





SFFMA Leadership Development Program

Introduction to
Community Risk Assessment


State Firefighters & Fire Marshals Association of Texas
Promoting Safety, Education, and Leadership for the Fire Service of Texas


Instructor information







- 31 years fire service experience**
 - Central Regional Manager / Consultant, ESCI
 - Fire Marshal & interim EMC for Harris County (retired)
 - Asst. Chief, Cy-Fair VFD (retired)
 - Guest Instructor, TEEEX Municipal School
 - TX-TF1 Logistics Manager
 - TEEEX Annual School Advisory Board
 - Lone Star College Advisory Council
 - TX Rural Fire Advisory Council
- 24 years private sector experience**

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Learning Objectives



- Concepts**
 - Risk
 - Community
 - Assessment
- Application**
 - Master Planning
 - Risk Reduction Programs
 - Best Practices

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What is risk ?



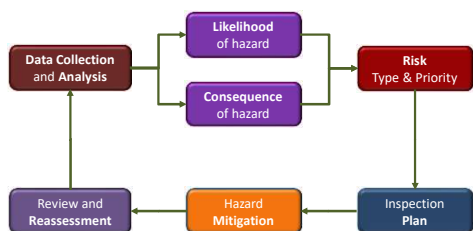
Combination of the **likelihood**
of an event and its **consequence**

$\text{Risk} = \text{Likelihood} \times \text{Consequence}$

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The Risk Reduction Process



Source: adapted from "Risk Based Inspection". R. Patel, Qatargas Operating Company, Ltd., 2006.

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What is a "Community" ?



Group of people connected by visible and invisible links


- May have physical or political boundaries
- Has shared concerns or interests
- Can be defined by one or more characteristics

Source: adapted from "Leadership Strategies for Community Risk Reduction", Student Manual, FEMA, 2015

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Community Types – U.S. Census Bureau




- **Urban**
 - Population density > 1,000 people per square mile
 - Urban Area > 50,000 population
 - Urban Cluster > 2,500 population
 - Land use Fully developed
 - Contiguous "Hop and jump" allowed
- **Rural**
 - Everything else

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Community Types – U.S. Fire Service



- **Metropolitan** > 3,000 ppsm > 200,000 people
 - Land use Fully-developed, Mid-rise / High rise
- **Urban** > 1,000 ppsm > 30,000 people
 - Land use Fully developed
- **Suburban** > 500 ppsm > 10,000 people
 - Land use Residential and commercial
- **Rural** < 500 ppsm < 10,000 people
 - Land use open spaces, low density
- **Wilderness / Frontier**
 - Land use Rural, not readily accessible

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Building a Community Profile



- Demographics
- Geographic overview
- Economic profile
- Building stock
- Hazards
- Fire experience
- Responses

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Building a **OVFIS** **Texas** **Profile**

Demographics

- Population
- Age and Sex
- Race and Origin
- Housing
- Living Arrangements
- Education
- Health
- Economy
- Transportation
- Income and Poverty
- Employment
- Businesses
- Geography
 - Size
 - Population Density

At Risk Populations



- Children
- Older adults
- People with disabilities
- English as a 2nd-language; and
- Low-income



Geographic overview



- Location
- Size
- History
- Features
 - Natural
 - Manmade
- Climate
- Gov't
- ...

Huntsville, Texas

From Wikipedia, the free encyclopedia

Huntsville is a city and the county seat of Walker County, Texas, United States.^[1] The population is 38,548 as of the 2010 census. It is the center of the Huntsville micropolitan area. It is located approximately 70 miles north of Houston in the East Texas Piney Woods on Interstate 45, which runs between Houston and Dallas. Huntsville is home to Sam Houston State University, the Texas Department of Criminal Justice, Huntsville State Park, the HEARTS Veterans Museum of Texas, located on Texas Veterans Memorial Parkway at Interstate 45, and the Texas Prison Museum, also on Highway 75 near Interstate 45. Huntsville served as the residence of Sam Houston, who is recognized in Huntsville by the Sam Houston Memorial Museum and a statue on Interstate 45.

- Contents** (hide)
- 1 History
 - 2 Demographics
 - 3 Geography
 - 4 Climate
 - 5 Economy
 - 6 Government and infrastructure
 - 6.1 State representation
 - 6.1.1 Texas Department of Criminal Justice
 - 6.1.2 Other state agencies
 - 7 Transportation
 - 7.1 Major highways
 - 8 Culture
 - 9 Media



Economic profile



- Financial institutions
- Economic development
- Land use
- Largest employers
- Special districts
- Tax Abatements
- ISO rating

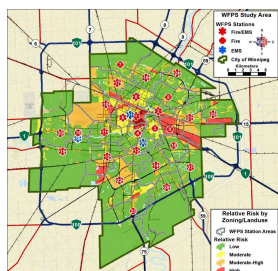
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Building stock



- Land use
- Building types
- Occupancy types
- Target hazards
- CIKR



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Hazards



Medical Hazards

- EMS
- Rescue - mass casualty trauma
- Hospitals - Pandemic/Public Health

Natural Hazards

- Winter Storm / Blizzard
- Tornado
- Thunderstorms /Lightning
- Flooding
- Drought
- Heat event

Fire Hazards

- Structure Fires
- Non-Structure Fires
- Wildfires

Technological Hazards

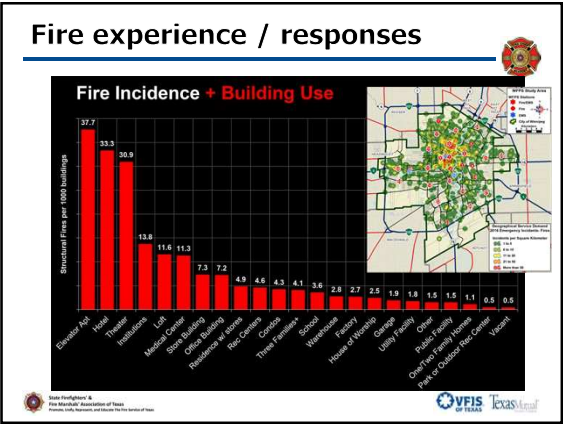
- Transportation
- Dangerous Goods
- Utility failure

Human Hazards

- Business Interruption
- Communication / Cyber Incident
- Terrorism
- VIP / Hostage Situation
- Civil Disturbance /Labor Action
- Bomb Threat

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Fire Experience / responses

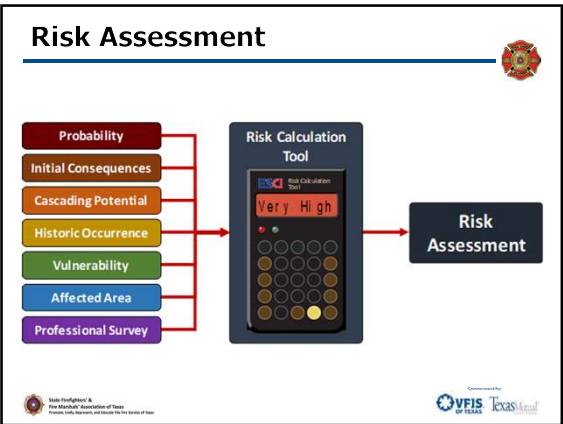
Summary By Incident Type

Report Period: 1/1/18 - 12/31/18

Incident Type	Frequency	Percent of Total	Major Fire Loss	Minor Fire Loss	Major Fire Damage	Minor Fire Damage	Major Fire Injury	Minor Fire Injury	Major Fire Property	Minor Fire Property	Total Losses
FIRES											
Building Fire (200-100, 100-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Vehicle Fire (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Fire (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
OVERSIGHTS											
Overnight Fire (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
RESCUE CALLS											
Rescue Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS MATERIAL											
Hazardous Material Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS WASTE											
Hazardous Waste Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS LIQUID											
Hazardous Liquid Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS SOLID											
Hazardous Solid Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS GAS											
Hazardous Gas Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
HAZARDOUS OTHER											
Hazardous Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
Other Call (200-100)	100	3.4%	100	100	100	100	100	100	100	100	100
TOTAL CALLS	2000	100.0%	2000	2000	2000	2000	2000	2000	2000	2000	2000

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Fire Incident Reporting System (FIRS) - Texas
Fire Incident Reporting System (FIRS) - Texas

- Call nature
- Location
- Time of day
- Occupancy Type
- Area of Origin
- Cause
- Contributing factors



Example of a Risk Table



Figure 55. Incident Characteristics: Natural Hazards—Severe Weather

Characteristic	Conditions
Likelihood	▪ Highly Probable
Impact	▪ Significant
Location	▪ Throughout the Winnipeg region.
Duration	▪ Extreme heat/cold may last several days; wind events may last minutes to days.
Time pattern	▪ Winter weather: November through March. ▪ Extreme heat: July through August. ▪ Other severe weather: Year-round, with tornados and thunderstorm most likely during May through July.
Speed of Onset	▪ Rapid onset is typical with many severe weather events, in some cases less than 10 minutes.
Availability of Warning	▪ There are usually telltale precursors leading to a severe climatic event, may be present as much as 24 hours in advance. However, the actual event itself is extremely difficult to pinpoint and mitigate against.

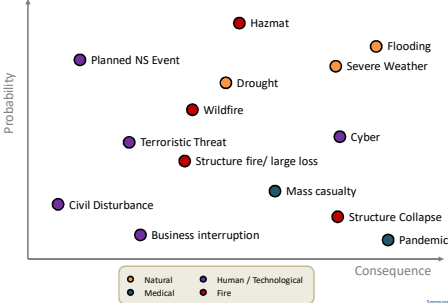
Example of a 2-D Risk Matrix



		Rare	Unlikely	Possible	Probable	Highly Probable	
		1	2	3	4	5	
Impact or Consequence	Catastrophic	5	Medium	High	High	Very High	Very High
	Significant	4	Medium	High	High	Very High	Very High
	Moderate	3	Medium	Medium	High	High	High
	Minor	2	Low	Low	Medium	Medium	Medium
	Insignificant	1	Low	Low	Low	Low	Low


Likelihood or Possibility

Example of visualizing 2-dimensional risk

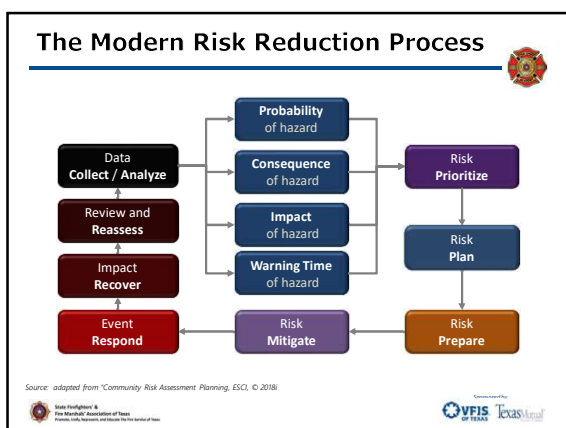


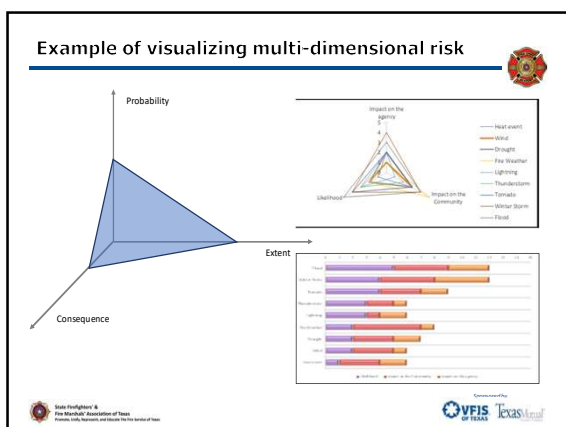
Consequences of Risk

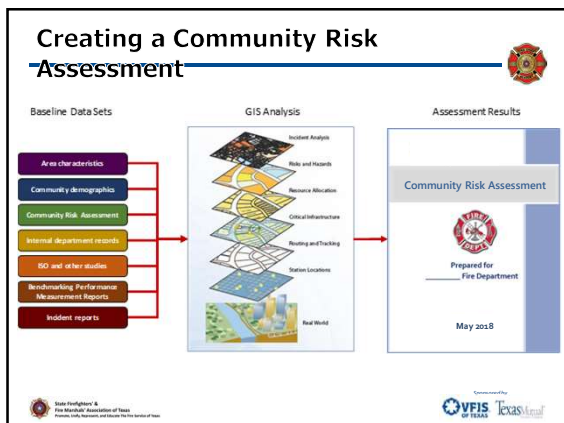
- Human
- Economic
- Psychological
- Functional
- Environmental



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Protecting Life, Property, and Creating the Fire Service of Tomorrow











For more information:



Mike Montgomery
Central Regional Manager / Consultant
281.960.5004
mike.montgomery@esci.us
ESCI Emergency Services
Consulting International
Providing Expertise and Guidance that Enhances Community Safety
