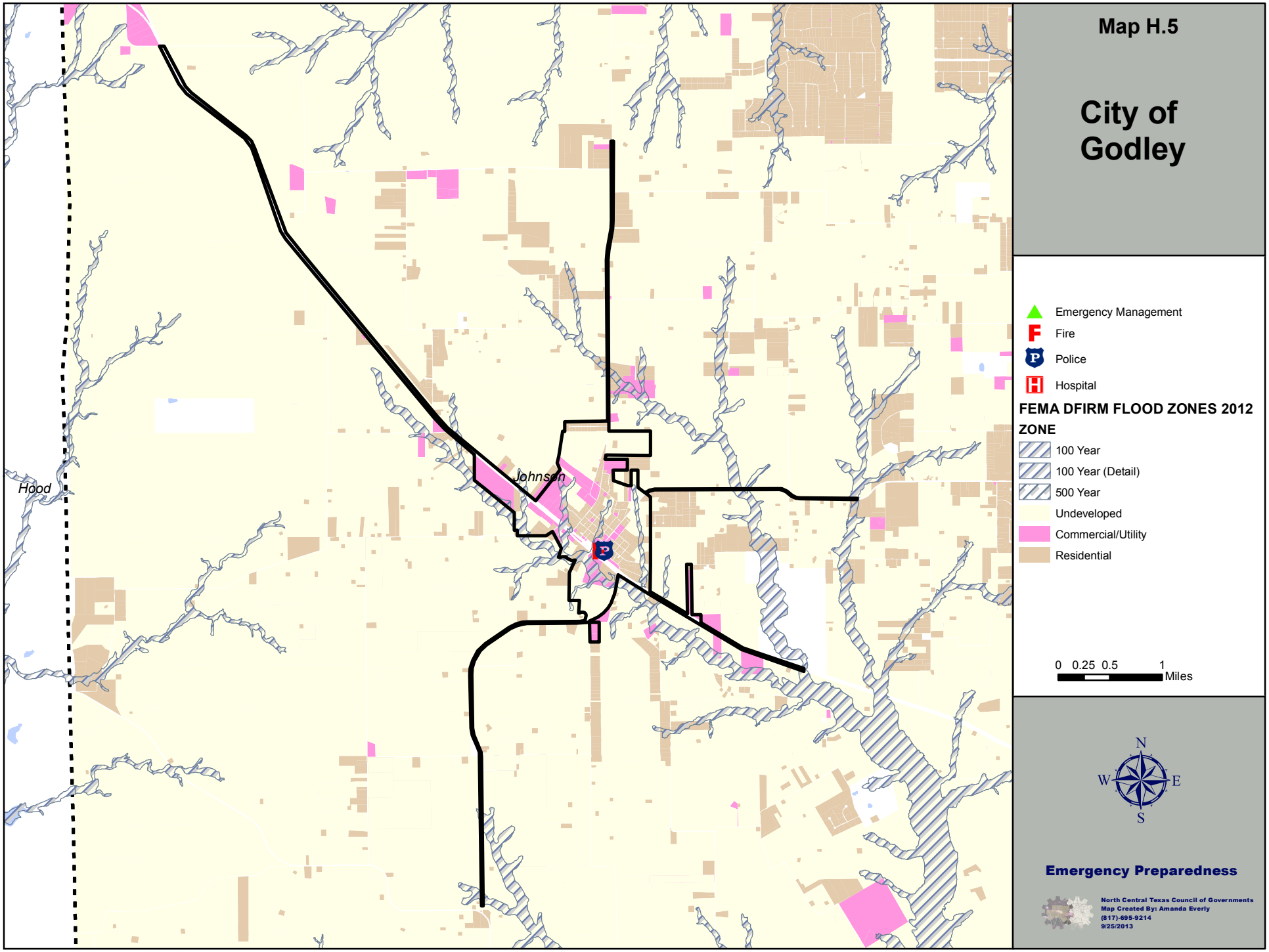

Map H.5

City of Godley

- Emergency Management
- Fire
- Police
- Hospital

FEMA DFIRM FLOOD ZONES 2012

ZONE

- 100 Year
- 100 Year (Detail)
- 500 Year
- Undeveloped
- Commercial/Utility
- Residential

0 0.25 0.5 1 Miles

N W E S

Emergency Preparedness

North Central Texas Council of Governments
Map Created By: Amanda Everly
(817)-695-9214
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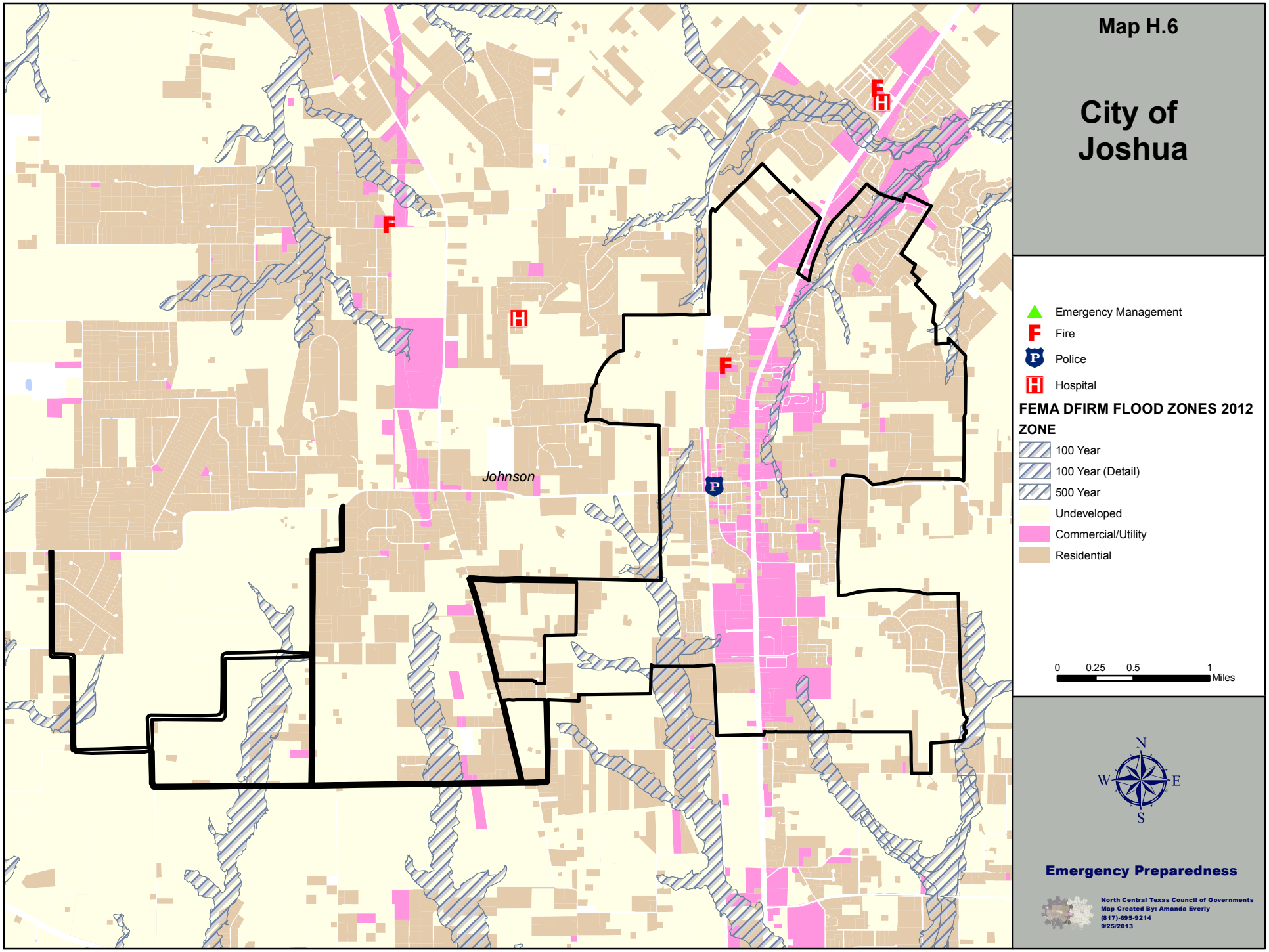
Map H.6
City of Joshua
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
Johnson
0 0.25 0.5 1 Miles
N
W E
S
Emergency Preparedness
North Central Texas Council of Governments
Map Created By: Amanda Everly
(817)-695-9214
9/25/2013

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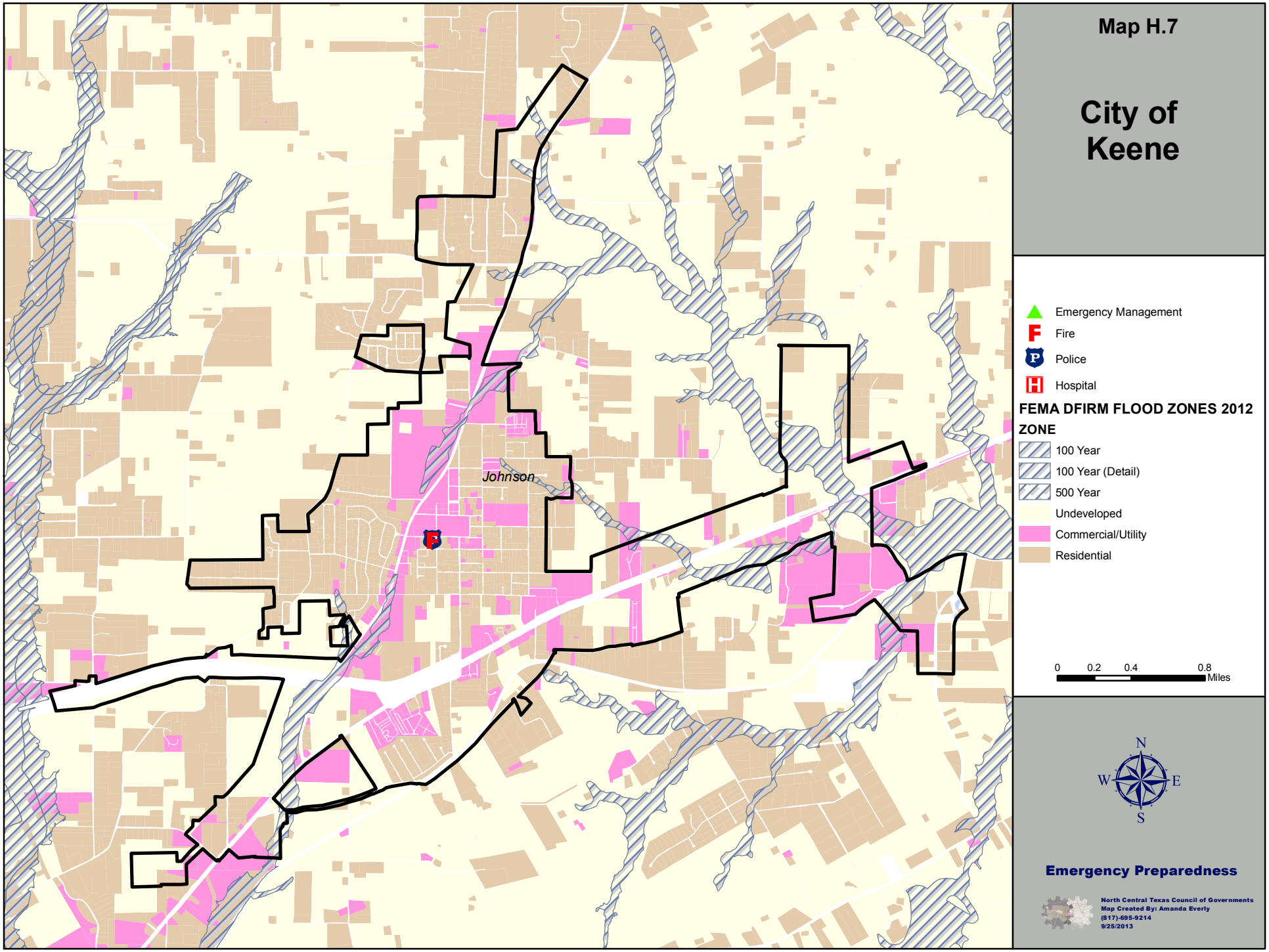
Map H.7
City of Keene
Johnson
Emergency Management
Fire
Police
Hospital
FEMA DFIRM FLOOD ZONES 2012
ZONE
100 Year
100 Year (Detail)
500 Year
Undeveloped
Commercial/Utility
Residential
0 0.2 0.4 0.8
Miles
N
W
E
S
Emergency Preparedness
North Central Texas Council of Governments
Map Created By: Amanda Everly
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3.7 Repetitive Loss Properties

Vulnerability of Repetitive Loss Properties The National Flood Insurance Reform Act of 2004 recognized repetitive loss as a significant problem and defined severe repetitive loss as:

> Four or more paid flood losses of more than $1,000 each; or
>
> Two paid flood losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property; or
>
> Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property.

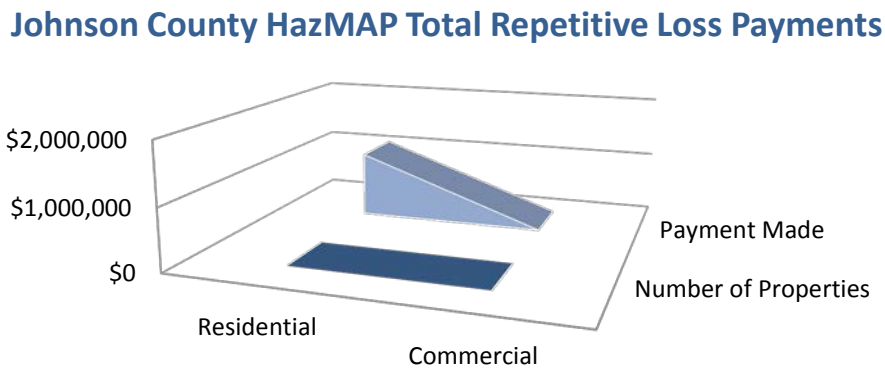
The loss history includes all flood claims paid on an insured property, regardless of any change of ownership, since the building's construction or back to 1978 if the building was constructed prior to 1978. The following chart lists all losses for the Johnson County planning area and was utilized in identifying Repetitive Loss property based on the FEMA screening criteria.

Texas Loss Statistics from January 1, 1978 through report September 9, 2013

Community Name	Total Payments	Closed Losses	Open Losses	CWOP Losses	Total Losses
Johnson County	$574,305	27	0	0	27
City of Alvarado	$0	0	0	0	0
City of Burleson	$245,041	12	0	0	12
City of Cleburne	$225,196	21	0	0	21
City of Godley	$0	0	0	0	0
City of Joshua	$0	0	0	0	0
City of Keene	$35,031	2	0	0	2

Types and Numbers of Repetitive Loss Properties The National Flood Insurance Program structures that have been repetitively damaged in floods have been assessed within Johnson County HazMAP, and provide a basis for addressing overall participating jurisdiction vulnerability in the terms of types and numbers of repetitive loss properties located within the identified hazard areas.

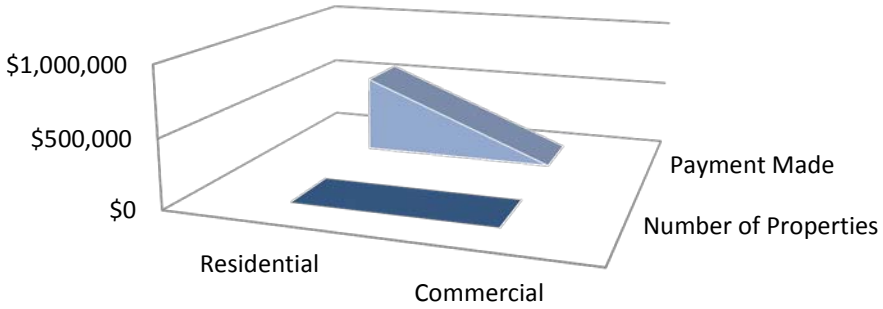
The following chart provides an overview for the entire planning area and subsequent charts provide specific information for types and numbers of repetitive loss properties.



	Residential	Commercial
Number of Properties	26	0
Payment Made	$1,079,572.00	$0.00

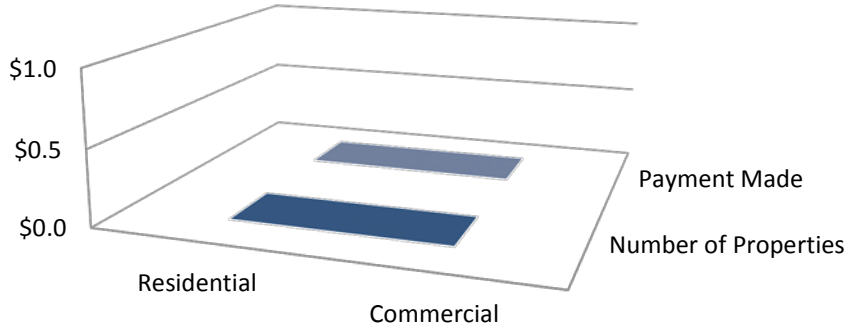
Jurisdiction Repetitive Loss Properties The following tables demonstrate the number and type of structures for each jurisdiction which are known to be repetitive loss properties as defined by FEMA in the Johnson County Hazard Mitigation Action Plan.

Unincorporated County Repetitive Loss Payments



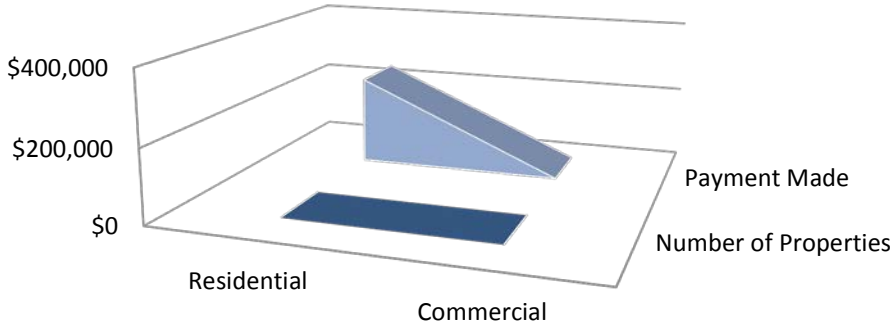
	Residential	Commercial
Number of Properties	11	0
Payment Made	$574,305.00	$0.00

City of Alvarado Repetitive Loss Payments



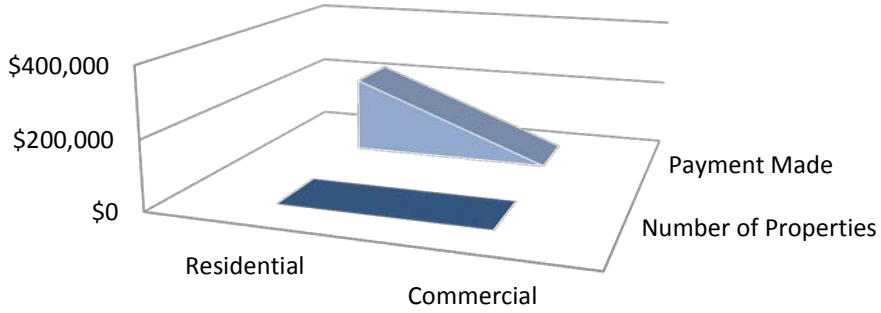
	Residential	Commercial
Number of Properties	0	0
Payment Made	$0.00	$0.00

City of Burleson Repetitive Loss Payments



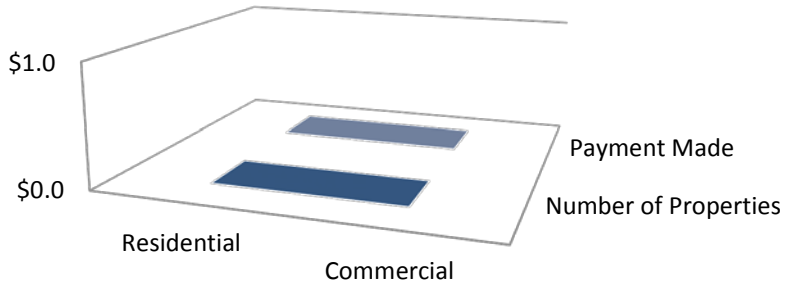
	Residential	Commercial
Number of Properties	6	0
Payment Made	$245,041.00	$0.00

City of Cleburne Repetitive Loss Payments



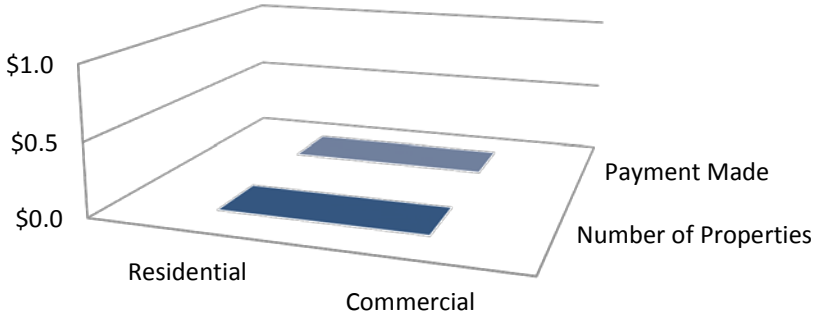
	Residential	Commercial
Number of Properties	8	0
Payment Made	$225,196.00	$0.00

City of Godley Repetitive Loss Payments



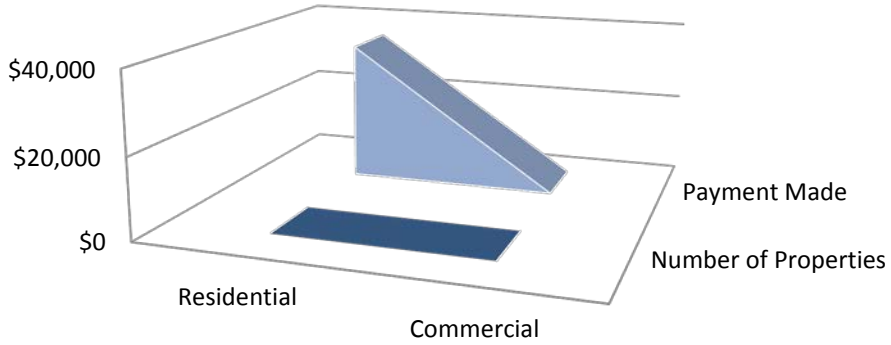
	Residential	Commercial
Number of Properties	0	0
Payment Made	$0.00	$0.00

City of Joshua Repetitive Loss Payments



	Residential	Commercial
Number of Properties	0	0
Payment Made	$0.00	$0.00

City of Keene Repetitive Loss Payments



	Residential	Commercial
Number of Properties	1	0
Payment Made	$35,031.00	$0.00

Chapter Four: Mitigation Goals and Action Items

Chapter Four of the Johnson County Hazard Mitigation Action Plan (HazMAP) describes each participating jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand and improve on these existing tools. By participating in the HazMAP, each jurisdiction currently has the necessary authorities, policies, programs, and resources to fulfil the requirements of the plan. By participating in the plan, each jurisdiction has both the ability and willingness to expand and improve on the existing policies and programs.

Hazard mitigation goals are outlined for the Hazard Mitigation Action Plan, and objectives are quantified through individual jurisdiction action items through which each participating jurisdiction plans to accomplish those objectives and reach goal completion. By participating in the plan, each jurisdiction will integrate the requirements of the plan into other planning mechanisms, including but not limited to comprehensive or capital improvement plans, whenever appropriate, as dictated by local policies and procedures.

The chapter identifies specific and identifiable action items for each participating jurisdiction, laying out each action item and how it will be implemented and administered, to include the responsible department, existing and potential funding sources, and the timeframe in which each item will be completed. The action items also present a cost benefit review statement and demonstrate the priority of emphasis on each action item by that particular jurisdiction.

4.1 Goals

The Johnson County Hazard Mitigation Action Plan corporately assessed the mitigation goals of the participating jurisdictions. The following goals and objectives were identified:

Goal 1 **Reduce or eliminate loss of life and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event

Objective 1-B Expand and coordinate Early Warning Systems currently in use

Objective 1-C Reduce or eliminate loss of life and property damage from tornadoes through the construction and use of safe rooms or shelter areas

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards

Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.

Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures

Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards

Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Johnson County

Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss

Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop Public Education Campaigns to educate the public on what actions they can take to mitigate the effects of loss of life or property damage resulting from all natural hazards**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards

Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards

Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program

4.2 Action Items

Each participating jurisdiction's Hazard Mitigation Team (HMT) in the Johnson County Hazard Mitigation Action plan collaboratively created action items based upon the direction of the city as identified in capital improvement Plans and special projects within each city department, as well as identified new mitigation action items within the Hazard Mitigation Action Plan. The mitigation strategy address how the actions will be implemented and administered, including the responsible department, existing and potential resources, and the timeframe to complete each action. The format for the Action Items follows this guideline and addresses the following areas:

1. Action Item Title
2. Hazard(s) Addressed
3. Goal/Objective
4. Priority
5. Estimated Cost
6. Potential Funding Sources
7. Lead Agency/Department Responsible
8. Implementation Schedule
9. Effect on New Buildings
10. Effect on Existing Buildings
11. Cost Effectiveness
12. Discussion

Hazard Mitigation Team representatives collaborated as a Hazard Mitigation Action Plan through the North Central Texas Council of Governments (NCTCOG) to further analyze the mitigation needs as a county.

Cost Benefit Review As specified by C.F.R. §201.6(c)(3)(iii), the prioritization also includes a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed project and their associated costs for each jurisdiction.

The comprehensive range of specific mitigation actions and projects being considered in the Johnson County HazMAP have been determined by each of the Hazard Mitigation Teams. As a part of the prioritization process, there is an emphasis on the use of a cost-benefit review to maximize benefits. Each mitigation action item for the participating jurisdictions has a priority indicator of high, medium, or low, and the cost-benefit review was conducted as a part of determining the priority based on the evaluation criteria of use in current planning mechanisms, public approval, feasibility, and political implications. The priorities were determined by the Hazard Mitigation Teams by examining available jurisdictional funding, local priorities, economic impact, and comparison to special projects, capital improvement plans, plans and studies, and the benefit of the mitigation action in comparison to another or to no action at all.

Action Item Complete Listing The complete listing of each participating jurisdiction's action items is detailed below. Each action item addresses how the actions will be implemented and administered, including the responsible department, existing and potential resources, and the timeframe to complete each action. The action item discussion also includes the jurisdiction's assessed priority according to the prioritization methodology utilized, as well as the results of the cost-benefit review.

See the following Table listings for the detailed action item descriptions.

Section 4.2.A – Unincorporated Johnson County Action Items

4.2.A.1 – Multi-Hazard Action Items

Johnson County Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Dam Failure, Flooding, Hail, High Winds, Tornado, Wildfire, Winter Storm, Earthquake
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$20,000
Potential Funding sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	1 to 2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Potential to save lives.
Discussion	Provide early warning by increasing the use of NOAA All-Hazard Weather Radios in public facilities.

Johnson County Action Item	Installation of automated stream gauges to monitor water levels.
Hazard(s) Addressed	Flooding, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated cost	$120,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Cost savings 30% over sending personnel to monitor streams and low water crossings.
Discussion	Stream gauge installation would allow for more efficient response, as it would be able to provide more timely information on water flow in major drainages.

Johnson County Action Item	Installation and maintenance of a CASA Weather Radar system.
Hazard(s) Addressed	Hail, Tornadoes, High Wind, Wildfire, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$50,000

Potential Funding sources	HMGP, Local Funding
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Increase response decisions by 100%.
Discussion	CASA WX Radar provides the most detailed information available about storms and strong winds. This enhanced view would help persons in public safety and citizens prepare for and respond to, storms and strong winds, more efficiently.

Johnson County Action Item	Implement individual tornado safe room rebate program.
Hazard(s) Addressed	High Wind, Tornadoes, Severe Storms
Goal/Objective	1-C, 2-D
Priority	High
Estimated cost	$250,000
Potential Funding sources	HMGP, PHMGP, Resident Match
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	12 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	Some buildings modified for shelter retrofit.
Cost Effectiveness	Moderate
Discussion	Residential safe room shelters have the potential to decrease personal injuries and death during severe weather, tornado, or high wind events.

Johnson County Action Item	Implement system for ensuring maintenance of utility infrastructure in easement right-of-ways are clear of obstructions.
Hazard(s) Addressed	Winter Storms, Wildfire, Extreme Heat
Goal/Objective	3-C
Priority	Medium
Estimated cost	$100,000
Potential Funding sources	HMGP, Utility Special District Match
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Moderate

Discussion	Clearing trees and brush from around power lines would reduce potential power line damage during winter storms, wildfire events, or extreme heat, ensuring power remains delivered.

Johnson County Action Item	Develop damage assessment systems utilizing citizen teams and volunteers.
Hazard(s) Addressed	Earthquake, Hail, High Winds, Tornadoes, Winter Storms
Goal/Objective	3-C, 4-A
Priority	Medium
Estimated cost	$8,000
Potential Funding sources	HMGP, General Fund
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	The use of citizen volunteers for post damage assessment increases the speed at which damage reports are completed and frees up paid personnel for more critical assignments.

4.2.A.2 Tornado Action Items

Johnson County has no individual action items for Tornadoes.

4.2.A.3 – Hail Action Items

Johnson County has no individual action items for Hail.

4.2.A.4 – High Wind Action Items

Johnson County has no individual action items for High Winds.

4.2.A.5 – Winter Storm Action items

Johnson County has no individual action items for Winter Storms.

4.2.A.6 – Extreme Heat Action Items

Johnson County Action Item	Mitigate effects of extreme heat through installation of covered patios in public parks.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Low
Estimated cost	$25,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Covered patios in park areas would provide cover/protection, from the sun, for residents that are outside during extreme heat days.

Johnson County Action Item	Create temporary public cooling centers to mitigate effects of extreme heat.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Medium
Estimated cost	TBD
Potential Funding sources	HMGP, Municipal Funds
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Cooling centers would be identified and equipped with appropriate cooling systems. The cooling centers would be open to the public during extreme heat events.

4.2.A.7 – Drought Action Items

Johnson County Action Item	Expand enforcement of water conservation measures during periods of drought.
Hazard(s) Addressed	Drought
Goal/Objective	3-C
Priority	Low
Estimated cost	TBD
Potential Funding sources	HMGP, General Fund
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works/Code Enforcement
Implementation Schedule	12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Hire temporary code enforcement personnel to address violation of water use codes during extreme drought and times of water restriction, to ensure compliance.

Johnson County Action Item	Reduce property damage from drought through a comprehensive public education campaign
Objectives	4-A, 4-B
Hazards Addressed	Drought
Priority (High, Medium, Low)	Medium
Estimated cost	$10,000
Potential Funding sources	HMGP, General Fund, Special Utility Districts, Watershed Authorities
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Medium
Discussion	Develop education program and materials to address water conservation on personal property such as xeriscaping, water times, drip lines, etc.

4.2.A.8 – Earthquake Action Items

Johnson County Action Item	Conduct an earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	3-C
Priority	Low
Estimated cost	$20,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Project would allow educated development of mitigation projects on public facilities from earthquake hazards.

4.2.A.9 – Wildland Fire Action Items

Johnson County Action Item	Develop Community Wildfire Protection Plan (CWPP) and implement fuels reduction programs.
Hazard(s)Addressed	Wildfire
Goal/Objective	3-C, 4-A, 4-B, 4-C
Priority	Medium
Estimated cost	$35,000
Potential Funding sources	HMGP, Community Match
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	18 months – 48 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	CWPP would help reduce the impact of wildfires through strategic fuel reduction projects, as well as educate the public on defensible space.

4.2.A.10 – Flooding Action Items

Johnson County has no individual action items for Flooding.

4.2.A.11 – Dam Failure Action Items

Johnson County Action Item	Hire consultant to complete inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure
Goal/Objective	3-A, 3-C
Priority	Medium
Estimated cost	$75,000
Potential Funding sources	HMGP, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local funds, donations, In-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	12 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Identify, through inundation studies, what property, utility or infrastructure would be impacted by dam failure.

Section 4.2.B – Alvarado Action Items

4.2.B.1 – Multi-Hazard Action Items

The City of Alvarado has no Multi-Hazard action items.

4.2.B.2 Tornado Action Items

City of Alvarado Action Item	Expand and coordinate Early Warning Systems currently in use.
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-A, 1-B
Priority	Low
Estimated Cost	$55,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	36 Months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Cost is outweighed by the benefits of Early Warning Systems
Discussion	Adding two out-door warning sirens to the system in place would help increase the coverage area to all parts of the city. Early warnings have been shown to help save lives and property from severe weather events. Upgrading the Connect CTY system in place to add an automatic call feature would save valuable time in getting out early mass call warnings to citizens.

City of Alvarado Action Item	Partner with other jurisdictions in Johnson County to purchase and install CASA WX weather radar system.
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-A
Priority	Low
Estimated Cost	$15,000 annually
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	24 Months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	The cost is this project is low compared to the potential benefits.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA WX radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.

City of Alvarado Action Item	Administer grant programs to install safe rooms to reduce the injuries and deaths to citizens associated with high winds and debris from a tornado or severe weather event.
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-C
Priority	Low
Estimated Cost	$150,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Homeowner match
Lead Department	Emergency Management
Implementation Schedule	Ongoing program
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Low compared to potential benefits
Discussion	By installing safe rooms throughout the community the vulnerability of citizens to tornadoes, hail, and high winds would be reduced.

City of Alvarado Action Item	Assist citizens with funding for purchase of Weather Alert Radios.
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-A
Priority	Low
Estimated Cost	2,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, cost share
Lead Department	Emergency Management
Implementation Schedule	12 Months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning systems save lives, justifying costs
Discussion	Weather Alert Radios are a proven means to alert and warn citizens about severe weather and civil emergencies. It is impossible to quantify the value of a human life and difficult to quantify the value of an injury. The city believes that the value of a single life saved or injury avoided will offset the cost of this project. An added benefit of this project would be to raise awareness of Weather Alert Radios and severe weather safety throughout the area, thus providing benefits even to citizens who do not participate in this program.

4.2.B.3 – Hail Action Items

City of Alvarado Action Item	Adopt codes requiring hail resistant roofing on all new construction and roof replacements.
Hazard(s) Addressed	Hail
Goal/Objective	2-C
Priority	Low
Estimated Cost	None
Potential Funding Sources	None
Potential Matching Sources	None
Lead Department	Code Services
Implementation Schedule	12 Months
Effect on New Buildings	This action will potentially decrease the damage caused by most hailstorms in new buildings.
Effect on Old Buildings	This action will potentially decrease the damage caused by most hailstorms in existing buildings
Cost Effectiveness	Costs nothing and significantly decreases the susceptibility of structures to roof damage
Discussion	Improving Building Codes has proven to be an effective means to achieve improved building design. Requiring hail resistant roofing will benefit citizens through reduced damage, business through reduced damage to their buildings and reduced claims against insurance companies, and government through reduced request for assistance.

City of Alvarado Action Item	Develop public education campaign to encourage “hail resistant” roofing in new construction and roof replacements.
Hazard(s) Addressed	Hail
Goal/Objective	4-A
Priority	Low
Estimated Cost	$2,000
Potential Funding Sources	HMGP
Potential Matching Sources	General Fund
Lead Department	Emergency Management
Implementation Schedule	12 Months
Effect on New Buildings	Potentially can reduce damage caused by hail storms.
Effect on Old Buildings	Potentially can reduce damage caused by hail storms.
Cost Effectiveness	High Cost but will provide great benefit to the community.
Discussion	Public education has proven to be a low cost effective means to achieve changes in public behavior. Encouraging hail resistant roofing can benefit citizens through reduced damage, business through reduced damage to their buildings and reduced claims against insurance companies, and government through reduced request for assistance.

4.2.B.4 – High Wind Action Items

City of Alvarado Action Item	Review current building codes to ensure measures are in place to protect construction as much as possible from severe weather events.
Hazard(s) Addressed	High Winds
Goal/Objective	2-C
Priority	Low
Estimated Cost	Staff time
Potential Funding Sources	General fund
Potential Matching Sources	None
Lead Department	Code Services
Implementation Schedule	12 Months
Effect on New Buildings	This action will potentially decrease the damage caused by high winds in new buildings.
Effect on Old Buildings	This action will potentially decrease the damage caused by high winds in existing buildings.
Cost Effectiveness	Cost effective
Discussion	Improving Building Codes has proven to be an effective means to achieve improved building design. Requiring roofing that is resistant to high winds would benefit citizens through reduced damage, businesses through reduced damage to their buildings and reduced claims against insurance companies, and government through reduced request for assistance.

City of Alvarado Action Item	Educate builders and residents about mitigating wind damage.
Hazard(s) Addressed	High Winds
Goal/Objective	4-B
Priority	Low
Estimated Cost	$1500
Potential Funding Sources	General fund
Potential Matching Sources	None
Lead Department	Code Services
Implementation Schedule	12 Months
Effect on New Buildings	This action will potentially decrease the damage caused by high winds in new buildings.
Effect on Old Buildings	This action will potentially decrease the damage caused by high winds in existing buildings.
Cost Effectiveness	Cost effective
Discussion	Public Education has proven to be an effective way to change behavior. Educating the public and builders on the benefits of wind resistant construction will benefit citizens through reduced damage, business through reduced damage to their buildings and reduced claims against insurance companies, and government through reduced request for assistance. This project will provide written materials to be provided to the public and builders.

4.2.B.5 – Winter Storm Action items

City of Alvarado Action Item	Increase public education concerning winter storm preparedness and mitigation.
Hazard(s) Addressed	Winter Storms
Goal/Objective	4-A
Priority	Low
Estimated Cost	$2,000
Potential Funding Sources	HMGP
Potential Matching Sources	General Fund, in-kind
Lead Department	Emergency Management
Implementation Schedule	Immediately
Effect on New Buildings	This action will provide information concerning severe winter storm mitigation that can be incorporated into new buildings.
Effect on Old Buildings	This action will provide information concerning severe winter storm mitigation that can be incorporated into existing buildings.
Cost Effectiveness	The low cost is effective when compared to benefits provided to citizens.
Discussion	Winter weather preparedness has not been emphasized in Alvarado as much as severe thunderstorms. This action will provide preparedness information to citizens during the fall months.

City of Alvarado Action Item	Purchase street sanding equipment and supplies.
Hazard(s) Addressed	Winter Storms
Goal/Objective	2-D
Priority	Low
Estimated Cost	Undetermined
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	General Fund, in-kind
Lead Department	Emergency Management
Implementation Schedule	Immediately
Effect on New Buildings	None
Effect on Old Buildings	None
Cost Effectiveness	The cost is effective when compared to benefits provided to citizens.
Discussion	Having the ability to sand city streets during times of icy weather would help reduce the number of motor vehicle crashes in the jurisdiction during icy weather times. This action would also help free up city emergency services for other emergencies.

4.2.B.6 – Extreme Heat Action Items

City of Alvarado Action Item	Determine feasibility of monitoring populations at risk from extreme heat.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Low
Estimated Cost	Staff time
Potential Funding Sources	HMGP
Potential Matching Sources	General Fund
Lead Department	Emergency Management
Implementation Schedule	12 Months
Effect on New Buildings	None
Effect on Old Buildings	None
Cost Effectiveness	Prevents special populations from requiring advanced care, saving EMS time and money.
Discussion	This action would determine the feasibility of monitoring populations at risk from extreme heat.

City of Alvarado Action Item	Increase public education programs on the dangers of excessive heat.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Low
Estimated Cost	$3,000
Potential Funding Sources	HMGP
Potential Matching Sources	General Fund
Lead Department	Emergency Management
Implementation Schedule	12 Months
Effect on New Buildings	None
Effect on Old Buildings	None
Cost Effectiveness	Public education programs can provide significant results for relatively low costs.
Discussion	Public education on severe weather in the City of Alvarado has traditionally focused on severe thunderstorms and associated hazards (tornadoes, lighting, flooding, high winds). This action would expand public education to include hazards from extreme heat.

4.2.B.7 – Drought Action Items

City of Alvarado Action Item	Determining how the community and its water sources have been impacted by droughts in the past.
Hazard(s) Addressed	Drought
Goal/Objective	2-A
Priority	High
Estimated Cost	TBD, staff time
Potential Funding Sources	Water Use Fees, Impact Studies
Potential Matching Sources	Normal budgeting process
Lead Department	Public Works
Implementation Schedule	6 Months
Effect on New Buildings	This action will identify drought impacts in the city of Alvarado thus providing specific information for builders of new structures to incorporate drought mitigation into the structures.
Effect on Old Buildings	This action will identify drought impacts in the city of Alvarado thus providing specific information for owners of existing structures to incorporate drought mitigation into the structures.
Cost Effectiveness	This planning effort will have a low cost with the potential for significant benefits for the entire community.
Discussion	This planning effort will focus attention on the effects of drought on the community. Specific drought effects will be identified and efforts can be made to mitigate those effects.

City of Alvarado Action Item	Improve water supply and delivery systems to save water by designing water delivery systems to accommodate drought events and developing new or upgrading existing water delivery systems to eliminate breaks and leaks.
Hazard(s) Addressed	Drought
Goal/Objective	2-B
Priority	Medium
Estimated Cost	$2.4 Million
Potential Funding Sources	Hazard Mitigation Grant Program; Texas Water Development Board Grant Program.
Potential Matching Sources	Certificate of Obligation Bonds; Water usage fees.
Lead Department	Public Works
Implementation Schedule	60 Months
Effect on New Buildings	This action will allow for additional new building construction by providing adequate water supplies for sanitation, drinking and fire protection during drought conditions.
Effect on Old Buildings	This action will provide existing buildings adequate water supplies for sanitation, drinking and fire protection during drought conditions.
Cost Effectiveness	Very high cost with long term benefit for the community.
Discussion	To ensure adequate water supply during drought conditions in the city, an additional deep water well, storage facility and all connecting equipment is needed.

City of Alvarado Action Item	Design and implement specific water conservation public education efforts to complement existing programs.
Hazard(s) Addressed	Drought
Goal/Objective	4-A
Priority	Low
Estimated Cost	$1,000
Potential Funding Sources	Normal Budgeting Process
Potential Matching Sources	Impact Fees
Lead Department	Public Works
Implementation Schedule	12 Months
Effect on New Buildings	This action will publicize water conservation efforts that can be incorporated into new construction.
Effect on Old Buildings	This action will publicize water conservation efforts that can be incorporated into new construction.
Cost Effectiveness	Public education programs can provide significant results for relatively low costs.
Discussion	Most cities in the area have existing water conservation programs designed to educate the public and businesses on ways to conserve water. This action will develop a specific program that will complement existing programs in the City of Alvarado. Jurisdictional public education efforts have been very successful in attracting the attention of local citizens.

4.2.B.8 – Earthquake Action Items

City of Alvarado Action Item	Conduct a seismic survey to further investigate the rise in earthquakes in Alvarado.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$5,000
Potential Funding Sources	HMPG
Potential Matching Sources	General Fund
Lead Department	Engineering Department
Implementation Schedule	12 Months
Effect on New Buildings	This action will publicize possible earthquake dangers so adjustments can be incorporated into new construction building codes if necessary.
Effect on Old Buildings	This action will provide information concerning the possibility of earthquakes in the city of Alvarado so owners may make adjustments in building construction if they so desire.
Cost Effectiveness	Low cost for high value to the community.
Discussion	The City of Alvarado has recently experienced several small earthquakes. A study needs to be conducted to see if a more serious incident could be expected to occur.

4.2.B.9 – Wildland Fire Action Items

City of Alvarado Action Item	Increase public education on how to reduce the risks from wildfires.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	4-A, 4-B
Priority	Low
Estimated Cost	$3,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Fire Department
Implementation Schedule	12 Months
Effect on Old Buildings	This action will reduce the effects of wildfire on existing buildings through increased use of wildfire mitigation measures.
Effect on New Buildings	This action will reduce the effects of wildfire on new buildings through increased use of wildfire mitigation measures.
Cost Effectiveness	Public education has high rewards from low costs.
Discussion	Wildfire mitigation measures are not widely known in urban areas. This action would increase citizens' knowledge of wildfire mitigation measures and help reduce casualties and damages from wildfires.

City of Alvarado Action Item	Partner with the Texas Fire Service in creating "Firewise" Communities in Alvarado.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	2-B, 4-A, 4-B
Priority	Low
Estimated Cost	$130,000
Potential Funding Sources	HMGP, PDM, Texas Forest Service grants
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Fire Department
Implementation Schedule	24 months
Effect on New Buildings	This action will reduce the effects of wildfire on new buildings through increased use of wildfire mitigation measures.
Effect on Old Buildings	This action will reduce the effects of wildfire on existing buildings through increased use of wildfire mitigation measures.
Cost Effectiveness	Program cost is low compared to benefits
Discussion	Creating "Firewise" Communities will provide a wider buffer between residential and commercial properties and the wild land environment. This project will fund one full time position for a period of 24 months to assist the community in planning and accomplishing the required measures to achieve the "Firewise Community" designation.

City of Alvarado Action Item	Increase code enforcement activity for high grass and debris clean up.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	2-C
Priority	Low
Estimated Cost	Staff time
Potential Funding Sources	General fund
Potential Matching Sources	N/A
Lead Department	Emergency Management
Implementation Schedule	Immediate
Effect on New Buildings	This action will reduce the effects of wildfire on new buildings through increased use of code enforcement measures.
Effect on Old Buildings	This action will reduce the effects of wildfire on existing buildings through increased use of code enforcement measures.
Cost Effectiveness	Program cost is low compared to benefits
Discussion	Increasing code enforcement activity on high grass, weeds and debris clean-up will help prevent the spread of unwanted fire and help decrease the intensity of any fire that is started.

4.2.B.10 – Flooding Action Items

City of Alvarado Action Item	Maintain waterways in order to prevent buildup of debris and materials that could cause flooding.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E, 3-C
Priority	Low
Estimated Cost	Undetermined
Potential Funding Sources	HMPG
Potential Matching Sources	Impact Fees
Lead Department	Public Works
Implementation Schedule	36 months after funding
Effect on Old Buildings	Reduce the possible damage from flooding
Effect on New Buildings	No new construction would be permitted in flood plains or flood prone areas.
Cost Effectiveness	Undetermined at this time
Discussion	The City of Alvarado needs to maintain waterways in order to prevent buildup of debris and materials that could cause flooding. Removal of debris would allow the creeks to flow without damming up the creek and flooding surrounding areas. This project would be a one-time project. Once all debris and vegetation is cleared from creek the city would adopt ordinances requiring property owners adjacent to the creek to maintain the water way clear of debris and vegetation.

City of Alvarado Action Item	Raise the road level of Atchley Street at Creek.
Hazard(s) Addressed	Flooding
Goal/Objective	2-B
Priority	Low
Estimated Cost	Undetermined
Potential Funding Sources	HMPG
Potential Matching Sources	Other state grants
Lead Department	Public Works
Implementation Schedule	12 months
Effect on New Buildings	None
Effect on Old Buildings	None
Cost Effectiveness	High initial cost, but would ultimately save money, time, and possibly lives.
Discussion	This project would raise the road level to eliminate a low water crossing and stretch of road that floods periodically. The project would reduce the danger to life and property from flash flooding, as well as the need to repair pavement damage from flooding events.

City of Alvarado Action Item	Incorporate Flood Mitigation into local planning.
Hazard(s) Addressed	Flooding
Goal/Objective	3-C
Priority	High
Estimated Cost	None
Potential Funding Sources	General Fund
Potential Matching Sources	Impact fees
Lead Department	Planning
Implementation Schedule	Immediately
Effect on New Buildings	Prevents new buildings from being constructed in the flood plain.
Effect on Old Buildings	None
Cost Effectiveness	Highly cost effective.
Discussion	By incorporating flood mitigation into local planning, the City can determine and enforce acceptable land uses to alleviate the risk of damage by limiting exposure in flood hazard areas.

4.2.B.11 – Dam Failure Action Items

City of Alvarado Action Item	Coordinate results of existing inundation studies for all high hazard dams that could affect the City of Alvarado.
Hazard(s) Addressed	Dam Failure
Goal/Objective	3-A, 3-C
Priority	Medium
Estimated cost	$25,000
Potential Funding sources	HMGP
Potential Matching Sources	General Fund
Lead Agency / Department Responsible	Public Works
Implementation Schedule	12 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Identify, through inundation studies, what property, utility or infrastructure would be impacted by dam failure.

Section 4.2.C – Burleson Action Items

4.2.C.1 – Multi-Hazard Action Items

City of Burleson Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Flooding, Hail, High Winds, Tornado
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$80,000
Potential Funding sources	General Fund, HMGP, PDM
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	1 to 2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Potential to save lives.
Discussion	Provide early warning through increasing density of Outdoor Warning Sirens, weather radios, scrolling LED indoor signs, and programs to encourage enrollment in the Cities telephone notification system.

City of Burleson Action Item	Purchase and install CASA WX Weather Radar in Johnson County.
Hazard(s) Addressed	Flooding, Hail, High Winds, Tornado, Extreme Heat, Winter Storm
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$15,000 annually for Cleburne
Potential Funding sources	General Fund, Private Donations, User Fees
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	< 2 Years
Effect on New Building	None
Effect on Existing Buildings	None
Cost Effectiveness	Low compared to life saving benefits.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA WX radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.

City of Burleson Action Item	Administer grant programs to install Safe Rooms to reduce the injuries and deaths to citizens associated with high winds and debris from a tornado or severe weather event.
Hazard(s) Addressed	Hail, High Winds, Tornado
Goal/Objective	1-C
Priority	High
Estimated cost	$200,000
Potential Funding sources	HMPG, PDM, and private funds
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Safe room will add value to residence.
Discussion	By installing safe rooms throughout the community the vulnerability of citizens to tornadoes, hail, and high winds would be reduced.

City of Burleson Action Item	Increase conservation of water by developing and implementing drought contingency plan and public awareness campaign on water conservation.
Hazard(s) Addressed	Drought, Extreme Heat
Goal/Objective	2-C, 4-A
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Water Department
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Low compared to benefits.
Discussion	The City of Burleson will be better prepared for long periods of drought with a comprehensive contingency plan. A public awareness campaign will help to reduce the amount of water used by citizens, conserving the limited resource.

City of Burleson Action Item	Obtain and distribute "Know What To Do" public education materials for natural hazards.
Hazard(s) Addressed	Drought, Extreme Heat, Flooding, Hail, High Winds, Tornado, Wildland Fire, Winter Storms
Goal/Hazard	4-A, 4-B, 4-C
Priority	Medium
Estimated cost	$2000.00

Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson can distribute “Know What To Do” materials to increase public awareness and education for all hazards.

City of Burleson Action Item	Increase the inspection and trimming of tree limbs next to high voltage power lines.
Hazard(s) Addressed	Wildland Fires, Winter Storm, High Winds
Goal/Objective	2-B, 2-C
Priority	Medium
Estimated cost	$2000.00 Anually
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Street Department / Parks & Rec.
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Low compared to mitigation benefits.
Discussion	The City of Burleson can distribute “Know What To Do” materials to increase public awareness and education for all hazards.

City of Burleson Action Item	Provide underground high voltage power lines for new developments.
Hazard(s) Addressed	Wildland Fires, Winter Storm, High Winds
Goal/Objective	2-B, 2-C, 3-C
Priority	Medium
Estimated cost	None
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Engineering/ P&Z
Implementation Schedule	Ongoing
Effect on New Building	Less Hazards from overhead power lines.
Effect on Existing buildings	None
Cost Effectiveness	Low compared to mitigation benefits.
Discussion	The City of Burleson can create safer and more sustainable infrastructure by requiring buried power lines.

4.2.C.2 Tornado Action Items

The City of Burleson has no individual action items for Tornadoes.

4.2.C.3 – Hail Action Items

The City of Burleson has no individual action items for Hail

4.2.C.4 – High Wind Action Items

The City of Burleson has no individual action items for High Wind

4.2.C.5 – Winter Storm Action items

The City of Burleson has no individual action items for Winter Storms.

4.2.C.6 – Extreme Heat Action Items

The City of Burleson has no individual action items for Extreme Heat.

4.2.C.7 – Drought Action Items

The City of Burleson has no action items for Drought.

4.2.C.8 – Earthquake Action Items

City of Burleson Action Item	Conduct a study to determine the cause, vulnerability, and severity of an earthquake in Burleson.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A, 2-C
Priority	Low
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Engineering department
Implementation Schedule	<2 years
Effect on New Building	Study could reveal newer, stricter building codes should be adopted to mitigate against earthquakes.
Effect on Existing buildings	None
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson has recently experienced several small earthquakes. A study needs to be conducted to see if a more serious incident could be expected to occur.

4.2.C.9 – Wildland Fire Action Items

The City of Burleson has no individual action items for Wildland Fire

4.2.C.10 – Flooding Action Items

City of Burleson Action Item	Maintain erosion and vegetative management on creek waterways.
Hazard(s) Addressed	Flooding
Goal/Adjective	2-E
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Water Department
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	Could prevent from flooding
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson needs to maintain waterways in order to prevent buildup of debris and materials that could cause flooding.

City of Burleson Action Item	Maintain storm drains and ditches to minimize flash flooding.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Water Department
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	Could prevent from flooding.
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson needs to maintain waterways in order to prevent buildup of debris and materials that could cause flooding.

City of Burleson Action Item	Develop and implement drainage study to update master utility plan.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-C
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind

Lead Agency / Department Responsible	Water Department
Implementation Schedule	1 Year
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson needs to review and update drainage and master utility plans as growth and population density increase.

City of Burleson Action Item	Identify and complete capital improvements to storm drainage system.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Water Department
Implementation Schedule	Ongoing
Effect on New Building	Less Prone to Flooding
Effect on Existing buildings	Less Prone to Flooding
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson needs to complete improvements to the storm drainage system on a continual basis as growth and population density increase.

City of Burleson Action Item	Update city GIS capability to optimize drainage collection and control system.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$5000.00
Potential Funding sources	General Funds, HMPG
Potential Matching sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Water Department
Implementation Schedule	Ongoing
Effect on New Building	Less Prone to Flooding.
Effect on Existing buildings	Less Prone to Flooding.
Cost Effectiveness	Low compared to life safety benefits.
Discussion	The City of Burleson needs to continually update GIS capabilities to optimize drainage collection data and track control systems.

4.2.C.11 – Dam Failure Action Items

The city of Burleson has no individual action items for Dam Failure.

Section 4.2.D – Cleburne Action Items

4.2.D.1 – Multi-Hazard Action Items

City of Cleburne Action Item	Implement codes for underground high voltage power lines for new developments.
Hazard(s) Addressed	Wildland Fires, Winter Storm, High Winds
Goal/Objective	2-B, 2-C, 3-C
Priority	Medium
Estimated cost	$250,000
Potential Funding sources	Private Funds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	3 years
Effect on New Building	Reduces power outages.
Effect on Existing buildings	None
Cost Effectiveness	Long term reliability of power grid.
Discussion	Underground utilities reduce the chance of power outages due to wind, fire, and ice.

City of Cleburne Action Item	Increase the inspection and trimming of tree limbs next to high voltage power lines.
Hazard(s) Addressed	Wildland Fires, Winter Storm, High Winds
Goal/Objective	2-B, 2-C
Priority	Medium
Estimated cost	$50,000
Potential Funding sources	Enterprise Funds, Private Funds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Maintain infrastructure.
Discussion	Removing limbs from power lines reduces power outages and needed repairs from high winds or ice. Reduces hazards to public and utility workers.

City of Cleburne Action Item	Obtain and distribute "Know What To Do" public education materials for natural hazards.
Hazard(s) Addressed	Drought, Extreme Heat, Flooding, Hail, High Winds, Tornado, Wildland Fire, Winter Storms
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated cost	$1,000 annually
Potential Funding sources	Emergency Management, Private Funds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	Ongoing
Effect on New Building	None

Effect on Existing buildings	None
Cost Effectiveness	Small investment for public education.
Discussion	Obtain and distribute emergency preparedness materials to the citizens of Cleburne.

City of Cleburne Action Item	Increase conservation of water by developing and implementing drought contingency plan and public awareness campaign on water conservation.
Hazard(s) Addressed	Drought, Extreme Heat
Goal/Objective	2-C, 4-A
Priority	Medium
Estimated cost	$50,000
Potential Funding sources	Enterprise Fund, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Protects city from effects of drought.
Discussion	The education of citizens would assist in the conservation of water resources.

City of Cleburne Action Item	Establish a secondary water supply from Lake Whitney to Lake Pat Cleburne.
Hazard(s) Addressed	Drought, Extreme Heat
Goals/Objectives	3-C, 2-D
Priority	High
Estimated cost	$10,000,000
Potential Funding sources	Enterprise Fund, HMPG, Bonds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	5 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Critical to growth of city.
Discussion	The goal is to install a pipeline from Lake Whitney to Lake Pat Cleburne to supplement the City of Cleburne's water supply. Water rights for Lake Whitney have been obtained.

City of Cleburne Action Item	Improve emergency spillway on Lake Pat Cleburne.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flooding
Goal/Objective	2-B, 2-D
Priority	High
Estimated cost	$2,000,000
Potential Funding sources	Enterprise Fund, HMPG, Bonds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	2years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Provide for safety of citizens and stability of the dam.

Discussion	Lake Pat Cleburne Dam is only capable of passing 52% of the Probable Maximum Flood (PMF). The emergency spillway needs to be improved to meet the 100% standard.

City of Cleburne Action Item	Perform annual inspection, maintenance and repair on Lake Pat Cleburne Dam and Marti Reservoir Dam.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flooding
Goal/Objective	2-B
Priority	High
Estimated cost	$50,000
Potential Funding sources	Enterprise Fund, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Cleburne Public Works
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Protects city water supply.
Discussion	The condition of Lake Pat Dam is critical to the ability of the City of Cleburne to provide water supply for its citizens. Marti Reservoir Dam provides flood control for the city. Both dams are rated as high hazard dams and have EAP's in place.

City of Cleburne Action Item	Administer grant programs to install Safe Rooms to reduce the injuries and deaths to citizens associated with high winds and debris from a tornado or severe weather event.
Hazard(s) Addressed	Hail, High Winds, Tornado
Goal/Objective	1-C
Priority	Medium
Estimated cost	$200,000
Potential Funding sources	HMPG, PDM, and private funds
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Safe room will add value to residence.
Discussion	By installing safe rooms throughout the community the vulnerability of citizens to tornadoes, hail, and high winds would be reduced.

City of Cleburne Action Item	Purchase and install CASA WX Weather Radar in Johnson County.
Hazard(s) Addressed	Flooding, Hail, High Winds, Tornado, Extreme Heat, Winter Storm
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$15,000 annually for Cleburne
Potential Funding sources	General Fund, Private Donations, User Fees
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	1 Year
Effect on New Building	None
Effect on Existing buildings	None

Cost Effectiveness	Low compared to life saving benefits.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA WX radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.

City of Cleburne Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Dam Failure, Flooding, Hail, High Winds, Tornado
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$80,000
Potential Funding sources	General Fund, HMGP, PDM
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Potential to save lives.
Discussion	Provide early warning through increasing density of Outdoor Warning Sirens, weather radios, and programs to encourage enrollment in cities telephone notification system.

4.2.D.2 Tornado Action Items

The City of Cleburne has no individual action items for Tornadoes.

4.2.D.3 – Hail Action Items

The City of Cleburne has no individual action items for Hail.

4.2.D.4 – High Wind Action Items

The City of Cleburne has no individual action items for High Winds.

4.2.D.5 – Winter Storm Action items

City of Cleburne Action Item	Obtain additional road sanding equipment to maintain access to city infrastructure, maintain bridges and streets, and provide safe response for police, fire, and ems.
Hazard(s) Addressed	Winter Storm
Goal/Objective	2-D
Priority	Medium
Estimated cost	$50,000
Potential Funding sources	General Fund, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Increase public safety on streets.
Discussion	Even though winter storms are rare in Texas, bridges often need treatment due to ice to remain open and safe for travel.

4.2.D.6 – Extreme Heat Action Items

The City of Cleburne has no individual action items for Extreme Heat

4.2.D.7 – Drought Action Items

The City of Cleburne has no individual action items for Drought.

4.2.D.8 – Earthquake Action Items

City of Cleburne Action Item	Conduct a study to determine the cause, vulnerability, and severity of earthquakes in Cleburne.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A, 2-C
Priority	Low
Estimated cost	$100,000
Potential Funding sources	Enterprise Fund, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	3 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Provides guidance on drilling regulations to protect city infrastructure.
Discussion	Further research needs to be conducted to determine the cause of recent earthquakes in the Johnson County area. Natural gas drilling has been linked to the earthquakes. The long term effect from the drilling needs to be determined.

4.2.D.9 – Wildland Fire Action Items

The City of Cleburne has no individual action items for Wildland Fire.

4.2.D.10 – Flooding Action Items

City of Cleburne Action Item	Update city GIS capability to optimize drainage collection and control system.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$250,000
Potential Funding sources	Drainage Utility, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	3 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Accurate mapping may reduce future costs.
Discussion	Upgrade the hardware and software for GIS along with additional staffing.

City of Cleburne Action Item	Identify and complete capital improvements to storm drainage system.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$2,000,000
Potential Funding sources	Drainage Utility, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	5 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Protects current and future structures from storm runoff.
Discussion	Improve capacity and reliability of storm drainage system. Replace old systems and install new to areas where city is expanding.

City of Cleburne Action Item	Develop and implement drainage study to update master utility plan.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-C
Priority	Medium
Estimated cost	$50,000
Potential Funding sources	Drainage Utility, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Reduces future cost for utilities.
Discussion	As the city grows the changes to the drainage of storm runoff have to be studied and accounted for with retention ponds, etc.

City of Cleburne Action Item	Develop a flood threat recognition system.
Hazard(s) Addressed	Flooding
Goal/Objective	1-A, 1-B
Priority	Medium
Estimated cost	$30,000
Potential Funding sources	General Fund, HMGP
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Increase early warning and life safety.
Discussion	Develop an early warning system for Buffalo and Meaner Creek which would remotely alert at the site when the water reaches a dangerous level.

City of Cleburne Action Item	Maintain storm drains and ditches of debris to minimize flash flooding.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$20,000 annually
Potential Funding sources	Drainage Utility, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Increases safety by decreasing water on roadways.
Discussion	Annual program to maintain all city storm drains and ditches free from debris to reduce flash flooding on roadways.

City of Cleburne Action Item	Maintain erosion and vegetative management on Meaner and Buffalo Creek waterways.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	Medium
Estimated cost	$20,000 annually
Potential Funding sources	Drainage Utility, HMPG
Potential Match Sources	Local funds, donations, in-kind match
Lead Agency / Department Responsible	Public Works
Implementation Schedule	Ongoing
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Reduces damage from creek flooding.
Discussion	Annual program to keep trees, brush, and other obstructions out of creek waterways to allow water to flow without backing up.

4.2.D.11 – Dam Failure Action Items

The City of Cleburne has no individual action items for Dam Failure

4.2.E – Godley Action Items

4.2.E.1 – Multi-Hazard Action Items

City of Godley Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Flooding, High Winds, Tornado, Hail, Extreme Heat, Wildland Fire, Winter Storms
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$10,000
Potential Funding Sources	General Fund
Potential Matching Sources	Donation
Lead Department	Emergency Management
Implementation Schedule	1 year
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Relatively low cost versus high dispersed warning value.
Discussion	Provide additional early warning outdoor notification sirens and other information devices to notify community of impending threats

City of Godley Action Item	Participate in implementation of CASA Weather Radar in Johnson County.
Hazard(s) Addressed	Flooding, High Winds, Tornado, Hail, Winter Storm
Goal/Observation	1-A, 1-B
Priority	High
Estimated Cost	$2,500
Potential Funding Sources	General Fund
Potential Matching Sources	Donation
Lead Department	Emergency Management
Implementation Schedule	1 year
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Relatively low cost for wide area warning value.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.

City of Godley Action Item	Administer grant programs to install Safe Rooms to reduce the injuries and deaths to citizens associated with high winds and debris from a tornado or severe weather event.
Hazard(s) Addressed	Hail, High Winds, Tornado

Goal/Objective	1-C, 3-C, 4-A, 4-B, 4-C
Priority	High
Estimated Cost	$20,000.00
Potential Funding Sources	HMPG, PDM, private funds
Potential Matching Sources	Donations
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Increase number of hardened structures to withstand severe weather
Discussion	By installing safe rooms throughout the community the vulnerability of citizens to tornados, hail, and high winds will be reduced.

City of Godley Action Item	Enforce Water Restriction Ordinances
Hazard(s) Addressed	Drought, Extreme Heat, Wildland Fire
Goal/Objective	1-A, 1-B, 2-C, 3-C, 4-A-C
Priority	Medium
Estimated Cost	Limited to staff time
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Public Works
Implementation Schedule	Immediately
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Use existing staff budgeted time to communicate water use restrictions
Discussion	Seeking compliance will reduce water usage and make more available to respond to emergencies

City of Godley Action Item	Create and Implement a Natural Hazard Public Education Program for Residents
Hazard(s) Addressed	All Hazards
Goal/Objective	4-A
Priority	Medium
Estimated Cost	$1,000
Potential Funding Sources	HMGP, PDM, General fund, Fire Department budget
Potential Matching Sources	Local funds, in-kind, donations
Lead Department	Emergency Management
Implementation Schedule	Within One Year
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Public Education has a very high rate of return for a low cost.
Discussion	Using the Johnson County Hazard Mitigation Action Plan, create a public education program that allows citizens to become aware of the natural hazards in The City of Godley and what they can do to assist city officials with mitigation efforts.

4.2.E.2 Tornado Action Items

The City of Godley has no individual action items for Tornadoes.

4.2.E.3 – Hail Action Items

The City of Godley has no individual action items for Hail.

4.2.E.4 – High Wind Action Items

The City of Godley has no individual action items for High Wind.

4.2.E.5 – Winter Storm Action items

The City of Godley has no individual action items for Winter Storms.

4.2.E.6 – Extreme Heat Action Items

The City of Godley has no individual action items for Extreme Heat.

4.2.E.7 – Drought Action Items

City of Godley Action Item	Study assessing alternate means to enhance water supply to city and corresponding infrastructure improvements.
Hazard(s) Addressed	Drought
Goal/Objective	2-A, 3-C, 4-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	General Funds, HMPG
Potential Matching Sources	None
Lead Department	Engineering
Implementation Schedule	Dependent on funding availability
Effect on New Buildings	None
Effect on Existing Buildings	None
Cost Effectiveness	Contributes to water availability to all residents
Discussion	This project is intended to identify alternative sources of water for the City

4.2.E.8 – Earthquake Action Items

City of Godley Action Item	Conduct a study to determine cause, vulnerability, and severity of an earthquake in Godley.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A, 2-C, 2-D
Priority	Low
Estimated Cost	$2,500.00
Potential Funding Sources	General Funds, HMPG
Potential Matching Sources	None
Lead Department	Engineering
Implementation Schedule	2-3 years
Effect on New Buildings	Results could provide guidance for changes to building codes to enhance earthquake resistance
Effect on Existing Buildings	None
Cost Effectiveness	Provide guidance for new structures coming into city
Discussion	The City of Godley has recently experienced a few small earthquakes. A study needs to be conducted to see if a more serious incident could be expected to occur.

4.2.E.9 – Wildland Fire Action Items

The City of Godley has no individual action items for Wildland Fire.

4.2.E.10 – Flooding Action Items

The City of Godley has no action items for Flooding.

4.2.E.11 – Dam Failure Action Items

The City of Godley has no individual action items for Dam Failure.

4.2.F – Joshua Action Items

4.2.F.1 – Multi-Hazard Action Items

City of Joshua Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Dam Failure, Flooding, Hail, High Winds, Tornado, Wildfire, Winter Storm, Earthquake
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$20,000
Potential Funding sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	1 to 2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Potential to save lives
Discussion	Provide early warning through increasing use of NOAA All-Hazard Weather Radios in public facilities.

City of Joshua Action Item	Installation of automated stream gauges to monitor water levels.
Hazard(s) Addressed	Flooding, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated cost	$120,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, in-kind, user fees
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Cost savings 30% over sending personnel to monitor streams and low water crossings
Discussion	Stream gauge installation will allow for more efficient response as it will provide more timely information on water flow in major drainages.

City of Joshua Action Item	Installation and maintenance of a CASA WX Weather Radar system.
Hazard(s) Addressed	Hail, Tornadoes, High Wind, Wildfire, Flooding
Goal/Objective	1-A, 1-B

Priority	High
Estimated cost	$50,000
Potential Funding sources	HMGP, Local Funding, PDM
Potential Matching Sources	Local funds, donations, in-kind, user fees
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Increase response decisions by 100%
Discussion	CASA WX Radar provides the most detailed information available about storms and wind allowing public safety and citizens to prepare and respond more efficiently.

City of Joshua Action Item	Implement individual tornado safe room rebate program.
Hazard(s) Addressed	High Wind, Tornadoes, High Winds
Goal/Objective	1-C, 2-D
Priority	High
Estimated cost	$250,000
Potential Funding sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind, resident cost-share
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	12 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	Some buildings modified for shelter retrofit
Cost Effectiveness	Moderate
Discussion	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.

City of Joshua Action Item	Implement system for ensuring maintenance of utility infrastructure in easement right-of-ways are clear of obstructions.
Hazard(s) Addressed	Winter Storms, Wildfire, Extreme Heat
Goal/Objective	3-C
Priority	Medium
Estimated cost	$100,000
Potential Funding sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind, community match
Lead Agency / Department Responsible	Public Works

Implementation Schedule	6 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Moderate
Discussion	Tree and brush clearing near power lines to reduce potential for power line damage during winter storms, wildfire events, or extreme heat events to ensure power remains delivered.

City of Joshua Action Item	Develop damage assessment systems utilizing citizen teams and volunteers.
Hazard(s) Addressed	Earthquake, Hail, High Winds, Tornadoes, Winter Storms
Goal/Objective	3-C, 4-A
Priority	Medium
Estimated cost	$8,000
Potential Funding sources	HMGP, General Fund, PDM, Citizen Corps grants
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	The use of citizen volunteers for post damage assessment increases damage reporting times and frees up paid personnel for more critical assignments.

4.2.F.2 Tornado Action Items

The City of Joshua has no individual action items for Tornadoes.

4.2.F.3 – Hail Action Items

The City of Joshua has no individual action items for Hail.

4.2.F.4 – High Wind Action Items

The City of Joshua has no individual action items for High Wind.

4.2.F.5 – Winter Storm Action items

The City of Joshua has no individual action items for Winter Storms.

4.2.F.6 – Extreme Heat Action Items

City of Joshua Action Item	Mitigate effects of extreme heat through installation of covered patios in public parks.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Low
Estimated cost	$25,000
Potential Funding sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Covered patios in park areas would allow residents to temporarily be outside protected from the sun during extreme heat days.

4.2.F.7 – Drought Action Items

City of Joshua Action Item	Expand enforcement of water conservation measures during periods of drought.
Hazard(s) Addressed	Drought
Goal/Objective	3-C
Priority	Low
Estimated cost	$10,000
Potential Funding sources	HMGP, General Fund
Potential Matching Sources	Local funds, donations, in-kind, user fees
Lead Agency / Department Responsible	Public Works/Code Enforcement
Implementation Schedule	12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Hire temporary code enforcement personnel to address violation of water use codes during extreme drought and times of water restriction to ensure compliance.

City of Joshua Action Item	Reduce property damage from drought through a comprehensive public education campaign.
Hazard(s) Addressed	Drought
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated cost	$10,000
Potential Funding sources	HMGP, General Fund, Special Utility Districts, Watershed Authorities
Potential Matching Sources	Local funds, donations, in-kind, user fees
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Medium
Discussion	Develop education program and materials to address water conservation on personal property such as xeriscaping, water timing, drip lines, etc.

4.2.F.8 – Earthquake Action Items

City of Joshua Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	3-C
Priority	Low
Estimated cost	$20,000
Potential Funding sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Project would allow educated development of mitigation projects on public facilities from earthquake hazards.

4.2.F.9 – Wildland Fire Action Items

City of Joshua Action Item	Develop Community Wildfire Protection Plan (CWPP) and implement fuels reduction programs.
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C, 4-A, 4-B, 4-C
Priority	Medium
Estimated cost	$35,000
Potential Funding sources	HMGP, PDM, other state/federal grants, General fund
Potential Matching Sources	Local funds, donations, in-kind, community cost-share
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	18 months – 48 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	CWPP would reduce the impact of wildfires through strategic fuel reduction projects and educate the public on defensible space.

4.2.F.10 – Flooding Action Items

The City of Joshua has no individual action items for Flooding.

4.2.F.11 – Dam Failure Action Items

City of Joshua Action Item	Hire consultant to complete inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure
Goal/Objective	3-A, 3-C
Priority	Medium
Estimated cost	$75,000
Potential Funding sources	HMGP, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local funds, donations, in-kind, user fees
Lead Agency / Department Responsible	Public Works
Implementation Schedule	12 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Identify through inundation studies what property, utility or infrastructure would be impacted by dam failure.

4.2.G – Keene Action Items

4.2.G.1 – Multi-Hazard Action Items

City of Keene Action Item	Mitigate the effects of severe weather to citizens through early warning systems.
Hazard(s) Addressed	Dam Failure, Flooding, Hail, High Winds, Tornado, Wildfire, Winter Storm, Earthquake
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$20,000
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	1 to 2 years
Effect on New Building	None
Effect on Existing buildings	None
Cost Effectiveness	Potential to save lives
Discussion	Provide early warning through increasing use of NOAA All-Hazard Weather Radios in public facilities.

City of Keene Action Item	Installation of automated stream gauges to monitor water levels.
Hazard(s) Addressed	Flooding, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated cost	$120,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Cost savings 30% over sending personnel to monitor streams and low water crossings.
Discussion	Stream gauge installation would allow for more efficient response as it would provide more timely information on water flow in major drainages.

City of Keene Action Item	Installation and maintenance of a CASA WX Weather Radar system.
Hazard(s) Addressed	Hail, Tornadoes, High Wind, Wildfire, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated cost	$50,000
Potential Funding sources	HMGP, Local Funding
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Increase response decisions by 100%.
Discussion	CASA WX Radar provides the most detailed information available about storms and wind allowing public safety and citizens to prepare and respond more efficiently.

City of Keene Action Item	Implement individual tornado safe room rebate program.
Hazard(s) Addressed	High Wind, Tornadoes, Severe Storms
Goal/Objective	1-C, 2-D
Priority	High
Estimated cost	$250,000
Potential Funding sources	HMGP, PHMGP, Resident Match
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	12 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	Some buildings modified for shelter retrofit
Cost Effectiveness	Moderate
Discussion	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.

City of Keene Action Item	Implement system for ensuring maintenance of utility infrastructure in easement right-of-ways are clear of obstructions.
Hazard(s) Addressed	Winter Storms, Wildfire, Extreme Heat
Goal/Objective	3-C
Priority	Medium

Estimated cost	$100,000
Potential Funding sources	HMGP, Utility Special District Match
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 24 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Moderate
Discussion	Tree and brush clearing near power lines to reduce potential for power line damage during winter storms, wildfire events, or extreme heat events to ensure power remains delivered.

City of Keene Action Item	Develop damage assessment systems utilizing citizen teams and volunteers.
Hazard(s) Addressed	Earthquake, Hail, High Winds, Tornadoes, Winter Storms
Goal/Objective	3-C, 4-A
Priority	Medium
Estimated cost	$8,000
Potential Funding sources	HMGP, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	The use of citizen volunteers for post damage assessment increases damage reporting times and frees up paid personnel for more critical assignments.

4.2.G.2 Tornado Action Items

The City of Keene has no individual action items for Tornadoes.

4.2.G.3 – Hail Action Items

The City of Keene has no individual action items for Hail.

4.2.G.4 – High Wind Action Items

The City of Keene has no individual action items for High Wind.

4.2.G.5 – Winter Storm Action items

The City of Keene has no individual action items for Winter Storm.

4.2.G.6 – Extreme Heat Action Items

City of Keene Action Item	Mitigate effects of extreme heat through installation of covered patios in public parks.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Low
Estimated cost	$25,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Covered patios in park areas would allow residents to temporarily be outside protected from the sun during extreme heat days.

City of Keene Action Item	Create temporary public cooling centers to mitigate effects of extreme heat.
Hazards() Addressed	Extreme Heat
Goal/Objective	3-C
Priority	Medium
Estimated cost	tbd
Potential Funding sources	HMGP, Municipal Funds
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	6 months – 12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Cooling centers would be identified and equipped with appropriate cooling systems and be opened to the public during extreme heat events.

4.2.G.7 – Drought Action Items

City of Keene Action Item	Expand enforcement of water conservation measures during periods of drought.
Hazard(s) Addressed	Drought
Goal/Objective	3-C
Priority	Low
Estimated cost	tbd
Potential Funding sources	HMGP, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works/Code Enforcement
Implementation Schedule	12 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Hire temporary code enforcement personnel to address violation of water use codes during extreme drought and times of water restriction to ensure compliance.

City of Keene Action Item	Reduce property damage from drought through a comprehensive public education campaign.
Hazard(s) Addressed	Drought
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated cost	$10,000
Potential Funding sources	HMGP, General Fund, Special Utility Districts, Watershed Authorities
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Medium
Discussion	Develop education program and materials to address water conservation on personal property such as xeriscaping, water times, drip lines, etc.

4.2.G.8 – Earthquake Action Items

City of Keene Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	3-C
Priority	Low
Estimated cost	$20,000
Potential Funding sources	HMGP
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	6 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Project would allow educated development of mitigation projects on public facilities from earthquake hazards.

4.2.G.9 – Wildland Fire Action Items

City of Keene Action Item	Develop Community Wildfire Protection Plan (CWPP) and implement fuels reduction programs.
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C, 4-A, 4-B, 4-C
Priority	Medium
Estimated cost	$35,000
Potential Funding sources	HMGP, Community Match
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Emergency Management
Implementation Schedule	18 months – 48 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	High
Discussion	CWPP would reduce the impact of wildfires through strategic fuel reduction projects and educate the public on defensible space.

4.2.G.10 – Flooding Action Items

The City of Keene has no individual action items for Flooding

4.2.G.11 – Dam Failure Action Items

City of Keene Action Item	Hire consultant to complete inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure
Goal/Objective	3-A, 3-C
Priority	Medium
Estimated cost	$75,000
Potential Funding sources	HMGP, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local funds, donations, in-kind
Lead Agency / Department Responsible	Public Works
Implementation Schedule	12 months – 18 months
Effect on New Building	n/a
Effect on Existing buildings	n/a
Cost Effectiveness	Low
Discussion	Identify through inundation studies what property, utility or infrastructure would be impacted by dam failure.

4.3 National Flood Insurance Program (NFIP) Compliance

The National Flood Insurance Program (NFIP) The National Flood Insurance Program is a federally run program which enables property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

Community Participation A community applies for participation in the National Flood Insurance Program (NFIP) either as a result of interest in eligibility for flood insurance or as a result of receiving notification from FEMA that it contains one or more Special Flood Hazard Areas (SFHAs). In order for a community to apply for and receive participation in the NFIP, that community must adopt resolutions or ordinances to minimally regulate new construction in identified SFHAs. FEMA works closely with State and local officials to identify flood hazard areas and flood risks. The floodplain management requirements within the SFHA are designed to prevent new development from increasing the flood threat and to protect new and existing buildings from anticipated flood events.

When a community chooses to join the NFIP, it must require permits for all development in the SFHA and ensure that construction materials and methods used will minimize future flood damage. Permit files must contain documentation to substantiate how buildings were actually constructed. In return, the Federal Government makes flood insurance available for almost every building and its contents within the community.

Communities must ensure that their adopted floodplain management ordinance and enforcement procedures meet program requirements. Local regulations must be updated when additional data are provided by FEMA or when Federal or State standards are revised

Johnson County Jurisdiction Participation Johnson County jurisdictions are participating in the National Flood Insurance Program and have identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

TEXAS							
Communities Participating in the National Flood Program							
CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
485462#	CLEBURNE, CITY OF	JOHNSON COUNTY		7/13/1972	12/4/2012	6/23/1972	No
480880#	GODLEY, CITY OF	JOHNSON COUNTY	8/22/1975	9/27/1991	12/4/2012	2/18/2011	No
480879#	JOHNSON COUNTY*	JOHNSON COUNTY	5/17/1977	9/27/1991	12/4/2012	9/27/1991	No
480882#	JOSHUA, CITY OF	JOHNSON COUNTY	6/27/1975	9/27/1991	12/4/2012	9/27/1991	No
481107#	KEENE, CITY OF	JOHNSON COUNTY	6/4/1976	9/27/1991	12/4/2012	2/21/2001	No
485462#	CLEBURNE, CITY OF	JOHNSON COUNTY		7/13/1972	12/4/2012	6/23/1972	No
480880#	GODLEY, CITY OF	JOHNSON COUNTY	8/22/1975	9/27/1991	12/4/2012	2/18/2011	No

* - *Indicates unincorporated county*

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The Community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

The Community Rating System (CRS) The Community Rating System (CRS) is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. All CRS communities must maintain completed FEMA elevation and flood proofing certificates for all new and substantially improved construction in the Special Flood Hazard Area after the date of application for CRS classification.

The Johnson County Hazard Mitigation Action Plan jurisdictions will apply for and participate in the CRS program to provide discounted insurance premium incentives for communities to go beyond the minimum floodplain management requirements and to analyze and manage future development.

According to the current CRS document located on the following link http://www.fema.gov/library/viewRecord.do?id=3629, there are no communities in Johnson County that are currently participating.

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Chapter Five: Plan Maintenance Process

(In compliance with 201.6(c)(4)(i))

Monitoring Johnson County will serve as the coordinating point of contact for monitoring the Johnson County Hazard Mitigation Action Plan (HazMAP). In concurrence with the anniversary date annually, Johnson County will solicit monitoring reports from the participating jurisdictions. Progress on the implementation of the Action Plan and mitigation actions will be included in the reports from each jurisdiction. In order to monitor, each jurisdictions' representative will tour mitigation sites and report on the project schedule and its implementation.

Evaluating The Johnson County Hazard Mitigation Action Plan will be evaluated yearly, coinciding with the anniversary date. Johnson County will function as the coordinating point of contact for the participating jurisdictions. Each jurisdiction will evaluate its data in an effort to keep track of vulnerabilities which have changed and to ensure that goals and objectives are kept current.

The plan will be evaluated by the following criteria:

Is the natural hazard analysis accurate?
Are the goals and objectives being met through mitigation projects or other city planning mechanisms?
Are the identified mitigation projects relevant to current the resources and the current situation?
Are mitigation projects being implemented effectively?
Is the hazard mitigation plan being incorporated into other city planning processes?
What are the results of public comments?

Updating The Johnson County Hazard Mitigation Action Plan will be updated within the allotted five-year cycle in accordance with 44 CFR Section 201.6. The update process will include the annual reports from the monitoring and evaluating periods. Johnson County will use the annual monitoring and evaluation reports to make changes to the mitigation plan, vulnerability analysis, goals, and action items. The Johnson County Hazard Mitigation Action Plan will then be resubmitted for update approval.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*
The participating jurisdictions in the Johnson County Hazard Mitigation Action Plan recognize the importance of incorporating mitigating activities throughout city planning efforts. Other local planning mechanisms have been identified to include: Building codes, planning and zoning ordinances, fire codes, NFIP, and capital improvement plans. During annual evaluations of the identified planning mechanisms the Hazard Mitigation Action Plan's Goals and Mitigation Action Items will be taken into consideration.

During strategic planning cycles, members from the Hazard Mitigation teams will be available to provide data and input as the County Commissioner's Court and City Councils provide direction as to what areas of public safety and hazard mitigation they would like to see addressed and funded. Hopefully by funding mitigation strategies each year through normal and CIP processes, future impacts of hazards can be lessened which will save lives and money for the cities and citizens in the Johnson County Hazard Mitigation Action Plan.

The Johnson County Hazard Mitigation Action Plan participants currently have an Emergency Operation Plan (EOP). The HazMAP will support Annex P: Hazard Mitigation of the EOP for future submissions. HazMAP participants will be adopting the approved plan and will incorporate it into their existing local plans used for zoning and land use. All participants will follow local laws and guidelines when incorporating the HazMAP in their existing plans that are relevant to hazard mitigation. Each incorporating mechanism will follow their local laws or guidelines necessary for implementation through open forum public meetings. Each participant will monitor the incorporation into other planning mechanisms and report the success or failure in the annual report to Johnson County. With each update, all participants will be informed of the changes. Also, the HazMAP will be incorporated into the State of Texas Hazard Mitigation Plan through the risk assessment and mitigation strategies during their updating process every three years.

Continued Public Involvement *(In compliance with 201.6(c)(4)(iii))*The Johnson County Hazard Mitigation Action Plan recognizes the importance of public input for plan success. To continue to engage the public in the planning process, the completed Hazard Mitigation Action Plan will be posted on the North Central Texas Council of Governments Emergency Preparedness website as well as participating jurisdiction's websites. The Johnson County Hazard Mitigation Action Plan will be on file for public review at city libraries. The public will be encouraged to review the planning document and provide comments to the appropriate Emergency Management Coordinator. With each plan update, a public hearing will be held to seek comment from interested citizens and business owners relating to the Johnson County Hazard Mitigation Action Plan. The Hazard Mitigation Action Plan provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This may be accomplished through speaking engagements, future surveys, website information, disaster awareness campaigns, information pamphlets, and coordination with the University of North Texas Emergency Administration and Planning program, among other opportunities. Public comments will be used to make appropriate changes and guide direction in implementing mitigation strategies.

Appendix A: Planning and Public Meeting Documentation

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MEETING SIGN-IN SHEET

Meeting:	Johnson County Local Mitigation Strategy (JoLMS) Working Group Meeting	**Meeting Date:**	June 7, 2012
Facilitator:	Francisco San Miguel / Michael Gaciri , NCTCOG	**Place/Room:**	810 E. Kilpatrick Street Cleburne, TX

	Name	Title	Company	Phone	E-Mail
1.	DAVID DISHEROON	FLOODPLAIN MANAGER	JOHNSON COUNTY PUBLIC WORKS	817 556 - 6380	davidd@johnsoncountytx.org
2.	Gary A. Wisdom	Fire Chief	City of Burleson	817 426-9171	gwisdom@burlesontx.com
3.	Rey Gonzales	Asst. Public Works Dir.	City of Burleson	817-426-9838	rgonzales@burlesontx.com
4.	Randy Jenkins	EMC	Cleburne	817-645-0966	randy.Jenkins@cleburne.net
5.	Matt Gillin	Fire Chief	Keene	817-556-2474	firechief@keenetx.com
6.	Keith Tilge	EMC	City of Keene	817-996-5632	keithtilge@keenetx.com KSKEJ@yahoo.com
7.	JACK SNOW	EMC	Johnson County	817-240-1212	Jack@johnsoncountytx.org
8.	COURTNEY COATES	CITY ENGENEER	CLEBURNE	817-645-0942	courtney.coates@cleburne.net
9.	David Esquivel	City of Cleburne	Dir. of PW	817-645-0901	david.esquivel@cleburne.net.
10.	WAYNE BAKER	CITY OF JOSHUA	FIRE CHIEF	817-648-8865	WBAKER@CITYOFJOSHUATX.US

MEETING SIGN-IN SHEET

Meeting:	**Johnson County LMS Working Group Meeting**	**Meeting Date:**	**June 20, 2012**
Facilitator:	**Francisco San Miguel**	**Place/Room:**	**828 SW Asbury Burleson, TX 76028**

Name	Title	Company	Phone	E-Mail
Matthew Gillin	Fire Chief	City of Keene	817-641-3376	firechief@keenetx.com
Randy Jenkins	EMC	City of Clebume	817-645-0964	randy.Jenkins@clebume.net
Keith Silge	EMC	City of Keene	817-996-5632	keithjilge@keenetx.com

MEETING SIGN-IN SHEET

Meeting:	**Johnson County LMS Working Group Meeting**	**Meeting Date:**	**June 20, 2012**
Facilitator:	**Francisco San Miguel**	**Place/Room:**	**828 SW Asbury Burleson, TX 76028**

Name	Title	Company	Phone	E-Mail
DAVID DISILVESTRI	FLOOD PLAIN MANAGER	JOHNSON COUNTY PUBLIC WORKS	817-201 6919	DAVIDD@JOHNSONCOUNTYTX.ORG
TOM FOSTER	Battalion Chief	Burleson Fire	817-426-9171	TFOSTER@BURLESONTX.COM
Clint Davis	City Manager	City of Alvarado	817-790-3351	davisc@cityofalvarado.org
RICHARD VAN WINKLE	FIRE CHIEF/EMC	ALVARADO	817-538-2313	VANWINKLER@CITYOFALVARADO.ORG
DAVID WALLIS	MAYOR/EMC	GODLEY	817-487-3676	DAVID.WALLIS@GODLEYTX.GOV
Stephanie Hodges	City Admin	Godley	817-240-9009	Stephanie.hodges@godleytx.gov
JACK SNOW	Johnson CO. EMC	Johnson County	8172401212	jack@johnsoncountytx.org

HAZARD MITIGATION TEAM MEETING SIGN-IN SHEET

9:30am To 10:30am

Jurisdiction:	City of Keene	**Meeting Date:**	7-5-12
Facilitator:	Keith Silge	**Place/Room:**	City Hall Council Room

ATTENDEE SIGN IN

Name	Title	Company	Phone	E-Mail
Keith Silge	Economic Development	City of Keene	817-996-5632	keithsilge@keenetx.com
Bill Guinn	City Administrator	City of Keene	817-798-7422	billguinn@keenetx.com
Matt Gillin	Fire Chief	City of Keene	817-556-2474	firechief@keenetx.com

Agenda

1. Inform City Mgt of Project
2. Start Process To Pick/Choose HMT Members
3. Assign Hazard Mitigation Coordinator (HMC)
4. Give Inter-Local Aggreement To City Secretary

    1 Will Contact School EMC's When They Return

    2. Appoint Keith Tilge HMC.

MEETING SIGN-IN SHEET

Meeting:	Johnson County Mitigation Team Meeting	**Meeting Date:**	7/20/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Jack Snow	EMC	Johnson County Public Works	817-240-1212	jack@johnsoncountytx.org
David Dishroon	Inspector	Johnson County	817-201-6919	david2@johnsoncountytx.org
Erik Dumas	Public Works Director	Johnson County	817-205-2465	sdumas@johnsoncountytx.org
Mike Johnston	Executive Director	JCESD #1	817-556-2212	MJohnston@JohnsonCountyFire.org
Tim Jones	Lt. Sheriff Office	JESO	817-637-9740	TJones@johnsoncountytx.org

MEETING SIGN-IN SHEET

Meeting:	Alvarado Hazard Mitigation Team Meeting	**Meeting Date:**	7/24/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	104 West College Alvarado, TX

Name	Title	Company	Phone	E-Mail
WEBER PETE	CODE ENFORCEMENT	CITY OF ALVARADO	817-790-3351	WEBERP@CITYOFALVARADO.ORG
TERRY HAFER	Director of Public Works	City of Alvarado	(817) 933-6539	hafert@cityofalvarado.org
Clint Davis	City Mgr	City of Alvarado	817-403-6246	daviscc@cityofalvarado.org
Debbie Thomas	City Secretary	City of Alvarado	817-790-3351	thomasd@cityofalvarado.org

MEETING SIGN-IN SHEET 1.5 Hours

Meeting:	Burleson Hazard Mitigation Team Meeting	**Meeting Date:**	7/24/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	828 SW Asbury Burleson, TX

Name	Title	Company	Phone	E-Mail
Brent Batla	Batt chief	Burleson F.D	817-933-6867	Bbatla@burlesontx.com
Gary Wisdom	Fire chief	Burleson FD	817-426-9171	gwisdom@burlesontx.com
Doug Sandifer	Commander P.D.	Burleson P.D.	817-426-9917	dsandifer@burlesontx.com
Rey Gonzales	Asst. Dir. of Public Works	Burleson, TX	817-426-9838	rgonzales@burlesontx.com
Chris Havens	Commander - P.D.	Burleson, TX	817. 426. 9919	chavens@burlesontx.com

MEETING SIGN-IN SHEET

Meeting:	Keene Hazard Mitigation Team Meeting	**Meeting Date:**	7/25/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	203 W. Hillcrest Keene, TX

Name	Title	Company	Phone	E-Mail
Keith Tilge	EC Director	City of Keene	817-641-3336	
Matt Gillin	Fire Chief	City of Keene	817-556-2474	firechief@keenetx.com
Ryan Neighbors	FF/Paramedic	City of Keene	817-556 2474	Ryan.Neighbors@keenetx.com
Ryan Howerton	Lt./Paramedic	City of Keene	817-556-2474	rhowerton@keenetx.com

MEETING SIGN-IN SHEET

Meeting:	Cleburne Hazard Mitigation Team Meeting	**Meeting Date:**	7/31/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	Cleburne, TX

Name	Title	Company	Phone	E-Mail
Denise Jones	Admin. Coord.	City of Cleburne	817-645-0942	denise.jones@cleburne.net
Willie Stevenson	Building Official	City of Cleburne	817.556.8801	willie.stevenson@cleburne.net
Teresa Richardson	Health Insp.	City of Cleburne	817-645-0958	teresa.richardson@cleburne.net
Julie Winchell	Environmental Coord.	"	(817)645-0961	julie.winchell@cleburne.net
Randy Jenkins	EMC	" " "	817-645-0966	randy.jenkins@cleburne.net
ALAN FOUEMENTIN	OPS. MAN.	CITY	817-645-0942	ALANF@CLEBURNE.NET
COURTNEY COATES	CITY ENG.	"	"	courtney.coates@cleburne.net

MEETING SIGN-IN SHEET

Meeting:	Joshua Hazard Mitigation Team Meeting	**Meeting Date:**	7/31/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	200 Santa Fe St. Joshua, TX

Name	Title	Company	Phone	E-Mail
WAYNE BAKER	FIRE CHIEF	CITY OF JOSHUA	817-648-8865	WBAKER@CITYOFJOSHUATX.US
MIKE PEACOCK	Director of Operations EMC	City of Joshua	817-558-7447	MPEACOCK@cityofjoshuatx.us

Meeting Sign-In Sheet

Meeting:	Alvarado Hazard Analysis Meeting	**Meeting Date:**	9/12/2012
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	616 Six Flags Drive Arlington, TX

Name	Title	Company	Phone	E-Mail
Richard Van Winkle	Fire Chief/EMC	Alvarado	817-538-2313	vanwinkler@cityofalvarado.org
Francisco San Miguel	EP	NCTCOG	817-608-2352	

MEETING SIGN-IN SHEET

Meeting:	Johnson County Hazard Analysis Meeting	**Meeting Date:**	11/16/2012 3:30pm
Facilitator:	Francisco San Miguel	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Jack Snow	EMC	Johnson County	817-240-1212	jack@johnsoncountytx.org
Ken Bush	EMC Assist.	Johnson County	817-269-8312	KBush@johnsoncountyTX.org
Francisco San Miguel	EP	NCTCOG	817-608-2352	fsanmiguel@nctcog.org

MEETING SIGN-IN SHEET

Meeting:	Alvarado Hazard Analysis Meeting	**Meeting Date:**	11/16/2012 8:00am
Facilitator:	Francisco San Miguel	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Richard Van Winkle	Fire Chief/EMC	City of Alvarado	817-538-2313	vanwinkler@cityofalvarado.org
Francisco San Miguel	EP	NCTCOG	817-608-2352	fsanmiguel@nctcog.org

MEETING SIGN-IN SHEET

Meeting:	Burleson Hazard Analysis Meeting	**Meeting Date:**	11/16/2012 9:00am
Facilitator:	Francisco San Miguel	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Gary Wisdom	Fire chief	City of Burleson	817-805-2397	gwisdom@burlesontx.com
Rey Gonzales	Asst. Dir PW	City of Burleson	817-426-9838	rgonzales@burlesontx.com
Brent Batla	Batt. chief	City of Burleson	817-426-9173	BBatla@burlesonTX.com
Francisco San Miguel	EP	NCTCOG	817-608-2352	fsanmiguel@nctcog.org

MEETING SIGN-IN SHEET

Meeting:	Godley ~~Rio Vista~~ Hazard Analysis Meeting	**Meeting Date:**	11/16/2012 2:30pm
Facilitator:	Francisco San Miguel	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
DAVID J. WALLIS	MAYOR	CITY OF GODLEY	817-487-3672	DAVID.WALLIS@GODLEYTX.GOV
Francisco San Migu	E P	NCTCOG	817-608-2352	fsanmiguel@nctcog.org

MEETING SIGN-IN SHEET

Meeting:	Joshua Hazard Analysis Meeting	**Meeting Date:**	11/16/2012 11:00am
Facilitator:	Francisco San Miguel	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Wayne Baker	Fire Chief	City of Joshua	c 817-648-8865 o 817-558-7411	WBaker@cityofjoshua.tx.us
Francisco San Miguel	EP	NCTCOG	817-608-2352	fsanmiguel@nctcog.org

MEETING SIGN-IN SHEET

Meeting:	Johnson County Hazard Analysis Working Group- PUBLIC MEETING	**Meeting Date:**	12/11/12 10:00am
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Jack Snow	EMC	Johnson County	817-240-1212	jack@johnsoncountytx.org
DAVID DISHEROON	INSPECTOR	JOHNSON COUNTY	817-201-6919	DAVIDD@JOHNSONCOUNTYTX.ORG
DAVID J. WALLIS	MAYOR	GODLEY	817.487.3676	DAVID.WALLIS@GODLEYTX.GOV
WAYNE BAKER	FIRE CHIEF	JOSHUA	817-648-8865	WBAKER@CITYOFJOSHUATX.US
Matt Gillin	Fire Chief	Keene	817-648-753X	firechief@keenetx.com
RICHARD VAN WINKLE	FIRE CHIEF/EMC	ALVARADO	817-538-2313	VANWINKLER@CITYOFALVARADO.ORG
Randy Jenkins	EMC	cleburne	817-645-0964	randy.jenkins@cleburne.net
Clint Davis	city mgr	Alvarado	817-790-3351	davisc@cityofalvarado.org
Keith Jilge	EMC	Keene	817-641 3336	keithjilge@keenetx.com
Gary Wisdom	Fire chief	Burleson	817-426-9171	gwisdom@burlesontx.com
Brent Battle	Bat. Chief	Burleson	817-426-9170	bbattle@burlesontx.com

MEETING SIGN-IN SHEET

Meeting:	Johnson County Hazard Analysis Working Group- PUBLIC MEETING	**Meeting Date:**	12/11/12 10:00am
Facilitator:	Francisco San Miguel, NCTCOG	**Place/Room:**	810 E. Kilpatrick Cleburne, TX

Name	Title	Company	Phone	E-Mail
Matt Gillin	Fire Chief			

MEETING SIGN-IN SHEET

Meeting:	Johnson County HazMAP Meeting	**Meeting Date:**	7/23/2013
Facilitator:	Nicholas F. LaGrassa, NCTCOG	**Place/Room:**	Johnson County EOC

Name	Title	Company	Phone	E-Mail
Clint Davis	City Manager	City of Alvarado	817-790-3351	davisc@cityofalvarado.org
Randy Jenkins	EMC	City of Cleburne	817-645-0964	randy.jenkins@cleburne.net
Keith Jilge	ED Director	City of Keene	682-970 0395	keithj;ilge@keenetx.com
Matt Gillin	Fire Chief	City of Keene	817-822-0357	firechief@keenetx.com
Wayne Baker	Fire Chief	City of Joshua	817-558-7447	WBAKER@CITYOFJOSHUA.TX.US
Jack Tidwell	MGR of ENV & DEV	NCTCOG	817 695-9220	jtidwell@nctcog.org
Gary A. Wisdom	Fire chief	Burleson	817-426-9170	gwisdom@burlesontx.com
Brent G Bartl	Batt chief	Burleson	817-426-9173	Bbartl@burlesontx.com
MOLLY THOERNER	ED DIRECTOR	NCTCOG	817-608-2322	mthoerner@nctcog.org
Jamie Moore	EMC	Johnson County	817 933 6261	jmoore@johnsoncountytx.org
COURTNEY COATES	CLEBURNE →	CITY ENGINEER	817-645-0942	courtney.coates@cleburne.net
ERIK DUMAS	P.W. DIRECTOR	JOHNSON COUNTY	817-556-6380	sdumas@johnsoncountytx.org
Nicholas LaGrassa	EP Program assistant	NCTCOG	817 608 2323	nlagrassa@nctcog.org

The following documents present proof of the public Local Emergency Preparedness Council (LEPC) meeting held on August 28th, 2013 where discussion on the Johnson County Hazard Mitigation Action Plan was held.

1. The public notice, posted at Burleson City Hall on August 21, 2013
2. The agenda for the LEPC Meeting where the Hazard Mitigation Action Plan was discussed
3. The list of LEPC members that documents who was in attendance for the August LEPC meeting.

NOTICE OF MEETING
JOHNSON COUNTY
LOCAL EMERGENCY PLANNING COMMITTEE

Notice is hereby given that a REGULAR MEETING of the above named will be held on Wednesday August 28th, 2013 from 12:00 PM to 1 PM, at Texas Health Harris Methodist in Cleburne Tx.

At which time the following subjects will be discussed, to-wit:

Refer to attached agenda

I, the undersigned authority, do hereby certify that the above Notice of Meeting of the governing body of the above named is a true and correct copy of said Notice and that I posted a true and correct copy of said Notice, at the following,

On the bulletin board at City Hall, 141 W. Renfro St. Burleson, Texas, a place convenient and readily accessible to the general public at all times, and said Notice was posted on Wednesday, August 21st, 2013 by 5:00 PM.

CERTIFICATION

This is to certify that this notice was posted on the bulletin board of City Hall of the City of Burleson, 141 W. Renfro St. Burleson, Texas at 5:00 pm this 21st day of August 2013.

Amanda McCrory, City Secretary

REMOVED FROM POSTING BOARD
DATE 8-27-13
BY CB

JOHNSON COUNTY LEPC

AGENDA

August 28, 2013

Texas Health Harris Methodist Hospital Cleburne

12:00 PM TO 1:00 PM

I. Call meeting to order

II. Approval of minutes from May 8, 2013 meeting

III. Treasurer's Report

IV. President's Report (Discussion)

V. Agenda Items

A. Hazardous Mitigation Action Plan Discussion

VI. Unfinished Business

VII. New Business (Discussion)

IX. Set Next Meeting: November 13th, 2013
Texas Health Harris Methodist Hospital Cleburne
12:00 PM to 1:00 PM

X. Announcements

XI. Adjournment

2013 JOHNSON COUNTY LEPC MEMBERSHIP

January 1, 2013

2013 Attendance

Name	Title	E-Mail	Employer	Phone#	Catergory	Jan	Mar	May	Jul	Aug	Nov
ADAMS, RICK										X	
AMOS, GERALD	LEAD PRODUCTION TECH	gerald.amos@airliquide.com	AIR LIQUIDE AMERICA	817-559-4988	FACILITY OPERATOR	N/A			N/A		
BAKER, WAYNE	FIRE CHIEF	wbaker@cityofjoshuatx.us	JOSHUA CITY OF	817-648-8865	FIRE-FIGHTING	N/A	X	X	N/A		
BASS, MICHAEL	ENVIRONMENTAL INV.	CHAEL.BASS@TCEQ.TEXAS.G	TCEQ	817-588-5869	STATE GOVERNMETN	N/A	X		N/A		
BATLA, BRENT	BATTALION CHIEF	batla@trainingdivision.com	BURLESON, CITY OF	817-933-6967	EMERGENCY MGMT.	N/A	X		N/A		
BENCH, DARREN						N/A		X	N/A		
BOOTH, JOE	O & M MANAGER	joebooth@brazoselectric.com	BRAZOS ELECTRIC	817-641-5041	FACILITY OPERATOR	N/A			N/A		
BRAINARD, JEFF	SERGEANT	ERY.BRAINARD@MTCTRAINS.COM		972-3663334		N/A	X		N/A		
BUSH, KEN	ASSISTANT EMC	kbush@johnsoncountytx.org	JOHNSON COUNTY EM	817-556-3645	EMERGENCY MGMT.	N/A	X		N/A		
BUTLER, DAVID		dbutler@burlesontx.com	BURLESON, CITY OF	817-447-5400	LOCAL GOVERNMENT	N/A			N/A		
CAMP, SHEILA	OFFICE COORDINATOR		AIR LIQUIDE AMERICA	817-517-6430	FACILITY OPERATOR	N/A			N/A		
COOPER, JERRELL	TCEQ					N/A			N/A	X	
CRAIG, DANE	OWNER/OPERATOR	dane@dakotadistributing.com	DAKOTAL DISTRIBUTING	817-453-7776	PRIVATE ENTERPRIZE	N/A			N/A		
CUMMINS, MARK	OWNER / FF	cumminsfoam@yahoo.com	CAFS COMPANY/JOSHUA	817-996-0950	PRIVATE ENTERPRIZE	N/A			N/A		
CURFMAN, SUE	EMERG MAN COORD	suecurfman@texashealth.org	TEXAS HEALTH FW	817-250-3433	HOSPITAL	N/A	X		N/A		
CURRY, CARL	PLANT MANAGER	ccurry@brazoselectric.com	BRAZOS ELECTRIC	817-641-5041	FACILITY OPERATOR	N/A			N/A		
DAVIS, ZACH	COUNTY EXTENSION AGENT	ztdavis@ag.tamu.edu	JOHNSON COUNTY	817-556-6370	LOCAL GOVERNMENT	N/A			N/A		
EVERLY, AMANDA	NCTCOG					N/A	X		N/A		
FUCHS, VICTOR	OE COORDINATOR	victor.fuchs@halliburton.com	JRC / HALLIBURTON	817-761-2170	FACILITY OPERATOR	N/A			N/A		
GILBERT, MIKE		gilbert@johnsoncountytx.org	JOHNSON CO. SHERIFF	817-558-0024	LAW ENFORCEMENT	N/A			N/A		
GILLIN, MATT	FIRE CHIEF	mgillin@keenebroadband.com	KEENE FIRE DEPARTMENT	817-556-2474	FIRE-FIGHTING	N/A			N/A		
GUERRERO, VERONI	ENVIRONMENTAL INV.	NICA.GUERRERO@TCEQ.TEXA	TCEQ	817-558-5891	STATE GOVERNMETN	N/A	X		N/A		
HARBORTH, DARRELI	ASSET PROTECTION	dkharbo@wal-mart.com	WAL-MART DISTRIBUTION	817-202-3007	FACILITY OPERATOR	N/A			N/A		
HARRIS, KATRICE	CHEM STEWARDS COORD	kharris@sacheminc.com	SACHEM INC.	817-202-3228	FACILITY OPERATOR	N/A	X	X	N/A	X	
HAVELKA, MICHELLE	ER COODINATOR	michelle.havelka@tceq.texas.gov	TCEQ	817-588-5837	STATE GOVERNMETN	N/A		X	N/A		
HAWKES, VINCENT	OPERATIONS SUPERVISOR	vihawkes@brazoselectric.com	BRAZOS ELECTRIC	817-641-5041	FACILITY OPERATOR	N/A			N/A		
HOLT, NANCY	DIRECTOR	cleburnesarmy@sbcglobal.net	SALVATION ARMY	817-558-1296	VOLUNTEER ORG	N/A			N/A		
HOUSTON, KENDRA	ENVIRONMENTAL INV.	DRA.HOUSTON@TCEQ.TEXAS.	TCEQ	817-588-5817	STATE GOVERNMETN	N/A	X		N/A		

HOWE, JOE	TRAINING SUPERVISOR	jhowe@sachemusa.com	SACHEM INC.	817-202-3266	FACILITY OPERATOR	N/A			N/A		
HUNT, LOUIS		lhunt@sacheminc.com	SACHEM INC.	817-202-3211	FACILITY OPERATOR	N/A	X		N/A		
JA…, EDDIE	TEXAS HEALTH					N/A			N/A	X	
JENKINS, RANDY	ASST. FIRE CHIEF / EMC	randy.jenkins@cleburne.net	CLEBURNE, CITY OF	817-645-0964	EMERGENCY MGMT.	N/A	X	X	N/A	X	
JOHNSTON, MIKE	DIRECTOR	mjohnston@johnsoncountyfire.org	Johnson County ESD	817-556-2212	JCESD	N/A			N/A		
JONES, EDDIE						N/A		X	N/A		
KNOLL, JOE	DEPOT MANAGER	joe.knoll@airliquide.com	AIR LIQUIDE AMERICA	972-827-6825	FACILITY OPERATOR	N/A			N/A		
LAGRASSA, NICHOLA	NCTCOG	nlagrassa@nctcog.org				N/A			N/A	X	
LAFOSSE, LISA	OWNER / FF	lisa@cafsco.com	CAFS COMPANY/JOSHUA	817-584-4500	PRIVATE ENTERPRIZE	N/A			N/A		
LITTLE, GARY	REGIONAL OPS. MANAGER	glittle@dxgroup.com	DPC INDUSTRIES INC.	817-641-4712	FACILITY OPERATOR	N/A		X	N/A	X	
LUDWIG, MERISSA	INVESTIGATOR	merissa.ludwig@tceq.texas.gov	TCEQ	817-588-5800	STATE GOVERNMETN	N/A			N/A		
LUTZ, JENNIFER	TECHNICAL SALES	jlutz@setenv.com	SET ENVIRONMENTAL	214-437-1111	PRIVATE ENTERPRIZE	N/A			N/A		
MARVIN CLOUD			HARRIS METHODIST - CLEBURN	817-556-4263	HOSPITAL	N/A			N/A		
MAXON, RAY	GENERAL MANAGER	raymaxon@hotmail.com	HMER ONE INC.	817-8961202	PRIVATE ENTERPRIZE	N/A			N/A		
MCQUISTON, DANIEL	OPERATIONS SUPERVISOR	daniel.mcquiston@airliquide.com	AIR LIQUIDE AMERICA	817-776-3896	FACILITY OPERATOR	N/A			N/A		
MEARS, GARY	PRODUCTION SUPERVISOR	gmears@sachemusa.com	SACHEM INC.	817-202-3226	FACILITY OPERATOR	N/A			N/A		
MOORE, JAIME	EMC		JOHNSON COUNTY	817-556-6346	EMERGENCY MGMT.	N/A	X		N/A	X	
NELSON, ADAM	OPERATIONS MANAGER	adam@dakotadistributing.com	DAKOTAL DISTRIBUTING	817-453-7776	PRIVATE ENTERPRIZE	N/A		X	N/A		
NICHOLS, DANNY	MAINTENANCE MANAGER	dnichols@brazoselectric.com	BRAZOS ELECTRIC	817-641-5041	FACILITY OPERATOR	N/A			N/A		
NICHOLS, MANDY						N/A		X	N/A		
OSBORNE, TOMMY	BUSINESS DEVELOPMENT	tommyo@ecesi.com	EAGLE SWS	817-847-1333	PRIVATE ENTERPRIZE	N/A			N/A		
PATTERSON, BARB	TEXAS HEALTH					N/A		X	N/A	X	
PAKELTIS, JEFF	PLANT MANAGER	jpakeltis@sacheminc.com	SACHEM INC.	817-202-3224	FACILITY OPERATOR	N/A	X	X	N/A	X	
PEACOCK, MIKE	DIR. OF OPERATIONS	diroperations@cityofjoshuatx.us	JOSHUA CITY OF	817-558-7447	EMERGENCY MGMT.	N/A			N/A		
PRICHARD, GREG		gprichard@dxgroup.com	DPC INDUSTRIES INC.		FACILITY OPERATOR	N/A		X	N/A		
ROEBUCK, KYLE	PLANT ENGINEER	kyle.roebuck@airliquide.com	AIR LIQUIDE AMERICA	817-517-6430	FACILITY OPERATOR	N/A			N/A		
SAIN, STACY	TAS	ssain@taslp.com								X	
SCHNEIDER, CHRIS	COUNTY EXTENSION AGENT	c-schneider@tamu.edu	JOHNSON COUNTY	817-556-6370	LOCAL GOVERNMENT	N/A			N/A		
SHUFELT, DOROTHY						N/A	X		N/A		
SHUFELT, RICHARD	RISK MANAGER	richard.shufelt@mtctrains.com	SANDERS ESTES - MTC	972-366-3334	STATE GOVERNMETN	N/A	X		N/A	X	
SINGLETON, STACY	FIRE MARSHAL	ssingleton@burlesontx.com	BURLESON, CITY OF	817-447-5400	EMERGENCY MGMT.	N/A			N/A		
SOUTHARD, JOHN	AP AREA MANAGER	jgsouth@walmart.com	WALMART DISTRIBUTION	817-202-3009	FACILITY OPERATOR	N/A			N/A		
STACY SAIN	CUSTOMER RELATIONS	ssain@taslp.com	TAS ENVIRONMENTAL	817-535-7222	PRIVATE ENTERPRIZE	N/A			N/A		
STARK, DENNIS		dennis.stark@airliquide.com	AIR LIQUIDE AMERICA	817-517-6430	FACILITY OPERATOR	N/A		X	N/A		

STORY, DENISE						N/A		X	N/A		
THOERNER, MOLLY	NCTCOG					N/A			N/A	X	
TUNAITIS, FREDERIC	MAJOR	fred.tunaitis@mtctrains.com	SANDERS ESTES - MTC	972-366-3334	STATE GOVERNMETN	N/A			N/A		
UTTER, KEITH	HSE MANAGER	keith.utter@halliburton.com	JRC / HALLIBURTON	817-761-2012	FACILITY OPERATOR	N/A			N/A		
VANWINKLE, RICHAR	FIRE CHIEF	firechief@alvarado.net	ALVARADO, CITY OF	817-790-8884	FIRE-FIGHTING	N/A	X		N/A	X	
VAQUERA, RALPH	FIRE CHIEF	chief@bonovfd.org	BONO FIRE DEPARTMENT	817-845-6934	FIRE-FIGHTING	N/A			N/A		
WALLIS, DAVID	MAYOR	david.wallis@godleytx.gov	CITY OF GODLEY	817-487-3676	LOCAL GOVERNMENT	N/A			N/A		
WILLIAMS, SCOTT	FIREFIGHTER	swilliams_76@yahoo.com	VENUS FIRE DEPARTMENT	817-692-8406	FIRE-FIGHTING	N/A			N/A		
WILSON, MINDIE		mindiecleburnesa@yahoo.com	SALVATION ARMY	817-558-1296	VOLUNTEER ORG	N/A			N/A		
WRIGHT, JASON	REGIONAL OPS. MANAGER	jwright@taslp.com	TAS ENVIRONMENTAL	817-535-7222	EMERG RESPONSE	N/A			N/A		
YEH, ARIEL	ENVIRONMENTAL INV.	ARIEL.YEH@TCEQ.TEXAS.GOV	TCEQ	817-588-5878	STATE GOVERNMETN	N/A	X		N/A		