

Preparedness Houston

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Houston OEM

Houston Scenarios

- Flooding
- Severe Weather - Tornado
- Hurricane (Storm Surge / Wind)
- Heat
- Hazardous Materials
- Terrorism
- Flu
- Cyber

Risk Assessment

- What hazards can impact our operation?
- What is the likely impact?
- Can this be prevented?
- Can this be mitigated?
- How can we prepare?

The Process

- Buy-in and support from leaders
- Establish a disaster committee
 - Involve all levels
 - Brainstorm and be creative
- Engage local government
 - OEM, Police , Fire, and Health
- Identify supporting resources
 - NFPA 1600 – Standard on Disaster/Emergency Management & Business Continuity Programs

Risk / Vulnerability Summary

Risk Assessment / Vulnerability Analysis

Hazard	Vulnerability (0-3)	Frequency (0-3)	Total (Vulnerability X Frequency)
Natural			
Flooding		3	
Hurricane – Storm Surge		3	
Hurricane – Wind		3	
Heat	2	3	6
Tornado	2	3	6
Winter Storm	2	2	4
Drought	1	2	2
Hail	1	2	2
Lightning	1	2	2
Technological			
Hazardous Materials – Pipeline		2	
Hazardous Materials – Fixed Facility		2	
Hazardous Materials – Hazardous Cargo Route		2	
Hazardous Materials – Rail		2	
Utility Outage (gas, water, Electricity)	2	2	4
Human Caused			
Large Scale Special Events	1	2	2
Terrorism	1	1	1

Location Driven Vulnerability

Flooding

- Floodway = 3
- 100 Year = 2
- 500 Year = 1
- Outside = 1

■ Hazardous Mat.

- < 3000' = 3
- < 1 Mile = 2
- < 5 Miles = 1
- > 5 Miles = 0

■ Storm Surge

- Zone A = 3
- Zone B = 2
- Zone C = 1
- Outside = 0

■ Wind

- < 50 Miles to Coast = 3
- 50 – 75 Miles Inland = 2
- > 75 Miles Inland = 1

Flooding

- Most frequent Houston disaster
- Typically short lived
- Impacts to mobility

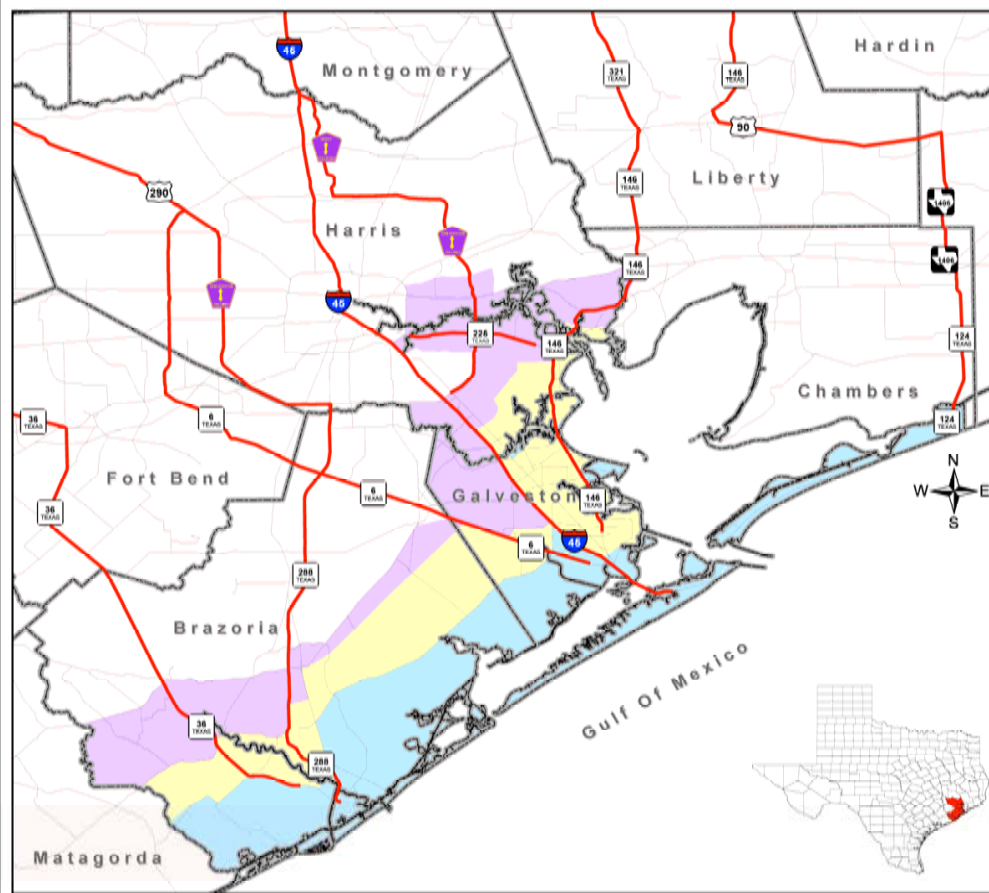
Severe Weather - Tornado

- More common Spring / Fall
- Limited Impact

Hurricane – Storm Surge

- Evacuation Plans
 - Mandatory Evacuation
- Limited Mobility
- Diminished Workforce
- Potential for High Dollar Loss

Hurricane – Storm Surge



Brazoria/Galveston/Harris County Hurricane Evacuation Map

Evacuation Zones

- Zone A Category 1-2 Hurricane
- Zone B Category 3 Hurricane
- Zone C Category 4-5 Hurricane

Evacuation Routes



Saffir Simpson Scale

Hurricane Category	Windspeed (MPH)
1	74-95
2	96-110
3	111-130
4	131-155
5	>155

Hurricane Evacuation Information

Find the location of your home on the map and note the evacuation zone where it is located. If you are in the **BLUE ZONE (A)**, plan to evacuate for all hurricanes. Those in the **YELLOW ZONE (B)** should plan to evacuate for Category 3, 4 or 5 storms. If you live in the **PURPLE ZONE (C)**, you should plan to evacuate for a Category 4 or 5 hurricane.

If you live near an evacuation zone boundary and are unsure of the evacuation zone you are in, err on the side of caution and assume you are in the zone nearest the coast. If you live in a mobile home in any of the three evacuation zones, plan to evacuate any time a hurricane threatens.

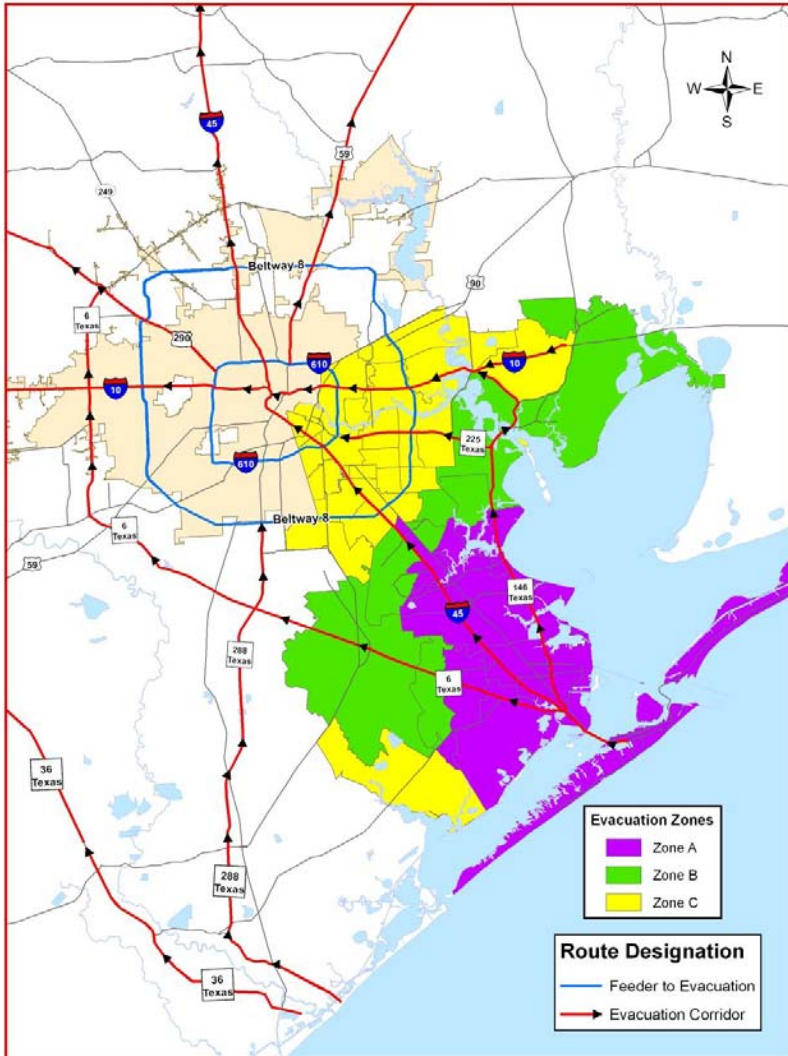
The main evacuation routes are highlighted in red on the map. These routes will take you out of the area of immediate danger to safety and shelter further inland. When a hurricane threatens, listen for instructions from local officials on how and when to evacuate and follow those instructions.



Hurricane – Evacuation

- Currently being revised
 - Evacuation Routes
 - Timing
 - Contra-Flow
 - Corridor Provisions
 - Fuel
 - Food/Water
 - Aid
 - Information

Evacuation - ZIP Zones



Zone A	Zone B		Zone C		
77058	77058	77568	77011	77502	77551
77510	77059	77571	77011	77503	77554
77518	77062	77573	77012	77504	77562
77539	77507	77586	77013	77505	77563
77550	77510	77590	77015	77506	77565
77551	77511	77591	77017	77507	77568
77554	77517	77598	77023	77510	77571
77563	77518	77650	77023	77511	77573
77565	77520		77029	77517	77577
77568	77539		77034	77518	77581
77573	77546		77049	77520	77586
77586	77550		77058	77521	77587
77590	77551		77059	77530	77590
77591	77554		77061	77536	77591
77598	77563		77062	77539	77598
77650	77565		77075	77546	77650
			77087	77547	
			77089	77550	

HOUSTON TO SAN ANTONIO

TEXAS



Hurricane Evacuation Route's Potential Contraflow Plan

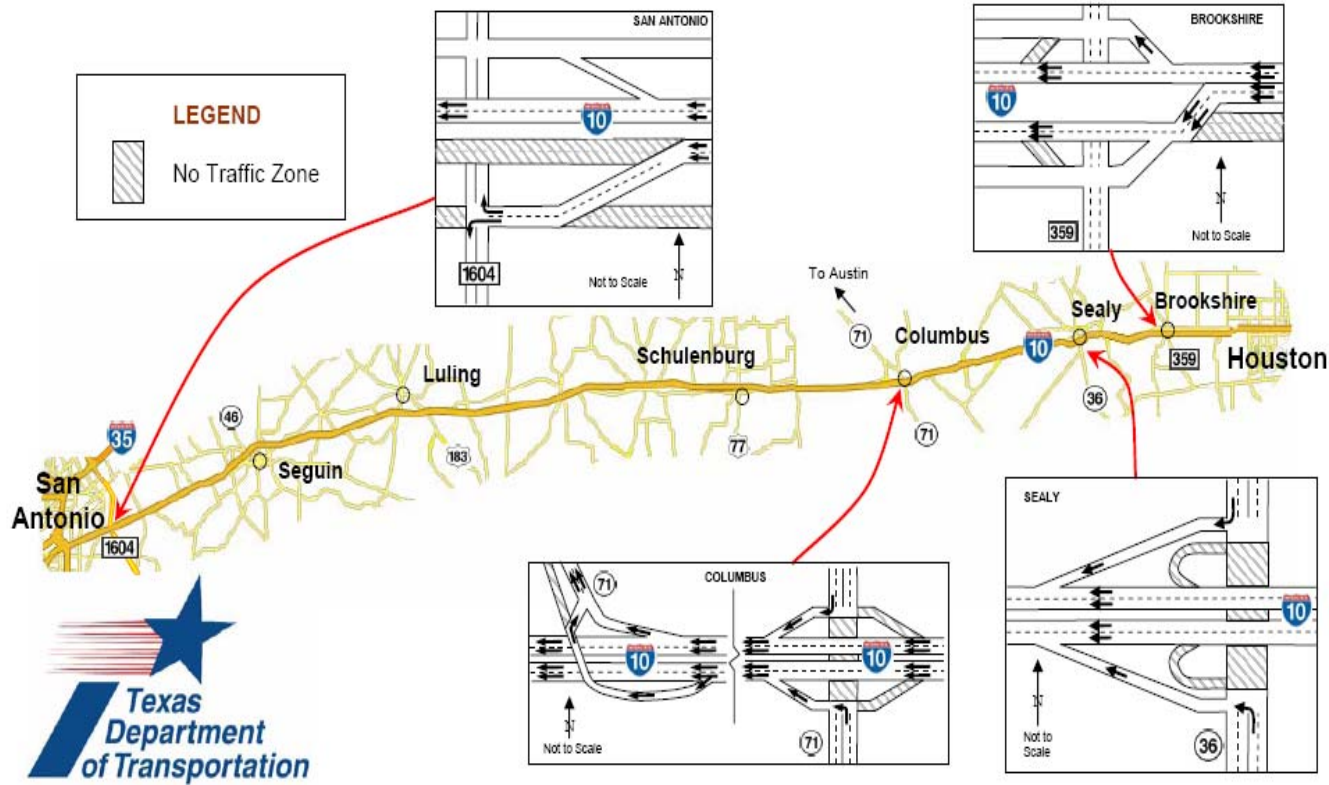
WHO.....This plan will affect motorists evacuating from Houston.

WHY.....To help move citizens safely and efficiently out of harm's way during large-scale evacuations.

WHAT...If this plan is activated, I-10 eastbound lanes will be reversed to carry two lanes of westbound traffic. Traffic in the contraflow lanes will be able to exit I-10 at selected locations.

WHEN...The reversal will be considered only when the Houston area is threatened by a major hurricane and mandatory evacuations are issued. A decision to reverse I-10 will be made by the Texas Department of Public Safety based on the strength of the storm and projected landfall.

WHERE...The contraflow operations will begin east of FM 359 in Brookshire, TX. Traffic in two westbound lanes will cross over to the contraflow side to travel westbound. The contraflow lanes will end at Loop 1604 in San Antonio, TX.



HOUSTON TO DALLAS

TEXAS



Hurricane Evacuation Route's Potential Contraflow Plan

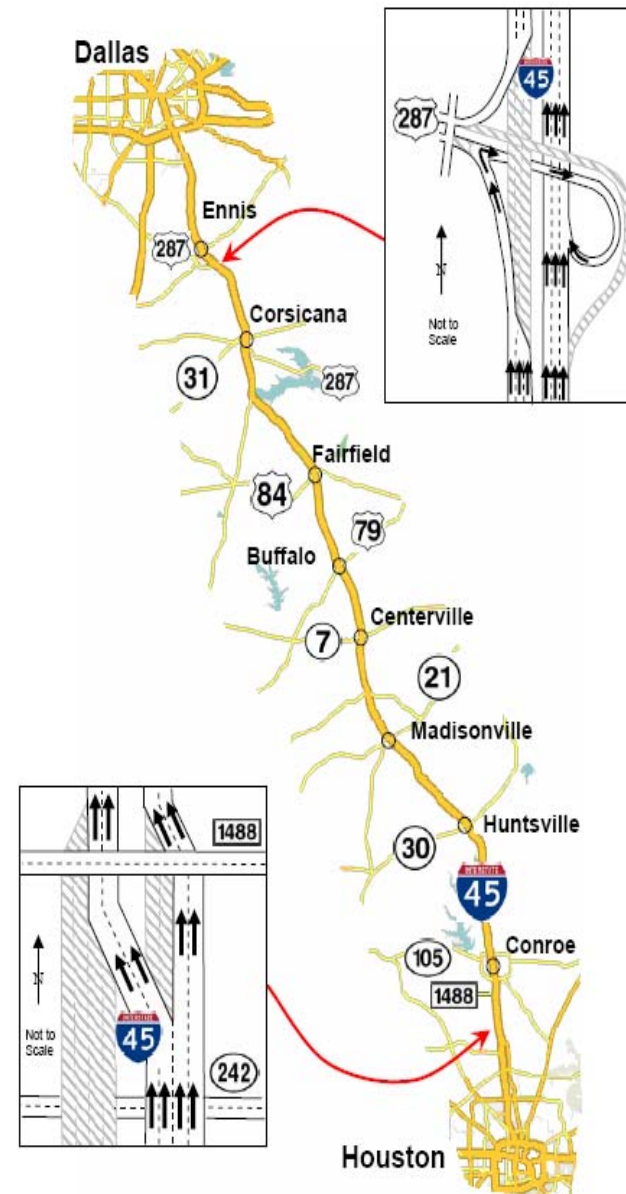
WHO.....This plan will affect motorists evacuating from the Houston area.

WHY.....To help move citizens safely and efficiently out of harm's way during large-scale evacuations.

WHAT....If this plan is activated, I-45 southbound lanes will be reversed to carry two lanes of northbound traffic. Traffic in the contraflow lanes will be able to exit I-45 at selected locations.

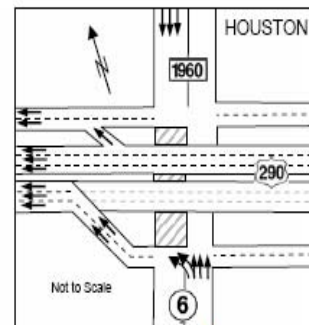
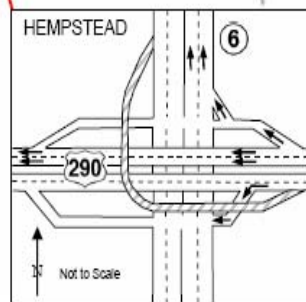
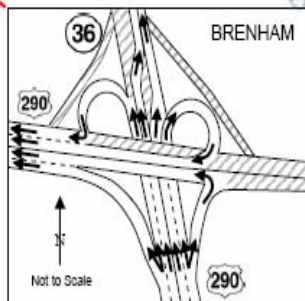
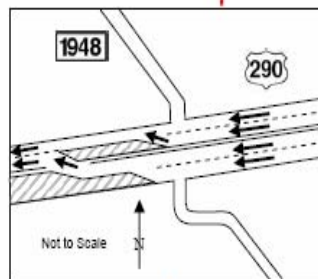
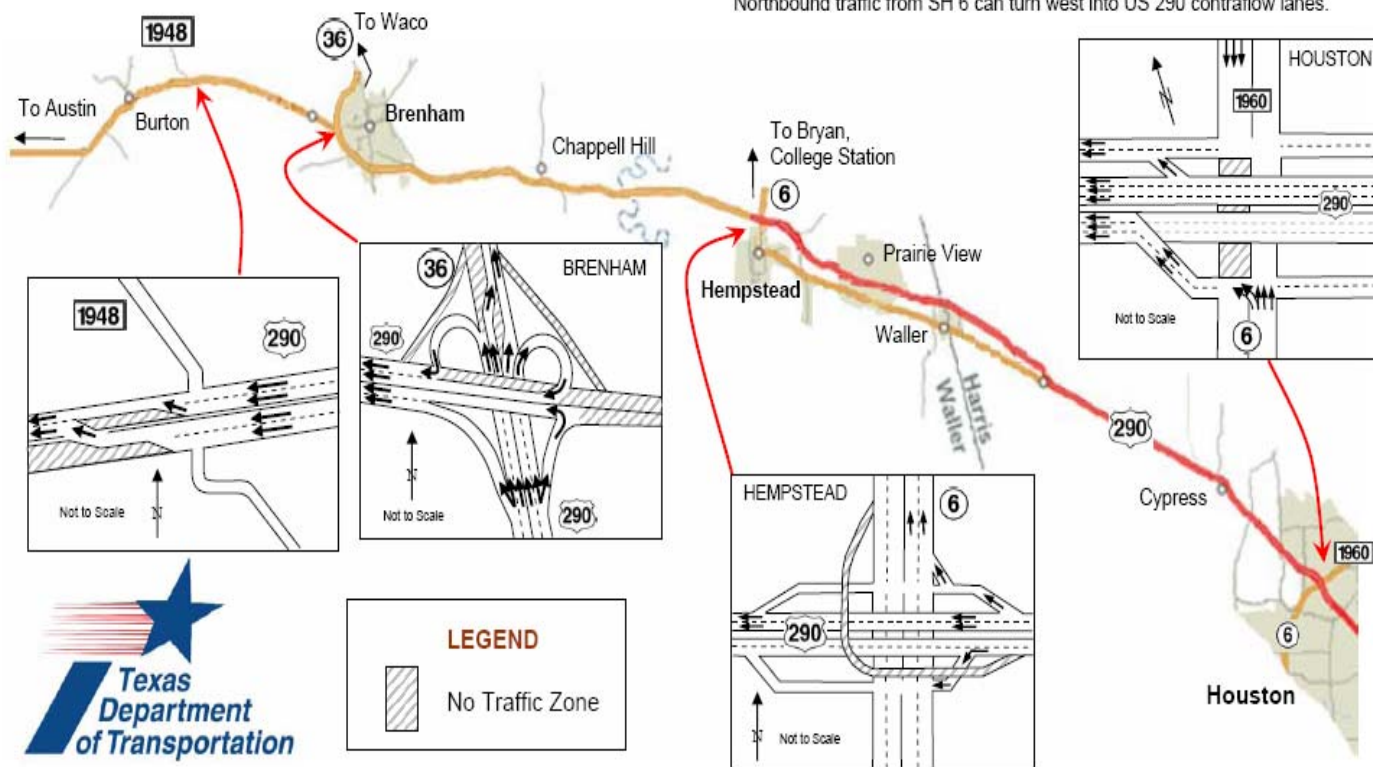
WHEN...The reversal will be considered only when the Houston area is threatened by a major hurricane and mandatory evacuations are issued. A decision to reverse I-45 will be made by the Texas Department of Public Safety based on the strength of the storm and projected landfall.

WHERE...The contraflow operations will begin north of SH 242. Some northbound traffic will cross over to the contraflow side to travel northbound. Contraflow and other I-45 motorists will have access to fuel stations at multiple locations along I-45. The contraflow lanes will end at US 287 near Ennis, TX, 40 miles south of Dallas, TX.




HOUSTON TO AUSTIN, BRYAN, COLLEGE STATION, WACO

TEXAS



LEGEND

 No Traffic Zone

Hurricane Evacuation Route's Potential Contraflow Plan

WHO.....This plan will affect motorists evacuating from the Houston area.

WHY.....To help move citizens safely and efficiently out of harm's way during large-scale evacuations.

WHAT...If this plan is activated, US 290 eastbound lanes will be reversed to carry two lanes of westbound traffic. Traffic in the contraflow lanes will be able to exit US 290 at selected locations.

WHEN...The reversal will be considered only when the Houston area is threatened by a major hurricane and mandatory evacuations are issued. A decision to reverse US 290 will be made by the Texas Department of Public Safety based on the strength of the storm and projected landfall.

WHERE...The contraflow operations will begin west of FM 1960. Northbound traffic from SH 6 can turn west into US 290 contraflow lanes.

HOUSTON TO NACOGDOCHES TEXAS



Hurricane Evacuation Route's Potential Contraflow Plan

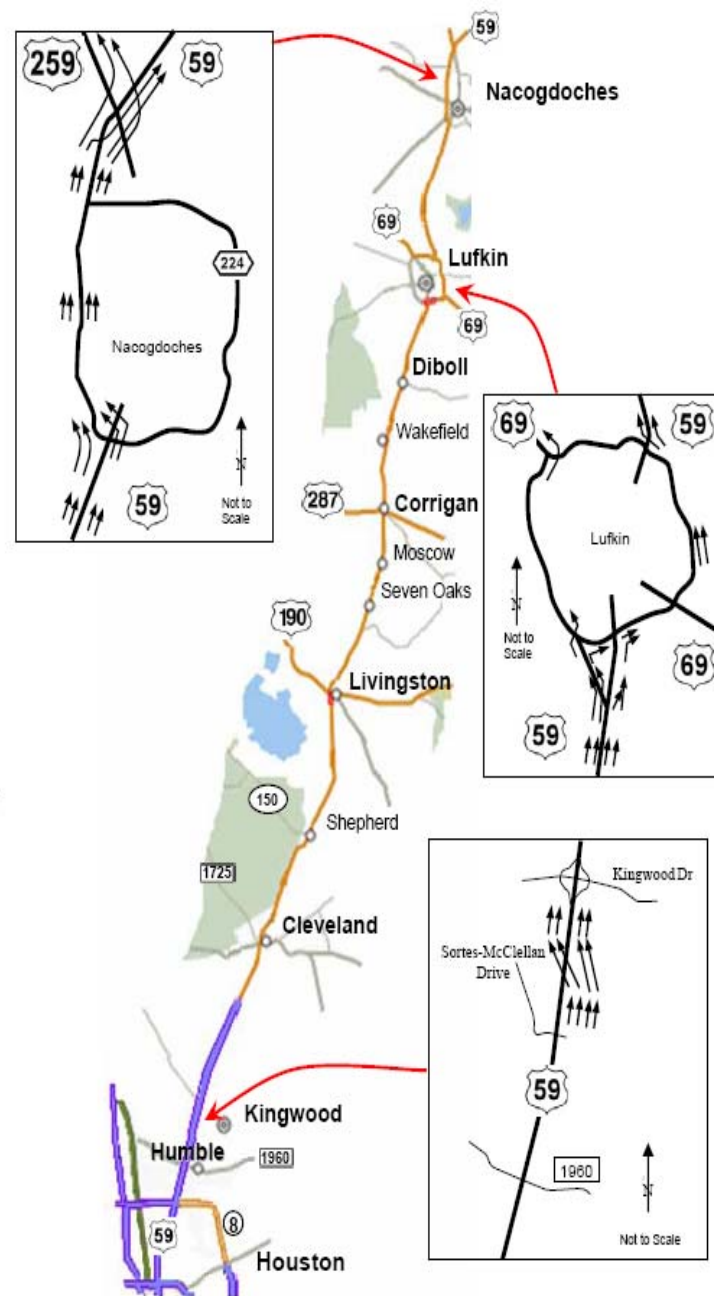
WHO.....This plan will affect motorists evacuating from the Houston area.

WHY.....To help move citizens safely and efficiently out of harm's way during large-scale evacuations.

WHAT...If this plan is activated, US 59 southbound lanes will be reversed to carry two lanes of northbound traffic. Traffic in the contraflow lanes will be able to exit US 59.

WHEN...The reversal will be considered only when the Houston area is threatened by a major hurricane and mandatory evacuations are issued. A decision to reverse US 59 will be made by the Texas Department of Public Safety based on the strength of the storm and projected landfall.

WHERE..The contraflow operations will begin south of Kingwood Drive and continue to Nacogdoches, TX.



Heat

- Historically # 1 Killer in Houston
 - Average > 20 per / year
 - Elderly / very young
- Potential impacts on power
 - Demand > Supply

Hazardous Materials

- In – Transit
 - Rail, Road, & Pipeline
- Fixed Facility
 - Storage
 - Production
 - Distribution
 - Use

Terrorism

- Good target
- On – Site Hazards
- Exposure
- Visibility
- Don't forget Cyber!

Pandemic Flu

- Likely in next few years
- Currently not transmitted human to human
- Protecting your employees
- Preparedness / COOP / Education is key

Prevention / Mitigation

- Prevention – Actions that can be taken to eliminate the risk
- Mitigation – Actions that can be taken to reduce the risk
 - Passive –
 - Active -

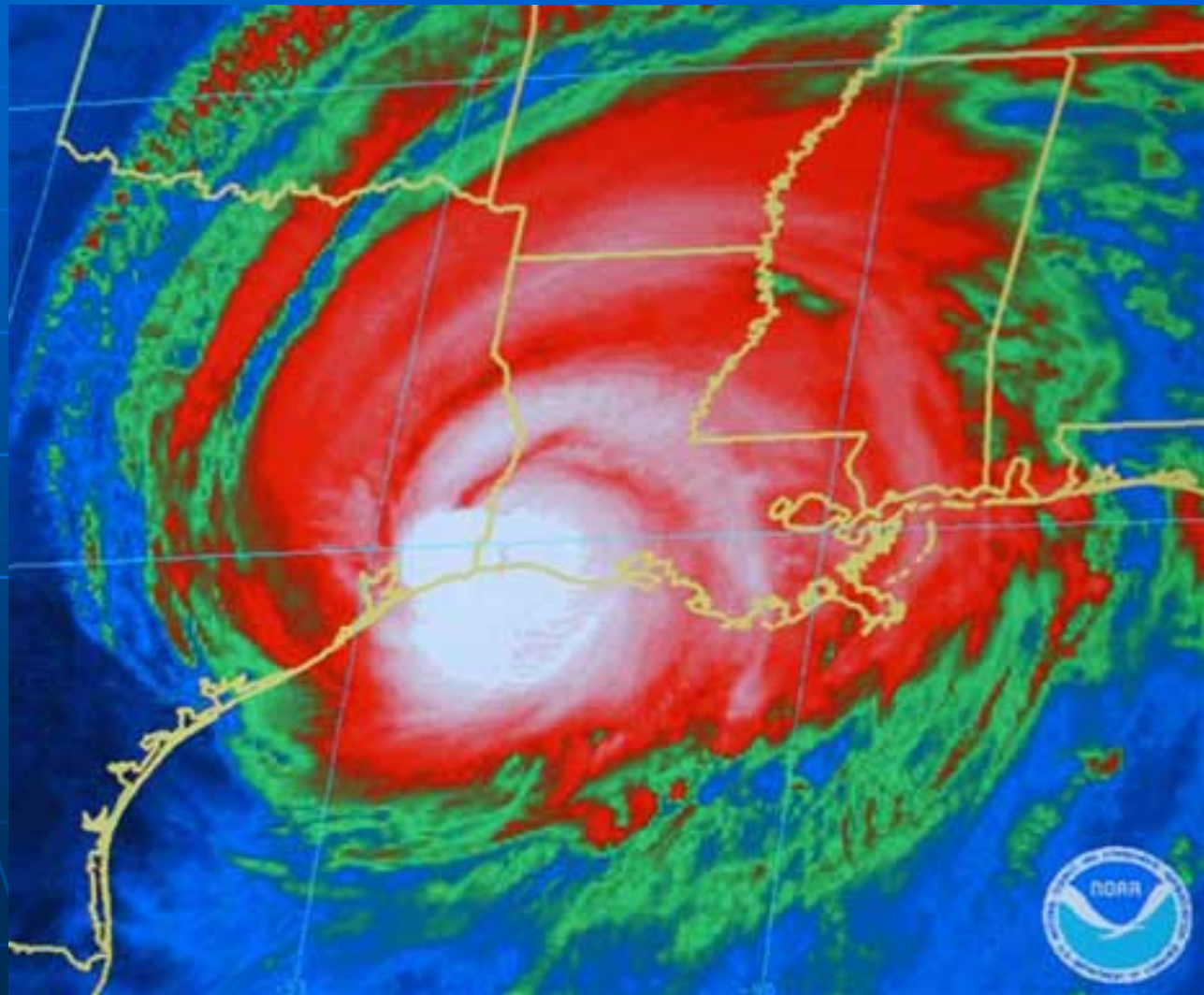
Preparedness / BCP

- Business Continuity Planning
 - Critical Functions
 - Critical Personnel
 - Communication
 - Alternate Facilities
- 25% of businesses do not reopen following a major disaster

Select your Disaster Role

- **Victim**
- Responder / Community Partner
 - Pre – Event
 - Intra - Event
 - Post – Event

Questions



Hurricane Rita
September 24, 2005

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