EXHIBIT "A"

THE CITY OF ROUND ROCK

HAZARD MITIGATION PLAN

Preparing for a Secure and Sustainable Future

2012-2017

ROUND ROCK, TEXAS
PURPOSE. PASSION. PROSPERITY.

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INTRODUCTION

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Background

The City of Round Rock is one of the fastest growing cities in the nation and is ranked as the fourth safest city with populations of at least 100,000[1]. It has also consistently ranked as one of the top 10 places to live by *Money* and *Kiplinger's Personal Finance* magazines[2]. In maintaining the City's commitment to safety and sustainability, Round Rock has developed this Hazard Mitigation Plan (HMP or Plan) entitled, *Preparing for a Secure and Sustainable Future*, to reduce risks from all hazards, both natural and technological.

The Federal Emergency Management Agency (FEMA) defines mitigation as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.[3]" Mitigation differs from emergency preparedness and protective measures, which focus on activities designed to make communities more ready to take appropriate action in a disaster with emergency response and equipment. Mitigation activities involve alteration of physical environments to reduce risks and vulnerabilities to hazards and make it more cost-effective to respond to and recover from disasters.

Car swept away during flash flooding after Tropical Storm Hermine in Sept. 2010

The City of Round Rock is susceptible to a wide range of natural and human-caused hazards, including flooding, tornadoes and wildfires. These life-threatening hazards can destroy property, disrupt the economy and lower the overall quality of life for individuals. This was most recently evident with flash flooding that occurred September 7-8, 2010, when Tropical Storm

[1] http://www.roundrocktexas.gov/home/index.asp?page=1629
[2] Ibid.
[3] www.fema.gov

Hermine drenched Central Texas, resulting in up to 12 inches of rain in some areas. Approximately 16 residences were evacuated in the City because of flooding on Lake Creek and Brushy Creek, and numerous families sought shelter as floodwaters rose in their homes.

While it is impossible to prevent a hazard event from occurring, the impact of hazards can be lessened in terms of their effect on people and property through effective hazard mitigation planning and implementation. This Plan provides an opportunity for the City and School District to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

Scope and Participation

The participating entities in this Plan include:

- The City of Round Rock
- Round Rock ISD

The focus of the Plan is to mitigate those hazards classified as "high" or "moderate" risk as determined through a detailed hazard risk assessment conducted for the City of Round Rock and Round Rock ISD. Hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables both entities to prioritize mitigation actions based on hazards which are understood to present the greatest risk to lives and property.

Purpose

The overarching goal of the HMAP is to minimize or eliminate long-term risks to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. The purpose of the Plan is twofold: to protect people and structures, and to minimize the costs of disaster response and recovery. The City of Round Rock and Round Rock ISD are required to have a mitigation plan in place to be eligible for and leverage FEMA disaster recovery assistance and mitigation funding. Through this process, the participating entities seek to examine options for improving, developing and implementing a comprehensive, all-hazards plan.

The Mission Statement for the Plan is, "*Preparing for a secure and sustainable future through the Development of targeted mitigation actions to reduce and eliminate loss of life and property damage from identified hazards.*"

Authority

The Plan will be tailored specifically for the City of Round Rock and Round Rock ISD. When complete, the Plan will comply with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). It will also comply with FEMA's February 26, 2002 Interim Final Rule ("the Rule") at 44 CFR Part 201, which specifies the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Multi-Hazard Mitigation Planning Guidance" (released July 1,2008). The Plan will also be developed in accordance with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

Summary of Sections

Sections 1 and 2 of the Plan outline the purpose and the process of development. Section 3 profiles the City and School District in terms of population and demographics and economy and education.

Sections 4 through 6 present information on individual, natural hazards. These hazards generally appear in order of priority based on potential losses in terms of loss of life and property and other community concerns. For each hazard, the Plan presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 7 presents mitigation goals and objectives. Actions for the City and ISD are presented in Section 8, while Section 9 identifies plan maintenance mechanisms.

Appendix A contains an assessment of the human-caused or technological hazards that may affect the area. Public survey results are analyzed in Appendix B. Appendix C contains information regarding stakeholder workshops and public meetings.

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Plan Preparation and Development

Mitigation planning involves bringing together multiple components and players to create a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

Overview of the Plan

The City of Round Rock received funding under the Hazard Mitigation Grant Program (HMGP) to develop a FEMA-approved Hazard Mitigation Plan. The City solicited bids and hired the consultant team of H2O Partners, Inc. to provide technical support and oversee the development of the Plan. In developing the Plan, the consultants used the July 2008 "*Local Multi-Hazard Mitigation Planning Guidance*" and the *State and Local Mitigation Planning How-to Guides* (FEMA Publication Series 386) to create the Plan in accordance with the process as shown in Figure 2-1 below.

Figure 2-1. Mitigation Planning Process

The City of Round Rock and the consultant team met in August 2010 to begin organizing resources by identifying Planning Team Members and conducting a capability assessment. Round Rock ISD was invited as a stakeholder to attend initial meetings and decided to participate fully in the planning effort.

Planning Team

The Planning Team was established using a direct representation model. Key members of H2O Partners, Inc. developed the plan in conjunction with the Executive Committee comprised of the Emergency Management Coordinator and Grants Coordinator. The overall Planning Team was made up of all city departments, including Public Works, Parks & Recreation, Utilities, Police and Fire Departments, and the Round Rock ISD. Departments and titles of team members are illustrated in Figure 2-2.

Figure 2-2. Planning Team Members

Some of the responsibilities of the Planning Team included: completing capability assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies.

Planning Process

The process used to prepare this Plan included following the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, the result of which was provided at the Risk Assessment Workshop. Based on the City and School District's vulnerabilities, specific mitigation strategies were discussed and created at the Mitigation Workshop. Finally plan maintenance and implementation procedures were developed and are included with this Plan at Section 9. Documentation for participation at each workshop is found in Appendix C.

At the HMP development workshops held throughout the planning process described herein, the following factors were taken into consideration:

- The nature/magnitude of risks currently affecting the community and school district;
- Mitigation goals to address current and expected conditions;
- Whether current resources will be appropriate for implementing the Plan;
- Implementation problems, such as technical, political, legal or coordination issues that may hinder development;
- Anticipated outcomes; and
- How the City, ISD, agencies and partners will participate in the implementation process.

Kickoff Workshop

The Kickoff Workshop was held at the City of Round Rock Police Department Training Room on September 21, 2010. This initial meeting was an opportunity to inform city officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities, and also to involve stakeholder groups such as the Round Rock ISD and area businesses. In addition to the kickoff presentation, participants received the following information:

- Background paperwork about the Plan;
- Public participation survey for distribution; and
- Capability assessment survey for completion.

Hazard Identification

At the close of the Kickoff Meeting, and through a series of email and phone correspondences, the Planning Team conducted preliminary hazard identification. The group reviewed and considered a full range of natural and man-caused hazards, then narrowed the list to significant hazards by reviewing hazards affecting the area as a whole, the State of Texas Hazard Mitigation Plan, and initial study results from reputable sources such as federal and state agencies. Based on this initial analysis, the team identified a total of 14 natural and man-caused hazards that could affect the area.

Risk Assessment

An initial risk assessment for the City was completed in November 2010, with the final product produced in February 2011. The results of the assessment were presented at a workshop for the City held on February 7, 2011. Participants and stakeholder groups were invited to the Risk Assessment Workshop. At this workshop, the characteristics and consequences of each hazard were evaluated to determine how much of the area would be affected, in terms of potential danger to property and citizens.

Potential dollar losses from each hazard were estimated using the Federal Emergency Management Agency's Hazards U.S. Multi-Hazards (MH) Model (HAZUS-MH) and other HAZUS-like modeling techniques. The assessments examined the impact of various hazards on the built environment, including on general building stock (e.g., residential, commercial, industrial), critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Each participant was also given a risk ranking sheet at the Risk Assessment Workshops in order to reflect unique and varied risks across the planning spectrum. Participants ranked hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact.

The assessments were also used to set priorities for mitigation based on potential dollar losses and loss of lives. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 6 in this Plan.

Mitigation Review and Development

The mitigation strategy development for the Plan involved developing mitigation goals, and developing new mitigation actions. A Mitigation Workshop was held at the Round Rock Office of Emergency Management (OEM) on May 4, 2011. As with the Risk Assessment Workshop, stakeholder groups were invited.

An inclusive and structured process was used to develop and prioritize new mitigation actions for this plan, including the following steps:

- A "menu" of optional mitigation actions was developed based on plan reviews, studies, and interviews with federal, state and local officials. The participants reviewed the optional mitigation actions, and narrowed the list down to those that were most applicable to their area

of responsibility, most cost-effective in reducing risk, could be implemented easily, and would be most likely to receive institutional and community support.

- The participants inventoried federal and state funding sources that could potentially assist in implementing the proposed mitigation actions. Information was collected, including the program name authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact. Mitigation Planning Team Members considered benefits that would result from the mitigation actions versus the cost of those projects. Detailed cost-benefit analyses were beyond the scope of this plan. However, economic evaluation was one factor that helped Team Members select one mitigation action from competing actions.
- Team Members then selected and prioritized mitigation actions.

The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic and environmental considerations. As a result of this exercise, an overall priority was assigned to each mitigation action by each Team Member. The overall priority of each action is reflected in the mitigation actions found in Section 8.

Team Members developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources.

Mitigation Actions identified in the process were made available to the Planning Team for review. In addition, the Plan will be made available for review and comment on the City of Round Rock's website.

Review and Incorporation of Existing Plans

Review

A variety of existing studies, plans, reports, and technical information were reviewed as part of the planning process. Sources of the information included FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the State Comptroller, the Texas State Data Center, Texas Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans.

Section 4 and the hazard-specific sections of the Plan (Sections 5-6) summarize the findings from these information sources. Some of these documents, including those from FEMA, provided information on risk, existing mitigation actions currently underway, and ideas for possible future mitigation actions. Other documents, including those from NOAA, provided histories of disasters in the area. The USACE studies were reviewed for their assessment of risk and potential projects in the region. State Data Center documents were used to obtain population projections. Materials from FEMA and TDEM were

reviewed for guidance on plan development requirements. Communities included actions from other plans, such as Floodplain Management Plans and developed actions to implement and incorporate other plans such as Stormwater Management Plans.

Incorporation of Existing Plans

Current projects and studies were utilized as a starting point for discussing mitigation actions among Team Members. This information was also developed into a table for review by the Planning Team for an assessment on the City's capability.

Previous hazard events, occurrences and descriptions were identified through NOAA's National Climatic Data Center (NCDC). Results of past hazard events were found through searching the NCDC and included in Section 5 of this Plan. The preliminary results were also presented at the Risk Assessment Workshop held in February 2011 in order to facilitate a discussion on risk to help participants appropriately rank hazards for their jurisdiction.

The TWDB studies were reviewed for population and other projections and included in Section 3 of the Plan. Further, these studies were used as a starting point for suggesting grant and mitigation activities based on flood-related funding availability. The State Comptroller materials were reviewed for regional economic projections, which were also used to fully develop Section 3 of the Plan. Information from the Texas Forest Service was used to appropriately rank the wildfire hazard, and to help identify potential grant opportunities. The State of Texas Mitigation Plan, developed by TDEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The State Plan was also used as a guidance document, along with FEMA materials, in the development of the Plan.

Public and Stakeholder Involvement

An important component of mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole, provides the Planning Team with a greater understanding of local concerns, and increases the likelihood of successfully implemented mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals and schools, are involved, they are more likely to gain a greater appreciation of the hazards present in their community and take steps to reduce their impact.

Public Participation

Public involvement in the development of the City of Round Rock Hazard Mitigation Plan was sought at three separate periods of the planning process: (1) during the beginning of the planning process; (2) during the hazard identification stage of the Plan; and (3) during mitigation development, but prior to official plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making copies of draft Plan deliverables available for public

review on the city's website, as well as in government offices and public libraries. Three open public meetings were held during the development of this Plan, as described below.

First Public Meeting

The first public workshop, in a series of open public meetings, was held on September 21, 2010. This meeting was scheduled on the same day as the Kickoff Workshop, and after the initial Planning Team conference call on August 16, 2010. These meetings were scheduled specifically for seeking public and stakeholder input. Topics of discussion for this first meeting included the purpose of hazard mitigation, discussion of the planning process, and types of hazards, both natural and human-caused.

Second Public Meeting

The second open public meeting was held on February 7, 2011. This meeting was scheduled in the evening following the Risk Assessment meeting for Planning Team Members, and was specifically for seeking public and stakeholder input. The meeting was advertised through a variety of means, including a newspaper ad, flyers at meeting locations, notices on the City's website, and invitations sent via e-mail to community members.

Representatives from area neighborhood associations were present at this meeting, as well as residents located in and around areas that flooded during Tropical Storm Hermine in September 2010. The purpose of the Plan and the planning process was described as a whole. Lengthy discussion regarding mitigating flood-prone areas ensued. Public surveys were distributed and attendees were asked to sign in so that they could be invited to future public meetings.

Third Public Meeting

The third open public meeting was held after the Mitigation Workshop on May 4, 2011. As with the other meetings, this round of meetings was advertised through local newspaper ads, flyers at meeting locations, notices on the City's website, and invitations sent to local businesses. In addition, members of the public who attended the first and second series of public meetings were also invited and encouraged to attend.

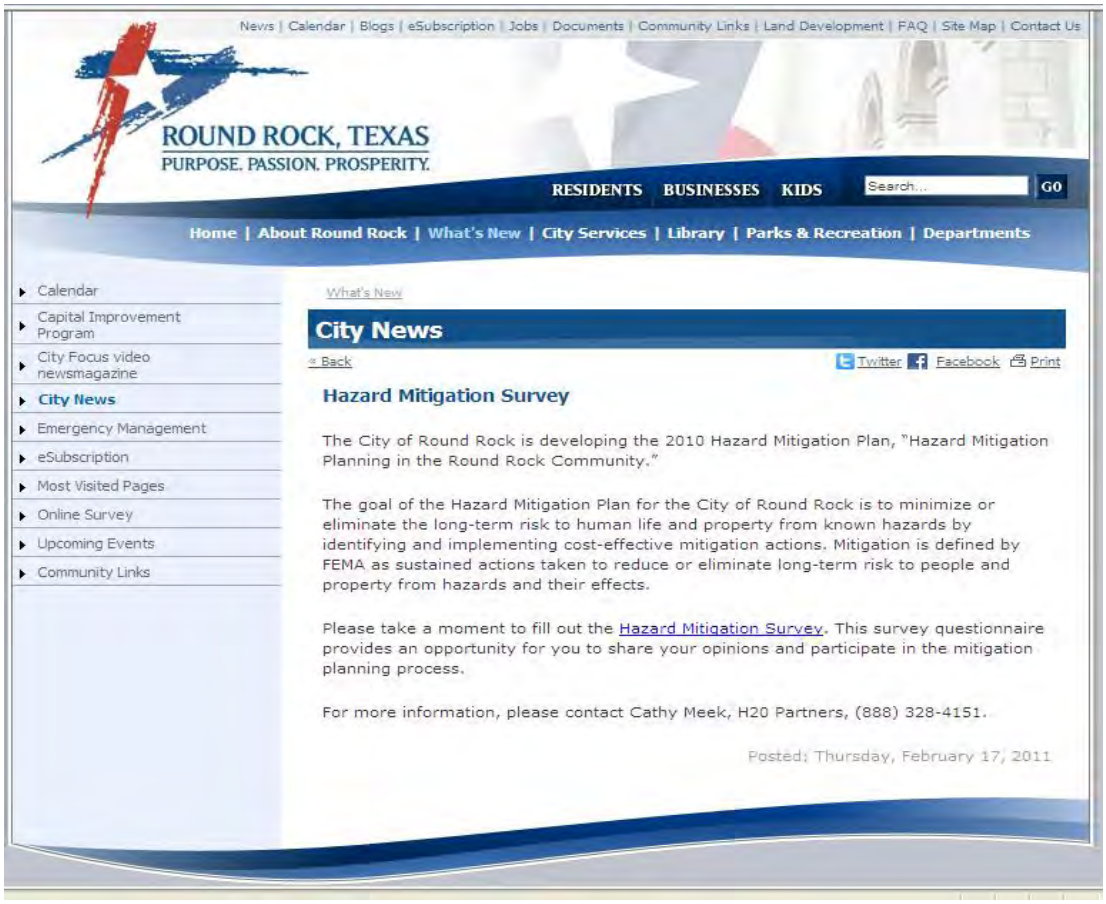
For this meeting, an update on the planning process was provided and surveys were collected. As surveys were still being processed, a detailed analysis of results could not be presented at this time. Members of the public interested in participating in the process were instructed to forward any ideas for mitigation to their local Planning Team member. Documentation of participation in meetings is found in Appendix C.

Public Participation Survey

In addition to the open public meetings, the City of Round Rock was able to solicit input from citizens and stakeholders through the use of a public participation survey. This survey was designed to obtain data and information from the residents of Round Rock.

Copies of the Participation Survey were distributed by local officials and made available for citizens to download from the City of Round Rock's website. A total of 126 responses to the survey were submitted, which provided valuable input in the development of the Plan. A summary of the survey findings is provided in Appendix B.

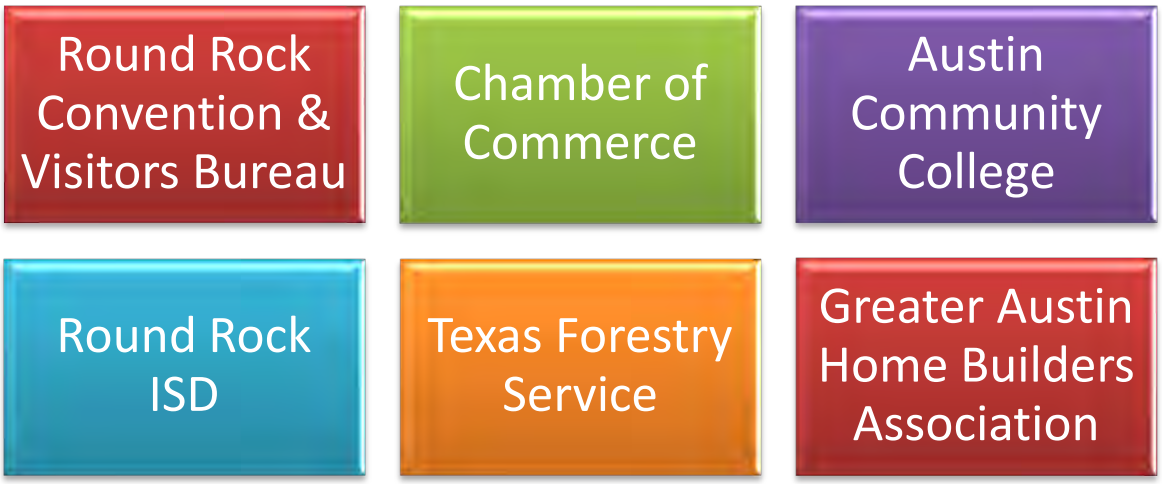
Figure 2-3. Screen Shot of the City of Round Rock's Online Public Survey



Stakeholder Involvement

Stakeholders provide an essential service in hazard mitigation planning; therefore, throughout the planning process, members of state and federal agencies, community groups, local businesses, schools, and hospitals were invited to workshops held. Through the Round Rock Chamber of Commerce and Convention and Visitor's Bureau, numerous local businesses were invited to participate in the Hazard Mitigation Plan. A partial list of organizations invited to attend may be found in Figure 2-4.

Figure 2-4. List of Stakeholders Invited to Attend HMAP Meetings



Round Rock ISD participated in planning meetings and became involved in discussions from the beginning of the planning process. The School District became a key planning partner by officially joining the Planning Team.

Round Rock ISD's Safety and Risk Management Department is committed to providing resource services for the active protection of the District's assets and resources by managing and ultimately minimizing both internal and external exposures and associated risks. One of the Department's objectives is to include, develop, implement and administer a comprehensive District-wide safety, crisis response and risk management program. This includes progressively promoting the protection of the environment and encouraging the efficient use and preservation of natural resources. The Safety and Risk Management Division also serve as the District's primary liaison with emergency response agencies. The Division worked closely with the City of Round Rock's Emergency Operation Division and other City Departments in meeting goals and objectives in development of the Hazard Mitigation Plan.

COMMUNITY PROFILE

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Overview

The City of Round Rock is a City located in both Travis and Williamson County in the State of Texas. It is part of the Austin-Round Rock metropolitan area. Located about 20 miles (32 km) north of downtown Austin, Round Rock shares a common border with Austin at SH 45.

In 1851, a small community was formed on the banks of Brushy Creek, near a large round and anvil-shaped rock located in the middle of the creek. This round rock marked a convenient low-water crossing for wagons, horses, and cattle. The first postmaster called the community "Brushy," and the creek was called "Brushy Creek". But in 1854, at the suggestion of the postmaster, the small settlement was renamed Round Rock in honor of this now famous rock.

In addition to periodic flooding from Brushy Creek, the City of Round Rock is subject to the natural and man-caused hazards discussed in Sections 5 and 6 of this Plan. This section looks at a general profile of the City as a whole, providing data, including:

- Population and Demographics;
- Housing and Household Income;

- Economy and Industry; and
- Land Use and Development Trends.

Figure 3-1. Location of Round Rock and Austin Metropolitan Area

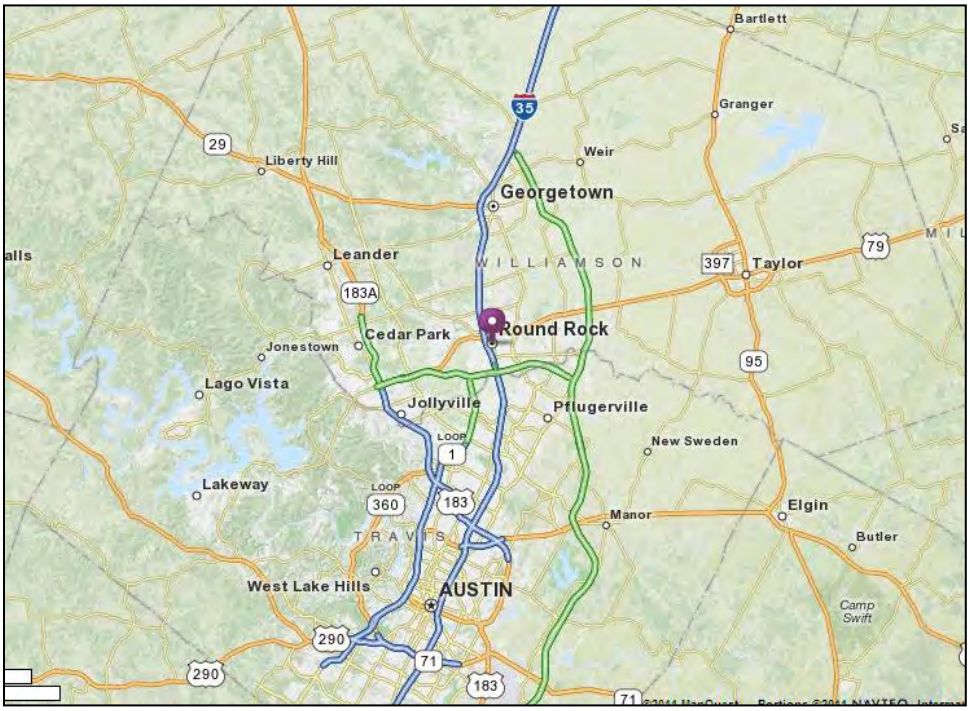
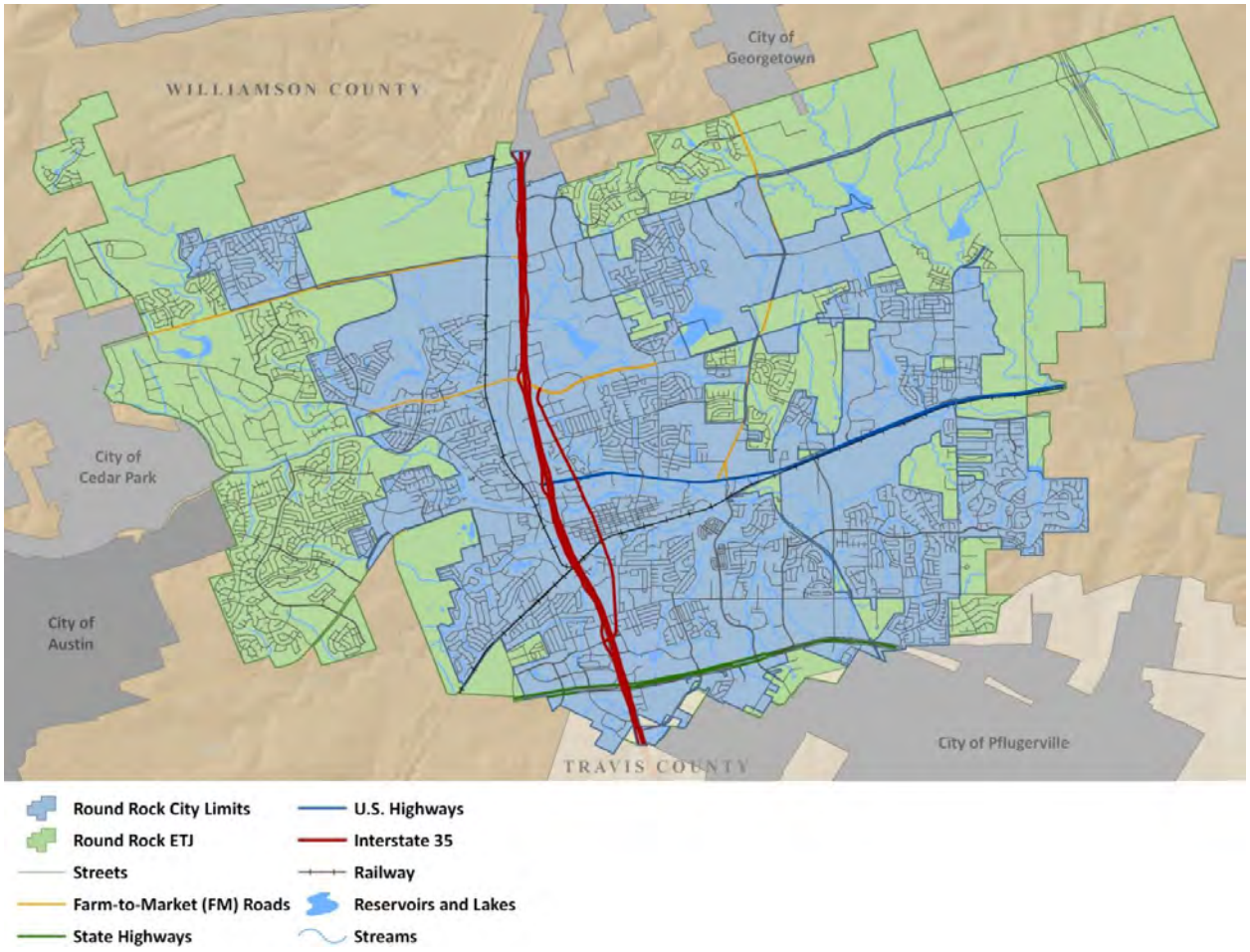


Figure 3-1 shows the location of the City of Round Rock and Figure 3-2 profiles the study area. All areas of the City, including the School District, are covered in the risk assessment to the Plan, including small portions of the City that extend into neighboring Travis County along the southern boundary of the community.

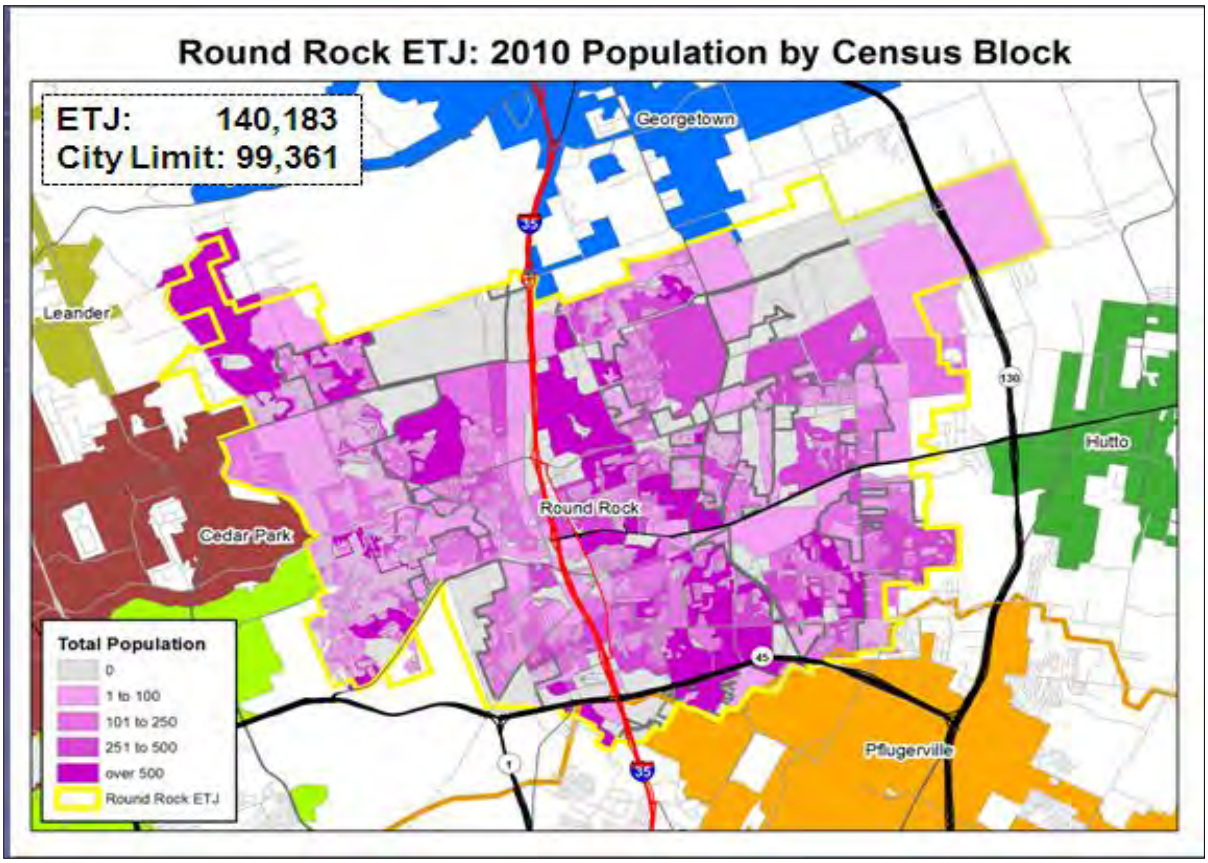
Figure 3-2. Study Area



Population and Demographics

By the 1990s, Round Rock was primarily a bedroom community with the majority of its employed residents working in Austin, and then returning home after work to places like Round Rock and Georgetown, where housing and land was less expensive; this is partly still true today. In the 1990s, Round Rock had few major employers and jobs other than local retail, or ranching and farming. But in the late 1990s, that began to change as economic development became a major focus of the City and the Chamber of Commerce. Dell Corporation moved its headquarters to Round Rock and provided a significant increase in jobs, with 16,000 employees at its Round Rock headquarters. Also, other major employers began allowing many residents to work in the community where they live.

Figure 3-3. Census 2010 Population Map for City of Round Rock and ETJ



The population of Round Rock in 1878 was 1,200. By 1890, that figure had grown to 1,438; however, the population declined between this period and 1900, when the population was only 1,138. The downward trend continued with the City's population reaching its all time low in 1920, only 900. By 1936, the population had climbed up to 1,173, and has continued to climb since then. The 1960 figure was 2,458 and crept up to 2,811 by 1970. Between 1970 and 1980, the exponential growth began. The 1980 population was 12,740, an increase of almost 400 percent. Rapid growth continued in the 1980s. By 1990, the population figure was 30,923, an increase of almost 150 percent from the 1980 figure. The City of Round Rock currently estimates the population at 103,342 for 2011, including 94,272 households in the City. The median value of housing units is $163,400.

Table 3-1 - Population of Round Rock 2005-2025

Year	New City Projections	New City Growth Rate	Greater Round Rock	Greater Round Rock Growth Rate
2005	82,311	-	113,214	-
2006	86,175	4.7%	118,441	4.6%
2007	90,930	5.5%	124,716	5.3%

Year	New City Projections	New City Growth Rate	Greater Round Rock	Greater Round Rock Growth Rate
2008	93,909	3.3%	133,085	6.7%
2009	97,458	3.8%	140,211	5.4%
2010	100,815	3.4%	148,258	5.7%
2011	103,342	2.5%	155,311	4.8%
2012	105,805	2.4%	162,300	4.5%
2013	109,191	3.2%	166,673	2.7%
2014	112,388	2.9%	170,857	2.5%
2015	115,587	2.8%	175,023	2.4%
2016	118,949	2.9%	178,667	2.1%
2017	122,312	2.8%	182,292	2.0%
2018	125,981	3.0%	186,223	2.2%
2019	129,634	2.9%	190,138	2.1%
2020	133,264	2.8%	194,030	2.0%
2021	136,596	2.5%	197,624	1.9%
2022	140,011	2.5%	201,301	1.9%
2023	143,511	2.5%	205,063	1.9%
2024	147,099	2.5%	208,913	1.9%
2025	150,776	2.5%	212,852	1.9%

Source: City of Round Rock Historical Collection

Ethnicity

The ethnic makeup of City of Round Rock, according to estimates for 2008 by the United States Census Bureau, is shown in Table 3-2 below.

Table 3-2. 2010 Ethnic and Racial Composition for City of Round Rock

Description	Percentage[1]
Hispanic Alone	24.34
White Alone	71.34
African American Alone	8.39
American Indian and Alaska Native Alone	0.04
Asian Alone	5.74
Native Hawaiian/Pacific Islander Alone	0.10
Multi-Racial	14.40

Source: CLRSearch

[1] Total Percent equals more than 100 as some individuals indicate more than one race.

Table 3-3 displays ethnic makeup for the State of Texas Year 2000-2040.

Table 3-3. 2010 Ethnic and Racial Composition for Texas - Year 2000-2040

Ethnicity	2000	2010	2020	2030	2040
White	11,074,716	11,331,876	11,381,134	11,171,448	10,733,060
African American	2,421,653	2,627,287	2,771,406	2,823,276	2,796,623
Hispanic	6,669,666	8,060,605	9,336,505	10,576,279	11,662,274
Other	685,785	783,215	841,642	878,111	893,152

Source: Texas State Data Center

Age

According to U.S. Census estimates for the year 2010, the median age for persons living in City of Round Rock is 29.8, with 9.81 percent of the population at 17 or under, and 4.27 percent 65 and older. The 2010 Census age results for the City of Round Rock, the State of Texas, and the United States are depicted in Table 3-4 below.

Table 3-4. Age of Population in Round Rock, the State of Texas, and the U.S.A.

2010 Population by Age	Round Rock, TX		Texas		United States	
Median Age	29.8		32.3		35.6	
Age 0 to 5	12,731	12.65%	2,520,040	10.07%	27,272,233	8.84%
Age 6 to 11	10,686	10.62%	2,306,956	9.22%	25,951,760	8.41
Age 12 to 17	9,874	9.81%	2,363,243	9.44%	26,670,752	8.65
Age 18 to 24	8,043	7.99%	2,696,982	10.78%	30,645,752	9.94
Age 25 to 34	18,632	18.51%	3,623,088	14.48%	41,347,003	13.4
Age 35 to 44	17,614	17.50%	3,469,956	13.86%	42,374,180	13.74
Age 45 to 54	12,684	12.60%	3,381,629	13.51%	44,166,693	14.32
Age 55 to 64	6,106	6.07%	2,367,137	9.46%	33,320,215	10.8
Age 65 to 74	2,340	2.32%	1,242,650	4.96%	18,843,973	6.11
Age 75 to 84	1,254	1.25%	738,150	2.95%	12,472,002	4.04
Age 85+	704	0.70%	318,462	1.27%	5,390,571	1.75

Source: CLRSearch

Education

The City of Round Rock is included in the Round Rock Independent School District. Table 3-5 depicts level of education data for the City of Round Rock, the State of Texas, and the United States.

Table 3-5. Level of Education for Round Rock, State of Texas, and the U.S.A.

2010 Highest Education Level Attained (Population Age 25+)	Round Rock, TX		Texas		United States	
Did Not Complete High School	3,664	6.18	2,890,174	19.09%	30,370,155	15.35%
Completed High School	11,328	19.09	3,868,877	25.55%	57,863,097	29.24%
Some College	15,230	25.67	3,330,008	21.99%	40,691,836	20.56%
Completed Associate Degree	4,828	8.14	960,669	6.34%	14,841,627	7.50%
Completed Bachelors Degree	17,617	29.69	2,759,550	18.23%	34,682,582	17.52%
Completed Graduate Degree	6,667	11.24	1,331,794	8.80%	19,465,340	9.84%

Source: CLRSearch

Housing and Household Income

According to the 2010 Demographic information, there were 34,765 housing units in the City of Round Rock. Of these, 58 percent had children under the age of 18 living with them, and 83 percent of the total number of households was comprised of married couples. Over 21 percent of households were non-families.

Table 3-6 reflects the median household income for the City of Round Rock, which was $72,920 in 2010, compared to a state-wide average of $54,591, and a national average of $55,970.

Table 3-6. 2010 Household Income for Round Rock, State of Texas, and the U.S.A.

2010 Household Income Statistics	Round Rock, TX	Texas	United States
Total Area Household Income	$2,943,755,091	$665,642,637,800	$8,877,041,207,141
Median Household Income	$72,920.00	$54,591.00	$55,970.00
Average Household Income	$84,676.00	$73,571.00	$74,974.00
Per Capita Household Income	$29,242.00	$26,596.00	$28,779.00

Income Less than $15,000	1,348	3.88%	1,119,096	12.37%	14,165,359	11.96%
Income $15,000 to $24,999	1,614	4.64%	849,946	9.39%	10,837,720	9.15%
Income $25,000 to $34,999	2,279	6.56%	929,798	10.28%	11,829,365	9.99%
Income $35,000 to $49,999	4,191	12.05%	1,316,758	14.55%	17,010,932	14.37%

2010 Household Income Statistics	Round Rock, TX		Texas		United States	
Income $50,000 to $74,999	8,672	24.94%	1,678,415	18.55%	22,437,035	18.95%
Income $75,000 to $99,999	6,899	19.84%	1,232,527	13.62%	16,654,204	14.07%
Income $100,000 to $124,999	4,286	12.33%	756,471	8.36%	10,110,396	8.54%
Income $125,000 to $149,999	2,376	6.83%	453,613	5.01%	5,931,821	5.01%
Income $150,000 to $199,999	1,668	4.80%	323,847	3.58%	4,245,070	3.59%
Income $200,000 and Over	1,432	4.12%	387,197	4.28%	5,180,241	4.38%

Source: CLRSearch

Economy and Industry

Round Rock is currently transitioning from a successful suburb into a prosperous and attractive midsize city. This transition presents major changes in Round Rock's quality of life and business environment, from the ways people move about the city to the number and types of places people can do business or have fun.

The City of Round Rock has maintained a high quality of life while becoming a major center for economic growth in Central Texas, with industry clusters in clean energy, advanced manufacturing, life sciences, and computer and computer software development.

Round Rock has more than twenty major employers including: Toppan Photomasks, Sears Customer Care, IKEA, Round Rock Premium Outlets, KoMiCo Technology Inc., Texas Guaranteed Student Loan Corp. (TGSL), Cintas, Dresser, Hospira, TECO-Westinghouse, Cerilliant Corporation and Dell.

Dell is a multinational computer and information technology corporation based in Round Rock, which develops, sells and supports computers and related products and services. The company employs about 16,000 people in the Round Rock facilities. The presence of Dell, along with other major employers, a strong economic development program, favorable tax rates, and major retailers such as IKEA and a Premium Outlet Mall, have changed Round Rock from a sleepy bedroom community into its own self-contained "super suburb."

In August 2008, *Money* magazine named Round Rock as the seventh-best American small city in which to live. Round Rock was the only Texas City to make the Top 10. In a CNN article dated July 1, 2009, Round Rock was listed as the second-fastest growing city in the country, with a population growth of 8.2% in the preceding year.

Per capita income for the city was $26,444 in 2009, with approximately 2.8 percent of families below the poverty line. Unemployment in 2011 was 6.7%.

Land Use and Development Trends

The City of Round Rock has a total land area of 26.1 square miles and a total water area of .1 square miles. Generally, the land surface can be characterized as broad and nearly level. The City straddles both sides of the Balcones Escarpment fault line. One side of the Escarpment is roughly east of IH-35, and is flat and characterized by the black, fertile soils of the Blackland Prairie. The west side of the Escarpment consists mostly of hilly terrain with little topsoil and higher elevations, and is part of the Texas Hill Country. Elevation ranges from 454 to 1265 mean sea level in the northwest part of the county (NRCS soils survey, 1985). Land use countywide supports the leading industries which include agriculture, oil and gas, shipping, and tourism.

Significant changes in land use occurred in the past decade. The most notable change was an increase in developed acreage. Including the ETJ, the amount of developed land has nearly doubled since 2000. The City has expanded land use to make room for regional attractions such as:

- Dell Diamond, home to the Triple-A Round Rock Express;
- Round Rock Premium Outlets;
- Scott & White Hospital and Seton Medical Center;
- Austin Community College;
- Texas State University;
- Texas A&M Health Science Center; and
- IKEA.

These developments not only assist in diversifying the local economy, but also foster increased opportunities for families to live, work, and play. These developments have also changed the demographics and business dynamics of the City. Round Rock has a negotiated ETJ boundary, which will not be subject to significant change. The total acreage within that boundary is currently 43,320. The total acreage within City limits is currently 22,038. Approximately 60% of the land area within the City and ETJ has been developed. Within the municipal boundaries, approximately 73% of the land is developed. The remaining area consists of agricultural and vacant land. The largest land use in the City and ETJ is single-family residential. Forty-four percent (44%) of the developed land within the municipal boundaries consists of single-family homes (48% when including the ETJ).

Table 3-7. Existing Land Use for 1998 and 2009

	1998			2009		
Land Use	**Acres**	**% of Developed Acres**	**% of Total Acres**	**Acres**	**% of Developed Acres**	**% of Total Acres**
Single-Family	8,047	66%	20.10%	11,347	48.3%	29%

Land Use	1998			2009		
	Acres	% of Developed Acres	% of Total Acres	Acres	% of Developed Acres	% of Total Acres
Two-Family	176	1.40%	0.40%	213	0.1%	0.50%
Multifamily	246	2.00%	0.60%	614	2.6%	1.60%
Commercial	1169	9.60%	2.90%	1,720	7.3%	4.40%
Industrial	783	6.40%	1.90%	780	3.3%	2%
Government/Institutional	369	3.00%	0.90%	792	3.4%	2%
Education Facilities	393	3.20%	0.90%	948	4.0%	2.40%
Recreation & Open Space	1,008	8.30%	2.50%	3,850	16.4%	9.90%
Mixed-Use	-	-	-	15	0.0%	0%
Office	-	-	-	541	2.3%	1.40%
Mining	-	-	-	1,301	5.5%	3.30%
Utilities	-	-	-	207	0.1%	0.10%
Drainage	-	-	-	1,158	4.9%	3%
Total Developed Acres	**12,191**	**100**	**30.40%**	**23,486**	**100.0%**	**60.10%**
Agriculture	10,554	n/a	26.30%	5,949	n/a	15.20%
Vacant	17,385	n/a	43.30%	9,628	n/a	24.60%
Total Acres	**40,130**	**-**	**100%**	**39,063**	**-**	**100%**

The largest land use in the City remained residential (single-family, multi-family, and two-family), accounting for 51%. The largest sum of new residential acreage was added to the single-family classification (3,300 acres; a 41% increase). The single-family housing stock accounts for approximately 93% of the residential total. This statistic is comparatively larger than the national average of 67%, as reported by the American Planning Association in 2006.

The fastest growing segment of residential land use was multi-family. There was an approximately 150% increase in the amount of land devoted to multi-family use in comparison to trends cited in Round Rock's 2000 General Plan. This trend can be explained by market demand for a diverse housing stock, most likely due to the planned college facilities and a previous shortage of multi-family housing units. Nevertheless, single-family development remains the predominant residential land use in Round Rock.

In the first half of the 20th century, the county's wealth came from the cotton fields. Cotton, row-crops, grapes, and truck farming were the predominate subsistence east of Interstate 35. West of the Balcones Divide, ranchers raised cattle, sheep and, to a lesser extent, goats. Due to Round Rock's favorable geographic location over the rich, fertile "blackland prairie" soils, also known locally as the "black waxy" (due to the soil's high clay content), cotton was the largest economic driver at that time. Because of the soil and climate, this eco-region is ideally suited to agriculture. Nearby Taylor, east of Round Rock, was

the primary cotton center where the crop was hauled for ginning (when seeds are mechanically removed), compressed into bales, and shipped by train. Austin was also a cotton center for a time, after the railroad arrived there in the 1870s. Cotton production and cattle raising, on a much smaller scale, continue today, primarily east of Round Rock. However, agricultural land use has decreased by approximately 43% in the last 10 years. As the City develops, it is expected that agricultural land use will continue to be converted to other uses, a trend which is prevalent in communities throughout the country.

The amount of land utilized for commercial use increased by 47%. As the residential population increased, a market demand for additional commercial land use was created. As noted previously, the Round Rock Premium Outlets and IKEA have been recently developed and are located on the east side of IH-35 adjacent to University Boulevard. Large shopping centers anchored by principal tenants (i.e., HEB Plus at the northwest corner of US-79 and A.W. Grimes Boulevard, Wal-Mart at the northeast corner of Red Bud Lane and US-79, and JCPenny at the southeast corner of University Oaks Boulevard and University Boulevard) all contributed to this increase. Part of this increase was also due to a concerted effort by the City to attract destination retail uses to diversify the community's economic base.

Land used for educational facilities also increased. The land devoted to education grew from 393 acres to 948 acres, a 141% increase. This can be explained partially by increased residential development as well as the development of the three higher education facilities in the northeast section of the City. As the population expands in the future, essential land uses, such as educational land use, will continue to increase.

Recreation and open space land use increased dramatically since 1998. In fact, there was a 281% increase in the amount of land utilized for recreation and open space. This increase represented the fastest growing land use segment over the last 10 years. This correlates to the marked residential expansion. As per the City's subdivision ordinance, residential developers are required to donate land or make a payment in-lieu of parkland. The City also acquired two large tracts for passive park uses, and Williamson County has developed a major regional park in the Round Rock ETJ.

Lake Georgetown, located 3 miles west of Georgetown, Texas, was constructed by the U.S. Army Corps of Engineers, Fort Worth District, to control flooding along the San Gabriel River. Impounded in 1980, Lake Georgetown serves as a water supply for Round Rock, Georgetown and the Brushy Creek Municipal Utility District.

Current and Future Water Supply

Lake Georgetown has 247 square miles of drainage, contributing to a total capacity of 124,610 acre-feet. At normal levels, this capacity is equivalent to more than 40 billion gallons of water. The surface area of the lake is 1,310 acres and it is approximately 423 miles from the Gulf of Mexico. Lake Georgetown is in the Brazos River Basin. Since 2004, the City of Round Rock, the City of Georgetown,

Brushy Creek MUD and Chisholm Trail Special Utility District, have participated in a 26-mile pipeline from Sillhouse Hollow Lake in Bell County, a much deeper lake on the Brazos River, to Lake Georgetown in Williamson County. The Brazos River Authority (BRA) operates the two reservoirs as one system, moving water to Lake Georgetown for the four entities.

In May 2011, the BRA installed two new high-volume pumps at Stillhouse Hollow Lake to help keep water levels at Lake Georgetown from getting too low. The additional pumps made a total of four pumps available to move water from Lake Stillhouse Hollow to Lake Georgetown. The new pumps are a collaborative effort by all four entities, coordinated by the BRA. When Lake Georgetown reaches pre-determined water levels, it triggers the use of the two new pumps in Lake Stillhouse Hollow. In addition, the City of Round Rock is partnering with the cities of Cedar Park and Leander to build a system to draw water from Lake Travis. That intake system will come on line in 2012.

Municipal Utility Districts

Municipal Utility Districts, commonly called "MUD's", play a significant role in Round Rock. Each is a special-purpose district that provides public utilities such as water, wastewater, storm water, and sometimes, roads, parks, solid waste and other infrastructure services to the residents of that district. MUD's are typically formed by a residential developer as a means to install utilities and roads to a project when a city is not ready or able to provide them. The developer gets reimbursed over time from the fees levied by the MUD, and at some point the area may be annexed by the City to bring the development into the City's tax base once the basic infrastructure costs are paid off. The MUD is represented by its own board of directors who are voted on by the residents of the district, and it has the authority to condemn land, add additional land area, and levy fees in lieu of property taxes to maintain the utilities and other facilities.

There are currently ten MUD's in Round Rock: Brushy Creek, Fern Bluff, Highlands at Mayfield Ranch, Meadows at Chandler Creek, Paloma Lake, Parkside at Mayfield Ranch, Siena, Teravista, Vista Oaks, and Walsh Ranch. Total population living within these MUD's is 47,648 (2010 city estimate).

School Districts

The only school district in the City of Round Rock and surrounding ETJ is Round Rock Independent School District (RRISD). RRISD is located in southern Williamson County and northwest Travis County and includes the City of Round Rock and portions of the City of Austin and the City o fCedar Park. The area covers 110 square miles. Roughly 45,000 students attend the district's five high schools, ten middle schools, 32 elementary schools, and two alternative learning centers. During the past five years, the number of students has increased by nearly 15%, and enrollment continues to grow by more than 1,200 students per year. Due to the growing student population and need to protect lives and property from natural hazards and possible acts of terrorism, RRISD participated in the Plan with the City of Round Rock.

HAZARD IDENTIFICATION

Hazards Considered 1
State and Local Plan Review 2
Hazard Descriptions 3

This is the first section of the risk assessment, which includes hazard profiles found in Section 5 and the vulnerability assessment found in Section 6. The purpose of this section is to provide background information for the hazard identification process as well as descriptions for the hazards identified in the Plan.

Hazards Considered

After the initial Kickoff Workshop, and upon a review of the full range of hazards suggested under FEMA planning guidance, the Planning Team identified 14 significant hazards to be addressed in the Plan. These hazards were identified through an extensive process utilizing input from Planning Team Members, research of past disaster declarations and a review of the current State of Texas Hazard Mitigation Plan ("State Plan"). Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information as needed. Natural hazards are profiled in Sections 5 and 6 of the Plan and technological or human-caused hazards are addressed in Appendix A.

In order to identify risks to the area, an examination of historic trends was conducted for relevant background information. This included reviewing disaster declarations for the area.

The State of Texas claims the highest number of disaster declarations, at 318, for any state or territory from 1953 to 2011[1]. From 2000 to 2010, the state experienced 16 declared disasters, including Hurricanes Dolly and Ike. In 2008 alone the state suffered 36 fatalities, 103 injuries and over 15 million dollars worth of property damage.

The City of Round Rock is located in Williamson County with the southern city limits extending into Travis County. The City has had a significantly lower amount of declarations than the state as a whole.

[1] http://www.fema.gov/femaNews/disasterSearch.do?pageInfo.pageStart=1

State and Local Plan Review

The City of Round Rock and Round Rock ISD have experienced many small-scale hazards. A recent noteworthy event was Tropical Storm Hermine in September 2010. Hermine dumped heavy rains on a slow crawl through Texas, leaving behind power outages and flooding in Round Rock and Williamson County. Smaller scale disasters such as Hermine threaten public safety and can cost the school district, city government, businesses and residents millions of dollars in direct and indirect damages; therefore, an extensive range of hazards was considered in the identification process. This included an evaluation of the State Plan, and federal and state resources.

Table 4-1 lists the full range of natural and technological hazards initially identified for consideration. The table documents the evaluation process used for determining the significance of each hazard. Only hazards identified as significant were included in the Plan. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

Table 4-1. Hazard Identification Process

Hazard Considered	Identified as Significant	Reason for Determination
Dam Failure	YES	Included in the State Plan. Although the risk of failure is low, the hazard should be included as dams are located within the City.
Drought	YES	Included in the State Plan. Drought can occur throughout the state and Round Rock experienced a period of extreme drought in 2000, 2009 and 2011.
Earthquake	NO	According to the State Plan, an earthquake occurrence for the South Central Region, where Round Rock is located, is considered rare. Although a small event is possible, it would pose little to no risk for the area.
Extreme Heat	YES	Included in the State Plan; high frequency of occurrence.
Flood	YES	Included in the State Plan; high frequency of occurrence.
Hail	YES	Included in the State Plan; high frequency of occurrence.
Hurricane Wind	YES	The City and School District have a potential risk for hurricane winds.
Land Subsidence	NO	There is no historical occurrence of land subsidence for the City or the ISD. The impact would be limited and the frequency of occurrence is unlikely according to the State Plan.
Thunderstorm	YES	Included in the State Plan; high frequency of occurrence.
Tornado	YES	Included in the State Plan; high frequency of occurrence.
Winter Storm	YES	Review of the State Plan and the NOAA National Climatic Data Center (NCDC) indicate that winter storms are a

Hazard Considered	Identified as Significant	Reason for Determination
		significant threat.
Wildfire	YES	Included in the State Plan; high probability of occurrence.
Windstorm	NO	The NCDC does not list a historical hazard windstorm event for the region separate from hurricane winds or winds associated with severe thunderstorms.
Infectious Disease	YES	Communicable diseases can occur at any geographic location.
Hazardous Materials Release	YES	Hazardous Material Releases and toxic releases can have a substantial impact which can include property damage.
Pipeline Failure	YES	Fuel pipelines are located throughout the City.
Terrorism	YES	Although there has been no past occurrence in the City, the potential impact of a Terrorism event could be great.

Hazard Descriptions

The 14 hazards identified as significant according to Table 4-1 are divided into two main categories: natural and technological. Natural hazards are further categorized as atmospheric, hydrologic, and other.

Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards identified as significant include: hail; hurricane wind; severe thunderstorms; tornadoes; winter storm; extreme heat. Hydrologic hazards are events or incidents associated with water related damage and account for over 75 percent of Federal disaster declarations in the United States. Flooding (inland) is the hydrologic hazards identified as significant in this assessment. For the purposes of the risk assessment, "other" natural hazards consist of wildfire, dam failure, and drought.

The term "technological hazards" refers to the origins of incidents that can arise from human activities such as the use of gas and oil pipelines and the manufacture, transportation, storage, and use of hazardous materials. These hazards are distinct from natural hazards primarily in that they originate from human activity. While the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced. Human-caused hazards are those hazards originating directly from human activity, such as terrorism or pandemic. The State Plan does not address these hazards or require that they be addressed in a mitigation plan, however, an analysis has been provided in Appendix A.

Table 4-2 provides descriptions for each of the natural, technological, other, and human-caused hazards included in the plan.

Table 4-2. Hazard Descriptions

Hazard	Description
ATMOSPHERIC	
Hail	Any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. With hail comes lightning; an abrupt, discontinuous natural electric discharge in the environment. Thunderstorms are also associated with hail storms. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms.
Severe Thunderstorm	A severe thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph.
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces.
Extreme Heat	Severe, excessive summer heat characterized by a combination of exceptionally high temperatures and humidity. When these conditions persist over time, it is called a heat wave.
Hurricane Wind	A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher.
HYDROLOGIC	
Flood	The accumulation of water within a water body, which results in the overflow of excess water onto adjacent lands, usually floodplains. 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. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding.
OTHER	
Dam Failure	A systematic failure of the dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100 year flood plain boundaries.

Hazard	Description
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface.
Drought	Period of time without substantial rainfall that persists from one year to the next. A normal part of all climatic regions, including areas with high and low average rainfall. Drought is classified as meteorological, hydrologic, agricultural, or socioeconomic.
TECHNOLOGICAL	
Hazardous Materials Release	Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. A hazardous material (HAZMAT) incident involves a substance outside normal safe containment in sufficient concentration to pose a threat to life, property, or the environment.
Pipeline Breach	An estimated 2.2 million miles of pipelines in the United States carry hazardous materials such as oil and natural gas. Pipelines are out of sight and unnoticed, yet have caused fires and explosions that have killed more than 200 people and injured more than 1,000 people nationwide in the last decade.
HUMAN-CAUSED	
Pandemic	An epidemic that becomes very widespread and affects a whole region, a continent, or the world (e.g., the 1957 flu pandemic caused at least 70,000 deaths in the United States and 1-2 million deaths worldwide). Fears of pandemic have risen in recent years as our globalized economy and growing population fosters large scale international travel and trade. Also, growing populations increase the vulnerability of all areas to disease as it can travel more quickly and creates difficulty in preventing the spread of infection.
Terrorism	Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom. It is categorized as either domestic or International, referring to where the terrorist act takes place.

HAZARD PROFILE

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Overview

This section contains profiles for the natural hazards that were identified in Section 4. All human caused hazards are addressed in Appendix A. All hazards are discussed in terms of location, extent, previous occurrences and probability of future events, including any specific or detailed items noted by the Planning Team as it relates to historical hazard information. A full vulnerability assessment for each is included in Section 6.

The detailed profiles in this section are discussed according to category, and included in the following order:

- Atmospheric
  - Hurricane Wind
  - Severe Thunderstorm
  - Tornado
  - Severe Winter Storm
  - Hail

- Hydrologic
  - Flood
  - Drought
- Other Natural Hazards
  - Wildfire
  - Extreme Heat
- Technological
  - Dam Failure

Atmospheric

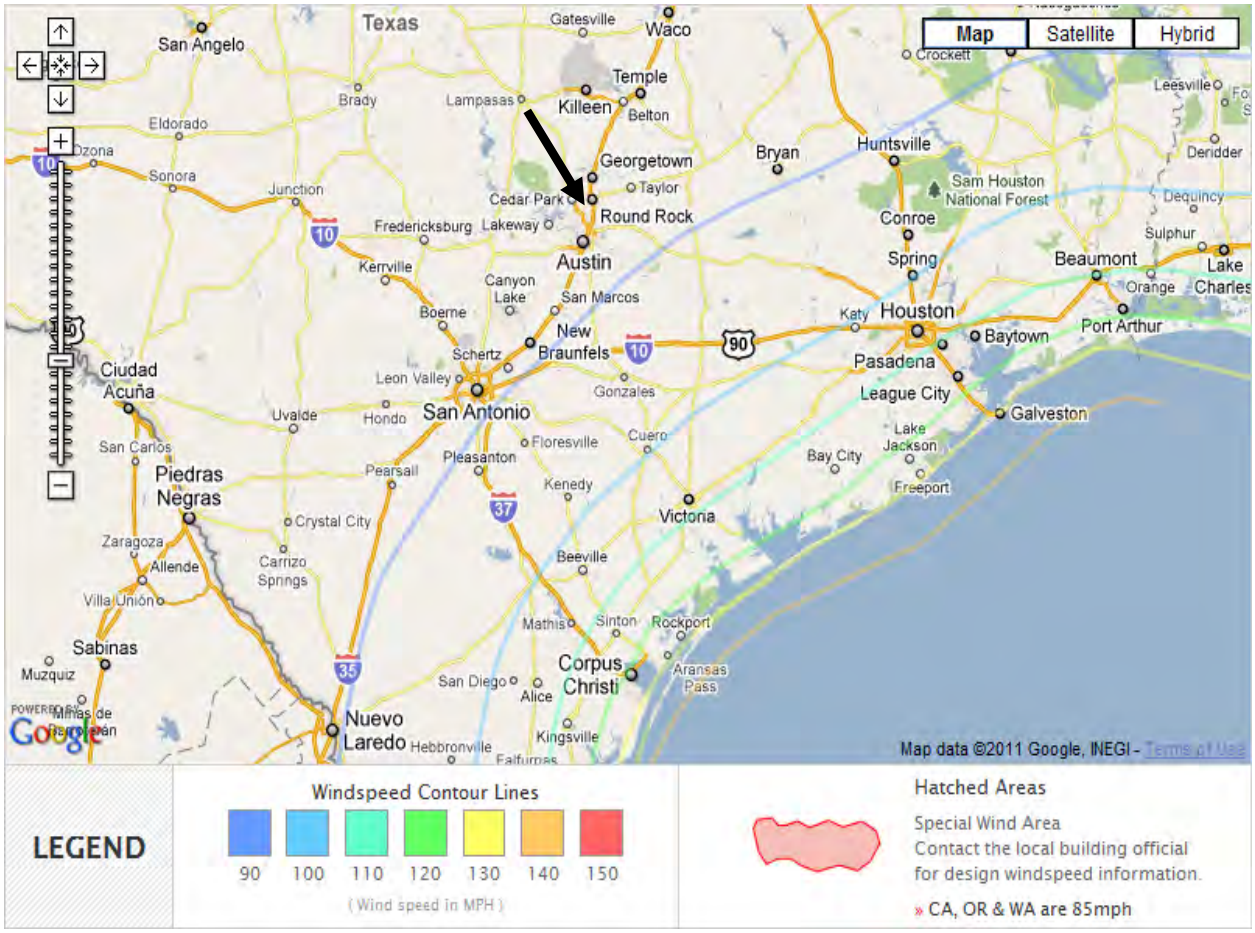
Hurricane Wind

Hurricanes often begin as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35-64 knots (39 – 73 mph). At these wind speeds the storm becomes more organized and circular in shape and begins to resemble a hurricane. Tropical storms can be equally problematic without ever becoming a hurricane, resulting in high winds and heavy rainfall, as Tropical Storm Hermine did for the City of Round Rock and Round Rock ISD in September 2010. Once sustained winds reach or exceed 74 mph, the storm becomes a hurricane. The intensity of a land falling hurricane is expressed in categories relating wind speeds and potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them.

Location

The City of Round Rock is vulnerable to threats indirectly related to a hurricane event, such as high-force winds and heavy rainfall, which is addressed with the subsections on flooding. Round Rock ISD and the City are located inland from the coast, which makes them less vulnerable to high winds from a hurricane event. Schools are also used as shelters for hurricane evacuees from the Texas Coast. Therefore, both the City and School District are in a low risk area for hurricane wind speeds of 90 miles per hour (mph) or less as shown in Figure 5-1 on the following page.

Figure 5.1 – Location of Hurricane Wind Zones



Source: American Society of Civil Engineers (ASCE)

Extent

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (See Table 5-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. This scale only ranks wind speed, but lower category storms can inflict greater damage than higher category storms depending on where they strike, the amount of storm surge, other weather they interact with and how slow they move.

Table 5.1 - Extent Scale for Hurricanes

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)	STORM SURGE (FEET)
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8
3	111–130	964–945	9–12
4	131–155	944–920	13–18

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)	STORM SURGE (FEET)
5	155 +	Less than 920	19+

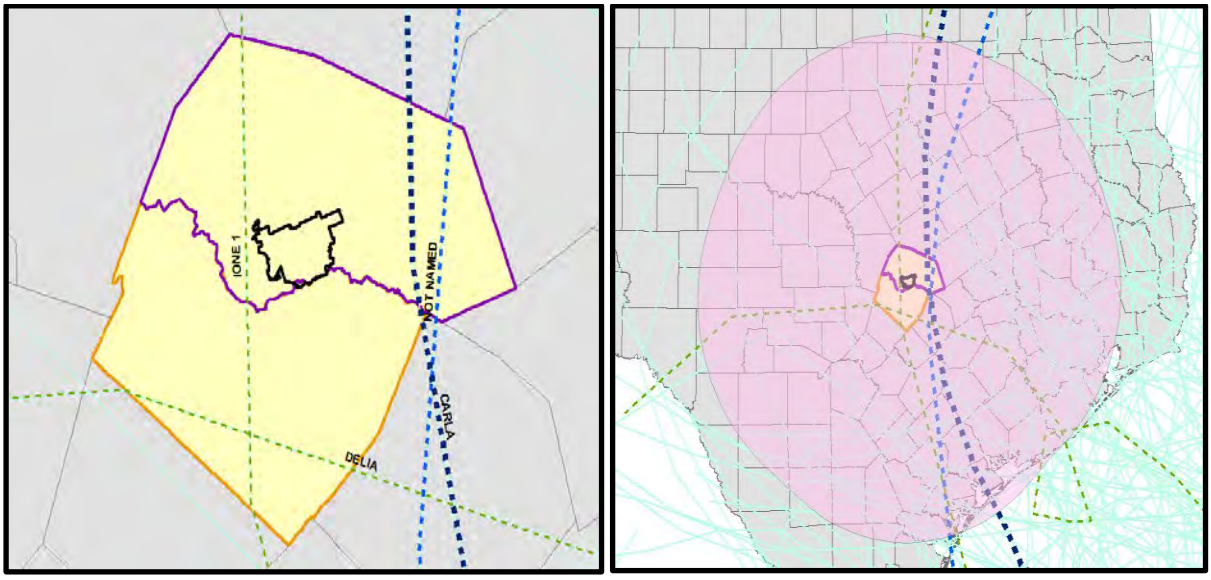
Source: National Hurricane Center

Reading Table 5-1 in conjunction with Figure 5-1, the average extent to be mitigated for the City and ISD is a Category 1 storm. Round Rock is located in the 80-90 mph zone in terms of average wind speeds that should be mitigated in the event of a hurricane. This data is based on the design wind speeds for a 100-year event.

Previous Occurrences

Previous occurrences include storms that had an indirect impact on the City of Round Rock. These storms did not follow a direct route through the City, but followed a track near the county, impacting surrounding areas. Figure 5-2 displays historic events that have followed the track indicated.

Figure 5.2 - Location of Historic Hurricane Tracks



Source: NOAA: National Hurricane Center

Table 5-2 lists the storms that have impacted Williamson and Travis Counties during the years 1902 – 2010 as shown in Figure 5-2.

Table 5-2. Hurricane Events (1902-2010)

Hurricane Season (Yr.)	Storm Name	Category	Track w/in County
1902	Not Named	H1	Williamson
1961	Carla	H5	Williamson & Travis
1970	Ione 1	TS	Williamson & Travis
1973	Delia	TS	Travis

Source: NOAA National Hurricane Center

Probability of Future Events

Due to the inland location, and the previous history of hurricanes for the area, the probability of a future tropical storm event or hurricane in the City of Round Rock, including Round Rock ISD, is unlikely, meaning it is possible that the area will be impacted by a hurricane event in the next 10 years.

Severe Thunderstorm

Thunderstorms are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm, and sub hazards of thunderstorms are hail, lightning and tornados. According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms. Along with rolling thunder, lightning detection networks routinely track cloud-to-ground flashes to help track thunderstorms.

Location

Thunderstorms can develop in any geographic location, and are considered a common occurrence in Texas. A thunderstorm could occur at any location within the City of Round Rock's planning area, including the Round Rock ISD campus, as these storms develop randomly and are not confined to any geographic area within the county. It is assumed that the City of Round Rock is uniformly exposed to the threat of thunderstorms.

Extent

The extent or magnitude of a thunderstorm event is measured by the Beaufort Wind Scale. Table 5-3 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

Table 5-3. Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	Violent Storm	If experienced on land, widespread damage
12	73+	Hurricane	Violence and destruction

Source: World Meteorological Organization (WMO)

On average, the planning area experiences one thunderstorm every three or four years, which is not usually accompanied by maximum wind speeds. The City of Round Rock has experienced a significant wind event, or an event with winds in the range of "Force 10" on the Beaufort Wind Scale, although the average measurement of severe winds with a thunderstorm event in Round Rock is a "Force 8", with winds at 52-60 knots. Therefore planning participants on average could experience a range of wind speeds where trees are in motion and resistance is felt walking and driving against the wind.

Previous Occurrences

Table 5-4 on the following page depicts historical occurrences of thunderstorm events for the City and School District according to National Climatic Data Center (NCDC) data. Since January 1950, 129 severe thunderstorm events are known to have impacted Williamson County, based upon NCDC records. The table presents information on nine of those historical events known to have specifically impacted the City of Round Rock. It is important to note that high wind events associated with other hazards, such as tornadoes, are not accounted for in this subsection.

Table 5-4 - Historical Severe Thunderstorm Events (NCDC 1950–2010)

DATE	TIME	MAGNITUDE
05/29/1994	10:36 p.m.	52 knots
05/27/1997	3:37 p.m.	52 knots
04/11/2000	11:50 p.m.	N/A
09/02/2000	5:15 p.m.	N/A
05/20/2001	8:32 p.m.	53 knots
10/12/2001	10:30 p.m.	58 knots
05/22/2007	1:59 a.m.	60 knots
08/27/2009	10:30 p.m.	52 knots

Source: NCDC

Probability of Future Events

Most thunderstorms occur during the spring, in the months of March, April and May, and in the fall, during the month of September. The frequency of occurrence for a thunderstorm event is likely, meaning that an event is probable within the next three years for the City of Round Rock and Round Rock ISD.

Tornado

Tornadoes are among the most violent storms on the planet. A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction, with wind speeds of 250 miles per hour or more. In extreme cases, winds may approach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long.

Location

As with thunderstorms, tornadoes do not have any specific geographic boundary and can occur throughout the City uniformly. It is assumed that the City and Round Rock ISD are uniformly exposed to tornado activity.

Extent

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes (particularly mobile homes). Two extent scales are presented as scale numbers differ depending on the year in which they were recorded. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 5-5), whereas tornadoes that occurred in 2005 and later were determined using the Enhanced Fujita Scale[1] (Table 5-6).

Table 5-5. The Fujita Scale (Effective Prior to 2005)

F-SCALE NUMBER	INTENSITY	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 to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile 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; mobile 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 re-enforced 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

[1] Source: National Weather Service

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE
			achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Table 5-6. The Enhanced Fujita Scale (Effective 2005 and Later)

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	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 re-enforced concrete structures badly damaged.

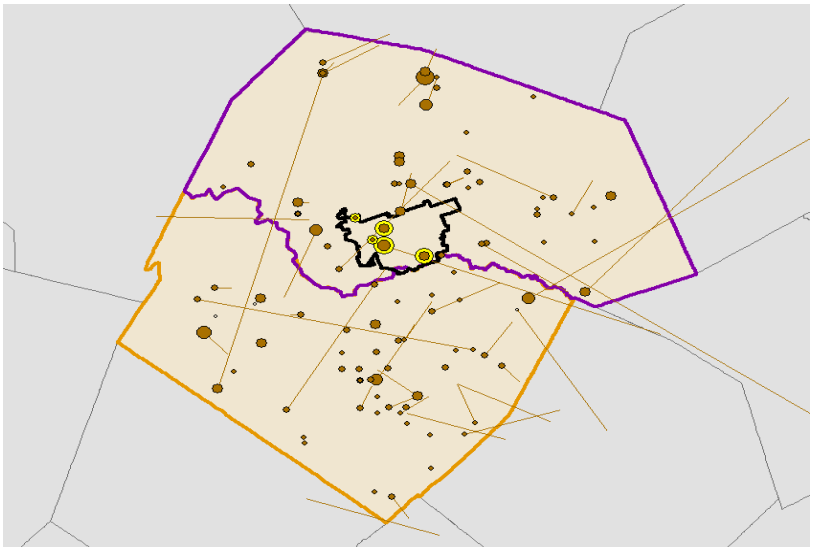
The City of Round Rock has experienced a tornado on the scale of an F3 or severe tornado. Under the enhanced scale, this would be considered a devastating tornado or an EF4. In addition Williamson County has experienced a tornado at an EF5. Although previous occurrences have reached this level, the majority of storms only rise to a level of EF1. Therefore the range of intensity to be mitigated for a tornado event for the City of Round Rock and Round Rock ISD is from an EF0 to an EF4.

Previous Occurrences

It is important to note that only reported tornadoes were factored into the risk assessment. It is likely that a high number of occurrences have gone unreported over the past 58 years.

Figure 5-3 shows the locations of previous occurrences in Williamson and Travis Counties from 1950-2009. A total of 104 events have been recorded by the Storm Prediction Center (NOAA) for both counties. Five of the events occurred in the City of Round Rock; two events were categorized as gale tornados (F0), two were significant tornados (F2), and one was a severe tornado (F3).

Figure 5-3. Tornado Events in Williamson and Travis Counties (1950-2009)



Source: NOAA: Storm Prediction Center

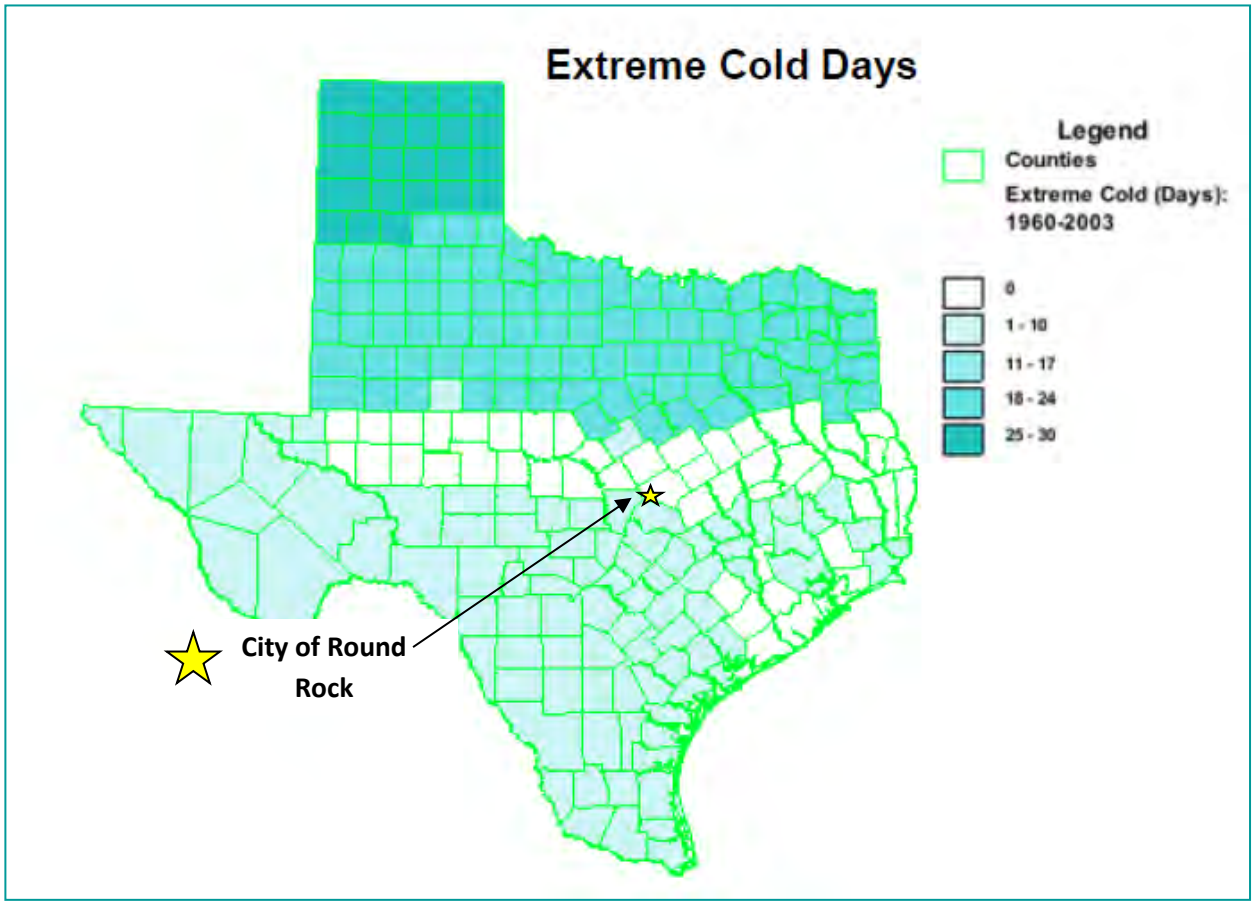
Probability of Future Events

Tornadic storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A typically smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to historical records, the City experiences a tornado touchdown every 10 or 12 years. Hence, the probability of future tornado occurrences affecting the City of Round Rock and Round Rock ISD is unlikely, meaning an event may occur in the next 10 years.

Severe Winter Storm

Winter storms that threaten the City of Round Rock usually begin as powerful cold fronts that push south from central Canada. Although the City and School District are at risk to ice hazards and extremely cold temperatures, as well as snow, the effects and frequency of winter storm events are generally mild and short-lived. As indicated in Figure 5-4, on average, the area experiences less than 10 extreme cold days a year, meaning less than 10 days at or around freezing temperatures.

Figure 5-4. Extreme Cold Days 1960-2003



Source: NOAA: Storm Prediction Center

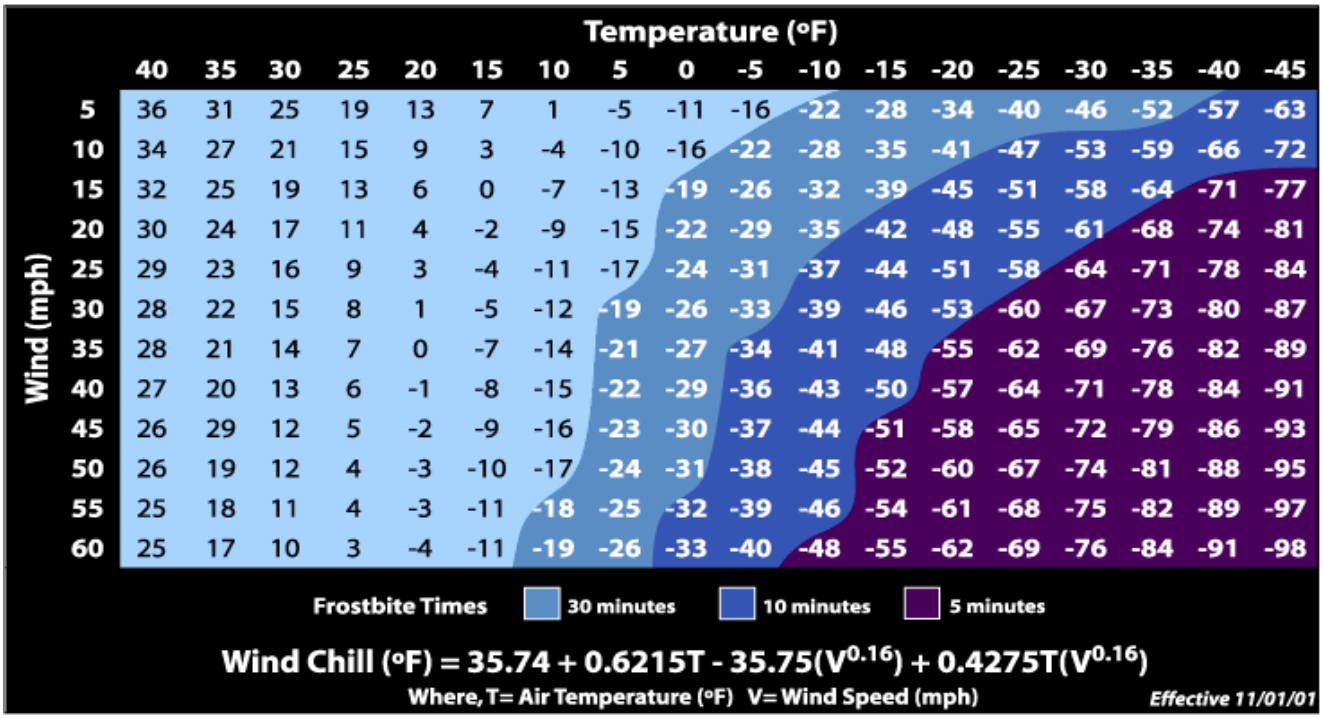
Location

Because winter storm events are not confined to specific geographic boundaries, all areas for the City and ISD are considered uniformly exposed.

Extent

Extent for winter storm is measured by the intensity of the event coupled with the temperature. The wind chill factor effects temperature as described in Figure 5-5 and the magnitude overall is shown in Table 5-7. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50° or winds are calm. Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. This is often referred to as "feels like" weather since the wind can accelerate the loss of heat from the body. Therefore a temperature of 25° on a day where there are winds of at least 35 miles per hour could feel just as cold as a 15° day with calm winds due to the loss of heat from cold winds (See Figure 5-5). Both temperature and wind chill affect the degree of intensity of a winter storm event.

Figure 5-5. Wind Chill Chart



Wind (mph)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Source: National Weather Service

Winter months are generally mild for the City of Round Rock and Round Rock ISD due to their location in Central Texas. Nevertheless, the City and ISD have experienced freezes and more intense winter weather that sometimes result in sleet and snow.

Table 5-7. Magnitude of Severe Winter Storms

Intensity	Temperature Range	Extent
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches

Intensity	Temperature Range	Extent
Significant	25° – 30°	Intense snow showers accompanied with strong gust winds, between 15 and 20 mph with significant accumulation
Extreme	20° – 25°	Wind driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to 5 millimeters in diameter
Severe	Below 20°	Winds of 35 mph or more and snow and sleet greater than 4 inches

Round Rock has never experienced a blizzard, but based on 16 previous occurrences recorded from 1950-2009, the area has been subject to winter storm watches, warnings, freezing rain, sleet, snow and wind chill.

Based on the data for previous occurrences and the area where the City and ISD are located, the average event to mitigate would be a mild to moderate winter storm. The City and School District can expect anywhere between 0.1 to 3.0 inches of ice and snow during a winter storm event and temperatures between 30 and 50 degrees with winds ranging from 0 to 15 mph. Reading this in concurrence with Figure 5-5 Wind Chill Chart means that it would take 30 minutes for frostbite to take place if one was exposed to a severe winter event.

Previous Occurrences

From 1950 to 2011, the NCDC has recorded 16 events in Williamson County and 12 events in Travis County; most will be one and the same event. Approximately 16 severe winter weather events were reported in the region over the past 60 years.

Probability of Future Events

Based on the available data for previous occurrences of winter storms, the probability of a future event is occasional, with a winter storm possible every five years or less.

Hail

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals, until they fall as precipitation that is round or irregularly shaped masses of ice greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity

of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a byproduct of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

Location

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. As a result, they are not confined to any specific geographic location, and can vary greatly in terms of size, location, intensity and duration.

Extent

The National Weather Service classifies a storm as severe if hail of three-quarters of an inch in diameter (approximately the size of a penny) or greater is present, based on radar intensity or seen by observers. The intensity category of a hailstorm depends on its size and the potential damage it could cause, as depicted in the NCDC Intensity Scale in Table 5-8.

Table 5-8. Hailstorm Intensity Scale (H0 to H10)

	Intensity Category	Typical Hail Diameter (in)[2]	Description	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
H0	Hard Hail	Up to 0.33	Pea	0-20	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	>20	Slight general damage to plants, crops
H2	Significant	0.60-0.80	Dime	>100	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.2	Nickel	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Ping	>800	Widespread destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Hen's Egg		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	2.4-3.0	Golf Ball		Severe roof damage, risk of serious

[2] Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

	Intensity Category	Typical Hail Diameter (in)[2]	Description	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
					injuries
H8	Destructive	3.0-3.5	Hen's Egg		Severe damage to all structures
H9	Super Hailstorms	3.5-4.0	Tennis Ball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>4.0	Baseball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: NCDC Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

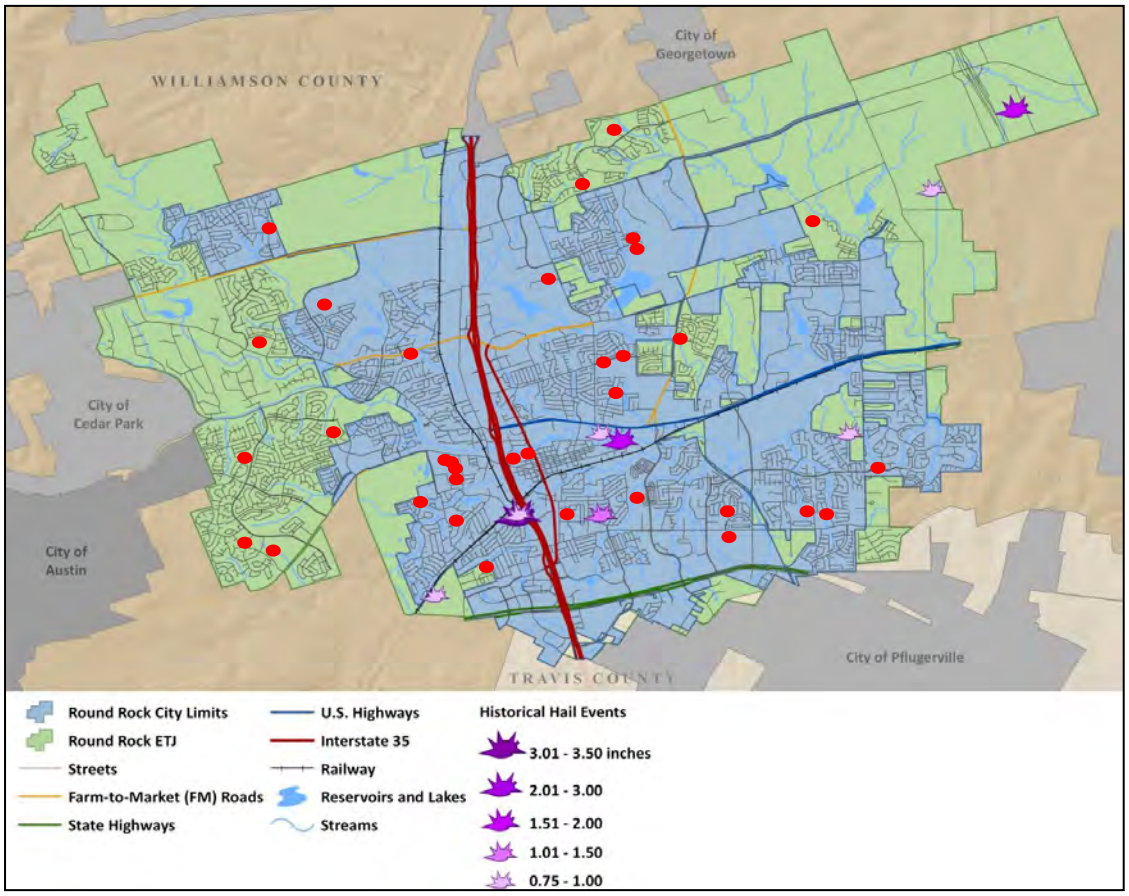
The scale in Table 5-8 extends from H0 to H10, with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on available data regarding the previous occurrences for the area, the City of Round Rock and Round Rock ISD may experience hailstorms ranging from an H0 to an H7. Therefore the City can mitigate a storm from low risk or hard hail to a more intense, destructive storm with golf-ball size hail that leads to severe roof damage and risks serious injuries.

Previous Occurrences

Historical evidence shown in Figure 5-6 shows that all the planning area is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Indications are that 23 historical hail events are known to have impacted the City of Round Rock and outlying areas between January 1950 and August 2010. These events were reported to NCDC and may not represent all hail events to have occurred during the past 60 years. Only those events for Williamson and Travis counties with latitude and longitude available were factored into this analysis and plotted on the map (Figure 5-6).

According to Round Rock ISD records, there was hail damage from the late 1990's, as well as in 2009. There was a $3,000,000 hail claim in March of 2009 that affected multiple of their schools.

Figure 5-6. Historical Hail Events



Source: NCDC

Probability of Future Events

Based on 23 events over the last 50 years (1959 – 2009), a hail event is a likely occurrence happening approximately every other year. Most hailstorms occur during the spring (March, April and May) and in the fall during the month of September. Warning time for a hailstorm is generally minimal or there is no warning.

Hydrologic

Flood

Flooding is generally considered to be the most serious natural hazard for the region and constitutes a year-round threat. Flooding due to rainfall alone depends on basin topography, precipitation amounts, dominating weather patterns, soil moisture conditions, and the amount of permeable surface available to absorb the rain. Floods resulting from excessive precipitation can be classified under two categories: general floods, precipitation over a given river basin for an extended period of time combined with

storm-induced wave or tidal action; or flash floods, the product of heavy localized precipitation in a short time period.

The primary types of general flooding include riverine, coastal and urban flooding[3]. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff. Urban flooding occurs as land is converted from fields or woodlands to roads, buildings and parking lots and when the natural land loses its ability to absorb rainfall. Urbanization changes the natural hydrologic systems of a basin, increasing runoff two to six times over what would occur on natural terrain. During periods of urban flooding, streets can become swift-moving rivers, while highway underpasses and underground parking garages can become death traps as they fill with water.

Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

Inland and riverine flooding typically result from large-scale weather systems that generate prolonged rainfall over a wide geographic area. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

Location

For mapping purposes, Digital Q3 Flood Data is also shown for neighboring counties as well as the Round Rock area as a whole in Figure 5-7. The Digital Flood Insurance Rate Mate (DFIRM) data provided by FEMA for Travis County shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.

[3] Coastal flooding will not be discussed herein as only riverine and urban flooding affect the Round Rock area.

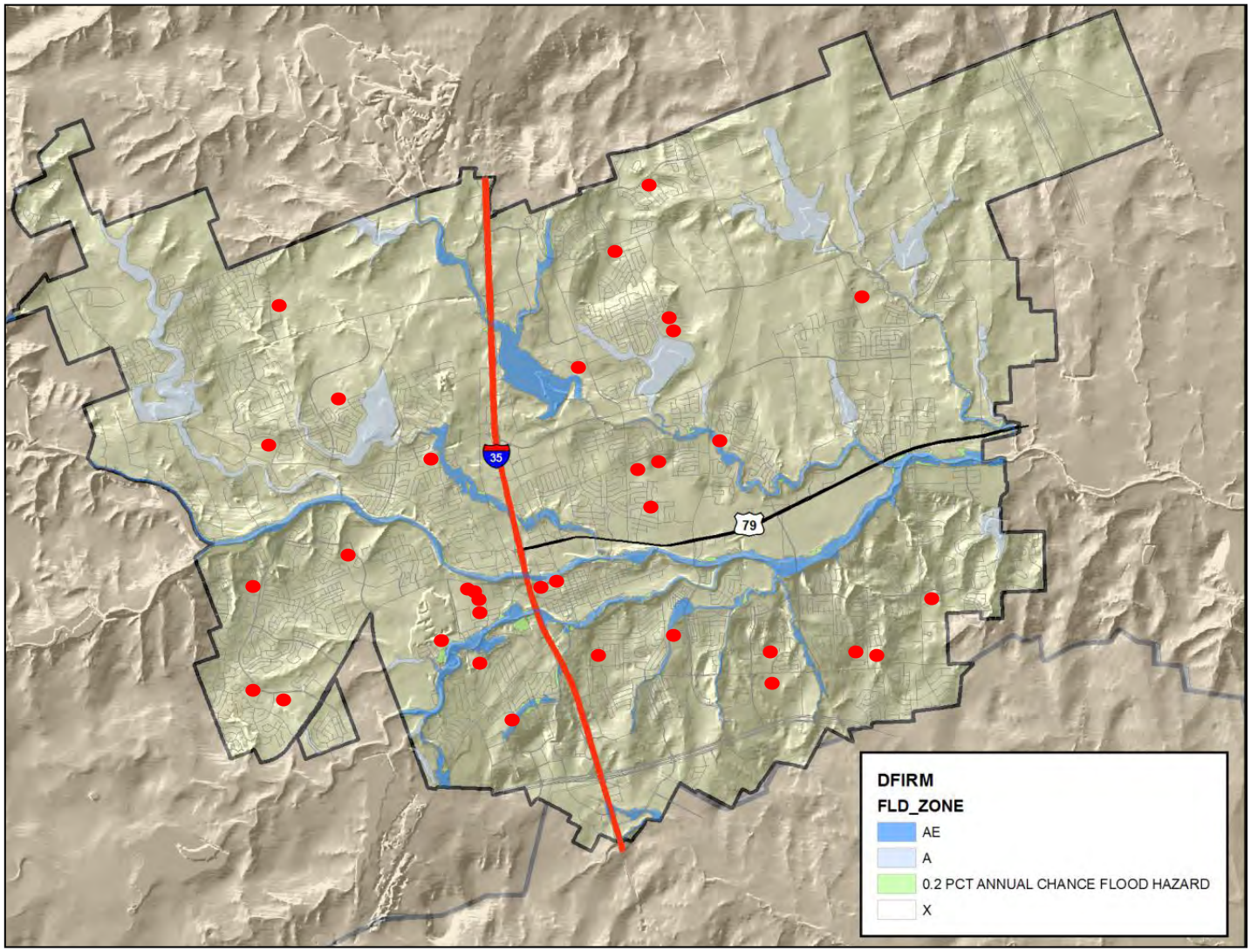
- Zone AO: Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

- Zone X Protected by Levee: Areas protected from the 1-percent-annual-chance flood hazard by a levee system. These areas are now indicated on the Flood Insurance Rate Map (FIRM) and DFIRM panels as Zone X (shaded) and are typically considered to be at moderate risk of flooding.

- 0.2% Annual Chance Flood Hazard: This is the boundary of the flood that has a 0.2 percent chance of being equaled or exceeded in any given year.

The figure below shows the delineated flood plain. The area outlined is the City of Round Rock based on the digital Flood Insurance Rate Map (DFIRM) from FEMA. Round Rock ISD school locations are represented by the red dots.

Figure 5-7. FEMA Flood Insurance Rate Map of the City of Round Rock



Source: FEMA

Extent

The severity of a flooding event is typically determined by a combination of several factors including:

- Stream and river basin topography and physiography;
- Precipitation and weather patterns;
- Recent soil moisture conditions; and
- The degree of vegetative clearing and impervious surface.

Floods resulting from excessive precipitation can be classified under one of two categories: (1) general floods, precipitation over a given river basin for an extended period of time combined with storm-induced wave or tidal action; or (2) flash floods, the product of heavy localized precipitation in a short time period.

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to depths of flood waters. Extent of flood damages can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey flood water. Flood zones are the categories that are mapped on Flood Insurance Rate Maps. Table 5-9 provides a description of flood zones as indicated below.

Table 5-9. Flood Zones

Flood Zones		
Zone A	**The Base Floodplain. There are six types of A zones:**	
	A	The base floodplain 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 & 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 & Zone X (shaded)	Area of moderate flood hazard, usually the area between the limits of the base flood 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 base flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.	

Flood Zones	
Zone C & 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: Understanding Your Risks, identifying hazards and estimating losses, FEMA 386-2

In addition to the flood zones, extent is provided in terms of depth of flood waters. Table 5-10 below describes the category of risk and potential magnitude of an event. The water depths depicted in Table 5-10 are an approximation based on elevation data (above sea level rather than above ground). Table 5-11 reflects extent associated with stream gauge data provided by the Upper Brushy Creek W.C.I.D. Flood Monitoring System depicting record rain levels for Tropical Storm Hermine in 2010.

Table 5-10. Extent Scale – Water Depth (Mean Sea Level, MSL)

SEVERITY	MSL (IN FEET)	DESCRIPTION
BELOW FLOOD STAGE	0 to 15	Water begins to exceed low sections of banks and the lowest sections of the floodplain.
ACTION STAGE	16 to 23	Flow is well into the floodplain, minor lowland flooding reaches low areas of the floodplain. Livestock should be moved from low lying areas.
FLOOD STAGE	24 to 28	Homes are threatened and properties downstream of river flows or in low lying areas begin to flood.
MODERATE FLOOD STAGE	29 to 32	At this stage the lowest homes downstream flood. Roads and bridges in the floodplain flood severely and are dangerous to motorists.
MAJOR FLOOD STAGE	33 and above	Major flooding approaches homes in the floodplain. Primary and secondary roads and bridges are severely flooded and very dangerous. Major flooding extends well into the floodplain, destroying property, equipment and livestock.

Table 5-11. Extent for Round Rock/Severe Flood Event

REPORTING ENTITY	ESTIMATED SEVERITY PER FLOOD EVENT	PEAK FLOOD EVENT
Upper Brushy Creek W.C.I.D.	Record rain event for City of Round Rock in Sep. 2010 associated with Tropical Storm Hermine place the event as the statistical equivalent of a 100-year storm event in some areas; i.e., a rainfall which has a one percent chance of occurring in any given year.	Below Flood Stage – Avg. MSL 12'-15'' Private property was impacted by the flood. One home received minor flooding and several homes were significantly flooded.

Based on reporting from the Upper Brushy Creek W.C.I.D., the flood event resulting from Tropical Storm Hermine places the City at the extent of "Below Flood Stage". However, Williamson and Travis County have experienced flooding over 30 feet MSL. Therefore, reading Tables 5-10 and 5-11 together with previous occurrences for the area, the City and School District may experience a range of flooding events from below 15 upwards to 30 feet or from "Below Flood Stage" to almost a "Moderate Flood Stage."

Previous Occurrences

The National Climatic Data Center has recorded 96 flood events in Williamson County from 1996 to April 2011. Four fatalities resulted from three of the events, ten people were injured, $2.2 million in property damages was reported and $80,000 in crop damages.

Flash Flood on September 8, 1994:

County wide, a one to two inch rain fell in the early morning hours, with four to five inches of rain in areas. Several cars were reported washed from roadways between these two towns. No injuries were reported. Property damages totaled $30,000 and crop damages $10,000.

Flood on June 22, 1997:

Heavy rain fell from Friday night through Sunday leaving the soils saturated. Very heavy rains over the Texas Hill Country Saturday night and Sunday morning caused widespread flooding as well as flash flooding across numerous counties. Rainfall averaged four to six inches, with over 15 inches across many locations in the Texas Hill Country. The Guadalupe River first crested at 25.9 in the surrounding area of Comfort, Texas. No fatalities were reported, though $500,000 in property damage and $50,000 in crop damages were reported for several counties, including Williamson.

Flash flood on November 15, 2001:

Four to six inches of rain fell on Williamson County resulting in some of the worst flooding that Emergency Managers had seen 1957. Numerous rescues were required including pulling people from trees. At least three cars washed off of a Brushy Creek bridge. Hundreds of people were evacuated from

their homes and a few homes were destroyed. Two fatalities were reported; both due to cars stalling on Brushy Creek low water crossings. Property damages totaled $500,000.

Flash flood on March 13, 2007:

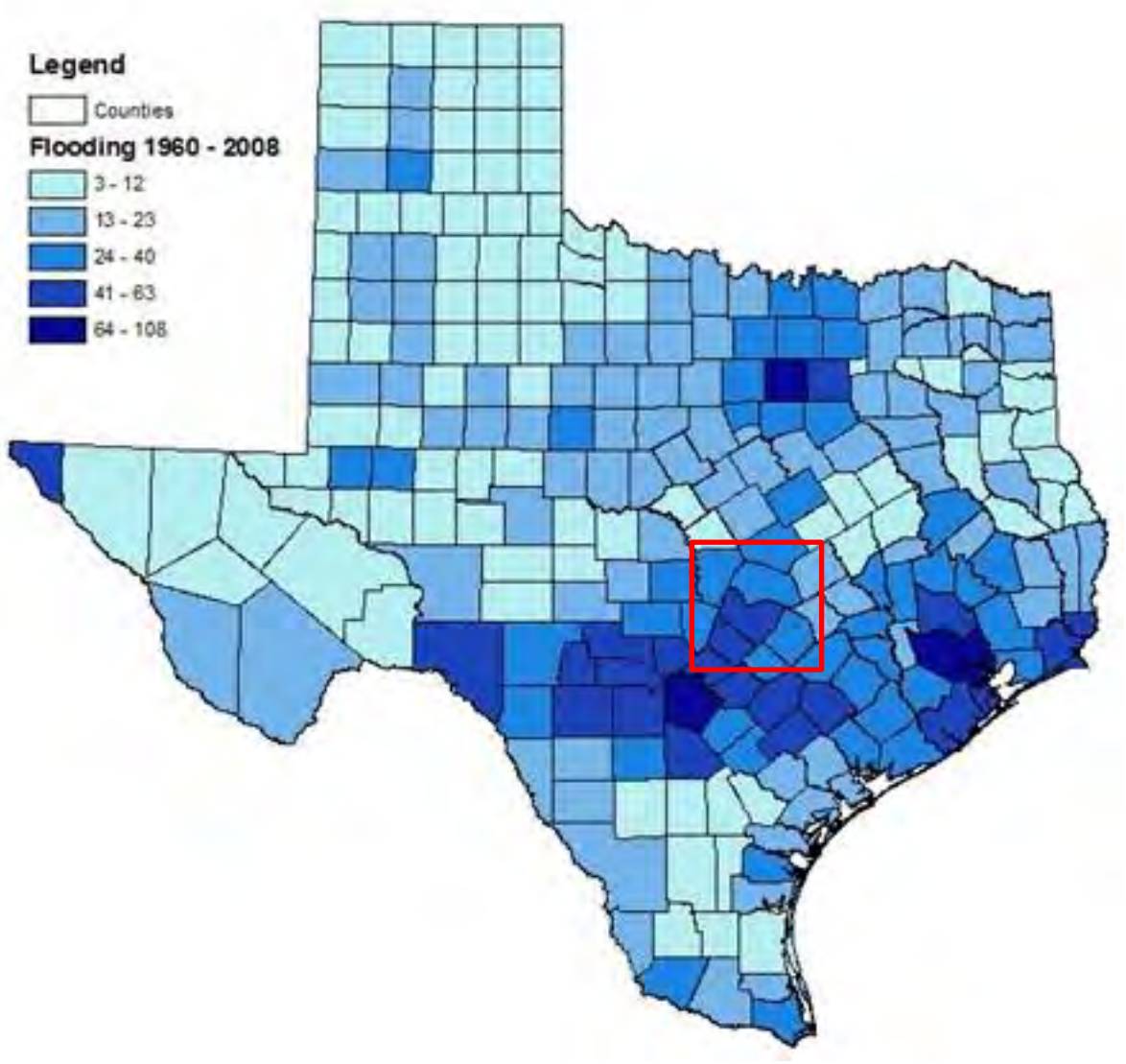
Thunderstorms developed over most of South Central Texas as an upper level low moved slowly across North Texas. High floodwater caused four area county roads to be closed. A husband and wife were driving in the area when their vehicle stalled in high water. The husband was tragically swept downstream and out of the grasp of rescuers. No damages were reported.

Flash flood on September 8, 2010:

Heavy rain from Tropical Storm Hermine produced flash flooding which closed sections of Interstate 35. One man was found dead one week later in a drainage field. Williamson County reported 637 homes damaged by flood waters. Damage estimates are near $8 million dollars for county infrastructure including roads, bridges, public buildings and parks.

Flooding in the State of Texas has occurred at frequencies represented by the map in Figure 5-8. The Round Rock area has averaged 40-62 flood events over the past 50 years. The area can expect a flood event annually.

Figure 5-8. Frequency of flooding in the State of Texas (SHELDUS Database 1950-2008)



Probability of Future Events

Based on recorded historical occurrences and average flooding events, the City of Round Rock and Round Rock ISD is prone to inland flooding. Flooding in the area is highly likely, meaning it is probable that a flooding event will occur in the next year.

Drought

Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall and is considered a major threat to Texas agricultural industries and water supplies. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological,

hydrologic, agricultural and socioeconomic. Table 5-12 includes definitions for these different types of drought.

Table 5-12. Drought Classification Definitions[4]

METEOROLOGICAL DROUGHT	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
HYDROLOGIC DROUGHT	The effects of precipitation shortfalls on stream flows and reservoir, lake and groundwater levels.
AGRICULTURAL DROUGHT	Soil moisture deficiencies relative to water demands of plant life, usually crops.
SOCIOECONOMIC DROUGHT	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Location

Drought can occur throughout the area and is not confined to any specific location. Areas of impact can be county wide and regional. A general and recent snapshot of the southern US shows current areas of intense drought.

Table 5-13. Legend for the Drought Index Map

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.30	91.70	84.47	79.33	64.10	47.32
Last Week (07/26/2011 map)	9.44	90.56	85.25	73.95	63.56	47.93
3 Months Ago (05/03/2011 map)	22.71	77.29	71.52	64.13	46.58	14.68
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/28/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (07/27/2010 map)	74.63	25.37	11.64	4.90	1.63	0.00

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

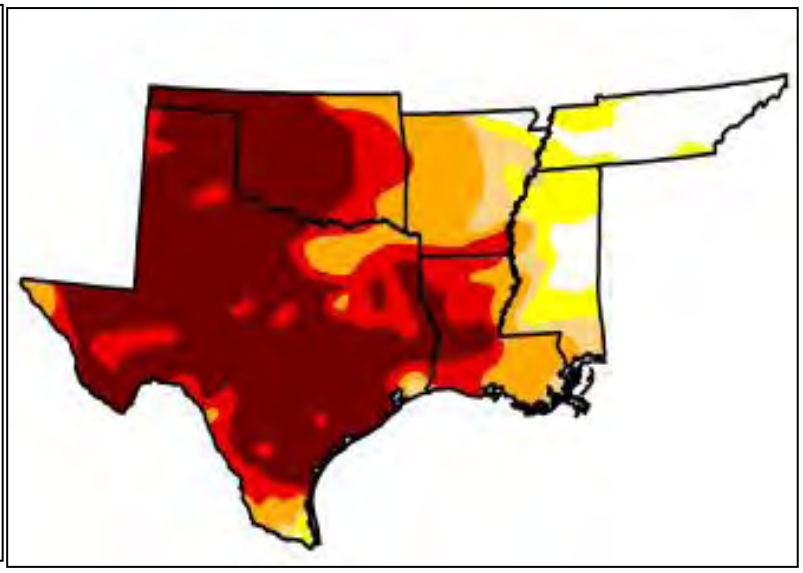


Figure 5-9. Area of drought in the southern US (August 2, 2011)

Table 5-13 above describes the drought conditions that are represented by each color on the map in Figure 5-9 above. The City of Round Rock is located in an area of exceptional drought (D4) for the summer of 2011.

[4] Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Extent

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant. Table 5-14 depicts the extent or magnitude of drought for the area.

Table 5-14. Extent Scale - Palmer Drought Index

Category	Description	Possible Impacts	Palmer Drought Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies	-5.0 or less

Source: National Drought Mitigation Center

The Central Texas area has experienced periods of moderate, severe, extreme, and even exceptional drought, both agricultural and hydrological, according to Palmer Drought Index classifications and U.S. Drought Monitor. The real danger with drought of this magnitude is the amount of crop failure and the potential for wildfires to break out. This danger has become evident for much of Central Texas, including Travis and Williamson County including the City of Round Rock, as extreme and exceptional drought has resulted in crop losses and devastating wildfire outbreaks in 2011. Therefore the range of intensity for the area to mitigate is from a D0 in milder summers, to a D4 or exceptional drought, as the area has experienced thus far in 2011.

Previous Occurrences

Within NCDC records, two drought events occurred between 1996 and 2000 that are associated with Williamson County and the surrounding region. Property and crop damages accumulated from April to August 1996 and from July to October 2000[5]. Two other droughts have affected the area in recent years, but have not been reported to NCDC, the 2009 and 2011 drought, which are described below.

[55] Crop damages are reported by region and results are averaged.

The 2011 drought, which has not subsided at the time of drafting of this Plan, is the worst drought for the State of Texas in the history of droughts for the state.

1996 Drought Conditions

Drought conditions persisted into April across South and Central Texas. Through the first four months of 1996, rainfall accumulations were between one and two inches across the area.

2000 Drought Conditions

In spite of rainfall east of Interstate 35 in June 2000, the severe drought that began early in 2000 across the southwest parts of south-central Texas spread again in July to cover all but the southeast counties. Little to no rain was recorded across these counties in July, and nearly all river levels were reported to be low. Aquifer levels and lake levels were approaching all-time low readings, and strong conservation measures were enacted across much of the area. Numerous small creeks and streams ceased flowing. Agricultural activities were essentially brought to a halt. Drought conditions abated with widespread rainfall which developed on October 17, 2000 across south-central Texas, with repeat heavy rainfall on October 22 through October 24. The drought, already weakened by the rainfall of the 17th, ended with the additional widespread heavy rain.

2009 Drought Conditions

Much of Central Texas experienced extreme and exceptional drought in 2009. Rainfall was 44 percent below normal, resulting in crop damages for famers and the loss of cattle for ranchers due to stock ponds drying up.

2011 Drought Conditions

Lack of rainfall in the spring and summer months and record-breaking temperatures have created a period of extreme and exceptional drought for the State of Texas, including the City of Round Rock. Crop damages have not been totaled as the drought continues to affect already-stricken areas.

Probability of Future Events

Although instances of extreme drought have been frequent in the last few years looking back fifty years, this is a period of extreme or abnormal activity. Based on the previous occurrence data and location of the area, probability of a future drought event for the City and Round Rock ISD is occasional, meaning that a drought is probable within the next five years.

Other Natural Hazards

Wildfire

A wildfire can rapidly spread out of control and occurs most often in the summer, when the brush is dry and flames can move unchecked through a highly vegetative area. The fire often begins unnoticed and

spreads quickly, lighting brush, trees and homes. It may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, lightning or arson.

Wildfires can start as a slow burning along the forest floor, killing and damaging trees. They often spread more rapidly as they reach the tops of trees, with wind carrying the flames from tree to tree. Usually, dense smoke is the first indication of a fire.

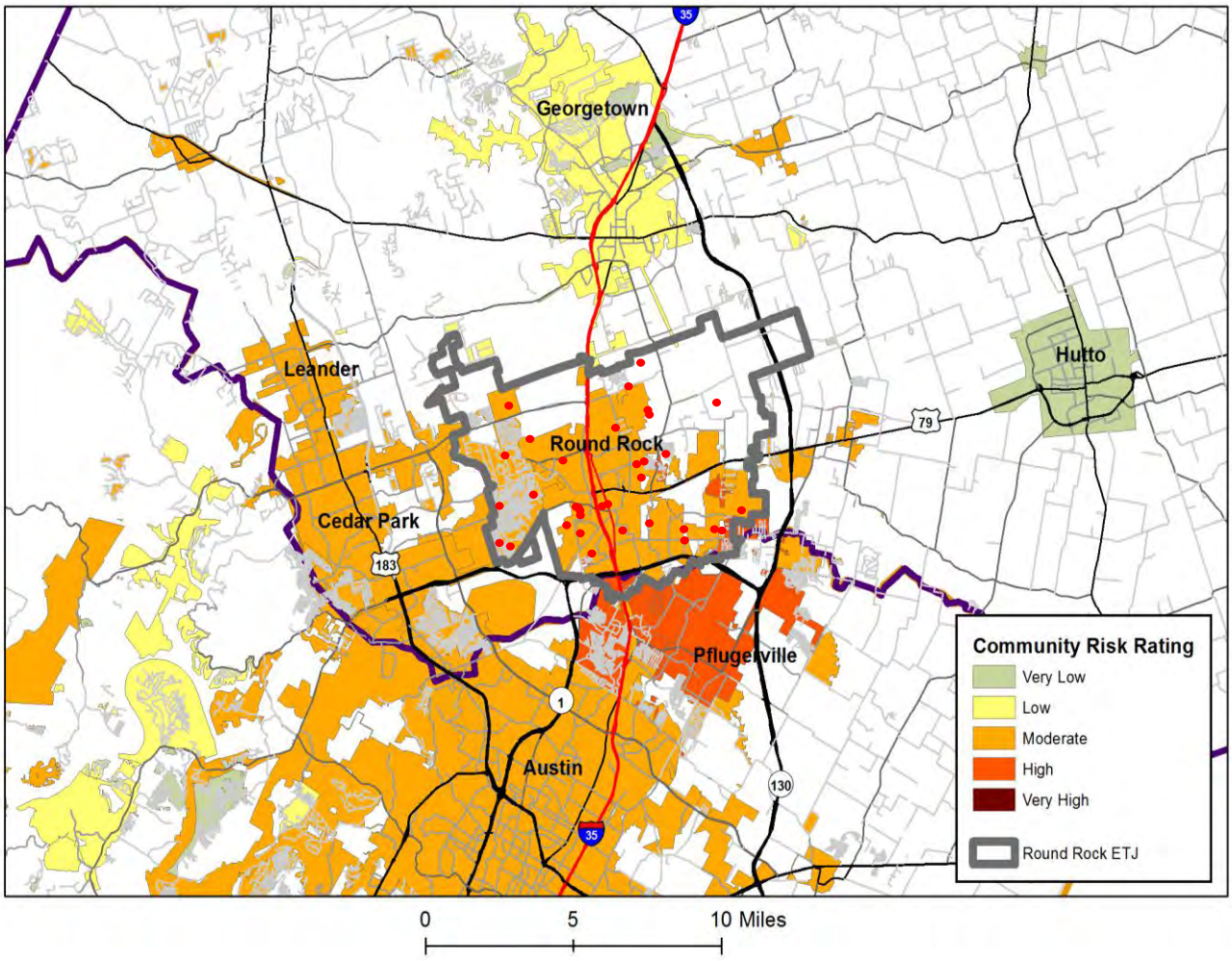
Texas has seen a significant increase in the number of wildfires in the past 30 years, which included wildland, interface or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation while interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide the fuel.

Wildfire outbreaks have been uncommonly high in the summer of 2011. The President issued a Disaster Declaration (DR 1999) for wildfires that broke out in April and May of 2011 in the Hill Country and West Texas. The historically dry and hot conditions did not subside, which led to an outbreak of wildfires. Another Presidential Disaster Declaration was issued for Bastrop, Travis and Williamson counties. Numerous wildfires broke out in multiple areas across Central Texas, destroying homes and property, over Labor Day weekend in 2011.

Location

The Texas Forest Service provides location for the wildfire hazard per community based on their level of risk. Figure 5-10, on the following page, illustrates the location of the City of Round Rock, Round Rock ISD (red dots) and vicinity and the level of risk in terms of urban wildfire interface.

Figure 5-10. Communities at Risk: Round Rock and Vicinity (Texas Forest Service)

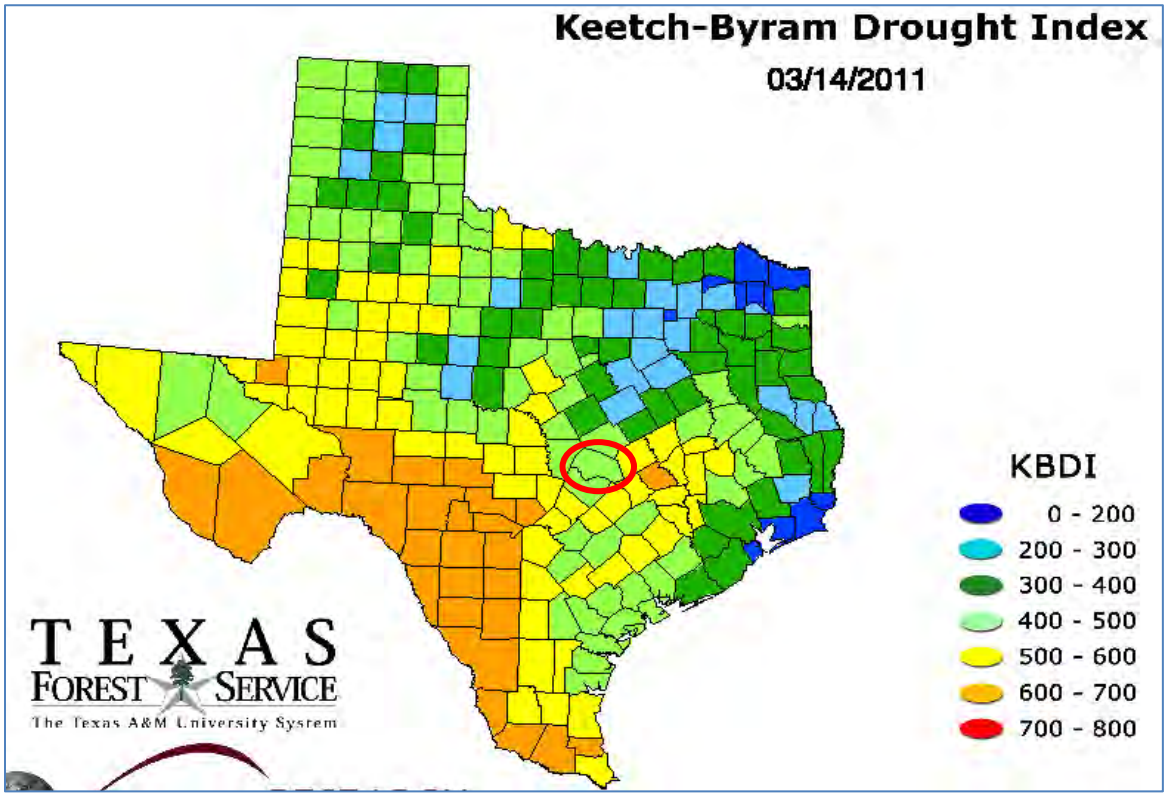


Extent

Fire risk is measured in terms of magnitude and intensity using the Keetch-Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. The KBDI determines forest fire potential based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches), and is expressed in hundredths of an inch of soil moisture depletion.

Each color on the map represents the drought index at that location. The drought index ranges from 0 to 800, where a drought index of 0 represents no moisture depletion, and an index of 800 represents absolutely dry conditions.

Figure 5-11. KBDI for the State of Texas, 2011



Source: Texas Forest Service. Red circle denotes Williamson County.

Fire behavior can be categorized at four distinct levels:

- **0 - 200** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
- **200 - 400** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400 - 600** Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
- **600 - 800** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Using the KBDI index is a good measure of the readiness of fuels for wildland fire. Caution should be exercised in dryer, hotter conditions, and the KBDI should be referenced as the area experiences changes in precipitation and soil moisture.

The range for intensity for the City of Round Rock is within 400 – 800. In a period of extreme heat or drought, the KBDI could be over 700 for the area. Table 5-15 provides information on the average, maximum, and minimum KBDI for Williamson County where the City of Round Rock is located. This table should be read in conjunction with the current KBDI index in determining the potential magnitude of a wildfire event. Because the KBDI is a measure of the current readiness of fuels for wildfire, caution should be exercised in dryer, hotter conditions, and the KBDI should be referenced as the area experiences changes in precipitation and soil moisture.

Table 5-15. Extent for Wildfire by County

COUNTY	AVERAGE KBDI	MAXIMUM KBDI	MINIMUM KBDI
Williamson County	633	735	612

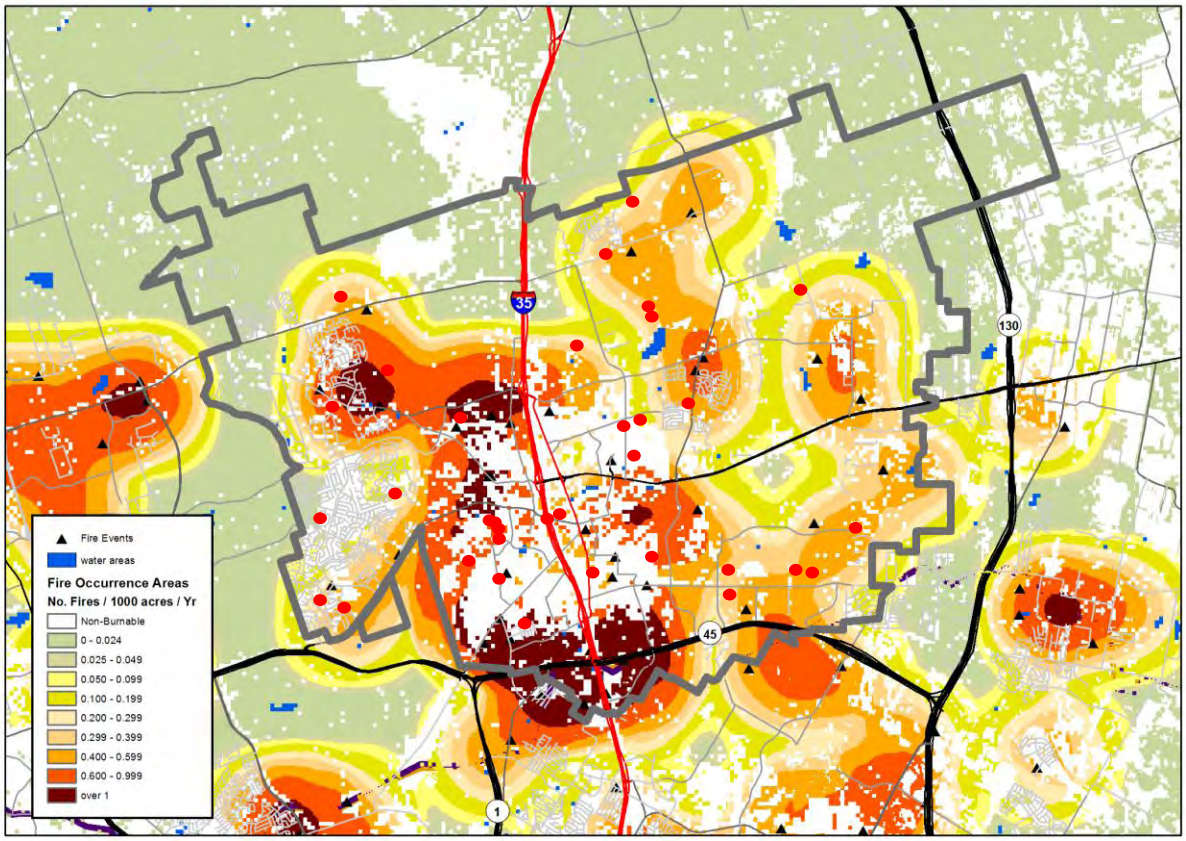
The average extent to be mitigated for the City of Round Rock is a KBDI index of 633. At this level fires will burn to mineral soils. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Round Rock ISD facilities are wholly located within the City of Round Rock. As such, the Round Rock ISD can expect a range for wildfire with a minimum KBDI of 612 and a maximum of 735. Round Rock ISD has not experienced a maximum of 735; therefore the average extent to be mitigated for is the same for the City of 633.

Previous Occurrences

From 2005 to 2009 the Texas Forest Service is able to report over 50 wildfire events within the city limits of Round Rock. Figure 5-12 below shows a map of approximate locations of wildfires which can be grass or brushfires of any size, the Round Rock ISD school locations are shown with red dots. Although the City has not been directly affected by wildfire in 2011, there have been several wildfires in 2011 for Williamson County and much of Central Texas. Data has not been provided for these wildfires as reports were not complete at the time of drafting.

Figure 5-12. Previous Occurrences of Area Wildfires in Round Rock



Probability of Future Events

Wildfires can occur at any time of the year. As the city moves into wildland, the potential area of occurrence of wildfire increases. With 50 events in a 5 year period, an event for the City of Round Rock is highly likely, with an event probable within the next year. Due to the locations of schools for Round Rock ISD in areas with an increased risk, the probability for the School District is also highly likely.

Extreme Heat

The Round Rock area has a humid subtropical climate, characterized by humid summers, where temperatures average around 90 degrees Fahrenheit. The combination of high temperatures mixed with humidity leads to heat waves or periods of extreme heat. Although heat can damage buildings and facilities, it presents a more significant threat to the safety and welfare of citizens and animals.

The major human risks associated with severe summer heat include: heat cramps; sunburn; dehydration; fatigue; heat exhaustion; and even heat stroke. The most vulnerable population to heat casualties are children and the elderly or infirm, who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to care for their well-being.

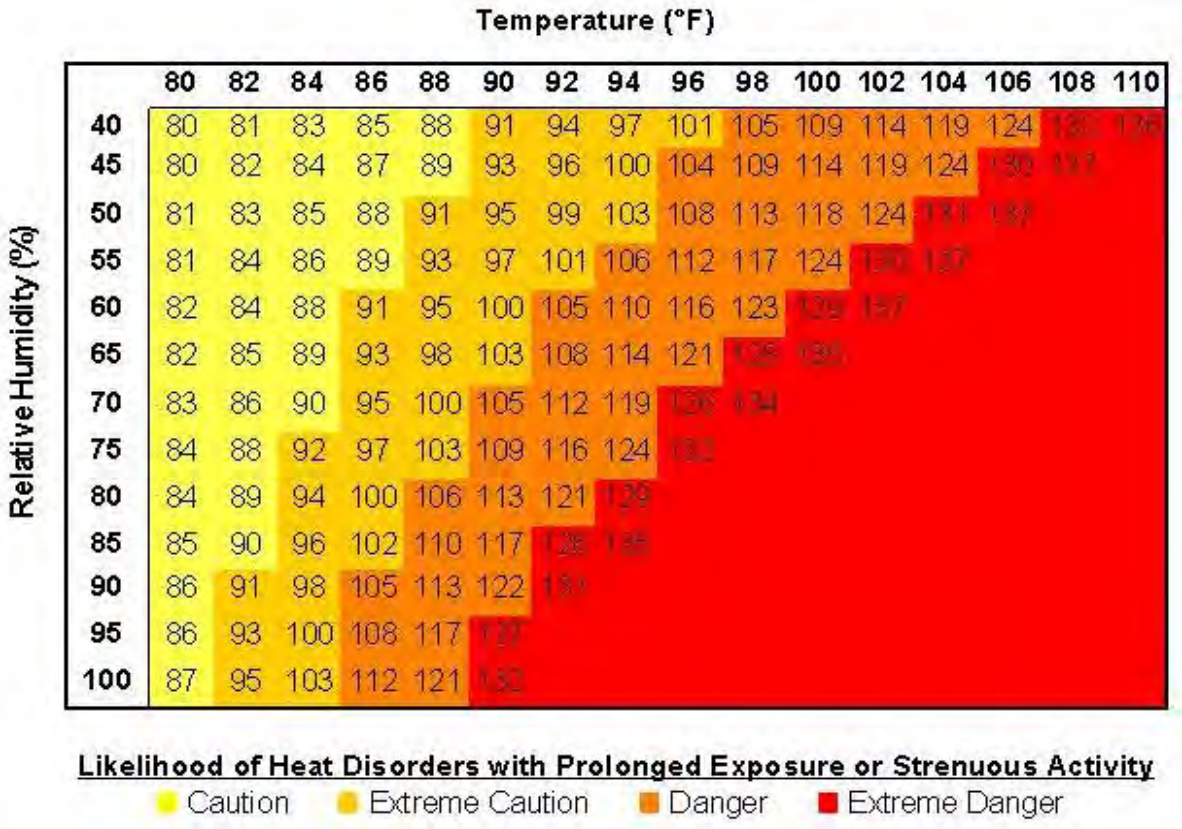
Location

Though injuries or deaths from extreme heat have been recorded at different locations throughout the City, there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur at any area of the City.

Extent

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the "Heat Index," and is depicted in Figure 5-13. This index measures how hot it feels outside when humidity is combined with high temperatures.

Figure 5-13. Extent Scale for Extreme Summer Heat (National Weather Service)



The extent scale in Figure 5-13 displays varying degrees of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. "Caution" is the first level of intensity where fatigue due to heat exposure is possible. "Extreme Caution" indicates that sunstroke, muscle cramps or heat exhaustion are possible, whereas a "Danger" level means that these symptoms are likely. "Extreme Danger" indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown Table 5-16.

Table 5-16. Extreme Summer Heat Warnings

Warning	Detailed Description
Heat Advisory	Heat Index is expected to exceed 105 °F to 110 °F.
Excessive Heat Warning	Heat Index above 105 °F for 3 hours or more during the day and at or above 80 °F at night.

Due to its location, and its urban makeup, the City of Round Rock and Round Rock ISD can expect an extreme heat event each summer, with a range of temperature intensities from "Extreme Caution" to "Extreme Danger" as excessive heat warnings are often issued in the summer months.

Citizens, especially children and the elderly should exercise caution by staying out of the heat for prolonged periods when a heat advisory or excessive heat warning is issued. Also at risk are those working or remaining outdoors for prolonged periods of time. Due to the abundance of concrete and metal infrastructure, the effects of an extreme heat event can be intensified. Concrete and metal absorb heat energy and emit that energy at night, thereby trapping heat, and causing the temperature to feel as much as 10 degrees higher than surrounding areas. This is known as the "heat island" effect.

Previous Occurrences

One event has been recorded by NCDC. It was on July 25, 2000 when temperatures rose to 105-120 °F. A victim was found in his home in front of an open refrigerator. The home had no air conditioning, only a window fan.

Probability of Future Events

Having only one previous occurrence recorded in a database having events recorded from 1950 to the present, it appears a heat event is not likely to occur again in the next 50 years. However, the lack of listed events is due to a lack of reporting, not a lack of occurrence. Temperatures will rise to upper 90's

and lower 100's every year. Additionally, a bubble in senior citizen population numbers is expected within 10 years. Therefore the probability of future occurrence of an extreme heat event is highly likely, with an event probable within the next year.

Technological

Dam Failure

Dams are water storage, control, or diversion barriers that impound water upstream in reservoirs. Dam failure is a collapse or breach in the structure. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant flooding downstream.

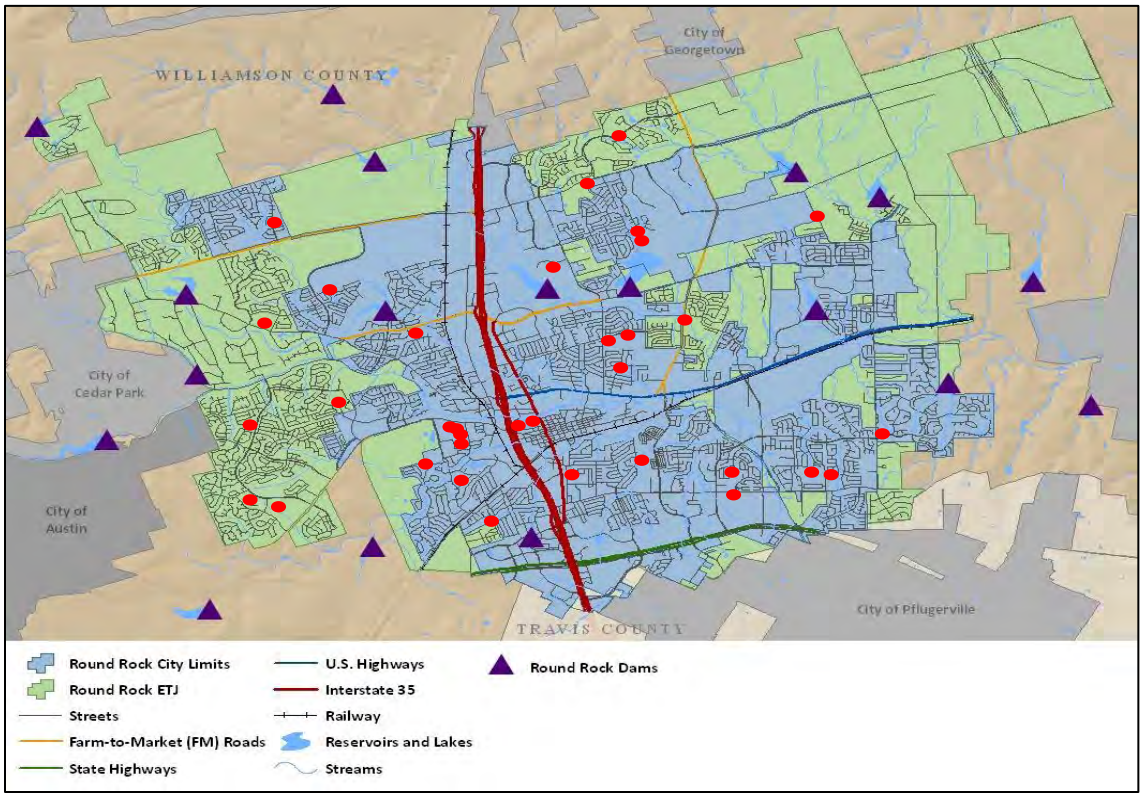
Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment, piping or foundation leakage;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components;
- Improper design, such as use of improper construction materials;
- Failure of upstream dams in the same drainage basin;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, leading to structural failure.

Location

Figure 5-14 illustrates the general location of 22 dams as recognized by the U.S. Army Corps of Engineers (USACE) in the National Inventory of Dams; the locations of the schools in the Round Rock ISD are represented with red dots. Of the 22 listed, all are considered a low risk dam for the City of Round Rock and Round Rock ISD. Significant and high hazard dams are not located within the planning area, as all 22 dams have a storage capacity of less than 10,000 acre feet.

Figure 5.14 - General Location of Dams in the Round Rock Area



Source: (USACE)

Table 5-17. Latitude/Longitude for Dams in the Round Rock Area

LATITUDE	LONGITUDE
30.487442	-97.809842
30.484172	-97.713573
30.584406	-97.721401
30.569442	-97.713219
30.541358	-97.678738
30.536535	-97.710947
30.541862	-97.662362
30.561536	-97.612788
30.567170	-97.629383

LATITUDE	LONGITUDE
30.536662	-97.625222
30.542941	-97.582330
30.520457	-97.599098
30.515645	-97.570711
30.522309	-97.748596
30.554288	-97.805767
30.534679	-97.791313
30.577267	-97.780334
30.507858	-97.766405
30.540025	-97.750604
30.470298	-97.745865
30.486466	-97.681984
30.493926	-97.806179

Extent

The extent or magnitude of a dam failure event is described in terms of the classification of the damages that could result from a dam's failure; not the probability of failure. The National Interagency Committee on Dam Safety defines high hazard dams as those where failure or mis-operation will cause loss of human life. Prior to 2009, high hazard dams were defined as those at which failure or mis-operation would probably cause loss of human life. Dams classified as "significant" were those at which failure or mis-operation probably would not result in loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or other significant damage. Low hazard potential dams are those at which failure or mis-operation probably would not result in loss of human life but would cause limited economic and/or environmental losses. Losses would be limited mainly to the owner's property. Classifications for extent after 2009 are found in Table 5-18 on the following page.

Table 5-18. Extent Classifications

HAZARD POTENTIAL CLASSIFICATION	LOSS OF HUMAN LIFE	DAM STORAGE CAPACITY
Low	None Expected	Less than 10,000 acre-feet
Significant	Probable (1 to 6)	Between 10,000 and 100,000 acre-feet
High	Loss of Life Expected (7 or More)	100,000 acre-feet or more

Total exposure was estimated by using 2010 Census population and local parcel data, in combination with the location and maximum storage capacity of each dam. GIS analysis was used to create a semi-circle buffer in each anticipated inundation area. All 22 dams in the City of Round Rock planning area, which includes Round Rock ISD, have a capacity of less than 10,000 acre-feet. The potential classification is low and loss of human life is not expected in the event of a dam failure.

Previous Occurrence

There are about 80,000 dams in the United States today. Catastrophic dam failures have occurred frequently throughout the past century. Between 1918 and 1958, 33 major dam failures in the United States caused 1,680 deaths—an average of 42 deaths a year. From 1959 to 1965, nine major dams failed worldwide.

According to the TCEQ, there have been a total of 98 dam failures from 1970 to 2008 in the State of Texas. Of these, 13 were high hazard dams, 28 were significant, and 55 were low[6]. One of the dams that failed is no longer classified and another has been removed from inventory.

There have been no previous occurrences of dam failure in the City of Round Rock, including Round Rock ISD.

Probability of Future Events

No major dam failure has affected the City of Round Rock or Round Rock ISD. Therefore failure of a major dam for the City or School District is an unlikely event, meaning that an occurrence is possible over the next ten years.

[6] These dams total 96, as one of the dams that failed is no longer classified, while the other has been removed from inventory.

HAZARD VULNERABILITY

Overview 1
Atmospheric Hazards 3
Hurricane Wind 3
Severe Thunderstorm 3
Tornado 4
Severe Winter Storm 5
Hail 5
Hydrologic Hazards 6
Flood 6
NFIP Participation 6
Repetitive Losses 7
Drought 8
Other Natural Hazards 8
Wildfire 8
Extreme Heat 10
Technological Hazard 10
Dam Failure 10

Overview

This section builds upon the information provided in Section 5 by providing a statement of vulnerability and assessing the potential impact and where available, losses, that can be expected to be caused by each identified hazard event.

This section focuses on the results of the vulnerability assessment, and is organized by hazard as listed below:

- Atmospheric
  - Hurricane Wind
  - Severe Thunderstorm
  - Tornado
  - Severe Winter Storm
  - Hail

- Hydrologic
  - Flood
  - Drought
- Other Natural Hazards
  - Wildfire
  - Extreme Heat
- Technological
  - Dam Failure

This risk assessment was conducted using two distinct methodologies: utilizing GIS-based analysis and statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information.

A GIS-based analysis was conducted for three hazards:

- Dam failure
- Hazardous materials release from fixed and mobile sites
- Oil and gas pipeline failure

A statistical risk assessment approach was used to analyze seven hazards:

- Drought
- Hail
- Severe thunderstorm

For each of the hazards profiled, a description of general vulnerability and impact statement are included. Impact statements are defined in the Table 6-1.

Table 6-1. Impact Statements

Potential Severity	Description
Substantial	Multiple deaths Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week.

Potential Severity	Description
	More than 10 percent of property destroyed or with major damage.
Limited	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Atmospheric Hazards

Hurricane Wind

'Due to the City of Round Rock's Central Texas geographic location, this area of the State is less vulnerable to damage from hurricane winds and inland impact of coastal storms. The City of Round Rock is vulnerable to threats indirectly related to a hurricane or tropical storm event. Structures along the beachfront or in coastal areas face the primary impact of hurricane winds; however, hurricanes' secondary hazards can affect inland counties as well. The effects of a hurricane or tropical storm begin to diminish as it moves inland, although effects may be far-reaching. For example, winds alone from Hurricane Ike covered 120 miles, stretching well beyond the coastal area.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing materials, and small items left outside become extremely hazardous in hurricanes and tropical storms. Extensive damage to trees, towers, and underground utility lines (from uprooted trees) and fallen poles cause considerable civic disruption.

The impact from a hurricane for the City of Round Rock and Round Rock ISD is classified as "Minor".

Severe Thunderstorm

Vulnerability is difficult to evaluate since thunderstorms can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of this event, all existing and future structures, and facilities at the Round Rock ISD and in the City of Round Rock could potentially be impacted and remain vulnerable to possible injury and/or property loss from lightning, hail and strong winds associated with tornadoes and severe thunderstorm.

Trees, power lines and poles, signage, manufactured housing, radio towers, lighting, concrete block walls, storage barns, windows, garbage recepticles, brick facades, and vehicles, unless reinforced, are

vulnerable to severe winds associated with thunderstorm events. More severe damage involves windborne debris—in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings.

A severe event can result in heavy rains and extensive damage to personal property and critical facilities as accompanying winds can down trees and powerlines.Traffic discruptions, injuries and in rare cases, fatalities, can occur. Therefore the impact of a thunderstorm event for the Round Rock ISD and the City of Round Rock is "Minor".

Tornado

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities and populations in the City of Round Rock and Round Rock ISD are considered to be exposed to this hazard and could potentially be impacted.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured Homes
- Homes on crawlspaces (more susceptible to lift)
- Buildings with large spans, such as shopping malls, gymnasiums, and factories

The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Most tornadoes are a few dozen yards wide and touchdown briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long. However, impact for tornado is "Minor" based on previous losses and potential risk.

Severe Winter Storm

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for long periods.

Economic impact may be felt by increased consumption of heating fuel which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

All populations, buildings, critical facilities, and infrastructure at the Round Rock ISD and in the City of Round Rock are vulnerable to severe winter events. People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the rural areas of the county where populations are sparse, icy roads may impede travel, and there are fewer neighbors to check in on the elderly. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Despite the potential harm from a winter storm event, based on the level of risk and previous occurrences for winter storms in the City of Round Rock and Round Rock ISD, the impact for winter storm is “Minor”.

Hail

Damage from hail approaches $1billion in the US each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail.

Hail has been known to cause injury to humans, and occasionally has been fatal. Due to the lower level of risk for hail for the City of Round Rock and Round Rock ISD and previous damages, impact for hail is “Limited”.

Hydrologic Hazards

Flood

A property's vulnerability to a flood depends on its location in, or in proximity, to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures.

The City of Round Rock and Williamson County has experienced high growth (US Census 2000), resulting in greater flood losses due to extensive development in this area. However, due to the generally flat terrain of this Central Texas County, homes and businesses in the floodplain remain at risk of flash flooding. During periods of heavy rainfall, homes and businesses located in some areas of the City experience rapid runoff and are vulnerable to flooding from Brushy Creek and other minor waterways.

Although the city has encouraged development outside of the floodplain, impact for flood for the City and ISD is "Major" as it could result in the shutdown of facilities for multiple weeks, depending on the scale of the storm.

NFIP Participation

The City of Round Rock participates in the National Flood Insurance Program (NFIP).

As part of continual compliance with the NFIP, the City has developed a floodplain management plan and has taken part in the Community Assistance Program (CAP), which ensures that communities are taking flood loss reduction steps.

Planning participants analyzed actions in terms of the availability of funding for NFIP strategies.

As discussed in Sections 2 and 8, mitigation strategies were prioritized using the STAPLE+E method of evaluation. At the mitigation workshop, planning participants separated into groups to facilitate discussion and prioritized actions for the NFIP taking into account grant funding opportunities available through the Flood Mitigation Assistance Program and other flood reduction programs administered by the TWDB. Actions were then prioritized based on the likelihood of funding for the type of actions. For example, eligible activities, such as dry flood proofing or elevating structures, were given a higher priority based on the availability of funding for these actions.

NFIP actions can be found in Section 8 with all of the mitigation actions for participating entities in this Plan. NFIP actions are denoted as "NFIP" in the top row of the action item.

Repetitive Losses

The Severe Repetitive Loss (SRL) Grant Program under FEMA provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the National Flood Insurance Program (NFIP). The Texas Water Development Board administers the SRL grant program for the State of Texas.

Severe Repetitive Loss properties are defined as residential properties that are:

- covered under the NFIP and have at least four (4) flood related damage claim payments (building and contents) over $5,000.00 each, and the cumulative amount of such claims payments exceed $20,000; or
- for which at least two (2) separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

In either instance, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart[1]. Table 6-2 below shows repetitive loss properties for the City of Round Rock and the participating jurisdictions in the Plan Update.

Table 6-2. Repetitive Loss Properties, City of Round Rock[2]

Community Name	Community Number	Property Locater	Mitigated?	Insured?	Property Type?
ROUND ROCK	481048	0052406	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0052373	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0050514	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0052262	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0026816	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0050485	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0026626	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0050365	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0050387	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0026115	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0050379	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0050407	NO	YES	RESIDENTIAL

[1] Source: Texas Water Development Board (TWDB)

[2] Source: TWDB

Community Name	Community Number	Property Locater	Mitigated?	Insured?	Property Type?
ROUND ROCK	481048	0050369	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0043695	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0050454	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0052420	NO	NO	RESIDENTIAL
ROUND ROCK	481048	0050388	NO	YES	RESIDENTIAL
ROUND ROCK	481048	0049598	NO	YES	RESIDENTIAL

Drought

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

Drought warnings are issued by the State Drought Preparedness Council, as directed by H.B. 2660, based upon input from NOAA, the Office of the State Climatologist, the U.S. Geological Service, the Texas Water Development Board, Texas Commission on Environmental Quality, and the Texas Agricultural Statistics Service. Warnings utilize five "levels of concern" and take into account assessments of climatology, agriculture and water availability for each of 10 climatic regions of the state.

Although Round Rock is currently experiencing exceptional drought, on average, the impact for the City and Round Rock ISD is "Limited" as drought mainly affects crops and livestock and not critical facilities. Injuries due to drought are from wildfires that might be developed as a result of dry conditions.

Other Natural Hazards

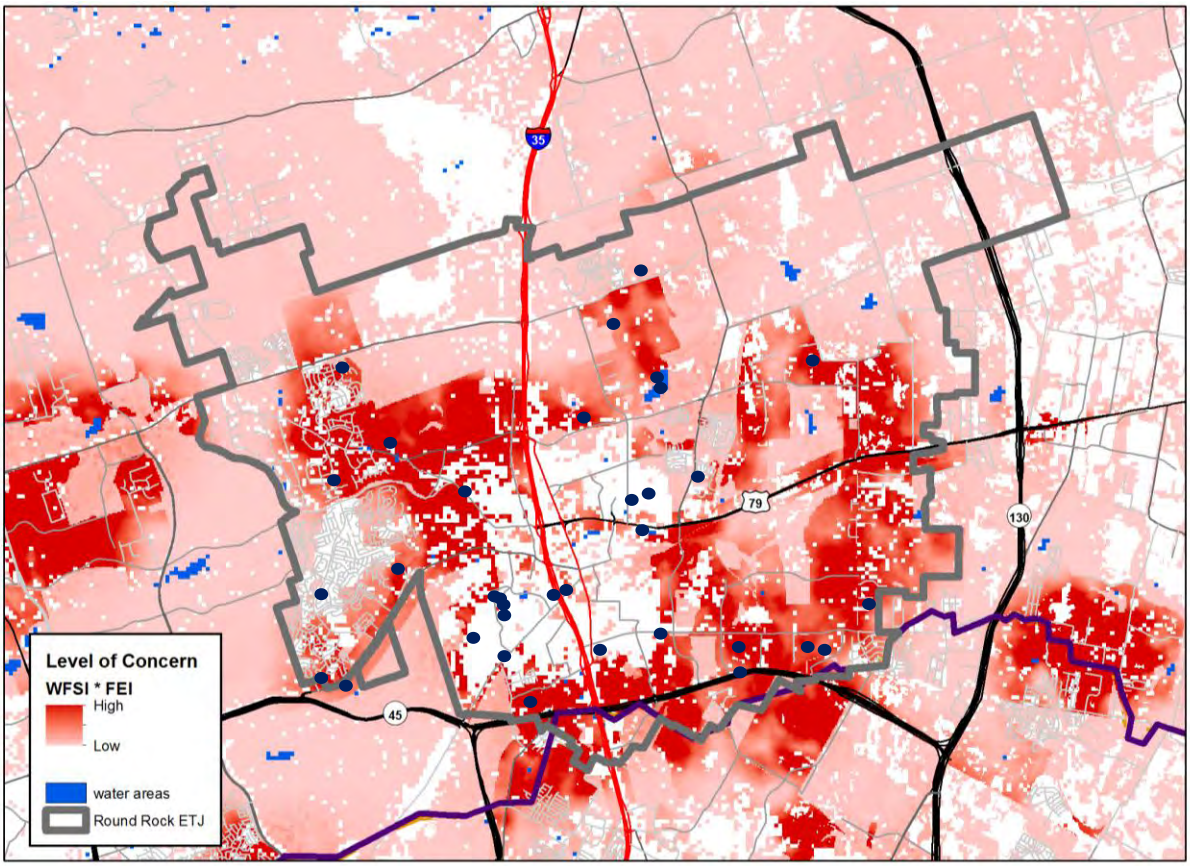
Wildfire

Periods of drought, dry conditions, high temperatures, and low humidity set the stage for wildfires. Areas along railroads and people whose homes are in woodland settings in rural areas have an increased risk of wildfire.

The heavily populated, urban areas of the City of Round Rock are not prone to experiencing large, sweeping fires.

Outside the City, in the unincorporated areas of the county, the greatest vulnerability is unoccupied buildings and open space that have not been maintained, as shown in Figure 6-1 below. Round Rock ISD school locations are identified on Figure 6-1 by dots, which some are located within areas with a high level of concern for wildfire.

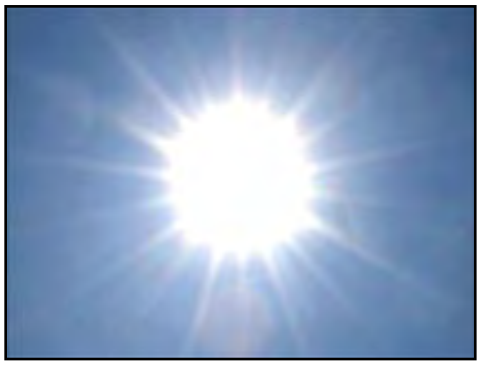
Figure 6-1. Vulnerability for the City of Round Rock



Diminished air quality may be a result of wildfire. The smoke plumes from wildfires can contain potentially carcinogenic matter. Fine particles of invisible soot and ash that too small for the respiratory system to filter can cause immediate and possibly long term affects. The elderly or those individuals with compromised respiratory systems may be more vulnerable to these effects.

Climatic conditions such as severe freezes and drought can significantly increase the intensity of wildfires since these conditions kill vegetation, creating a prime fuel source for these types of fires. The intensity of fires and the rate at which they spread are directly related to wind speed, temperature, and relative humidity.

Due to the potential for an occurrence and risk area, the impact for the City of Round Rock and Round Rock ISD is “Minor”.



Extreme Heat

Severe, excessive summer heat is characterized by a combination of exceptionally high temperatures and humidity. When these conditions persist over a period of time, it is called a heat wave.

Although heat can damage buildings and facilities, it presents a more significant threat to the safety and welfare of citizens, particularly the elderly population or the infirmed that live within the City of Round Rock and cannot afford air conditioning or to run it on a regular basis. Students at Round Rock ISD are also susceptible as sporting events and practices are often held outside during early fall or late spring when temperatures are at the highest. The major human risks associated with severe summer heat include: heat cramps; sunburn; dehydration; fatigue; heat exhaustion; and even heat stroke.

Although there is no specific geographic scope to the extreme heat hazard, area mobile home housing may not be equipped to cool residents. These persons may need a place to go during the hottest daytime hours.

Because students are exposed due to the timing of the school year, Round Rock ISD has developed a four-part Heat Plan, provided in part by Dr. Robert Murray, Ph.D., FACSM, and Director of the Gatorade Sports Science Institute in Barrington, IL. Each part is important to insure that the athletes in the Round Rock ISD are protected from the problems that can arise as coaches and athletes begin workouts during the hot summer months of August and September. The four parts are Education, Acclamation, Hydration, and Monitoring of Athletes for heat related problems.

The impact to the City of Round Rock and Round Rock ISD would be minor when an event occurs. Injuries or illnesses could result because of extremely high temperatures, but permanent disability and fatalities would not be expected.

Technological Hazard

Dam Failure

There are 22 dams in the City of Round Rock, which includes Round Rock ISD, recognized by the U.S. Army corps of Engineers (USACE) in the National Inventory of Dams. All 22 are considered low hazard dams based on their storage capacity. For low hazard dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within a half mile radius are considered to be at a low risk to the effects of a potential dam failure. Although the risk is low, a dam failure could result in economic losses, such as damage to agriculture and housing within a half-mile radius. In addition, flooding from a dam failure event, albeit minor, could result in debris and hazardous materials downstream that can damage

local ecosystems. Debris carried downstream could also block traffic, cause power outages, and disrupt utilities, which could result in school closures if severe.

Annualized loss-estimates for dam failure are not available; neither is a breakdown of potential dollar losses of critical facilities, infrastructure and lifelines, or hazardous-materials facilities. If a dam should fail, however, the severity of impact could be minor.

A dam breach could result in injuries and illness for citizens and students. City and school facilities could be shut down for more than a week. More than 10 percent of city and school property could be destroyed or damaged.

Mitigation Strategy

Mitigation Goals 1
Goal 1 1
Goal 2 2
Goal 3 2
Goal 4 2
Goal 5 3

Mitigation Goals

Based on the results of the risk and capability assessments, the Planning Team was able to develop and prioritize the mitigation strategy. At the Risk Assessment Workshop held February 2011, and the Mitigation Workshop held in May 2011, Planning Team members refined the mitigation strategy for the Plan, changing the order of the mitigation goals. However, Team members chose to maintain the overall goal of reducing and eliminating the long-term risk of loss of life and property damage from the full range of disasters.

Goal 1

Protect public health and safety.

Objective 1.1

Maintain critical facilities.

Objective 1.2

Maximize the utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

Objective 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

Objective 1.4

Protect critical facilities and services.

Goal 2

Protect new and existing properties.

Objective 2.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

Objective 2.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

Objective 2.3

Enact and enforce regulatory measures to ensure that development will not put people in harm's way or increase threats to existing properties.

Goal 3

Build and support partnerships to enhance mitigation to continuously become less vulnerable to hazards.

Objective 3.1

Build and support local partnerships to continuously become less vulnerable to hazards.

Objective 3.2

Build a cadre of committed volunteers to safeguard the community before, during and after a disaster.

Objective 3.3

Build hazard mitigation concerns into City planning and budgeting processes.

Goal 4

Leverage outside funds for investment in hazard mitigation.

Objective 4.1

Maximize the use of outside sources of funding.

Objective 4.2

Maximize participation of property owners in protecting their properties.

Objective 4.3

Maximize insurance coverage to provide financial protection against hazard event.

Objective 4.4

Prioritize mitigation projects based on cost-effectiveness, and starting with those sites facing the greatest threat to life, health and property.

Goal 5

Increase the understanding of residents for the need for mitigation, and steps they can take to protect people and properties.

Objective 5.1

Heighten public awareness of the full range of natural and man-made hazards they face.

Objective 5.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 5.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

MITIGATION ACTIONS

City of Round Rock 2
Mitigation Actions 2
Round Rock ISD 112
Mitigation Actions 112

At the mitigation workshop, the Planning Team developed mitigation actions, prioritizing actions based on the STAPLE+E analysis, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. A STAPLE+E analysis follows each mitigation action in this section.

As part of the economic evaluation of the STAPLE+E analysis, Team Members analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed all costs associated with it. As a result of this exercise, Team Members assigned priority to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as "High" indicates that the action will be implemented as soon as funding is received. A "Moderate" action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as "Low" indicate that they will not be implemented without first seeking grant funding and after "High" and "Moderate" actions have been completed.

The City also developed and prioritized mitigation actions regarding the National Flood Insurance Program (NFIP) for continual compliance. These actions are denoted with "(NFIP)" next to each corresponding action number in the beginning row of each mitigation action[1].

[1] NFIP actions have not been developed for Round Rock ISD as NFIP compliance is not applicable for schools.

City of Round Rock

Mitigation Actions

		City of Round Rock – 1
	Proposed Action	**Acquire warning system for high-hazard dams.**
	BACKGROUND INFORMATION	
	Site and Location	To be determined
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam Failure
Effect on new/existing buildings	Mitigation downstream flooding to all structures in inundation zone in the event of dam failure
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	HMGP
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

	City of Round Rock – 2
Proposed Action	**Develop public awareness program for notifying residents in inundation zone downstream of high-hazard dams to seek safe shelter in the event of dam failure.**
BACKGROUND INFORMATION	
Site and Location	To be determined
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam Failure
Effect on new/existing buildings	Increase response time to protect structures in inundation zone in the event of dam failure
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	HMGP or other available grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding 2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 3
	Proposed Action	**Acquire inflatable Zumro structure (860 square feet) and 4 HVAC units to provide cooling/heating shelters for weather related events to house first responders/public as needed.**
	BACKGROUND INFORMATION	
	Site and Location	Set up community –wide and transported as needed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat, Winter Storm, Hurricane Wind, Wildfire
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$106,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding 2013

COMMENTS
May be funded under alternate programs

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

	City of Round Rock – 4
Proposed Action	**Increase measures in place for tree trimming program to protect critical infrastructure from overhanging and dead limbs that pose a threat when downed during severe thunderstorm events.**
BACKGROUND INFORMATION	
Site and Location	City wide
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Thunderstorm, Winter Storm
Effect on new/existing buildings	Decrease potential damage to structures from downed limbs
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Public Works
Implementation Schedule	Upon funding 2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 5
	Proposed Action	**Install bullet-resistant material on entry doors; reinforce bench with fiberglass composite bulletproof panels; extend bench shelving to create added distance between judge and defendant; consider reinforcing walls of courtroom.**
	BACKGROUND INFORMATION	
	Site and Location	McConico Building; Suite 120
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Terrorism, Tornado
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Municipal Court
Implementation Schedule	Upon funding 2014

COMMENTS
May be funded under DHS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 6	
Proposed Action	**Install bullet resistant materials in pertinent areas of Municipal Court lobby.**
BACKGROUND INFORMATION	
Site and Location	McConico Building, Suite 110
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Terrorism
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	Unknown
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Municipal Court
Implementation Schedule	2012

COMMENTS

May be funded under DHS

- Replace 5 customer service windows with bullet resistant materials
- Pass-through trays installed on desktops
- Some type of speaker system
- Hardening of underneath with fiberglass composite panels

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐

		City of Round Rock – 7
	Proposed Action	**Install outdoor warning system to alert residents, park visitors to seek shelter in the event of severe weather and in the event of other disasters or need for public alert.**
	BACKGROUND INFORMATION	
	Site and Location	Old Settler's Park
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Tornado, Thunderstorm
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$300,000
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	PARD
Implementation Schedule	Upon funding 2012-2013

COMMENTS
The City of Round Rock's park system consists of 1,700 acres (map attached), of which the crown jewel is Old Settlers Park, with 570 acres. There is a need to for a modern alert/warning system for the many participants utilizing the parks on a year-round basis. This will be a phased project beginning with Old Setter's Park.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 8
	Proposed Action	**Retrofit Emergency Operation Center and *911*-Emergency Communications supporting areas of building to provide additional electrical backup and backup generator in the event of severe weather or disaster events.**
	BACKGROUND INFORMATION	
	Site and Location	Located in Police Building
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Winter Storm, Tornado
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$400,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	2014-2015

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 9
	Proposed Action	**Purchase point of distribution (POD) 2 inflatable Zumro structures (860 square feet, and may be zipped together) and 8 HVAC units as needed for distribution of pandemic-like and S&S Strategic national stockpile.**
	BACKGROUND INFORMATION	
	Site and Location	Transport community-wide as needed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Pandemic
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$215,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding

COMMENTS
May be funded under DHS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 10
	Proposed Action	**Construct safe shelter as part of Capital Area Shelter HUB plan shelter in proposed Sports Complex to house residents in the event of local disasters and house evacuees from coastal communities during hurricane events.**
	BACKGROUND INFORMATION	
	Site and Location	To be determined
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane Wind, Thunderstorm, Tornado
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Office of Emergency Management, City Manager
Implementation Schedule	2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 11 (NFIP)
	Proposed Action	**Purchase and install Flood early warning system and modeling stream gauge system for area waterways.**
	BACKGROUND INFORMATION	
	Site and Location	**1. Brushy Creek at HWY-183 (or Regan Blvd.)** **2. Brushy Creek at Great Oaks Dr.** **3. Brushy Creek at CR-122** **4. South Brushy Creek at Hwy-183** **5. Lake Creek at Round Rock West Dr.**
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention and Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$125,000 installation; $25,000 per site; annual O&M: $77,000; $15,400 per site per annum
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Office of Emergency Management, Watershed Management
Implementation Schedule	2013-2014

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 12
	Proposed Action	**Upgrade existing program to notify residents within the community in the event of train derailment and/or transportation disaster involving chemical spills or chemical/radiological release.**
	BACKGROUND INFORMATION	
	Site and Location	Community wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hazardous Materials Incident, Terrorism
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding

COMMENTS
May be funded under DHS or alternate funding

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

	City of Round Rock – 13 (NFIP)
Proposed Action	**Purchase equipment and install gates and video surveillance equipment for area low-water crossings.**
BACKGROUND INFORMATION	
Site and Location	Various sites on area waterways. Top ten include: 1. Chisholm Trail at the "round rock" 2. Lee St. in Memorial Park 3. Chisholm Trail 1600 Block 4. Harrell Parkway in Old Settlers Park 5. Lake Creek in Lake Creek Park 6. A.W. Grimes Blvd. south of 79 7. Old Bowman Rd. 8. Burnet St. bridge over Lake Creek 9. Round Rock West Dr. south of Lake Creek Dr. 10. Deepwood Dr. between St. Williams Loop and Lake Creek Dr
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 14
	Proposed Action	**Work with area businesses through the local Chamber to develop disaster preparedness and public awareness plans related to pandemic outbreak.**
	BACKGROUND INFORMATION	
	Site and Location	Community wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Pandemic
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	2013

COMMENTS
May be funded under other programs

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 15
	Proposed Action	**Work with area businesses through the local Chamber to develop disaster preparedness and public awareness plans related to Fuel Pipeline Breach.**
	BACKGROUND INFORMATION	
	Site and Location	Community wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Fuel Pipeline Breach
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	2012-1013

COMMENTS
May be locally funded or through other programs

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 16
	Proposed Action	**Promote the use of rain barrels and pressurized rainwater harvesting to conserve water usage during extreme heat and drought conditions.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide, with a particular emphasis on neighborhoods in the Brushy Creek, Lake Creek, Chandler Branch, and McNutt Creek basins.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat, Drought
Effect on new/existing buildings	Reduces storm water run off
Priority (High, Moderate, Low)	Low
Estimated Cost	$82,500
Potential Funding Sources	HMGP, Drainage Utility Fees
Lead Agency/Department Responsible	Engineering Division/Storm Water Management
Implementation Schedule	TBD

COMMENTS

One option would be to offer a rebate for installing rainwater harvesting barrels. Rebate amounts would be calculated at $0.50 per gallon for non-pressurized systems and $1.00 per gallon for pressurized systems, not to exceed 50 percent of the project cost. Systems of more than 500 gallons would require approval prior to system installation. Participation would be limited to once every 12 months.

If 100 homeowners were to install 55-gallon rain barrels, the rebate would be $27.50 each, or $2,750. If 10 percent of homeowners (approx. 3,000) installed rain barrels, the cost of rebates would be in the $82,500 range. Consideration could be given to providing the rebate through a credit to the customer's water bill.

Promote the program through classes on making a rain barrel at local nurseries and rain barrel decorating/painting competitions.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 17
	Proposed Action	**Work with area businesses through the local Chamber to develop disaster preparedness and public awareness plans for area wildfires during extreme heat and drought.**
	BACKGROUND INFORMATION	
	Site and Location	Community wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat, Drought, Wildfire
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Office of Emergency Management, City Manager
Implementation Schedule	2013-2014

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 18
	Proposed Action	**Enhance security for Emergency Operations Center Facility. Funding will enable enhancement of security for the City's Emergency Operations Center and the Police Department building in which it is housed, including state-of-the-art intrusion detection and video surveillance equipment to secure and protect this critical facility.**
	BACKGROUND INFORMATION	
	Site and Location	Office of Emergency Management and Police Dept.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Terrorism
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$76,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Municipal Court
Implementation Schedule	Upon funding

COMMENTS
Alternate funding through DHS or other program

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 19
	Proposed Action	**Construct new bridge to pass the 1% storm, bridge approximately 10-feet high by 450-feet long would be required.**
	BACKGROUND INFORMATION	
	Site and Location	Brushy Creek and N Lee/ Summit Road
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Reduce potential flooding to existing structures when debris blocks floodwaters that eventually overtop banks and floods area structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 1,580,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon Funding

COMMENTS
North Lee and Summit Street are local streets that join in Memorial Park. This low water crossing is located approximately 585 feet downstream of IH 35 and the roadway overtops by approximately 8.5 feet of water during the 1% event.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 20	
Proposed Action	**Install an early warning system consisting of water level gauge(s), flashing signage, and new barricades to warn drivers of road overtopping before they enter Memorial Park.**
BACKGROUND INFORMATION	
Site and Location	Brushy Creek and N Lee/ Summit Road
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 125,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
North Lee and Summit Street are local streets that join in Memorial Park. This low water crossing is located approximately 585 feet downstream of IH 35 and the roadway is overtopped by approximately 8.5 feet of water during the 1% event.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 21
	Proposed Action	**Implement stream bank stabilization for the segment of Brushy Creek immediately downstream of Georgetown Street to just upstream of the west water treatment plant.**
	BACKGROUND INFORMATION	
	Site and Location	Brushy Creek (Georgetown Street to West Water Treatment Plant)
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 925,000.00
Potential Funding Sources	HMGP or other grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon Funding

COMMENTS

Due to upstream development and the loss of riparian buffers along the creek, the banks are unstable and erosion is present at the tow of the slope (at normal water line). Stabilizing the creek banks will protect twelve residential properties on the south bank and will improve water quality in Brushy Creek through reduced TSS loading. Based on field visits of the current conditions, the reach from the Georgetown street Bridge to a location approximately 1,200 feet downstream can be stabilized using toe blocks and re-establishing riparian vegetation/buffer zone.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 22
	Proposed Action	**Improve culverts under Old Settlers Boulevard at Chandler Branch and the associated channel improvements.**
	BACKGROUND INFORMATION	
	Site and Location	Chandler Branch and Old Settlers Boulevard
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Mitigate flooding to area structures
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 255,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
According to the FEMA DFIRM, Old Settlers is overtopped by two feet during the 100-year (1 %) storm. Upsizing the culvert will eliminate roadway overtopping.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 23
	Proposed Action	**Improve channel associated with tributary of Chandler Branch that runs through from Eagles Nest St. to Settlement Dr. Approximately 3400 feet will be improved.**
	BACKGROUND INFORMATION	
	Site and Location	Chandler Branch Tributary 16C (Eagles Nest to Settlement Drive)
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Channel improvements will increase conveyance and decrease the risk of flooding adjacent homes, businesses, and streets.
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 1,500,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
The channel does not contain existing 1% annual chance storm. The channel improvements will increase conveyance and decrease the risk of flooding adjacent homes, businesses, and streets.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 24
	Proposed Action	**Develop updated hydrologic and hydraulic models of the Chandler Branch Tributary 16C Watershed and evaluating alternate methods for providing flood protection to the inundated structures.**
	BACKGROUND INFORMATION	
	Site and Location	Chandler Branch Tributary 16C (Eagles Nest to Settlement Drive)
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$70,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
The channel does not contain existing 1% annual chance storm. The updated modeling will allow for analysis to design and build a channel section that increase conveyance and reduce flooding. Updated modeling and the subsequent construction project will likely result in updates to the FEMA Flood Insurance Rate Map.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 25	
Proposed Action	**Buy out multiple properties within the Chandler Branch Watershed to significantly reduce the flood hazard risk in the area. Area will be converted to permanent green space and land use planning initiative.**
BACKGROUND INFORMATION	
Site and Location	Chandler Branch Watershed
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Permanent removal of structures from the floodplain.
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 1,500,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are various structures identified within the existing floodplain in the Chandler Branch Watershed. An updated H&H analysis shall be used to determine priority of structures. Comprehensive Master Plan / Land Use Planning

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 26
	Proposed Action	**Construct second access way to the Rhodes Subdivision portions of which are at risk for flooding.**
	BACKGROUND INFORMATION	
	Site and Location	Rhodes Subdivision (Extend from Apollo Circle to AW Grimes)
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$750,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Currently there is only one access point for the Rhodes Subdivision. The project would construct a second access point including approximately 840 feet of roadway and bridge to connect the subdivision to AW Grimes. The subdivision is suspected of having up to a dozen lots in the 1% floodplain and is also located downstream of a dam.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 27
	Proposed Action	**Develop updated hydrologic and hydraulic models of the Chandler Branch Watershed and evaluating alternate methods and provide flood protection to the potentially inundated structures.**
	BACKGROUND INFORMATION	
	Site and Location	Chandler Branch Watershed along Rhodes Subdivision
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Reduce potential flooding to existing structures
Priority (High, Moderate, Low)	High
Estimated Cost	$80,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Based on previous observations, there are concerns that multiple structures are at significant risk of flooding. The hydrology and hydraulic models through the area need to be evaluated and modified to more accurately reflect real world conditions. It is likely that the revised models will require an update to the FEMA Flood Insurance Rate Map.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 28
	Proposed Action	**Develop a comprehensive citywide remediation plan related to discharge incidents into the drainage system or waterways.**
	BACKGROUND INFORMATION	
	Site and Location	City Wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	NA
Priority (High, Moderate, Low)	High
Estimated Cost	$150,000.00
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS

Currently the City does not have a comprehensive remediation plan for hazards that are not an immediate threat to human health and safety. This plan is a step towards being able to respond immediately and efficiently to incidents as they occur. Ordinance framework is already in place to recover any costs that the City incurs.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 29	
Proposed Action	**Stabilize stream bank and associated hydraulic modeling for the segment of Dry Branch Tributary 1 from Dell Way downstream to Greenlawn Boulevard.**
BACKGROUND INFORMATION	
Site and Location	Dry Branch Tributary 1 Greenlawn to Dell
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 325,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS

Due to upstream development and the loss of riparian buffers the banks are unstable and erosion is present at the toe of the slope and channel bottom of this man made channel. Stabilizing the banks will protect numerous residential properties on Stratford Drive and Lancaster Gate Drive and will improve water quality through reduced TSS loading. Based on field visits of the current conditions, the reach from Dell Way to Oxford can be stabilized using toe blocks, re-grading, and re-establishing riparian vegetation/buffer zone.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 30
	Proposed Action	**Install multiple box culverts in Dry Branch Tributary 5 under Gattis School Road and associated channel improvements. The project consists of installing four (4) 10' x 4' box culverts.**
	BACKGROUND INFORMATION	
	Site and Location	Dry Branch Trib 5 at Gattis School Road
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 290,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Gattis School Road is a 4-lane major arterial roadway that is overtopped by 0.9 feet during the 1% event. Upsizing the culverts will eliminate the roadway overtopping.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 31	
Proposed Action	**Reduce risk and stabilize stream bank for the segment of Dry Branch Tributary 5 from the existing stock pond to the confluence of the Dry Branch main stem (approximately 500 LF).**
BACKGROUND INFORMATION	
Site and Location	Dry Branch Tributary 5 (Gattis School Rd. to Confluence)
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 700,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Severe erosion has occurred from the confluence upstream to the existing stock pond / dam. Stabilizing the banks will protect some rural residential property, will protect existing City infrastructure, and will improve water quality through reduced TSS loading. Based on field visits of the current conditions, the reach can be stabilized using large rock or limestone blocks, several drop structures, re-grading, and re-establishing riparian vegetation/buffer zone.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 32 (NFIP)
	Proposed Action	**Develop Public Awareness and Education Campaign- Turn Around Don't Drown.**
	BACKGROUND INFORMATION	
	Site and Location	City Wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	NA
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5,000.00
Potential Funding Sources	HMGP, PDM, local funding
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Spring 2012

COMMENTS

The City currently has several roadways that overtop during heavy rainfall. Education campaign would focus on raising awareness within the community and prevention. While it is well known that Central Texas is a in the center of 'flash flood alley', it is also an area experiencing tremendous growth as people relocate from other areas. Unfortunately, those new to our community are not familiar with the frequency and intensity of localized flooding; thus, most flood-related deaths in Central Texas involve motor vehicles.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

	City of Round Rock – 33 (NFIP)
Proposed Action	**Strengthen local NFIP Program and implement Floodplain Education Campaign regarding risk of building in/near floodplain areas and availability and promotion of NFIP flood insurance policies.**
BACKGROUND INFORMATION	
Site and Location	City Wide
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Reduce risk to new structures through more stringent permitting requirements and education
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	2012

COMMENTS
Education campaign to include general floodplain information, NFIP program, and filling in the floodplain.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 34
	Proposed Action	**Replace six culverts with a bridge to prevent roadway overtopping. Gilleland Creek flows under Greenlawn Blvd and will require associated channel improvements.**
	BACKGROUND INFORMATION	
	Site and Location	Gilleland Creek and Greenlawn Blvd.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 580,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Greenlawn Boulevard is a 4-lane major arterial roadway that is overtopped 4.2 feet during the 1% event as per the Gilleland 2009 LOMR. Replacing the culverts with a bridge will increase the conveyance area and eliminate roadway overtopping.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 35	
Proposed Action	**Develop updated hydrologic and hydraulic models of the Lake Creek Tributary 2 Watershed and evaluate and implement alternate methods for providing flood protection to the inundated structures.**
BACKGROUND INFORMATION	
Site and Location	Lake Creek Tributary 2
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Mitigate flooding to affected structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 60,000.00
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 53 structures identified within the existing floodplain in the Lake Creek Tributary 2 Watershed.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 36	
Proposed Action	**Modify WCID SCS Dam #9 for increased flood control of the Lake Creek Watershed and improving protection levels for downstream structures.**
BACKGROUND INFORMATION	
Site and Location	Lake Creek Watershed
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood, Dam Failure
Effect on new/existing buildings	Reduce potential flooding
Priority (High, Moderate, Low)	High
Estimated Cost	$ 7,500,000
Potential Funding Sources	HMGP, PDM, WCID partnership
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 162 structures identified within the existing floodplain in the Lake Creek Watershed.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 37 (NFIP)
	Proposed Action	**Elevate and/or flood-proof structures to reduce costs from flood hazards. Assist owners with increased cost of compliance associated with elevating and flood-proofing structures currently located within the Lake Creek Watershed.**
	BACKGROUND INFORMATION	
	Site and Location	Lake Creek Watershed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Reduce the number of structures that are currently high risk of flood damage.
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 3,000,000
Potential Funding Sources	HMGP, PDM
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 162 structures identified within the existing floodplain in the Lake Creek Watershed. An updated H&H analysis shall be used to determine priority of structures.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 38
	Proposed Action	**Purchase multiple repetitive loss structures within the Lake Creek Watershed to significantly reduce the flood hazard risk in the area.**
	BACKGROUND INFORMATION	
	Site and Location	Lake Creek Watershed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Permanent removal of structures from the floodplain.
Priority (High, Moderate, Low)	Low
Estimated Cost	$ 5,000,000
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 162 structures identified within the existing floodplain in the Lake Creek Watershed. An updated H&H analysis shall be used to determine priority of structures.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 39	
Proposed Action	**Update hydrologic and hydraulic models of the Lake Creek Watershed and evaluating and implement alternate methods for providing flood protection to the inundated structures.**
BACKGROUND INFORMATION	
Site and Location	Lake Creek Watershed
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Flood reduction to existing structures
Priority (High, Moderate, Low)	High
Estimated Cost	$ 180,000.00
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 162 structures identified within the existing floodplain in the Lake Creek Watershed.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 40
	Proposed Action	**Develop updated hydrologic and hydraulic models of the Onion Branch Watershed and evaluating and implement alternate methods for providing flood protection to the inundated structures.**
	BACKGROUND INFORMATION	
	Site and Location	Onion Branch Watershed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Mitigate flooding to flood prone structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 115,00.00
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
There are approximately 35 structures identified within the existing floodplain in the Onion Creek Watershed. The houses are located between Old Settlers Blvd and the confluence of Onion Creek and Brushy Creek.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 41
	Proposed Action	**Assimilate Williamson County stakeholder's stream and rain gauge data for historical and real-time event analysis within a centralized interface.**
	BACKGROUND INFORMATION	
	Site and Location	Upper Brushy Creek Watershed
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 150,000.00
Potential Funding Sources	HMGP, PDM or local funding
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Local funding or alternate grant program Combining stream and rain gauges throughout the County will provide information needed to perform early warning systems functions, flood model calibrations, as well as real-time analysis data. Multiple cities, agencies, and organizations will be more prepared for flood hazards because of this project.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 42	
Proposed Action	**Purchase a vacuum truck to remove debris, materials from inlets, drains, and culverts.**
BACKGROUND INFORMATION	
Site and Location	City wide
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention, Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	NA
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$105,000.00
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	Drainage Operations
Implementation Schedule	Upon funding

COMMENTS
Currently, staff uses a vacuum trailer for debris removal. The trailer has a limited carrying capacity, which decreases efficiency, requiring more frequent trips to dewater and thus is often unavailable. The City's infrastructure and subsequent debris reduction burden continues to grow as the community develops. A vacuum truck could have positive effects on water quality and decrease flooding by allowing an expanded and more efficient carrying capacity.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 43
	Proposed Action	**Generate appropriate updates to the Flood Insurance Rate Map to formalize Base Flood Elevations for Zone A areas within the City of Round Rock.**
	BACKGROUND INFORMATION	
	Site and Location	Multiple Locations
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$ 50,000.00
Potential Funding Sources	Grants, private funding sources
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
Areas of interest include Zone A areas within the City's ETJ. Seek private partnership funding to work with FEMA to generate updated and more detailed federal flood maps.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 44
	Proposed Action	**Relocate approx. 100-200 feet of 6" high-pressure gas line. Remove 280 feet of 54" CMP pipe and replace with pre-cast Box Culvert and all the associated street repairs.**
	BACKGROUND INFORMATION	
	Site and Location	Drainage and pipeline cross Bowman Road approximately 110 feet east of Nicole Circle.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Fuel Pipeline Breach
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$500,000.00
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Storm Water
Implementation Schedule	Upon funding

COMMENTS
The existing gas line crosses diagonally under the 54" corrugated metal pipes. The pipes have deteriorated through to subgrade eroding the backfill around the gas line. There is not enough clearance over the gas line to install new pipes and maintain current gas line safety standards.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 45	
Proposed Action	**Redevelop and improve Ground Water Capacity.**
BACKGROUND INFORMATION	
Site and Location	Spring Street, Round Rock, TX 401 N. Mays, Round Rock, TX
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$2,000,000
Potential Funding Sources	Utility Fund/Grant
Lead Agency/Department Responsible	Utilities
Implementation Schedule	TBD

COMMENTS
Ground water capacity improvements include redeveloping existing ground water sources and improving treatment such that the water can be used for drinking. Targeted improvements will increase the system capacity by approximately more than two million gallons per day.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 46
	Proposed Action	**Reduce risk to infrastructure and Waste Water Lift Station Enhancement**
	BACKGROUND INFORMATION	
	Site and Location	NA, units are portable.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection and Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Tornado
Effect on new/existing buildings	None
Priority (High, Moderate, Low)	High
Estimated Cost	$125,000
Potential Funding Sources	Utility Fund, HMGP
Lead Agency/Department Responsible	Utilities
Implementation Schedule	TBD

COMMENTS

Enhancement includes the purchase of three (3) trailer mounted generators and three (3) trailer mounted transfer pumps. This equipment will be used to pump wastewater from lift stations in the event that power or pumping capability is lost during a flood or tornado. The ability to continue this service during storm events will prevent damage to natural resources by keeping wastewater in the sewage system and out of the streams and creeks. Continuing wastewater pumping also prevents sewage backups which protects public and private property.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 47	
Proposed Action	**Develop new water reuse irrigation systems and/or expand upon existing water reuse system.**
BACKGROUND INFORMATION	
Site and Location	Within economically feasible locations with the City of Round Rock.
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5 million
Potential Funding Sources	City of Round Rock water utility fund
Lead Agency/Department Responsible	Water Conservation or Water/Wastewater Systems Planning and Engineering
Implementation Schedule	Upon Funding

COMMENTS

Round Rock currently is using reclaim water from its wastewater treatment plant to irrigate a local golf course. The line is currently being extended through Old Settler's Park and is scheduled to be completed and usable in 2014. Adding onto this system would only benefit the City by decreasing our use of expensive potable water for irrigation, thus reducing the gallons used per capita, and saving the potable water for future population growth, reducing the cost of system expansions and/or procuring new water sources.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 48
	Proposed Action	**Develop and maintain education program for residents on increasing defensible space around structures to reduce potential wildfire.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Wildfire
Effect on new/existing buildings	Reduce potential fires for all structures
Priority (High, Moderate, Low)	High
Estimated Cost	$10,000
Potential Funding Sources	General Revenue/Forest Service
Lead Agency/Department Responsible	Fire Dept.
Implementation Schedule	Upon Funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 49
	Proposed Action	**Identify vacant land in areas at high risk to wildfire and develop trails or preserve space from development.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Wildfire
Effect on new/existing buildings	Prevent damage to new buildings by restricting development
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000
Potential Funding Sources	General Revenue, Texas Forest Service Grants, other HMA grants
Lead Agency/Department Responsible	Fire Department, Public Works, Office of Emergency Management
Implementation Schedule	2013 and ongoing

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 50
	Proposed Action	**Implement and expand StormReady program to increase public awareness of extreme weather events to reduce property damage and save lives.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness, Structural Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hail
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$15,000
Potential Funding Sources	General Revenue/Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Ongoing

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

City of Round Rock – 51	
Proposed Action	**Through the NOAA StormReady program, work with schools, nursing homes, and businesses to purchase weather radios with stand-alone receivers in order to receive weather alerts and warnings.**
BACKGROUND INFORMATION	
Site and Location	Citywide
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hail
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$15,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Ongoing Activity

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 52
	Proposed Action	**Purchase emergency generator and back-up equipment for major intersections to provide power to traffic lights and controls in the event of severe weather.**
	BACKGROUND INFORMATION	
	Site and Location	Multiple Locations
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane Wind
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$ 50,000.00
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Public Works/Transportation
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 53
	Proposed Action	**Identify suitable shelter locations and develop procedures for notifying citizens of available shelters in the event hurricane winds threaten the area.**
	BACKGROUND INFORMATION	
	Site and Location	City wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane Wind
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$ 5,000
Potential Funding Sources	Grants or Local funding
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		City of Round Rock – 54
	Proposed Action	**Procure and distribute Excessive Heat Events Guidebooks and 'Beat the Heat' pamphlets from NWS to provide best practices for saving lives during heat waves in urban areas.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	Minimal
Potential Funding Sources	N/A
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	2013

COMMENTS
This action would be incorporated into the City's Heat Emergency Plan.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

	City of Round Rock – 55
Proposed Action	**Purchase generators to supply back-up power to HVAC systems in the event of power failure in cooling and heating emergencies.**
BACKGROUND INFORMATION	
Site and Location	Clay Madsen Recreation Center Allen R. Baca Center
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To Be Determined
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Office of Emergency Management
Implementation Schedule	2013 and ongoing as funding available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

Round Rock ISD

Mitigation Actions

		Round Rock ISD – 1
	Proposed Action	**Acquire cell phone software/apps. enabling instructors/ISD employees' to access real-time weather alerts during outside sports activities, during / after school and weekend school activities.**
	BACKGROUND INFORMATION	
	Site and Location	Round Rock school district
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Thunderstorm, Extreme Heat
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	ISD
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		Round Rock ISD – 2
	Proposed Action	**Retrofit A/C units with hail guards as infrastructure protection.**
	BACKGROUND INFORMATION	
	Site and Location	Throughout Round Rock school district
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Thunderstorm, Hail
Effect on new/existing buildings	Protect units from damage
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM or other HMA grants
Lead Agency/Department Responsible	ISD
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

		Round Rock ISD – 3
	Proposed Action	**Purchase generators for emergency back-up for light and HVAC systems in the event of power failure in heating and cooling emergencies.**
	BACKGROUND INFORMATION	
	Site and Location	RISD campuses
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Extreme Heat
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	To be determined
Potential Funding Sources	Grants
Lead Agency/Department Responsible	ISD
Implementation Schedule	2013 and ongoing

COMMENTS
These multi-use buildings will provide for cooling and heating emergencies for our students and teachers, as well as our community population. In addition, the State uses these sites for State Hurricane Evacuation Shelters and the emergency power will provide for safe, illuminated, environmentally controlled hurricane shelters.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Technically Feasible:				
1 ☐	2 ☐	3 ■	4 ☐	5 ☐
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ■	5 ☐
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ■

PLAN MAINTENANCE

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Monitoring 3
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Plan Maintenance Procedures

The following is an explanation of how the City of Round Rock and Round Rock ISD will implement the plan, and continue to evaluate and enhance it over time. Continual public involvement is also addressed. The sustained hazard mitigation planning process consists of three main parts:

- Incorporation
- Monitoring and Evaluation
- Continued Public Involvement

Incorporation

The City and Round Rock ISD will be responsible for further development and implementation of mitigation action plans. Each action has been assigned to a specific department within the City and District. The following describes the process by which Round Rock will incorporate elements of the mitigation plan into other planning mechanisms as well.

Process of Incorporation

Once the Plan is adopted, the City and District will implement actions based on priority and the availability of funding. The City already implements policies and programs to reduce loss to life and property from hazards. The mitigation actions developed for this Plan build upon that effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction begins to seek funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Round Rock will integrate implementation of their mitigation actions with other plans and policies such as construction standards and emergency management plans and ensure that these actions, or proposed projects, are reflected in other planning efforts.

The School District's Safety and Risk Management Division will integrate implementation of their mitigation actions through a comprehensive District-wide safety, crisis response and risk management program by utilizing expertise and incorporating plans and policies of related departments.

Upon formal adoption of the Plan, Team Members will work to integrate hazard mitigation strategies into existing plans as indicated in Table 9-1 below.

Table 9.1 - Process of Incorporation by Planning Mechanism

Planning Mechanism	Incorporation of Plan
Grant Applications	The Plan will be consulted by Planning Team Members whenever grant funding is sought for mitigation projects. If a project is not in the Plan, an amendment may be necessary to include the action in the Plan.
Annual Budget Review	Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought or mitigation actions that will be undertaken according to the implementation schedule of the specific action
Regulatory Plans	Currently Round Rock has regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Disaster Recovery Plans, Economic Development or Evacuation Plans. The Plan will be consulted when city departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.
Capital Improvement Plans	Round Rock has a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and

Planning Mechanism	Incorporation of Plan
	mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Round Rock and the Round Rock ISD have comprehensive Plans in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore the actions for flooding, and information found in Section 5 of this plan discussing the people and property at risk to flood, will be reviewed and revised when Round Rock updates their management plans or develop new plans.

Incorporating the Adopted Resolution by Quasi-Jurisdictional Team Members

Since Round Rock ISD is a quasi-jurisdictional entity, upon FEMA approval, the ISD will post the item on the agenda for a regular board meeting, at least 72 hours in advance. A presentation and discussion regarding ISD's participation in the Plan will take place. Following discussion a board member would move to approve or adopt, there would be a second, and the recommendation to adopt the Plan would be approved by majority vote, and reflected in the minutes. The approved Plan will then be posted on the ISD's website.

Monitoring and Evaluation

Periodic revisions of the Plan are required to ensure that the goals, objectives, and mitigation action plans are kept current. More important, revisions may be necessary to ensure that the Plan is in full compliance with federal regulations and state statutes. This portion outlines the procedures for completing such revisions and future updates for the City and District.

Monitoring

Designated Hazard Mitigation Plan Team Members are responsible for yearly monitoring of components of the hazard mitigation plan that pertain to their jurisdiction. The City of Round Rock will oversee the monitoring and evaluation process. The City will organize two meetings a year to discuss the

implementation of the mitigation actions and to provide feedback on the progress of the Plan. The office responsible for each jurisdiction is included in Table 9-2.

Round Rock ISD will also monitor the Plan on a bi-annual basis. The Director of Safety/Risk Management will oversee the monitoring and evaluation process and organize two meetings a year that coincide with meetings of the School Board. At these meetings the Round Rock ISD team will discuss which actions included in the Plan may be implemented through federal, state or local funding sources. The District will also discuss whether new actions should be included in the Plan.

Evaluation

At the beginning of each fiscal year, Team Members for the City and District will meet once to evaluate the hazard mitigation plan. As part of the evaluation process, the jurisdictions will assess any changes in risk, determine whether implementation of mitigation actions is on schedule or if there are any implementation problems (such as technical, political, legal or coordination issues), and reflect changes in development. The District will look at changes in student population and potential growth, including the need for new facilities. The City will evaluate land development or programs that affect mitigation priorities in their respective departments. On an annual basis, Team Members for the District and City will identify any needed changes in the Plan based upon their evaluation activities. This yearly evaluation process will help determine if any further updates are necessary.

Table 9.2 – Chair Person/Office Responsible for Evaluation and Monitoring of the Plan

Jurisdiction	Office Responsible
The City of Round Rock	Emergency Management Coordinator
Round Rock Independent School District	Hazard and Risk Management

Plan Amendments

At any time, minor technical changes may be made to the Plan to keep it updated. However, any material changes to the mitigation actions or major changes in the overall direction of the Plan or the policies contained within it will be subject to formal adoption by the governing bodies of participating jurisdictions – Round Rock City Council and the Round Rock ISD School Board.

At the end of the comment period, the proposed amendment and any comments will be forwarded to the governing bodies of the City of Round Rock and Round Rock ISD. If no comments are received from the reviewing parties within the specified review period, this will also be noted. Planning Team

Members will then review the proposed amendment and comments received and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to TDEM.

In determining whether to recommend approval or denial of a plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan;
- New issues or needs that were not adequately addressed in the Plan; and
- Changes in information, data, or assumptions from those on which the Plan was based.

Five (5) Year Review

The Plan will be thoroughly reviewed by the Planning Team every five years to determine whether there have been any significant changes in the area that may necessitate changes in the types of mitigation actions proposed.

As with the development of this Plan, the Office of Emergency Management for The City of Round Rock and the Safety and Risk Management Office for Round Rock ISD will oversee the review process. At the beginning of each fiscal year, Team Members will meet once to evaluate the Plan. In addition, participants will also meet twice a year, by conference call or presentation, to discuss the implementation of the mitigation actions.

New developments in identified hazard areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the plan.

The Plan review will provide the City of Round Rock and the ISD with an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned.

Following the five-year review, any revisions deemed necessary will be summarized and utilized according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Continued Public Involvement

Input from the public was an integral part of the preparation of this Plan and will continue to be essential as the Plan grows and changes. Changes or suggestions to this Plan will require opportunities for the public to make its views known.

This plan will be available on the City of Round Rock Web Site (http://www.roundrocktexas.gov) where officials and the public are invited to provide ongoing feedback. Copies of the plan also will be kept for public review in the offices of the City and ISD.

Further, if necessary, the City can designate voluntary citizens or willing members of the private sectors as members of the Planning Team as well as utilize local media to notify the public of any maintenance or periodic review activities taking place. The District will keep the public involved by inviting members of the public and stakeholders to School Board meetings where the Plan will be monitored and evaluated.

APPENDIX A

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Overview

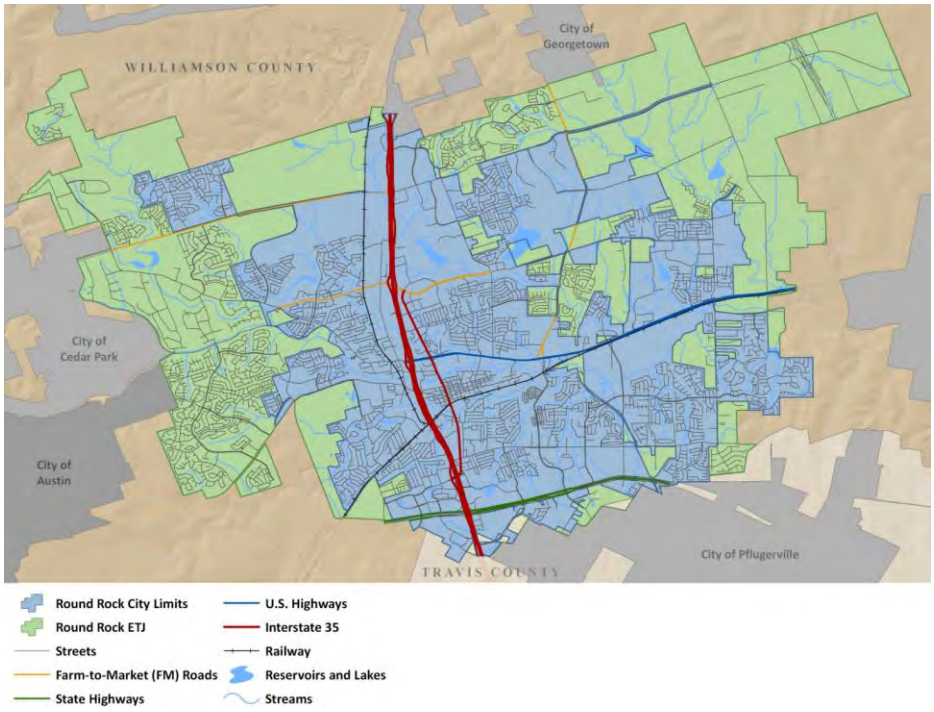
A risk assessment study was conducted to evaluate the probability of occurrence of a hazard event and the potential associated losses. This evaluation presents loss estimates to provide a foundation for evaluating mitigation measures in the event that a disaster occurs. The loss estimates are intended to support the decision making process for mitigation efforts.

Loss estimates calculated for this risk assessment are approximate, based upon available data and methodologies. These estimates should be used to understand relative risk from hazards and potential losses and are not intended to be predictive of precise results. Uncertainties are inherent in any loss estimation methodology arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete or outdated inventory, or demographic or economic parameter data). These factors can result in a range of uncertainty in loss estimates produced by this analysis, possibly at a factor of two or more.

Study Area Definition

All areas of the City are covered in this risk assessment, including Round Rock ISD and small portions of the City that extend into neighboring Travis County along the southern boundary of the community. Figure A-1 shows the study area for the City of Round Rock.

Figure A-1. Study Area



Population Data

Population distribution data of the planning area was at the census block level is based on Census 2000 population data. It is shown in Figure A-2 below. This represents the population data used in this hazard analyses.

Figure A-2. Population Distribution

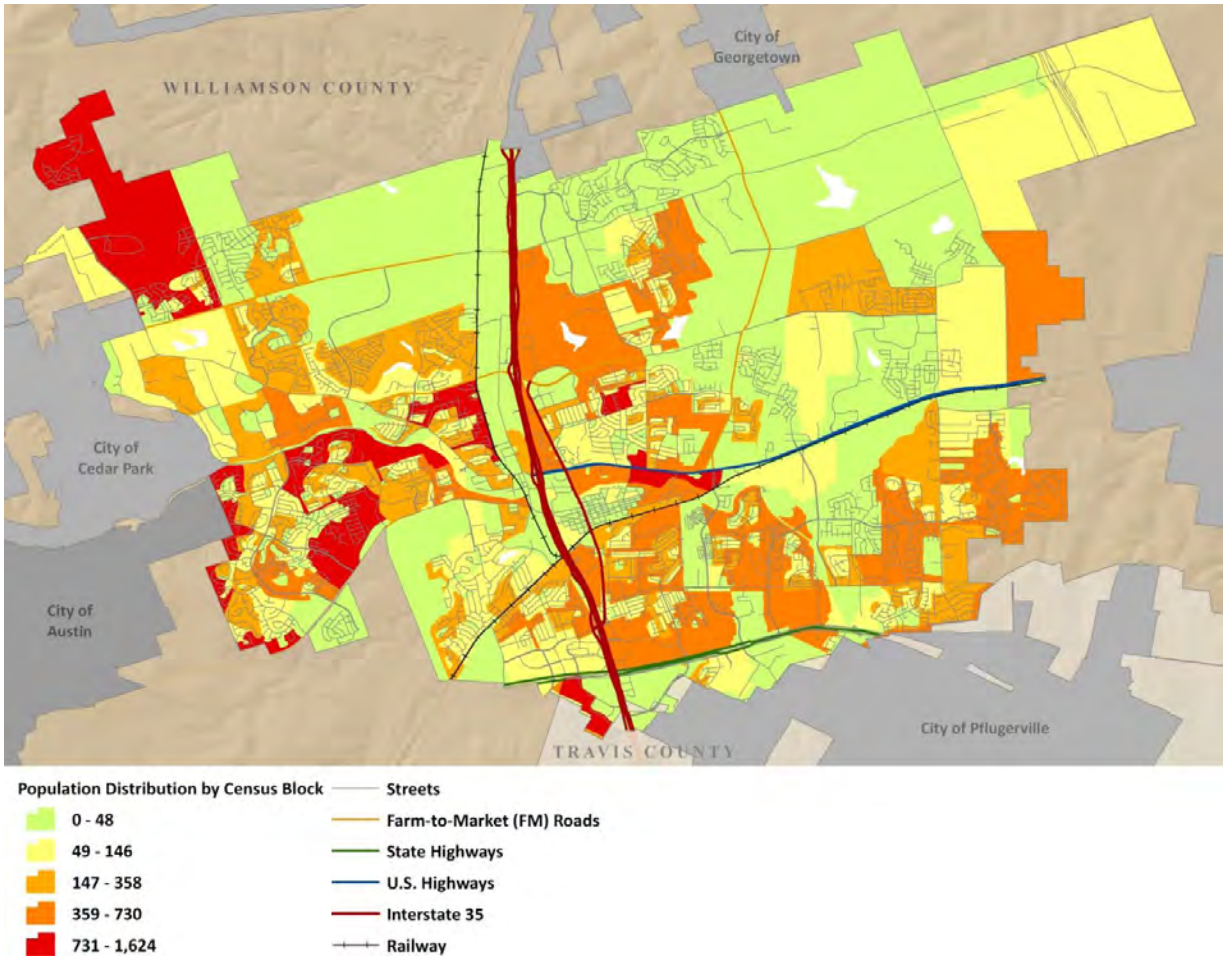


Table A-1 provides a numerical breakdown of the population of the City of Round Rock, including two groups of special needs populations—elderly (persons over the age of 65) and low income (those making less than $25,000 a year). The U.S. Census numbers for Round Rock show an official 2000 population count of 61,136 and a 2009 estimate of 105,424. The value of 86,971 derived from the demographics data used by FEMA's loss estimation software, HAZUS-MH MR4 (as shown in Table A-1), appears to be a midpoint between these two sets of official Census values. The total population value shown in Table A-1 and its underlying GIS data is used in the vulnerability studies for the technological hazards presented in this risk assessment.

Table A-1. Population Distribution and Special Needs by Jurisdiction

TOTAL POPULATION	ESTIMATES OF SPECIAL NEEDS POPULATIONS	
	Elderly (Over Age 65)	Low Income (< $25,000)
86,971	1,542	3,872

Source: Hazus-MH MR4 Loss Estimation Software/U.S. Census

Asset Inventory

Parcel-level information for the City of Round Rock is summarized in Table A-2 below. The full data set contains location (street address and spatial coordinates) and improvement value. This data is further introduced and explained within the discussion of individual hazards. It is important to note that some discrepancies may exist in portions of the analyses in that some parcels may intersect two different jurisdictional boundaries or may intersect more than one hazard boundary. As stated previously, the intent is to use this data to produce relative approximations and estimations of risk and is not necessarily expected to be 100 percent accurate when compared with real-world conditions.

Table A-2. Parcel Information

TOTAL ESTIMATED NUMBER OF PARCELS	TOTAL ESTIMATED NUMBER OF PARCELS WITH IMPROVED VALUES	TOTAL ESTIMATED IMPROVED VALUE OF PARCELS
43,750	37,036	$7,961,465,915

Source: Capital Area Council of Governments

Table A-3 includes the amount (in kilometers) of oil and gas pipelines, highways and railways and the number of hazardous materials sites (i.e., includes georeferenced Toxic Release Inventory [TRI] and Tier 2 sites) in the study area.

Table A-3. Infrastructure, Lifelines, and Hazardous Materials

ESTIMATED INFRASTRUCTURE AND LIFELINES					HAZARDOUS MATERIALS FACILITIES
Oil Pipe (km)*	Gas Pipe (km)*	Roads[1] (km)**	Highways Only[2] (km)**	Railroad (km)**	Number of Sites***
81.82	211.38	1,112.07	42.197	31.137	48

*Source: Railroad Commission of Texas

**Source: City of Round Rock

***Source: TRI and Tier II lists

Analysis of impact of technological hazards was framed within this demography and infrastructure.

The term “technological hazards” refers to the origins of incidents that can arise from human activities such as (for the purposes of this risk assessment) the use of gas and oil pipeline and the manufacture, transportation, and storage. The use of hazardous materials across all industries is a technological hazard as well as pandemic and acts of terrorism.

[1] Roads, for the purposes of this analysis, include U.S. Interstates, U.S. highways, State highways, Farm-to-Market (FM) roads, and streets.

[2] Highways, for the purposes of this analysis, include U.S. Interstates, U.S. highways, and State highways.

The scope of this risk assessment assumes that the technological events addressed in this section would be accidental in nature and that their consequences are unplanned and unintended.

Methodology

A GIS-based analysis was conducted for hazardous materials release from fixed and mobile sites and oil and gas pipeline failure. A statistical analysis and summary of potential impact was performed for the hazards terrorism and pandemic.

A GIS-based assessment was performed for pipeline failure and hazardous materials release from fixed and mobile sites. Geospatial data was collected from local, regional, state, and national sources, with local data being used to the maximum extent possible. ESRI® ArcGIS™ 9.3.1 was used to assess risk utilizing digital data such as parcel data and demographic data along with known hazard boundaries and buffers. Using these types of data layers, exposure and associated risk was approximated by estimating the assessed building value associated with developed parcels determined to be located in identified hazard areas. Census 2000 data (at the census block level) was used to estimate potentially exposed populations in hazard areas.

The objective of the GIS-based analysis was to determine the estimated vulnerability of people, buildings, and critical facilities to the identified hazards using best available data. In so doing, local databases, such as local tax assessor records, parcel boundaries, building footprints, and critical facilities data, were used in combination with digital hazard data. The results of the analysis provided an estimated number of people, as well as the numbers and values of buildings and critical facilities determined to be potentially at risk to those hazards with delineable geographic hazard boundaries, i.e., the technological hazards. A more specific description of the GIS-based analysis for each particular hazard is provided in the discussion of each individual hazard.

For the hazards terrorism and infectious disease, loss would have been based on observed historical losses. However, having no reported loss within the City of Round Rock for these hazards places all assets vulnerable to this impact.

Hazard Profiles, Vulnerability, and Impact

For each of the four technological hazards, a description of the hazard and the City of Round Rock's overall vulnerability to that hazard was developed. Annualized loss data is provided where available and impact is addressed looking at the warning time or potential speed of onset of the hazard. Impact statements are defined in Table A-4 below.

Table A-4. Impact Statements

Potential Severity	Description
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Pipeline Failure

Fuel pipeline breach or pipeline failure addresses the rare, but serious hazard of an oil or natural gas pipeline. An estimated 2.2 million miles of pipelines in the United States carry hazardous materials. Natural gas pipelines transport natural gas, and oil or liquid petroleum pipelines transport crude oil and refined products from crude oils, such as gasoline, home heating oil, jet fuel and kerosene in addition to liquefied propane, ethylene, butane and some petrochemical products. Sometimes oil pipelines are also used to transport liquefied gases, such as carbon dioxide.

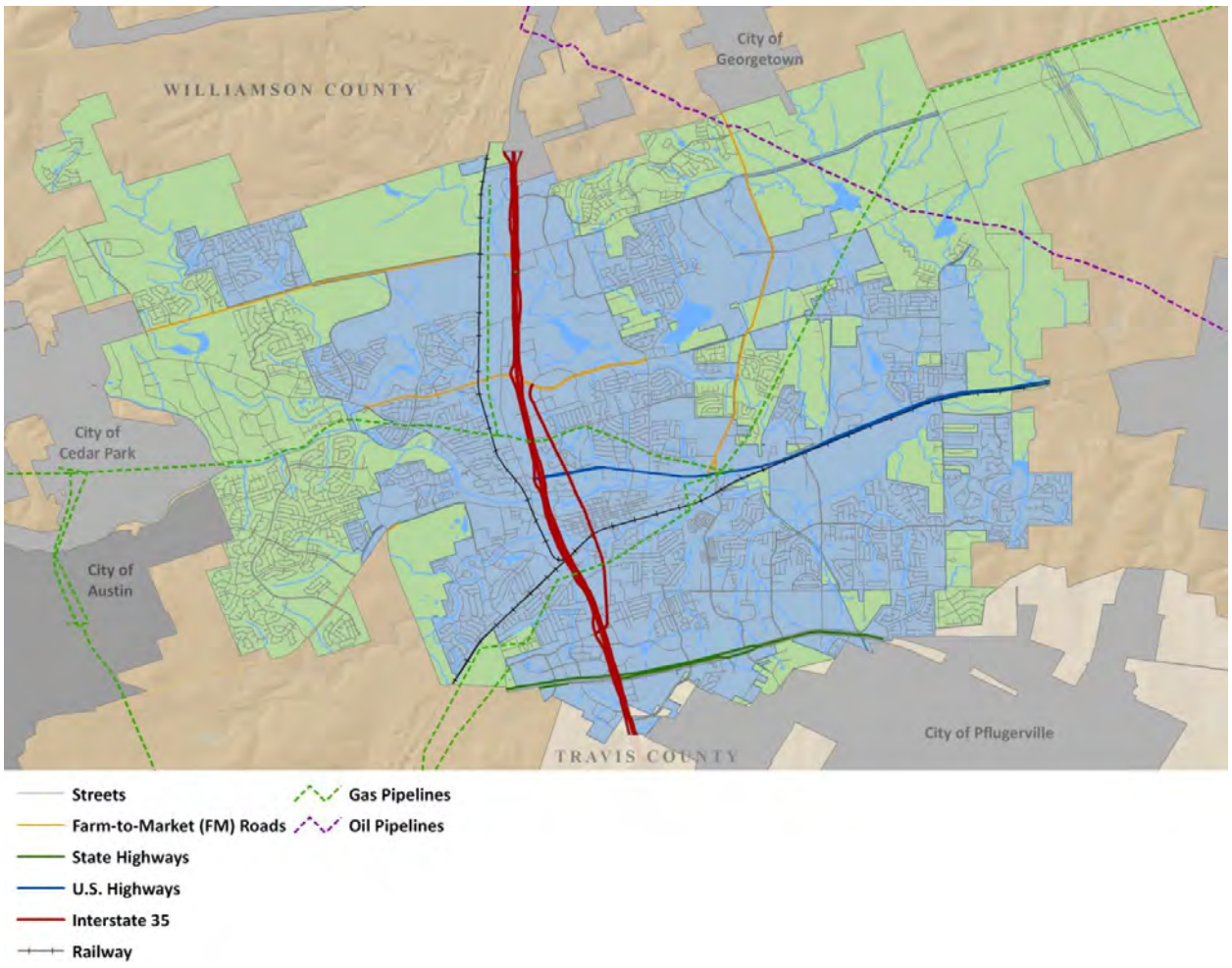
Pipeline failure is a rare occurrence, but has the potential to cause extensive property damage and loss of life. Pipelines have caused fires and explosions that killed more than 200 people and injured more than 1,000 people nationwide and 50 people in Texas in the last decade.

Location

Figure A-3 shows the location of energy pipelines (gas and oil) in and immediately around the City of Round Rock. If any of these energy pipelines, gas or oil, were to rupture, such an event could endanger

property and lives in the immediate area (up to 500 meters for immediate [primary] impact and up to 2,500 meters for secondary impact).

Figure A-3. Gas and Oil Pipelines



Extent

While many of the historical accidents presented in Table A-5 are relatively small in terms of the amount of property damage that was reported, and while some may not meet the conventional idea of a "pipeline failure," it is valuable to consider these events as part of the vulnerability assessment as they do provide some indication of the types of issues related to gas and oil in the county and the preventable nature of many of these occurrences. For example, several of the incidents reported to the Railroad Commission of Texas were the result of drivers hitting presumably unprotected facilities with their vehicles. Several incidents appeared to be the result of miscommunication or lack of communication regarding locates prior to digging. Maintenance and possibly homeowner education could have been a contributing factor in two of the events.

Previous Occurrences

The historical accidents presented in Table A-5 below do not report the amount of injuries and property damage. Further, many may be relatively minor events that do not meet the conventional idea of a "pipeline failure." However, it is valuable to consider these events as part of the vulnerability assessment as they do provide some indication of the types of issues related to gas and oil in the county and the preventable nature of many of these occurrences. For example, several of the incidents reported to the Railroad Commission of Texas were the result of drivers hitting presumably unprotected facilities with their vehicles. Several incidents appeared to be the result of miscommunication or lack of communication regarding locates prior to digging. Maintenance and possibly homeowner education could have been a contributing factor in two of the events.

Table A-5 summarizes the incident log of historical pipeline accidents (gas and oil combined) reported by the Railroad Commission of Texas for the Round Rock planning area.

Table A-5. Historical Pipeline Accidents (Gas and Oil Combined) (2003-2010)

AREA	INCIDENT DATE	OPERATOR	DESCRIPTION OF EVENT AND CAUSE	INJURIES	DEATHS	PROPERTY DAMAGE (IN 2010 DOLLARS)
Round Rock	09/14/2004	TXU Gas Company	Gas			
Round Rock	04/11/2005	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	06/19/2005	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	06/29/2005	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	10/03/2005	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	09/06/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	01/19/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	03/03/2006	ATMOS Energy Corp., Mid-Tex	Not reported	Not reported	Not reported	Not reported

AREA	INCIDENT DATE	OPERATOR	DESCRIPTION OF EVENT AND CAUSE	INJURIES	DEATHS	PROPERTY DAMAGE (IN 2010 DOLLARS)
		Division				
Round Rock	04/28/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	07/22/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	08/08/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	11/01/2006	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	02/16/2007	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	06/14/2007	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Round Rock	08/04/2007	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Austin*	02/02/2009	Texas Gas Service Company	Not reported	Not reported	Not reported	Not reported
Austin*	03/05/2009	Texas Gas Service Company	Not reported	Not reported	Not reported	Not reported
Pflugerville*	06/30/2009	ATMOS Energy Corp., Mid-Tex Division	Not reported	Not reported	Not reported	Not reported
Austin*	09/17/2010	Texas Gas Service Company	Not reported	Not reported	Not reported	Not reported

*Recent events reported for Williamson County near the Round Rock planning area.

Source: Railroad Commission of Texas

Probability of Future Events

According to the historical incident data, a pipeline incident for the City is highly likely, with an event occurring on average once or twice per year.

Vulnerability and Impact

Table A-6 and Table A-7 show total numbers of population and parcels potentially at risk from gas and oil pipeline accidents, respectively. The analysis for gas pipelines consists of natural gas. The analysis for oil pipelines consists of natural gas liquids. The immediate (primary) area of impact for both types of pipeline accidents is a 500-meter buffer. The secondary area of impact for both types of pipeline accidents is a 2,500-meter buffer. Both types of impact can inflict substantial damage on the surrounding areas. Pipeline breaches have the potential to cause multiple deaths and completely shutdown of facilities for 30 days or more.

Table A-6. Potential Impact Due to Gas Pipeline Failure

TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
			Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
PRIMARY IMPACT AREA (500 METERS)					
86,971	37,036	$7,961,465,915	35,657	7,532	$1,419,210,324
SECONDARY IMPACT AREA (500 TO 2,500 METERS)					
86,971	37,036	$7,961,465,915	35,148	17,722	$4,149,406,014
TOTAL IMPACT**					
86,971	37,036	$7,961,465,915	70,805	25,254	$5,568,616,338

Source: GIS Analysis

* With improved values.

**Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Table A-7. Potential Impact Due to Oil Pipeline Failure

TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
			Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
PRIMARY IMPACT AREA (500 METERS)					
86,971	37,036	$7,961,465,915	563	114	$1,500,000
SECONDARY IMPACT AREA (500 TO 2,500 METERS)					

86,971	37,036	$7,961,465,915	2,218	1,737	$93,691,196
TOTAL IMPACT**					
86,971	37,036	$7,961,465,915	2,781	1,851	$95,191,196

Source: GIS Analysis

* With improved values.

**Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Pipeline failure can have a "substantial" impact. Such events can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Hazardous Materials Incident (Fixed and Mobile)

In a hazardous materials incident, solid, liquid and/or gaseous contaminants are released from fixed or mobile containers, although this profile focuses on fixed sites. Weather conditions will directly affect how the hazard develops.

Hazardous materials incidents can have a substantial impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. The micro-meteorological effects of the buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering-in-place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time for hazardous materials incidents is minimal to none.

The Toxics Release Inventory (TRI) is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to EPA and to their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; RCRA Subtitle C treatment, storage and disposal (TSD) facilities; and solvent recovery services.

- Have 10 or more full-time employee equivalents.
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative and toxic (PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds or 0.1 grams depending on the chemical.

Tier 2 data is a publicly available database from the Texas Department of State Health Services Tier 2 Chemical Reporting Program. Under the community right-to-know program laws upheld at the state and federal level, all facilities which store significant quantities of hazardous chemicals must share this information with state and local emergency responders and planners. Facilities in Texas share this information by filing annual hazardous chemical inventories with the state, with Local Emergency Planning Committees (LEPCs) and with local fire departments. The Texas Tier 2 Reports contain facility identification information and detailed chemical data about hazardous chemicals stored at the facility.

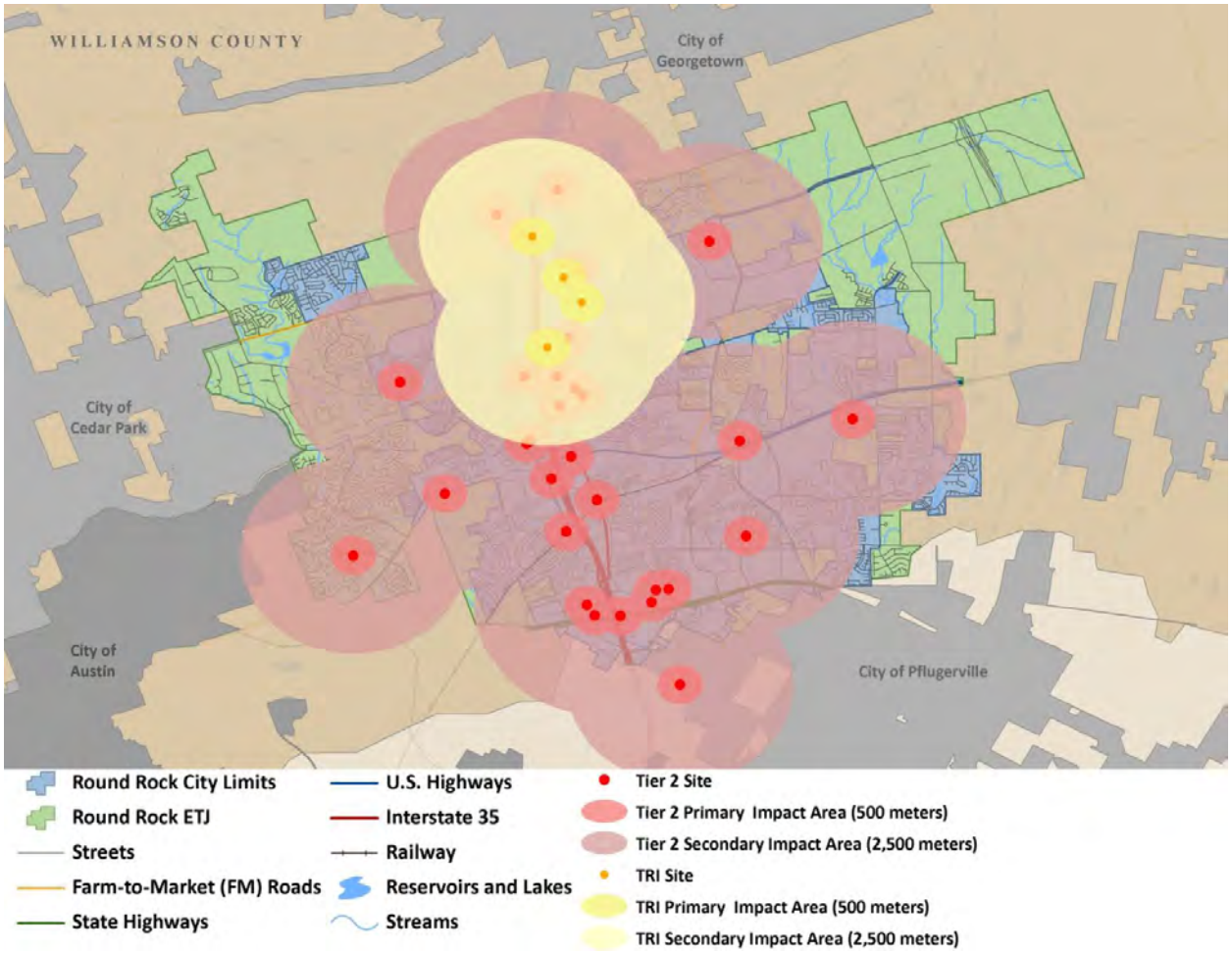
A facility must report if it meets the following criteria:

- Any company using chemicals that could present a physical or health hazard must report them, according to Tier 2 requirements.
- If an industry has an OSHA deemed hazardous chemical that exceeds the appropriate threshold at a certain point in time, then the chemical must be reported. These chemicals may be on the list of 356 Extremely Hazardous Substances (EHS) or could be one of the 650,000 reportable hazardous substances (not on the EHS list). This reporting format is for a "snapshot in time". EHS chemicals have to be reported if the quantity is either greater than 500 pounds, or if the Threshold Planning Quantity (TPQ) amount is less than 500 pounds.

Location

Figure A-4 shows the locations of available georeferenced TRI and Tier 2 listed toxic sites in the City of Round Rock planning area. For fixed site analysis, only toxic sites that have georeferenced data available were analyzed and the circle buffers are drawn around each hazardous material site. Two sizes of buffers, 500 and 2,500 meters are assumed in respect to the different levels of impact—immediate (primary) and secondary.

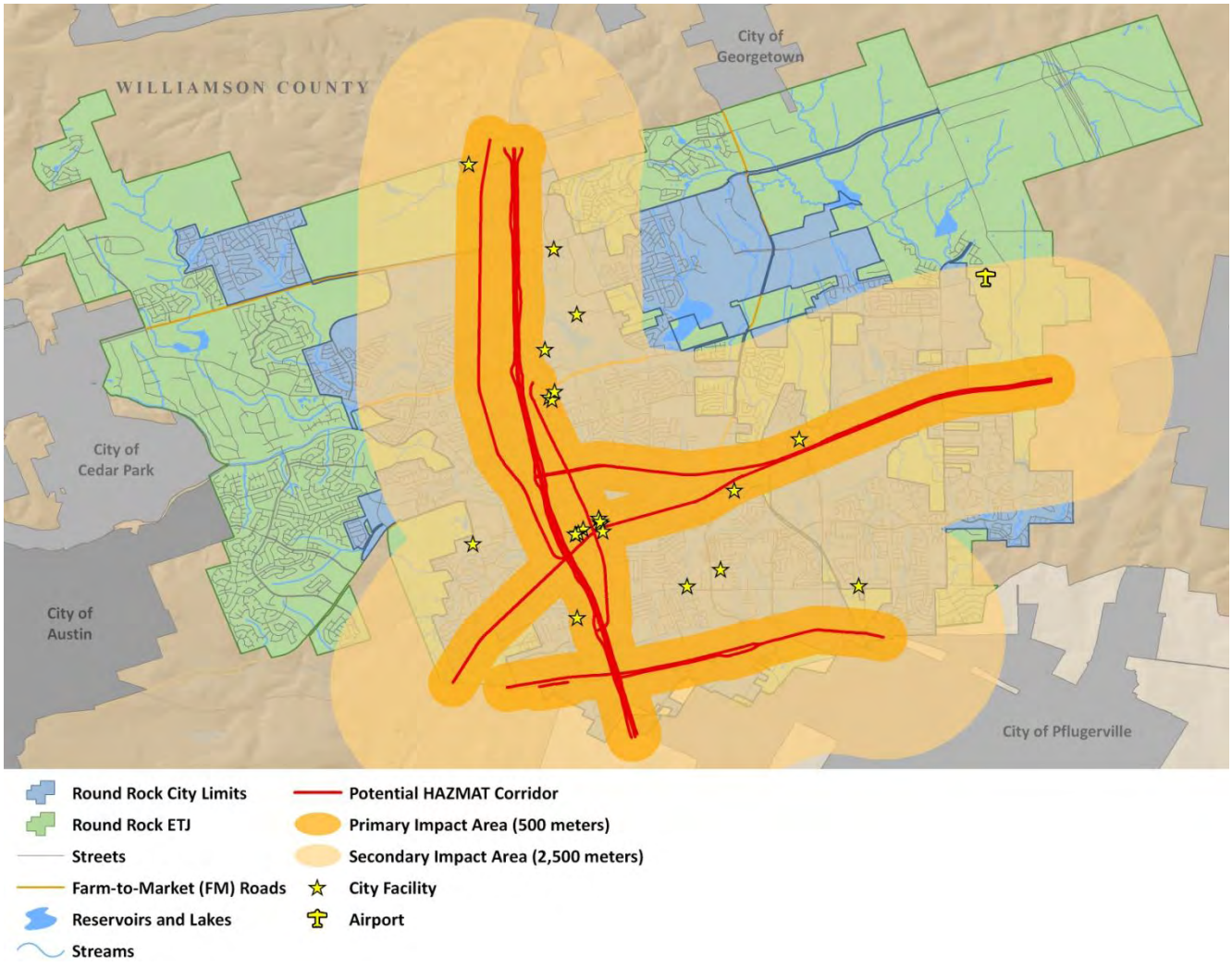
Figure A-4. Fixed HAZMAT Analysis Locations and Buffers (City of Round Rock)



For the mobile toxic release analysis, major roads consisting of Interstates, U.S. highways and State highways along with railroads were chosen as the routes where hazardous materials are most likely to be transported. The analysis buffer along these selected infrastructure elements is the same as that used for fixed site analysis (500 meters and 2,500 meters). Census block data was used to estimate population exposure and parcel data (improved parcels only) was used to estimate property exposure.

Figure A-5 illustrates the 500-meter and 2,500-meter buffers for the two infrastructure elements that comprise the mobile toxic release hazard: highway and rail. It is worth noting that all known city facilities fall within at least the 2,500-meter secondary impact buffer.

Figure A-5. Mobile HAZMAT Analysis Corridors and Buffers



Extent

In a hazardous materials incident, solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. The micro-meteorological effects of the buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering-in-place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time for hazardous materials incidents is minimal to none.

Previous Occurrences

No record of previous hazardous materials incidents from mobile toxic release incidents in the City of Round Rock.

Probability of Future Events

Based on the location of mobile and fixed hazardous material sites, an incident is possible for the City of Round Rock.

Vulnerability and Impact

Table A-8 shows estimated toxic release exposure of people and parcels by jurisdiction for fixed sites using census block data. Table A-9 shows estimated toxic release exposure of people and parcels for mobile sites. Primary and secondary impact distances were selected based on guidance from FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings and* engineering judgment. Because many sites containing hazardous materials are located in densely populated areas, there are population and structures that could be susceptible to a release from more than one site.

Table A-8. Estimated Exposure of People and Parcels (Fixed Site Toxic Release)

TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
			Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
PRIMARY IMPACT AREA (500 METERS)					
86,971	37,036	$7,961,465,915	8,013	2,735	$1,259,478,556
SECONDARY IMPACT AREA (500 TO 2,500 METERS)					
86,971	37,036	$7,961,465,915	71,849	34,102	$5,779,496,977
TOTAL IMPACT**					
86,971	37,036	$7,961,465,915	79,862	36,837	$7,038,975,533

Source: GIS Analysis

* With improved values only.

**Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Table A-9. Estimated Exposure of People and Parcels (Mobile Toxic Release—Highway[3] and Rail)

TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
			Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
PRIMARY IMPACT AREA (500 METERS)					
86,971	37,036	$7,961,465,915	33,989	5,564	$2,029,426,776
SECONDARY IMPACT AREA (500 TO 2,500 METERS)					
86,971	37,036	$7,961,465,915	32,766	18,406	$3,345,539,742
TOTAL IMPACT**					
86,971	37,036	$7,961,465,915	66,755	23,970	$5,374,966,518

Source: GIS Analysis

* With improved values.

**Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Hazardous materials or toxic releases can have a "substantial" impact. Such events can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Terrorism

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types—domestic terrorism or international terrorism. Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend their national boundaries.

A terrorist attack can take several forms, depending on the technological means available to the terrorist, the nature of issue motivating the attack, and the points of weakness of the terrorist's target. Bombings are the most frequently used terrorist method in the United States. A terrorist using a

[3] Highways, for the purposes of this analysis, include U.S. Interstates, U.S. highways, State highways, and loops.

chemical or biological weapon is of particular concern to officials. Special training and equipment is needed in order to safely manage a WMD incident.

Biological agents are infectious microbes or toxins used to produce illness or death in people, animals or plants. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water as they are extremely difficult to detect.

Chemical agents kill or incapacitate people, destroy livestock, or ravage crops. Some chemical agents are odorless and tasteless and are therefore difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

The Department of Defense estimates that as many as 26 nations may possess chemical agents and/or weapons and an additional 12 may be seeking to develop them. The Central Intelligence Agency reports that at least ten countries are believed to possess or to be conducting research on biological agents for weaponization.

Terrorist incidents – as with other natural and technological disasters – involve the application of one or more modes of harmful force to the built environment. These modes include contamination (as in the case of chemical, biological radiological or nuclear hazards), energy (explosives, arson, and even electromagnetic waves), or denial of service (sabotage, infrastructure breakdown, and transportation service disruption).

Location

There is no distinct geographic boundary to the threat of terrorism. An event is possible throughout the City.

Extent

The Homeland Security Advisory System, issued by the U.S. Department of Homeland Security, is a color-coded terrorism warning system that sets out five threat levels. Terrorism Warning Threat Levels are described in Table A-10.

Table A-10. Terrorism Warning System Threat Levels[4]

Color	Threat Level[5]	Governmental actions to be taken
Green	Low: Low risk of	Requires "protective measures" such as regularly assessing facilities for weaknesses and finding ways to reduce them, and making sure State and

[4] Department of Homeland Security

[5] Current threat levels can be found at: http://www.dhs.gov/xinfoshare/programs/Copy_of_press_release_0046.shtm.

Color	Threat Level[5]	Governmental actions to be taken
	attacks.	local government employees are trained to handle terrorism situations.
Blue	Guarded: General risk of attacks.	Requires government agencies to review and update emergency response procedures and communications systems, as well as provide the public with necessary information.
Yellow	Elevated: Significant risk of attacks.	Includes increasing surveillance of critical locations, coordinating emergency plans with nearby jurisdictions and implementing contingency and emergency response plans.
Orange	High: High risk of attacks.	Requires coordinating necessary security efforts with armed forces or law enforcement agencies, taking additional precautions at public events, preparing to work at an alternative site or with a dispersed workforce and restricting access to essential personnel.
Red	Severe: Severe risk of attacks.	Includes assigning emergency response personnel and setting up specially trained teams; monitoring, redirecting, or constraining transportation systems; closing public and government facilities; and increasing or redirecting personnel to address emergency needs.

The Red Cross also issues Advisory System Recommendations for individuals, families, neighborhoods, schools and businesses for each alert level. These may be found at: www.redcross.org.

There are heightened periods for terrorism risk based on intelligence and other information. A potential terrorist event could devastate the community physically, economically and psychologically for many years to come. Warning time for terrorism is minimal to none.

Previous Occurrences

The history of terrorism on United States soil includes the attacks of September 11, 2001, on the World Trade Center in New York and the Pentagon in Washington, D.C. and the ensuing anthrax attacks; the 1995 bombing of the Murrah Federal Building in Oklahoma City; and earlier bombing of the World Trade Center in 1993.

Round Rock has not experienced a terrorist act. While complete prevention of an attack may not be attainable, the county can lessen the likelihood and/or the potential effects of an incident. The City continues to improve its readiness to respond to a terrorist incident through participation in state and

federal programs that provide training and equipment for agencies that would respond to a local terrorist incident, and in exercises that help to improve agency coordination and test local response plans.

Probability of Future Events

The types, frequencies, and locations of many natural hazards are identifiable and, even in some cases, predictable. The laws of physics and nature govern them. Malevolence, however, cannot be forecast with any accuracy. There is, therefore, some potential for most, if not all, types of intentional terrorist acts to occur anywhere and at any time.

Vulnerability and Impact

There is no defined geographic boundary for a terrorist event. All of the population, buildings, critical facilities, infrastructure and lifelines and hazardous materials facilities are considered exposed to the hazards of terrorism and could potentially be affected.

There are no past local events. Therefore all assets and facilities are potentially at risk to damages that may for the most part be secondary. The primary impact of pandemic

Terrorist events can have a "substantial" severity of impact. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Infectious Disease / Pandemic

An infectious disease is defined as a clinically evident disease resulting from the presence of pathogenic microbial agents. According to FEMA, infectious diseases are a major threat around the world, killing millions globally each year. Transmission of an infectious disease may occur through one or more means including physical contact with infected individuals. These infecting agents may also be transmitted through liquids, food, bodily fluids, contaminated objects, airborne inhalation or through vector-borne dissemination.

Three terms are commonly used to classify disease impacts: endemic, epidemic and pandemic. An endemic is present at all times at a low frequency (e.g., chicken pox in the United States). An epidemic is a sudden severe outbreak of disease (e.g., the bubonic plague during Medieval times) and a pandemic is an epidemic that becomes very widespread and affects a whole region, a continent, or the world (e.g., the 1957 flu pandemic caused at least 70,000 deaths in the United States and 1-2 million deaths

worldwide). Fears of pandemic have risen in recent years as our globalized economy and growing population fosters large scale international travel and trade. Also, growing populations increase the vulnerability of all areas to disease as it can travel more quickly and creates difficulty in preventing the spread of infection.

The top 11 infectious diseases according to the World Health Organization based upon number of deaths are presented in Table A-11.

Table A-11. Worldwide Mortality Due to Infectious Disease

RANK	CAUSE OF DEATH	APPROXIMATE WORLDWIDE DEATHS IN 2002	PERCENTAGE OF ALL DEATHS WORLDWIDE
1	Lower Respiratory Infections	3.9 million	6.9%
2	HIV/AIDS	2.8 million	4.9%
3	Diarrheal diseases	1.8 million	3.2%
4	Tuberculosis (TB)	1.6 million	2.7%
5	Malaria	1.3 million	2.2%
6	Measles	600,000	1.1%
7	Pertussis	290,000	0.5%
8	Tetanus	210,000	0.4%
9	Meningitis	170,000	0.3%
10	Syphilis	160,000	0.3%
11	Hepatitis B	100,000	0.2%

Source: World Health Organization

Location

Pandemics are random, with a few happening every century. Wherever and whenever it starts, the disease impacts all areas of the world, and all areas are vulnerable. Third world countries have fewer resources to fight disease and may be more vulnerable than more industrialized nations. In the United States, the public health system works at the federal, state and local levels to monitor diseases, plan and prepare for outbreaks and prevent epidemics where possible. But, in the age of air travel and worldwide shipping, it is becoming increasingly difficult to contain localized outbreaks as infected or exposed people travel and work, sending the disease across the globe in a matter of hours.

Extent

The severity of a pandemic virus can be evaluated from two perspectives: that of the individual who has been infected and from the population level – that is, how many complications and deaths might be expected as a whole. Measuring severity from either perspective in real time is a major challenge. The most common measure of severity is the case-fatality rate (CFR) as depicted in Figure A-6.

The magnitude of a pandemic event is also evaluated from the population level in terms of warnings. Figure A-7 illustrates the various warning levels for pandemic. Dr. Margaret Chan, Director General of the World Health Organization (WHO) announced in June of 2009 that H1N1 had reached Phase 6, Pandemic.

Figure A-6. Case-Fatality Rate for Severity

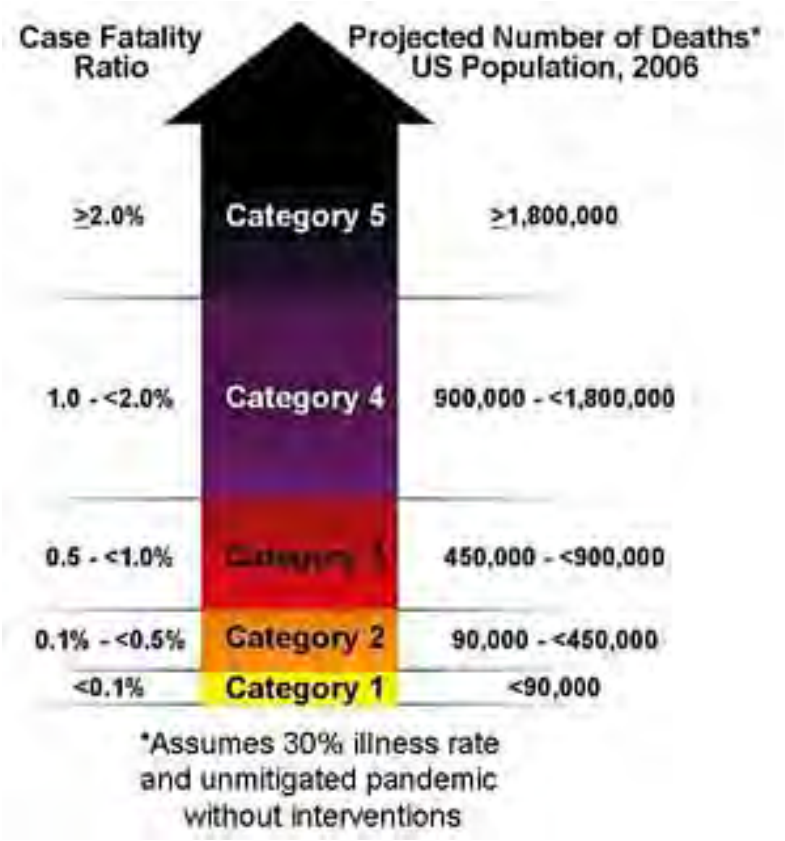
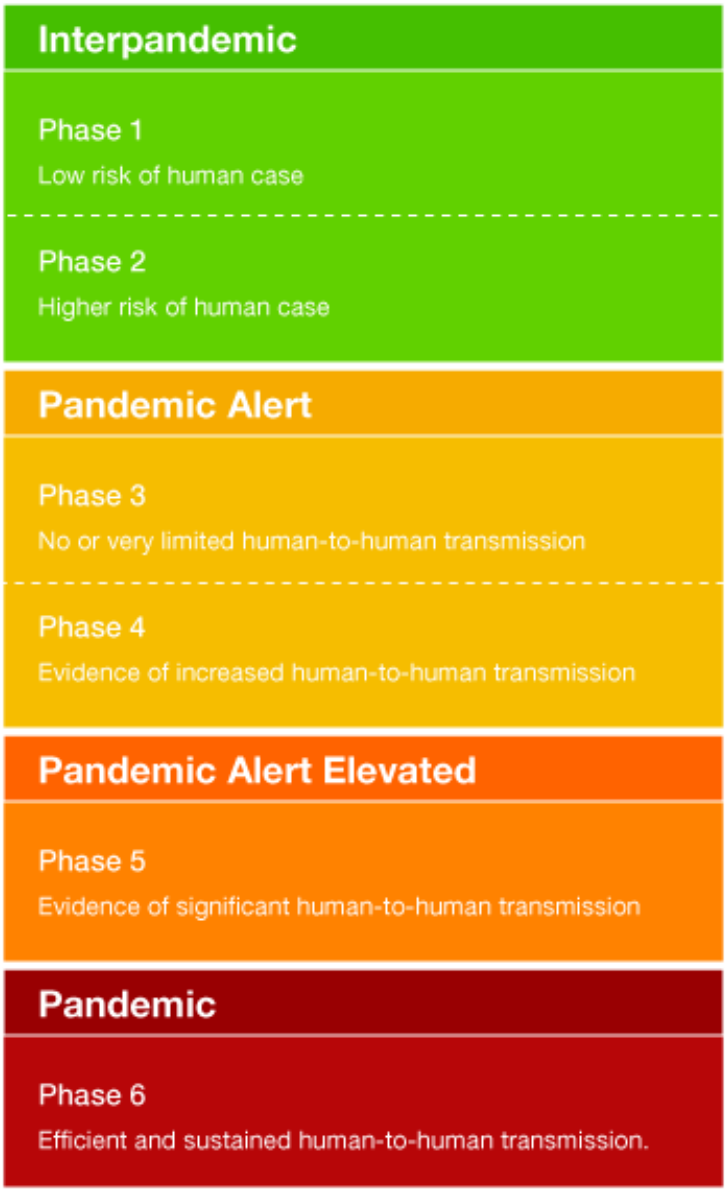


Figure A-7. Risk levels for Pandemic (World Health Organization)



Previous Occurrences

Statewide, outbreaks of infectious diseases are recorded by the Texas Department of State Health Services, Infectious Disease Control Unit (ICDU). The IDCU tracks reported cases of all non-genetic diseases. Table A-12 below reports the infectious disease outbreaks in the State over the last 5 years. The total number of cases for these diseases range from one reported case to as many as 16,527 reported cases during the timeframe studied.

Table A-12. Infectious Disease cases in the State of Texas 2004-2009

Infectious disease	number of cases reported per year in the State of Texas					
	2009	2008	2007	2006	2005	2004
AIDS	2,353	2,717	2,678	2,796	2,851	2,881
Aseptic Meningitis	1,858	1,747	2,126	1,740	1,878	2,521
Bacterial Meningitis	239	344	484	337	332	412
Campylobacteriosis	1,617	1,425	1,690	1,075	816	1,264
Chlamydia	103,829	98,707	84,784	75,319	71,621	70,186
Cryptosporidiosis	419	2,240	233	273	115	93
Diarrheal diseases	NR	NR	NR	NR	NR	NR
Gonorrhea	28,782	31,569	31,761	30,270	26,016	24,339
Hepatitis A	184	259	264	330	461	6,224
Hepatitis B, acute	420	562	741	833	742	687
HIV/AIDS*	4,355	4,161	4,098	3,956	4,326	4,398
Lower Respiratory Infections	NR	NR	NR	NR	NR	NR
Malaria	87	87	130	106	130	111
Measles	1	0	7	0	3	0
Meningococcal Disease	53	70	55	45	61	72
Mumps	40	20	21	58	25	23
Pertussis	3,358	2,046	1,051	954	2,224	1,184
Rubella	0	0	0	0	0	1
Salmonellosis	3,964	5,583	3,534	3,060	3,145	2,665
Shigellosis	2,295	4,665	2,358	2,065	3,100	3,336
Streptococcus Disease, invasive	NR	NR	NR	NR	NR	NR
Syphilis	6,989	6,321	5,573	4,961	4,374	4,191
Tetanus	1	3	0	1	0	2
Tuberculosis	1,501	1,500	1,507	1,566	1,524	1,671
Varicella (Chicken Pox)	4,445	7,839	10,061	11,768	8,336	8,544

*New HIV diagnoses regardless of disease status

Source: Texas Department of State Health and Human Services, Infectious Disease Control Unit

In March of 2009, a novel strain of Influenza A (H1N1 or "Swine Flu") virus was detected in Mexico and the United States. The virus has since spread worldwide. As of September 27, 2009, more than 340,000 cases of Swine Flu have been confirmed worldwide and approximately 4,100 deaths have been reported[6].

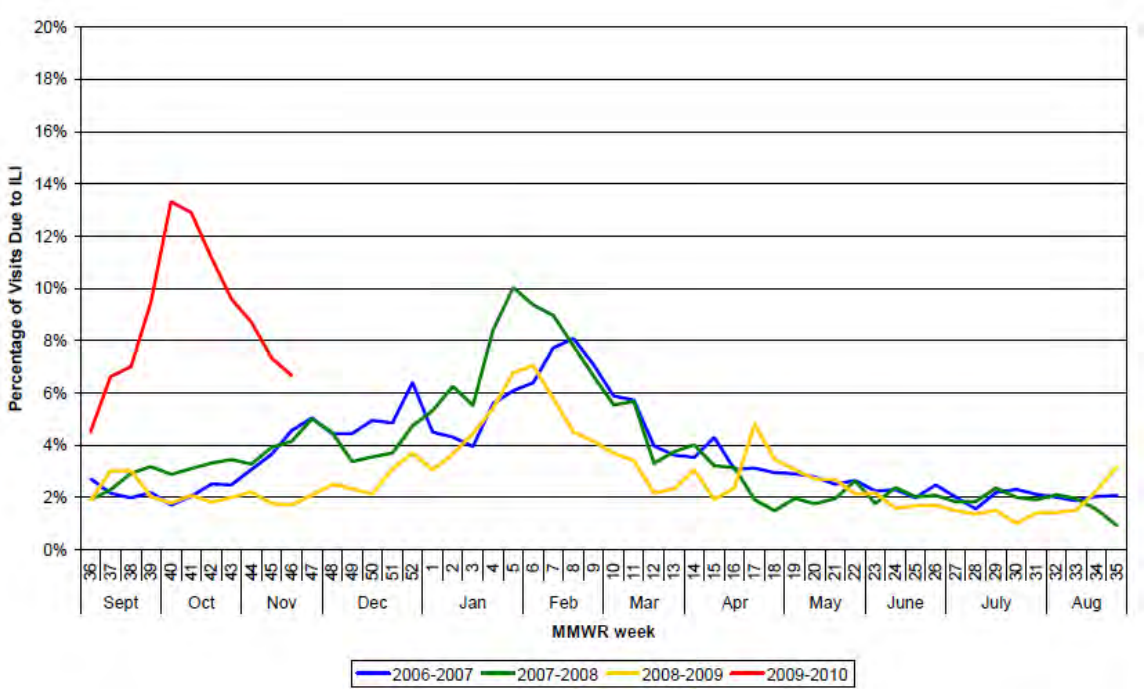
[6] World Health Organization

The most commonly reported symptoms include cough, fever, sore throat and gastrointestinal symptoms such as vomiting and diarrhea. Most cases with H1N1 did not require hospitalization and had symptoms that lasted four days[7].

Since June 9, 2009, the Center for Disease Control (CDC) has reported antigenic characterization results from 25 novel influenza A (H1N1) viruses and 1 seasonal influenza A (H1N1) virus received from the Texas Department of State Health Services (DSHS) Laboratory since April 26, 2009.

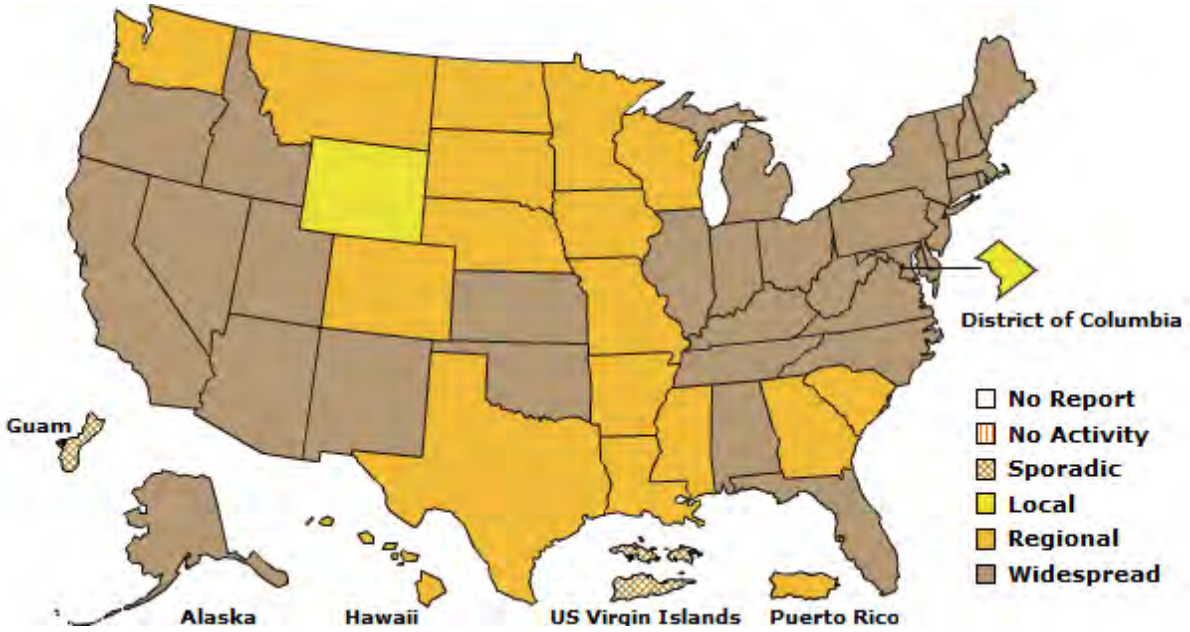
Figure A-8 illustrates the percentage of visits to Texas hospitals for influenza-like symptoms. Figure A-9 displays nationwide influenza activity.

Figure A-8. Percentage of Visits Due – Flu-Like Illness, Texas (2006-2010 Seasons)



[7] Carrat, F. et al. Timelines of Infection and Disease in Human Influenza: A Review of Volunteer Challenge Studies. American Journal of Epidemiology, 2008, 167: 775–785.

Figure A-9. Influenza Summary by State – Activity Estimates, Nov. 2009



Probability of Future Occurrences

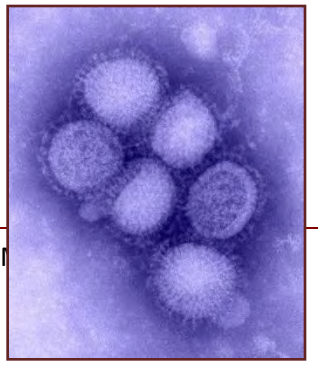
Disease impacts all areas of the world and all areas are vulnerable. Third world countries have fewer resources to fight disease and may be more vulnerable than more industrialized nations. In the United States, the public health system works at the Federal, state and local levels to monitor diseases, plan and prepare for outbreaks and prevent epidemics where possible. But, in the age of air travel and worldwide shipping, it is becoming increasingly difficult to contain localized outbreaks as infected or exposed people travel and work, sending the disease across the globe in a matter of hours.

The probability of an infectious disease outbreak in the City of Round Rock is unlikely; meaning event has the probability of occurring in the next 10 years.

Vulnerability and Impact

Estimated potential losses are difficult to calculate because infectious disease causes little damage to the built environment and damages generally are experienced through public health response and medical costs as well as lost wages by patients.

Therefore, it is assumed that all buildings and facilities are exposed to disease but would experience negligible damage in the occurrence of an outbreak. For example, upkeep and maintenance of buildings and facilities would fall behind due to the high absenteeism of employees or the closing of facilities.



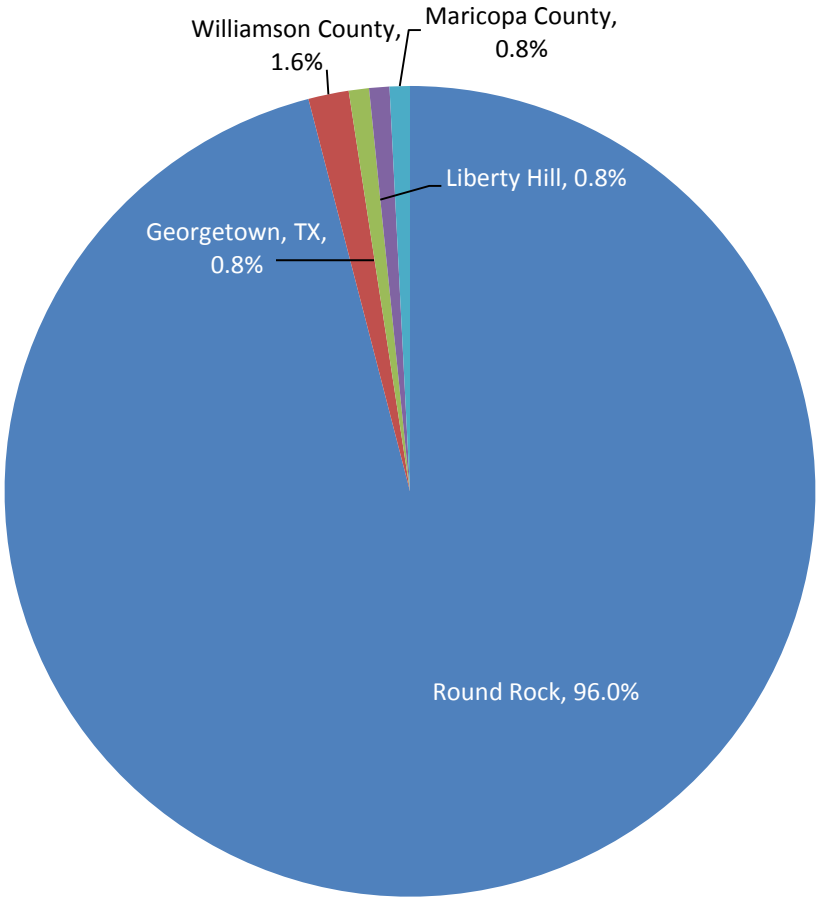
Even though a pandemic event would affect mainly people, critical infrastructure services, such as emergency services, utility services, water services and telecommunications can be limited by an event. With the 2009 H1N1 pandemic, most of the people affected will have mild illness and not require hospitalization. People at the highest risk for developing complications from H1N1 include children younger than 5, adults 65 year of age and older and pregnant women. People who have medical conditions such as: asthma, heart disease; chronic lung disease; blood, endocrine, kidney, liver or metabolic disorders; or a weakened immune system, can experience a worsening of existing conditions if they contract the H1N1 virus.

The costs to the public health sector in terms of responding to an outbreak as well as impact to health as a whole could potentially be “substantial”. Multiple deaths could occur; facilities could be shut down for 30 days or more. While indirect, it is possible that property damage would results from the high absenteeism of persons responsible for property management.

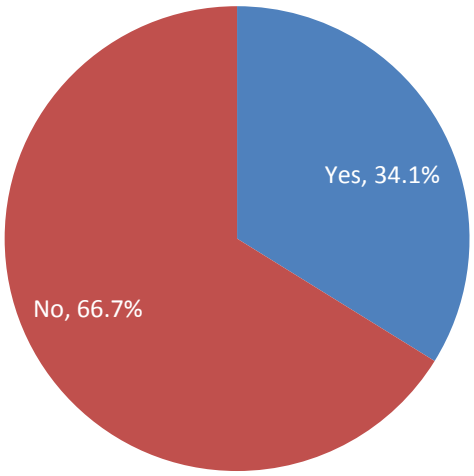
APPENDIX B

Public Survey Results

1. **Please state the jurisdiction (city and county) where you reside.**



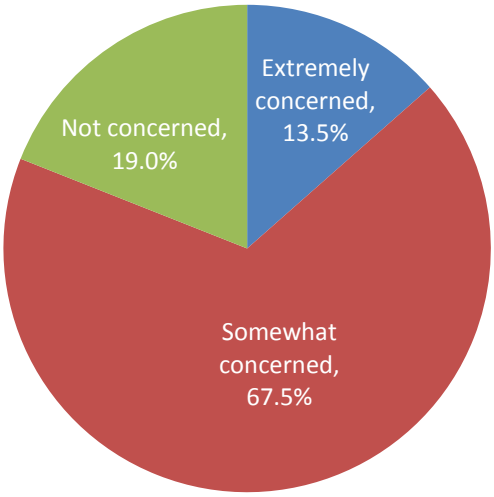
2a. Have you ever experienced or been impacted by a disaster?



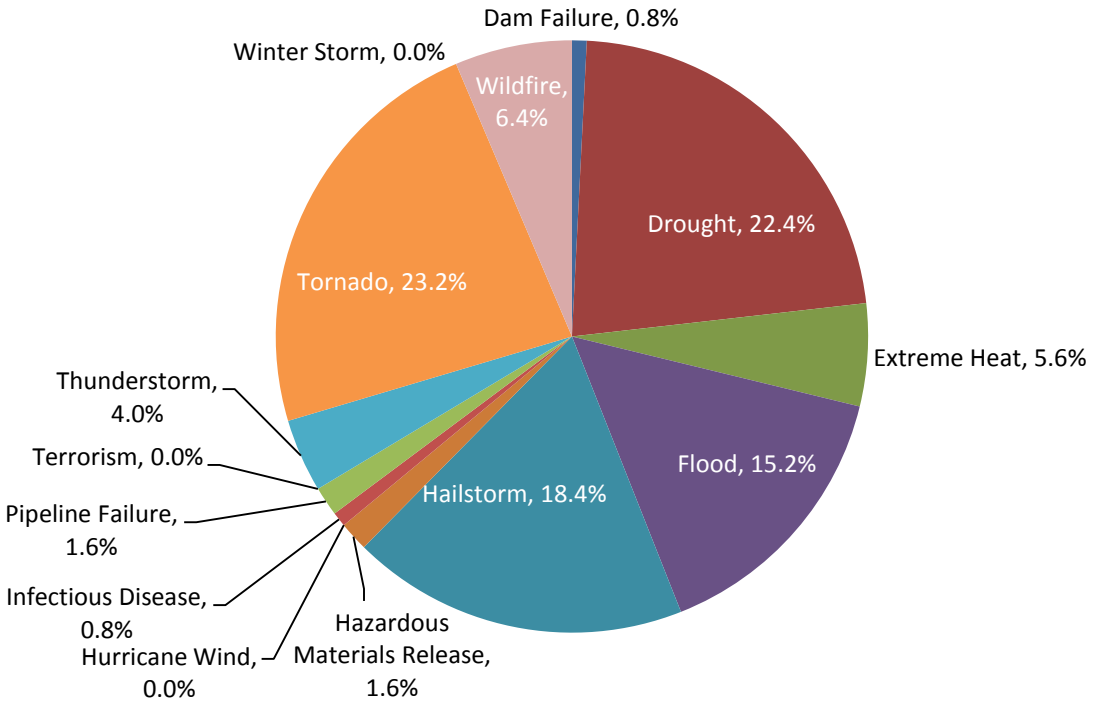
2b. If "Yes", how you have been impacted by a disaster?

- Flooding
- Brushy Creek Flooded during Hurricane Hermine
- Tornado
- Hail
- Hail and Winter Ice Storms

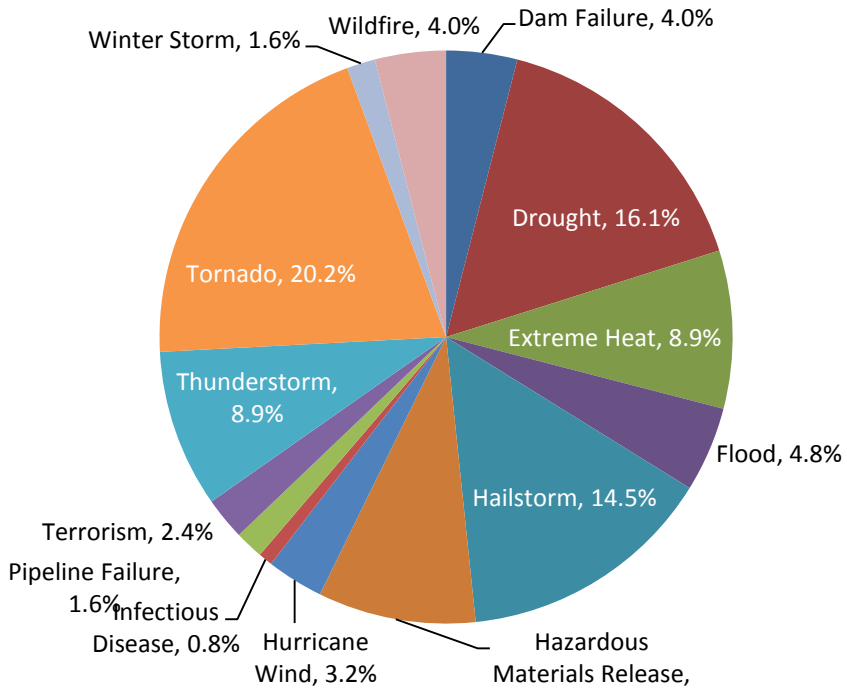
3. How concerned are you about the possibility of our community being impacted by a disaster?



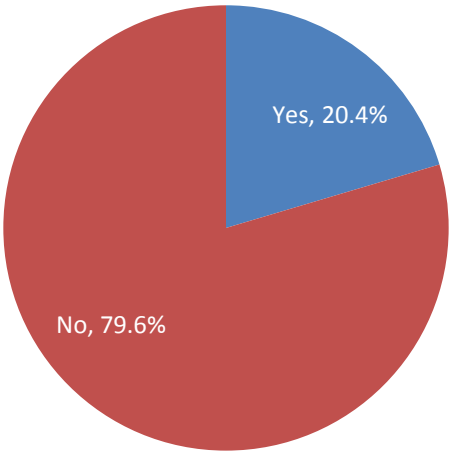
4. Please select the one hazard you think is the highest threat to your neighborhood:



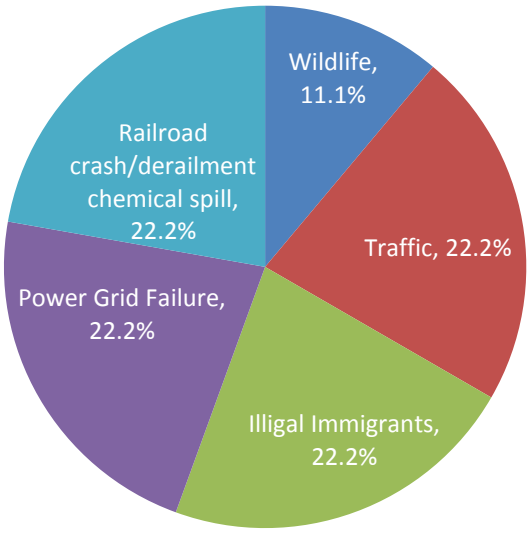
5. Please select the one hazard you think is the second highest threat to your neighborhood:



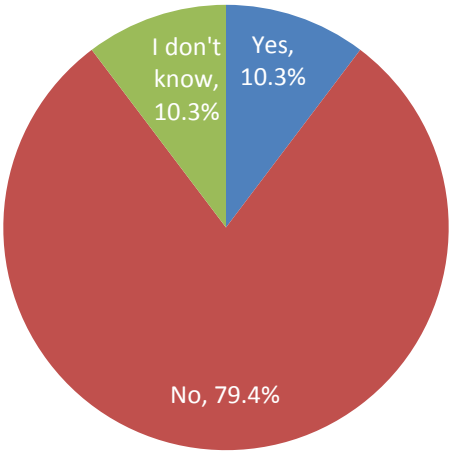
6a. Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?



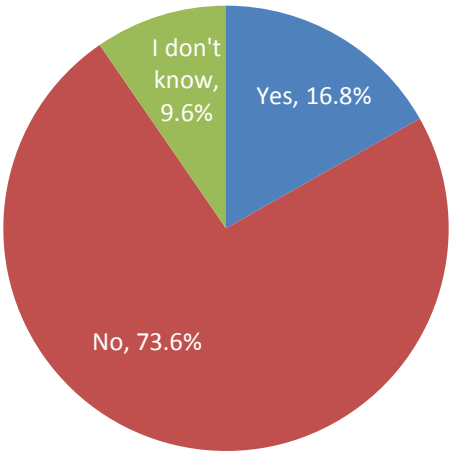
6b. If "Yes", please explain



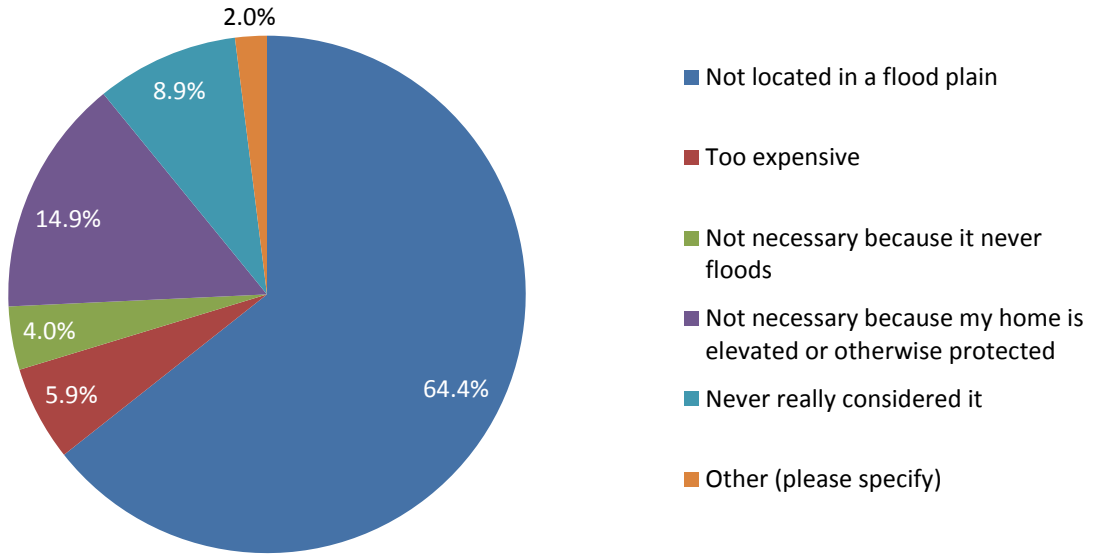
7. Is your home located in a floodplain?



8. Do you have flood insurance?



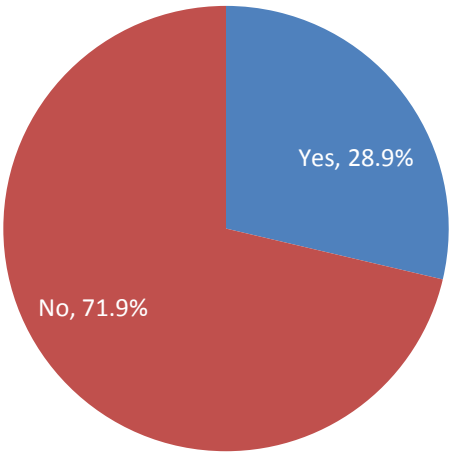
9a. If you do not have flood insurance, why not?



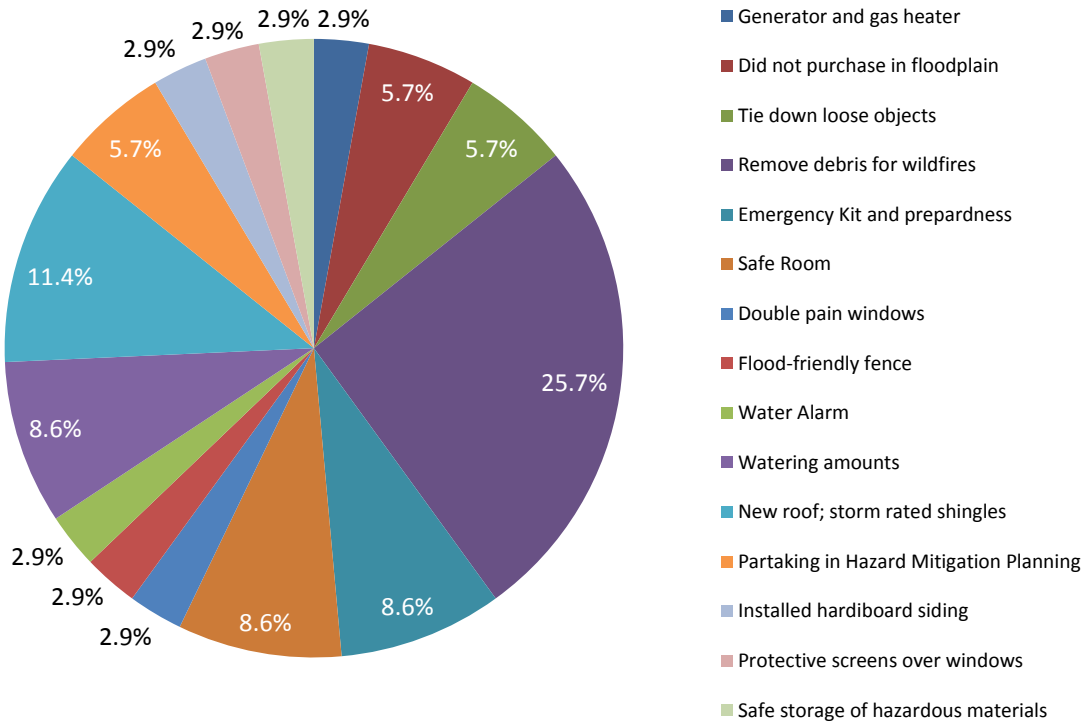
9b. If other, please specify:

N/A

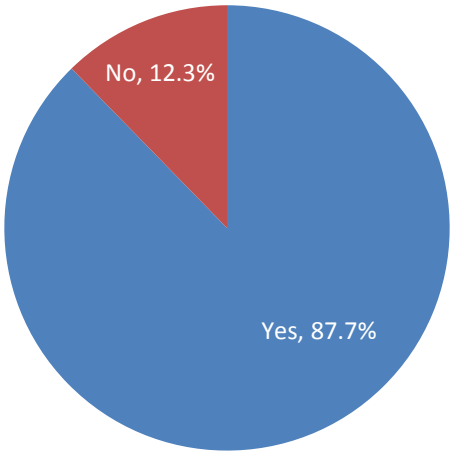
10a. Have you taken any actions to make your home or neighborhood more resistant to hazards?



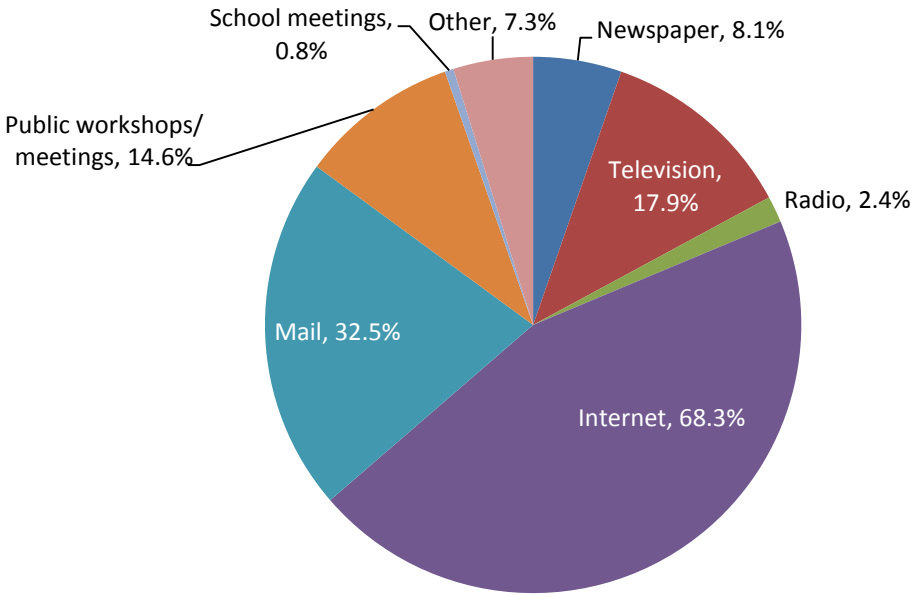
10b. What have you done?



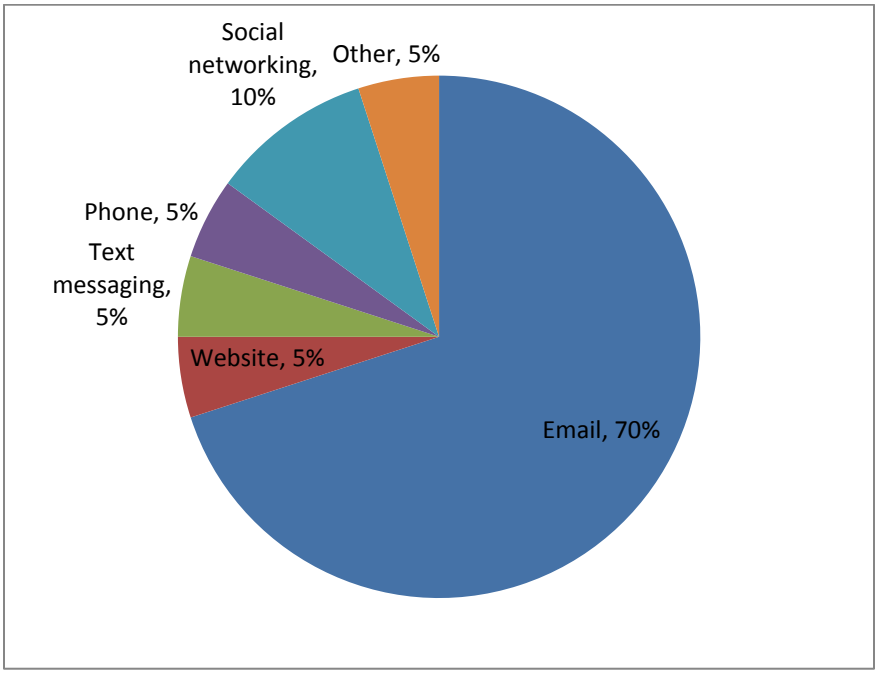
11. Are you interested in making your home or neighborhood more resistant to hazards?



12a. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?



12b. If other, please specify:



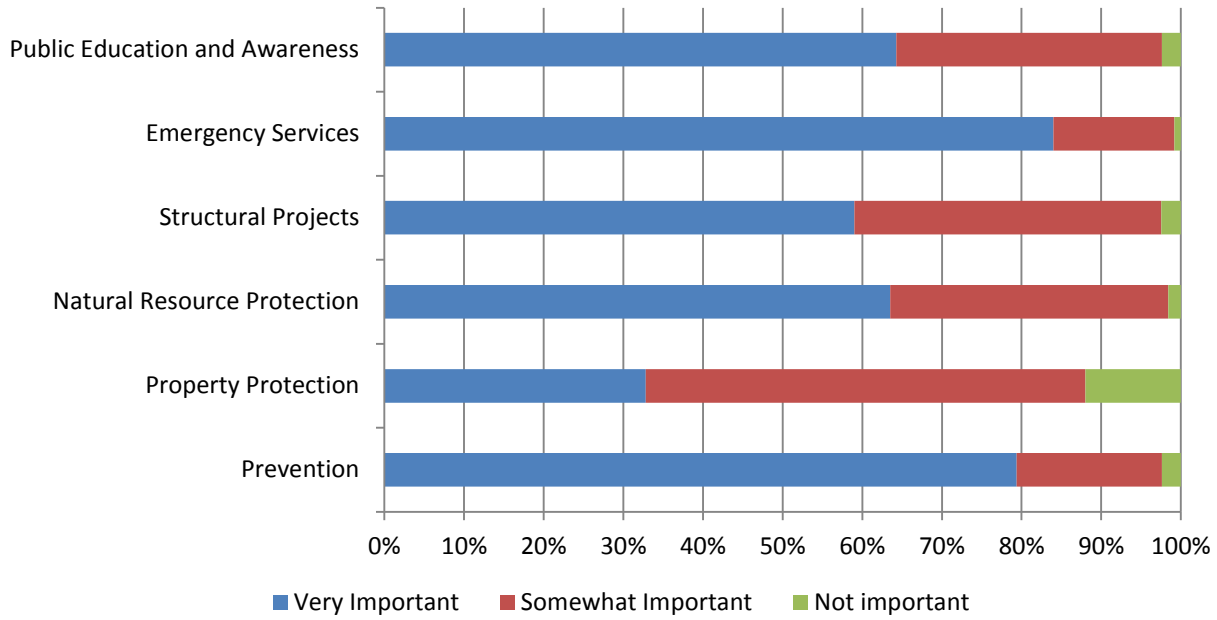
13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

- Ensure proper drainage and maintain a consistent source of water during fires
- Install warning sirens with different sounds to indicate different threats.
- Use the Eagle Ridge Community Association as a community tool to bring ideas of the community together
- Develop call back procedures on emergency telephone calls
- Develop a plan to create new lakes
- Keep power lines and bridges clear of debris
- Have wireless internet available during power outages
- Provide information to all communities of their disaster plan
- Develop a public awareness campaign to explain costs-benefits and risks
- Implement better building codes that improve structures from damage.
- Ban ALL fireworks
- Organize town hall meetings
- Monitor what is shipped on the train thru Round Rock.
- Pass a city ordinance requiring land owners to mow their fields
- Develop service agreements between the city and Williamson County
- Have emergency information available at local shelters, churches, etc.
- Use the media to inform the public to conserve water and maintain fire hydrants.
- Install sewer lines
- Change the Route for Trucks transporting hazardous waste
- Replace all wood fences with non flammable products
- Road Construction
- Improve Coordination between FEMA and the UBCWC and Improvement District
- Build more carports to prevent damage from hail
- Dredge Brushy Creek
- Educational Workshops on Water Conservation

14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

- The development of safe rooms and shelters are needed
- Protect housing developments from wildlife
- Implementing a Burning Ban during a drought.
- Maintenance of back trees, clearing debris from yard.
- Requiring screens on windows to lessen impact of hail
- Implement a school bus transportation system for children
- Adjust the timing of traffic lights during a disaster
- Encourage Community Watch programs to incorporate disaster evacuation plans
- Promote the local government disaster plans in place
- Develop a plan to tend to aging county dams
- Develop community shelters
- Enforcing accountability within the community when dealing with hazards and disasters
- Concern for the dams and if they are stable enough to withstand heavy rain.

15. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



1. Prevention - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.
2. Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.
3. Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.
4. Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls, detention/retention basins, channel modification, retaining walls and storm sewers.
5. Emergency Services - Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.
6. Public Education and Awareness - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.

APPENDIX C

Workshops 1
Public Meetings........ 4
Public Notices........ 6
Screenshots........ 11

The following are sign-in sheets and notices for workshops and meetings conducted in the development of the Plan.

Workshops

Figure C-1. Planning Team Kickoff Workshop

ROUND ROCK, TEXAS

H_2O PARTNERS

City of Round Rock Hazard Mitigation Plan
Mitigation Workshop
Tuesday, September 21, 2010

SIGN-IN SHEET

Name	Organization & Title	Phone/Fax	Email
Becky [illegible]	PD Comms/Mgr	671 [illegible]	[illegible]
[illegible]	[illegible] / Public Works	218 [illegible]	[illegible]
Bill Wusterhausen	Fire / Fire Marshal	218-6632	bwusterhausen@round-rock.tx.us
Brad Bradford	RRHSEM	341-3106	BBRADFORD@RoundRock.tx.us
Randy Gordon	PARD	341-3340	rgordon@ "
Emsud Horozovic	PARD / City Forester	341-3350	[illegible]@round-rock.tx.us
Tom Word	Public Works / Chief of PW Ops	218-5560	tomword@round-rock.tx.us
Shannon McIntire	Admin	218-5407	smcintire@round-rock.tx.us
Mark Selby	Fire	218-6633	selby@round-rock.tx.us
Chris Collier	IT	218-5423	ccollier@round-rock.tx.us
Larry Hodge	RRFD		
Ramsey Sayed	IT	671-2768	rsayed@round-rock.tx.us
Laurie Born	Finance	671-2876	lborn@round-rock.tx.us
Rick White	PD, Administrative Manager	218-5524	rwhite@round-rock.tx.us

Page 1 of 3

ROUND ROCK, TEXAS

H$_2$O PARTNERS

City of Round Rock Hazard Mitigation Plan
Mitigation Workshop
Tuesday, September 21, 2010

SIGN-IN SHEET

Name	Organization & Title	Phone/Fax	Email
Michelle Faust	Round Rock ISD Dir, Safety & Risk Mgt	464-5454	michelle_faust@roundrockisd.org
[illegible] Atkins	City of Round Rock Parks & Recreation	341-3344	[illegible]@round-rock.tx.us
Alvin Bagin	Round Rock PD	512-218-5500	[illegible]@round-rock.tx.us
[illegible] McAllister	PARD - [illegible]	218-5433	cmcallister@round-rock.tx.us
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	218-5445	[illegible]@round-rock.tx.us

Page 1 of 3

Figure C-2. Risk Assessment Workshop

ROUND ROCK, TEXAS

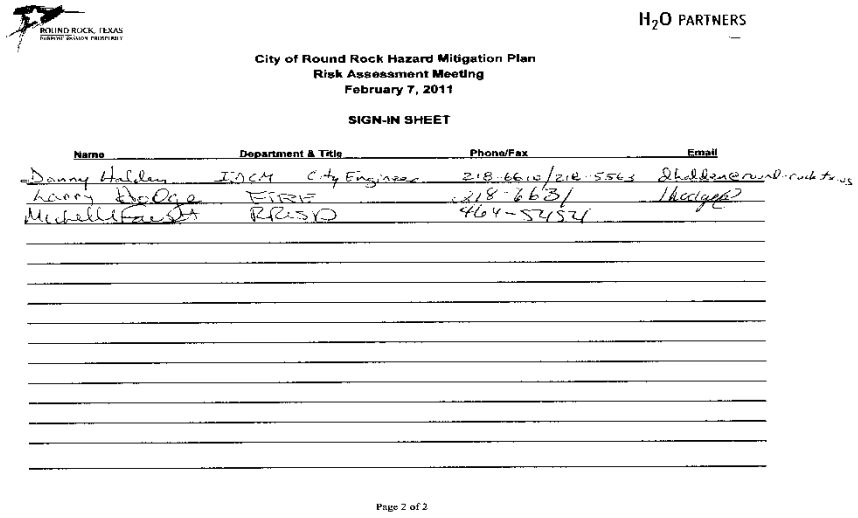
H$_2$O PARTNERS

City of Round Rock Hazard Mitigation Plan
Risk Assessment Meeting
February 7, 2011

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
Randy Gordon	PARD	3413300	rgordon@round-rock.tx.us
Brooks Bennett	ADMIN	671-2731	bbennett@round-rock.tx.us
Shannon McIntire	Admin	218-5407	smcintire@round-rock.tx.us
Barry Becker	Purchasing	218-5457	barry@round-rock.tx.us
Mark Selby	Fire	218-6633	sselby@round-rock.tx.us
Rick White	Police	218-5524	Rwhite@round-rock.tx.us
Mike Heard	Fire Dept	218-3204	mheard@round-rock.tx.us
Rick Atkins	PARD	218-5540	ratkins@round-rock.tx.us
Tom Word	PW	218-5560	tomword@round-rock.tx.us
Brad Bradford	EM	341-3106	BBradford@round-rock.tx.us

Page 1 of 2



ROUND ROCK, TEXAS

H_2O PARTNERS

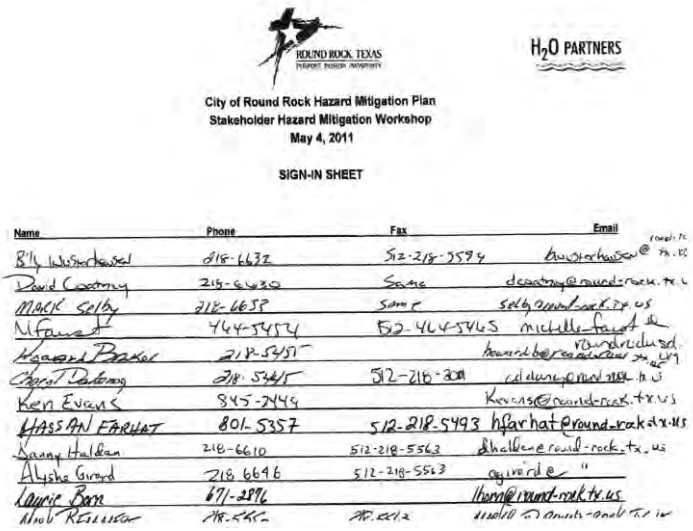
City of Round Rock Hazard Mitigation Plan
Risk Assessment Meeting
February 7, 2011

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
Danny Halbert	IAGM City Engineer	218-6610/218-5563	dhalbert@round-rock.tx.us
Laurie DeOca	ESRE	218-6631	ldeoca@
Michelle Faught	RRISD	464-5474	

Page 2 of 2

Figure C-3. Mitigation Workshop



ROUND ROCK, TEXAS

H_2O PARTNERS

City of Round Rock Hazard Mitigation Plan
Stakeholder Hazard Mitigation Workshop
May 4, 2011

SIGN-IN SHEET

Name	Phone	Fax	Email
Bill Winterhalter	218-6632	512-218-5594	bwinterhalter@
David Cooney	218-6630	Same	dcooney@round-rock.tx.u
Mack Selby	218-6658	Same	selby@round-rock.tx.us
M Faught	464-5454	512-464-5465	michelle-faught
Howard Baker	218-5451		howard.baker@
Cheryl Delong	218-5445	512-218-3011	cdelong@round-rock.tx.us
Ken Evans	845-7449		Kevans@round-rock.tx.us
HASSAN FARHAT	801-5357	512-218-5493	hfarhat@round-rock.tx.us
Danny Halbert	218-6610	512-218-5563	dhalbert@round-rock.tx.us
Alysha Girard	218 6696	512-218-5563	agirard@ "
Laurie Barr	671-2896		lbarr@round-rock.tx.us
Mindy Kellison	218-5426	218-5412	mkellison@round-rock.tx.us

Public Meetings

Figure C-4. Public Meeting Following Planning Team Workshops

ROUND ROCK, TEXAS
PURPOSE. PASSION. PROSPERITY.

H_2O PARTNERS

City of Round Rock Hazard Mitigation Plan
Public Meeting, Allen Baca Center
Tuesday, September 21, 2010

SIGN-IN SHEET

Name	Phone	Fax	Email
Will Hampton	244-0219		willhampton@gmail.com
Laurie Born	671-2876		lborn@round-rock.tx.us
Brad Bradford	341-3106		bbradford@round-rock.tx.us
Cathy Meek	512 924 9874		cathy@h2opartners.org

Page 1 of 3

Figure C-5. Public Meeting Following Planning Team Workshops

ROUND ROCK, TEXAS
PURPOSE. PASSION. PROSPERITY.

H_2O PARTNERS

City of Round Rock Hazard Mitigation Plan
Risk Assessment Public Meeting
February 7, 2011

SIGN-IN SHEET

send presentation to attendees

Name	Address	Phone/Fax	Email
[illegible]	[illegible]	[illegible]	[illegible]
Brad Bradford	RRHSEM	512-341-3106	BBRADFORD@Round-Rock.tx.us
Cathy Meek	PO Box 603	512 320 4151	cmeek1808@yahoo.com
Don Harris	906 [illegible] Ln	512-255-2914	drh@donharris.net
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] Creek Falls	244-1479	[illegible]
[illegible]	[illegible]	[illegible]	susan@thdepot[illegible]

send to Don

Figure C-6. Public Meeting Following Planning Team Workshops

ROUND ROCK, TEXAS
PURPOSE. PASSION. PROSPERITY

H_2O PARTNERS

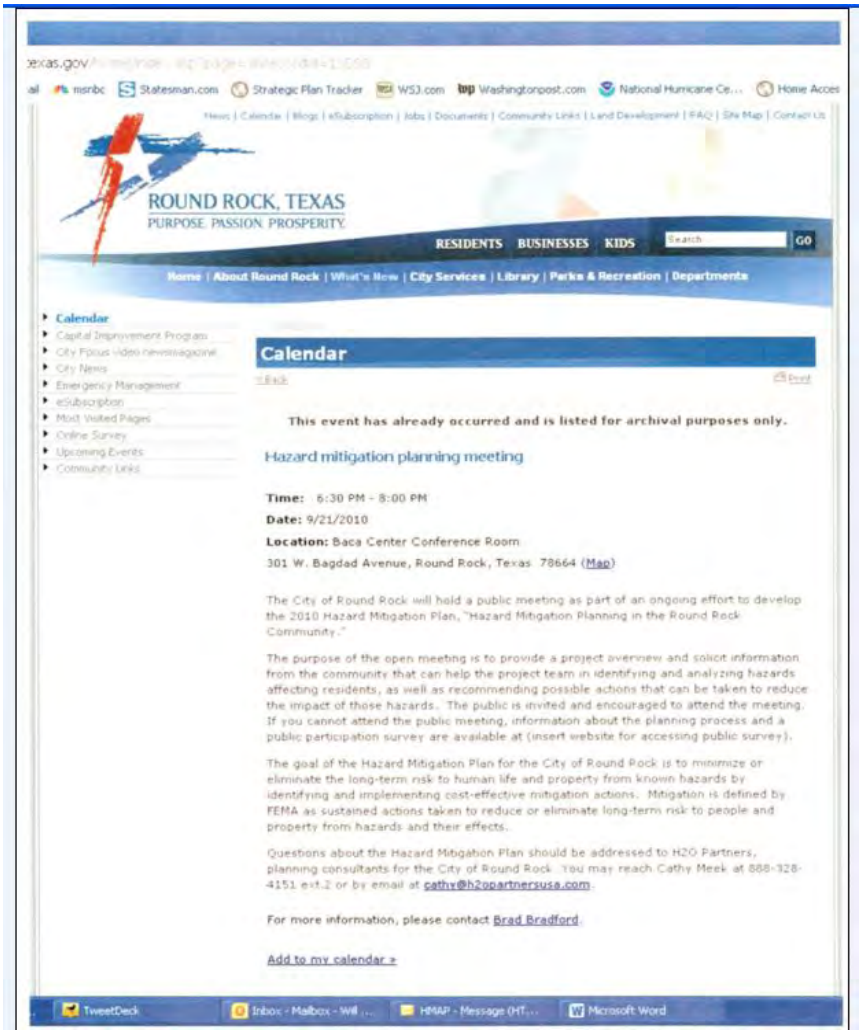
City of Round Rock Hazard Mitigation Plan
Public Meeting, May 4, 2011

SIGN-IN SHEET

Name	Phone	Fax	Email
Brad Bradford			
Will Williams			GWilliams@oaxlti.com
Rex Bowlin	512-255-0387		RGABUEEZ@yahoo.com
Cathy Mach			

Page 1 of 3

Public Notices



ROUND ROCK, TEXAS
PURPOSE. PASSION. PROSPERITY.

RESIDENTS BUSINESSES KIDS

Home | About Round Rock | What's New | City Services | Library | Parks & Recreation | Departments

Calendar

This event has already occurred and is listed for archival purposes only.

Hazard mitigation planning meeting

Time: 6:30 PM - 8:00 PM
Date: 9/21/2010
Location: Baca Center Conference Room
301 W. Bagdad Avenue, Round Rock, Texas 78664 (Map)

The City of Round Rock will hold a public meeting as part of an ongoing effort to develop the 2010 Hazard Mitigation Plan, "Hazard Mitigation Planning in the Round Rock Community."

The purpose of the open meeting is to provide a project overview and solicit information from the community that can help the project team in identifying and analyzing hazards affecting residents, as well as recommending possible actions that can be taken to reduce the impact of those hazards. The public is invited and encouraged to attend the meeting. If you cannot attend the public meeting, information about the planning process and a public participation survey are available at (insert website for accessing public survey).

The goal of the Hazard Mitigation Plan for the City of Round Rock is to minimize or eliminate the long-term risk to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. Mitigation is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

Questions about the Hazard Mitigation Plan should be addressed to H2O Partners, planning consultants for the City of Round Rock. You may reach Cathy Meek at 888-328-4151 ext.2 or by email at cathy@h2opartnersusa.com.

For more information, please contact Brad Bradford.

Add to my calendar »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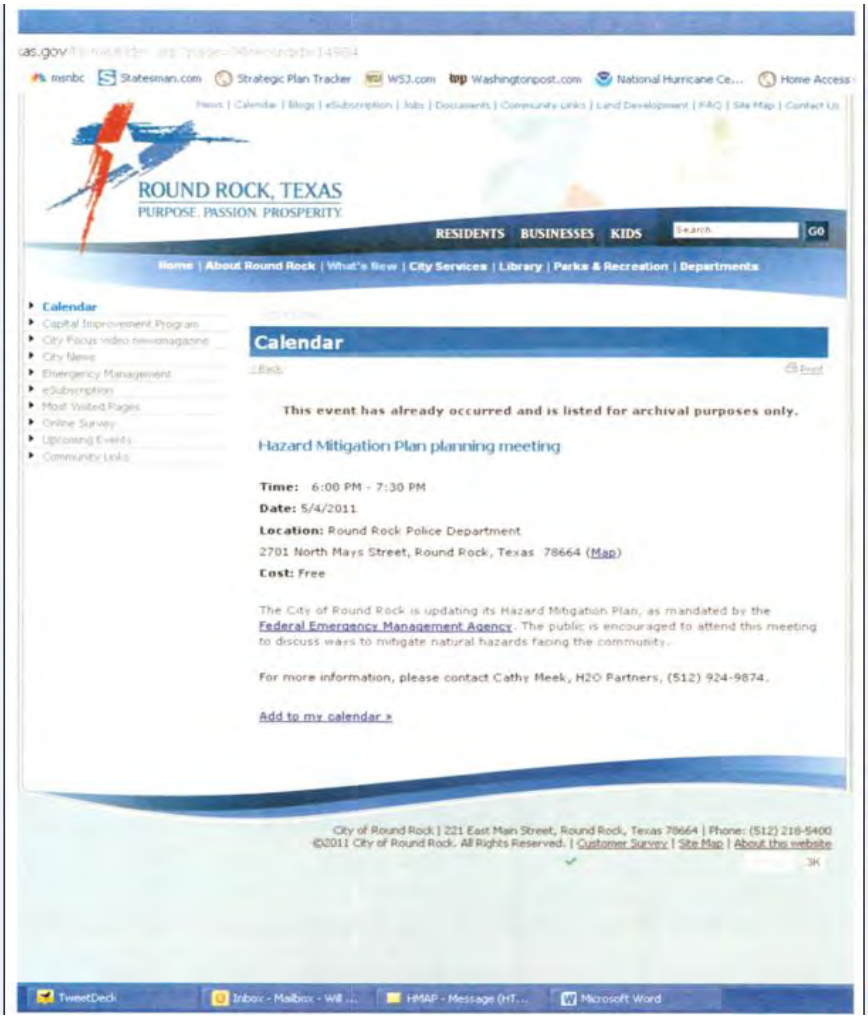
City Focus video newsmagazine
City News
Emergency Management
eSubscription
Most Visited Pages
Online Survey
Upcoming Events
Community Links
Calendar
This event has already occurred and is listed for archival purposes only.
Hazard mitigation planning meeting
Time: 6:00 PM - 7:00 PM
Date: 2/7/2011
Location: Baca Center Arts & Crafts Room
301 West Bagdad Avenue, Building 2, Round Rock, Texas 78664 (Map)
The City of Round Rock will hold a public meeting as part of an ongoing effort to develop the 2010 Hazard Mitigation Plan, "Hazard Mitigation Planning in the Round Rock Community."
The purpose of the open meeting is to provide a project overview and solicit information from the community that can help the project team in identifying and analyzing hazards affecting residents, as well as recommending possible actions that can be taken to reduce the impact of those hazards. The public is invited and encouraged to attend the meeting. If you cannot attend the public meeting, information about the planning process and a public participation survey will soon be available.
The goal of the Hazard Mitigation Plan for the City of Round Rock is to minimize or eliminate the long-term risk to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. Mitigation is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.
Questions about the Hazard Mitigation Plan should be addressed to H2O Partners, planning consultants for the City of Round Rock.
For more information, please contact Cathy Meek, H2O Partners, (888) 328-4151.
Add to my calendar »


msnbc
Statesman.com
Strategic Plan Tracker
WSJ.com
Washingtonpost.com
National Hurricane Ce...
Home Access
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Capital Improvement Program
City Focus video newsmagazine
City News
Emergency Management
eSubscription
Most Visited Pages
Online Survey
Upcoming Events
Community Links
Calendar
This event has already occurred and is listed for archival purposes only.
Hazard Mitigation Plan planning meeting
Time: 6:00 PM - 7:30 PM
Date: 5/4/2011
Location: Round Rock Police Department
2701 North Mays Street, Round Rock, Texas 78664 (Map)
Cost: Free
The City of Round Rock is updating its Hazard Mitigation Plan, as mandated by the Federal Emergency Management Agency. The public is encouraged to attend this meeting to discuss ways to mitigate natural hazards facing the community.
For more information, please contact Cathy Meek, H2O Partners, (512) 924-9874.
Add to my calendar »
City of Round Rock | 221 East Main Street, Round Rock, Texas 78664 | Phone: (512) 218-5400
©2011 City of Round Rock. All Rights Reserved. | Customer Survey | Site Map | About this website
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HMAP - Message (HT...
Microsoft Word

The Public is Invited to Participate in Hazard Mitigation Planning for the City of Round Rock

The City of Round Rock will hold a public meeting as part of an ongoing effort to develop the 2010 Hazard Mitigation Plan, "*Hazard Mitigation Planning in the Round Rock Community.*" The meeting will be held:

Where: Allen R. Baca Center
301 W. Bagdad Ave., Bldg. 2, Conference Room
Round Rock, TX 78664
When: September 21, 2010, 6:30 P.M.

Driving Directions: From IH 35, Exit FM 620/Main Street. Go East on 620/Main Street heading towards downtown Round Rock. Turn Right on N Brown St. Go two blocks and take a Right on W. Bagdad Ave. The Baca Center is the second building on the left. The parking garage is located underneath the Baca Center with an elevator in the center which leads up into the building. Phone number for Baca Center is (512) 218-5499.

The purpose of the open meeting is to provide a project overview and solicit information from the community that can help the project team in identifying and analyzing hazards affecting residents, as well as recommending possible actions that can be taken to reduce the impact of those hazards. **The public is invited and encouraged to attend the meeting.** If you cannot attend the public meeting, information about the planning process and a public participation survey are available at (insert website for accessing public survey).

The goal of the Hazard Mitigation Plan for the City of Round Rock is to minimize or eliminate the long-term risk to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. *Mitigation* is defined by FEMA as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*.

Questions about the Hazard Mitigation Plan should be addressed to H2O Partners, planning consultants for the City of Round Rock. You may reach Cathy Meek at 888-328-4151 ext.2 or by email at cathy@h2opartnersusa.com.

The City of Round Rock is sponsoring the development of a FEMA-mandated Hazard Mitigation Plan. The public is encouraged to attend the meeting to discuss ways to mitigate natural hazards facing the community on Wednesday, May 4 at 6 p.m. at the Round Rock Police Department, 2701 N. Mays St.. For questions, please, contact Cathy Meek, Hazard Mitigation Specialist, H2O Partners, Inc. at 512-924-9874.

http://www.roundrocktexas.gov/home/index.asp?page=9&recordid=14984

We hope you are able to attend.

Thank you,

Kathryn Eakens
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Mayor & City Council
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Screenshots