We Stood Our Post

The Role GIS Played in Hurricanes Katrina & Rita

by James E. Mitchell, Ph. D., IT GIS Manager
“Never have so many owed so much to so few.”
GIS Analysis to Support the Evacuation Plan
Evacuation Phases Based on GIS Analysis
Louisiana
Emergency Evacuation Plan

1. 72 hrs from Tropical Storm Wind Landfall
   Stage Assets and Personnel
2. 50 hrs from Tropical Storm Wind Landfall
   Evacuate Phase I
3. 40 hrs from Tropical Storm Wind Landfall
   Evacuate Phase II
4. 30 hrs from Tropical Storm Wind Landfall
   Evacuate Phase III - Contraflow
5. 6 hrs from Tropical Storm Wind Landfall
   Terminate Contraflow – Secure Assets and Personnel
6. Duck!
One Million Maps Distributed

1.38 million people safely evacuated from greater New Orleans
This is the largest evacuation of a major metropolitan area in history
HURREVAC – Friday August 26 Forecast Path
HURREVAC – Friday August 26 Forecast Winds
Pre-storm Information Delivery

NWS Advisory #13A - 1PMCST
HURRICANE KATRINA
LAT 24.9N  LONG 82.6W
72 HOUR NOTICE LINE FOR
(Tropical Storm Winds 39 MPH)

72 Hour Notice of 39 MPH
Tropical Storm Winds

HURREVAC ERROR CONE
For 72 Hour Notice of 39 MPH
Tropical Storm Winds

KATRINA Advisory #13A

39MPH Tropical Winds
58MPH Gale Force
74MPH Hurricane

72 Hour ERROR Notice of 39 MPH
Tropical Storm Winds (HURREVAC)

100 Nautical Mile Distances
from Louisiana State Line

<table>
<thead>
<tr>
<th>Distance from Louisiana State Line</th>
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<tbody>
<tr>
<td>100 miles from Louisiana Coast</td>
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<tr>
<td>200 miles from Louisiana Coast</td>
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<tr>
<td>300 miles from Louisiana Coast</td>
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<tr>
<td>400 miles from Louisiana Coast</td>
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<tr>
<td>500 miles from Louisiana Coast</td>
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<tr>
<td>600 miles from Louisiana Coast</td>
</tr>
<tr>
<td>700 miles from Louisiana Coast</td>
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</tbody>
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http://wavcis.csi.lsu.edu/
http://www.weathermatrix.net/tropical/surface/interactive.shtml

WeatherBuoy
100 Nautical Mile Distances from Louisiana State Line
HydroWatch Website
Access to Real-time Data
Real-time Weather Data from Meteorlogix
Road Speed Impact for Hurricane Rita
Geocoding Rescues
Tele Atlas and TomTom Made a Difference
Finding the Forgotten

NURSING HOMES IN THE FLOODED NEW ORLEANS AREA FROM KATRINA (USED FOR LOCATION DURING THE HURRICANE BY DHH AND OHSEP)

Legend
- NOAreaNursingHomes

Streets
OpsGrid
Waterbodies
Waterways
Parish
Water
Name
- Jefferson
- Orleans
- Plaquemines
- St. Bernard
- St. Charles

Map showing locations of nursing homes in the New Orleans area affected by Hurricane Katrina.
Flooded Street Elevations
Damage Assessment – Moveable Bridges
FLOODED ROADWAYS IN THE NEW ORLEANS METROPOLITAN AREA, JEFFERSON, ORLEANS, PLAQUEMINES, AND ST. BERNARD PARISHES, LOUISIANA

STATE ROADWAYS ELIGIBLE FOR FHWA OR FEMA FUNDING

- F H W A ROADWAY, FLOODED
- F E M A ROADWAY, FLOODED
- F H W A ROADWAY, NOT FLOODED
- F E M A ROADWAY, NOT FLOODED

NOTE: FLOODED AREA DATA PROVIDED BY FEMA

Flood Water (as of 02 September 2005)

Existing Water

URBAN AREA

NOTE: FLOODED AREA DATA PROVIDED BY FEMA

2 SEPTEMBER 2005 NEW ORLEANS FLOODED ROADWAYS
FLOODED ROADWAYS as of September 02, 2005

2 SEPTEMBER 2005 ESTIMATED FLOODED ROADWAYS, BY PARISH
Levees and Pump Stations
Who knew?
Mapping Debris Removal

[Map of Louisiana showing debris removal as of January 26, 2006.]

*Please consult the full document for detailed information.*
The Biggest Issue Facing Louisiana GIS Today?

Age of 7.5 Minute Quadrangle Published Map Series in Louisiana

LA 7.5 Minute Quad Age
- 0 - 4 Years 32 Quads
- 5 - 9 Years 167 Quads
- 10 - 14 Years 155 Quads
- 15 - 19 Years 219 Quads
- + 20 Years 300 Quads
- Water 14 Quads

Map in Geographic Coordinate System
World Geodetic System 1984

1:3,000,000
How Up to Date are Louisiana’s Maps?

- 96% of paper maps are 5 years or older
- 77% of paper maps are 10 years or older
- 59% of paper maps are 15 years or older
- 34% of paper maps are 20 years or older

Digital map data were created from paper maps 30 years ago and *NEVER* updated!
This presentation is dedicated to the IT Professionals who worked tirelessly to serve the State of Louisiana in the wake of Hurricanes Katrina and Rita.

Their efforts, although largely unsung, saved lives and property, and made a difference.
THE LOUISIANA CONTRAFLOW PLAN
Before, During & After Katrina
Factors Influencing an Evacuation

- Nearly 2 Million “At Risk” Population across South Louisiana, including the New Orleans Metro Area
- Limited roadway system for evacuation
- Significant number of people dependent upon Public Transportation
- Levee Protection System - Protects populated areas, but a “Bowl” exists
Storm Surge Susceptibility

A category 5 hurricane has the potential of generating a 25 foot high storm surge. If this occurs, only the areas colored dark green on this map will have sufficient elevation to avoid inundation.
The Hurricane Ivan Experience
(September 14-15, 2004)
Problems with Contraflow for Ivan

- Lack of coordination between Gulf States and across City-Parish borders
- **Slow reaction** of State to evacuation traffic
- **Poor management** of evacuation traffic beyond storm surge areas
- Lack of accurate and timely public information
- Uninformed evacuees (plans & expectations)
- Oversaturated highways
  - Congestion extended over 50 miles, 12 hours of delay
  - Affected Gulf Coast evacuees as well as New Orleans
Hurricane Ivan Evacuation
I-10 West (New Orleans to Baton Rouge)
Contraflow Plan for Hurricane Ivan

I-10 West
- US 51 to Loyola
- Via I-59
- LA 434 to I-10
- I-10 EB & WB
  - 3 to 2 Lane Merge
- I-10 EB & WB
  - I-10 EB to I-12 WB
- I-10 EB
  - I-10 EB to I-12 WB
- I-12 Alternate
  - LA 434 to I-10
- I-10 EB
  - I-10 EB to I-12 WB
- I-10 WB
  - I-10/I-12 Merge
  - 5 to 2 Lane Merge
- I-10 EB
  - I-10 EB to I-12 WB
- I-10 West
  - US 51 to Loyola
- I-10/I-12 Merge
  - 5 to 2 Lane Merge
- I-10/I-12 Merge
  - 5 to 2 Lane Merge
Improvements to Contraflow Plan

- **Coordinated Evacuations**, not only in vulnerable areas but in pass-through areas
- **Phased Evacuations** based on geographic areas of susceptibility
- **Increased Highway Efficiency** through active traffic management, better signage, alternate routes, better loading of Contraflow
- **Recognized Congestion is Inevitable**, everyone is competing for road space, increased timeline
- **Educated/Informed Public** on plans, alternatives and “realistic” expectations
- **Provided Real-time Information to Media** (every 30 minutes)
Phase 1
50 hours in advance

Phase 2
40 hours in advance

Phase 3
30 hours in advance

Contraflow Segment
Freeway Segment
Alternate Route

Phases of the Contraflow Plan
SE LA Contraflow Plan for Hurricane Katrina
The Hurricane Katrina Experience
(August 26-29, 2005)
Timeline for Activating Contraflow

- **72 hours**: Staged Traffic Control
- **60 hours**: Crews on Standby
- **48 hours**: Implemented Phase 1
- **36 hours**: Implemented Contraflow
- **12 hours**: Discontinued Contraflow
- **Landfall**:
Results of the Contraflow Plan for Hurricane Katrina

- Operated for 25 hours
- Over 1 million (est.) evacuated
- Longest delay: 2 – 3 hours
- Successes
  - Activated & operated the Traffic Control Center
  - Had an experienced Contraflow Team that included State of Mississippi, with clear lines of responsibility
  - Executed “live” practice during Hurricane Dennis
  - Educated & continuously informed public
After Hurricane Katrina

Interstate Traffic in Baton Rouge increases by 20%

I-110, I-10 & I-12

Daily Traffic

<table>
<thead>
<tr>
<th>Location</th>
<th>Traffic Count</th>
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<tbody>
<tr>
<td>North of I-10</td>
<td>120,000</td>
</tr>
<tr>
<td>West of Bridge</td>
<td>180,000</td>
</tr>
<tr>
<td>East of I-110</td>
<td>160,000</td>
</tr>
<tr>
<td>East of I-12</td>
<td>140,000</td>
</tr>
<tr>
<td>East of I-10</td>
<td>120,000</td>
</tr>
</tbody>
</table>
Development of SW LA Contraflow Plan

Study this map and CHOOSE YOUR ROUTE WISELY. There will be many restrictions on the Interstate System. Upon entering the Contraflow area, it may not be possible to change routes. If you do not wish to evacuate under the Contraflow restrictions, your best strategy is to LEAVE EARLY before Contraflow is activated.

Lake Charles Area Instructions

Lafayette Area Instructions
Installation of Traffic Monitoring Equipment
Implementation of a Statewide Traffic-Incident Management Program
Louisiana’s Contraflow Experience

- Implemented twice
- DOTD is a lead agency
- Requires proactive decision-making
- Teamwork
CONTRAFL O

- IMPLEMENTATION -
  Assets staged August 27, 2005 at 6 a.m.
  (16 sites – 45 employees)

  Implemented at 4 p.m. – Sites maintained by approximately half of the crews during the night. Others returned at approximately 8 a.m. Sunday morning.

  Contraflo suspended at 5 p.m. Sunday – assets picked up and returned to maintenance units.

- RESULT - DOTD and State Police estimated that phased evacuations and contraflo safely evacuated more than 1.2 million people.

- BRIDGE CLOSURES – By 6 a.m. Sunday morning, all moveable bridges in the Greater New Orleans area were closed to marine traffic. Empire and Ostrica Locks closed by Saturday at 6 p.m.
THE STORM

- **SUNDAY EVENING**
  Essential DOTD employees evacuated the district, many in DOTD vehicles, to help expedite their return after passage of the storm. A handful of employees (5) remained behind at District Headquarters.

- **MONDAY MORNING**
  Headquarters building lost power early Monday morning as Katrina passed. Switched over to generator which provided emergency lights and limited power – no air conditioner. Also lost our water supply later in the day.

- **MONDAY AFTERNOON AND EVENING**
  After passage of the storm, crews began clearing downed trees on westbound US 90 near the office at approximately 2 p.m., working until 11p.m. (16 employees). Also cleared downed trees on River Road (LA 18) in St. Charles Parish (4 employees).
DAY 2 (TUESDAY)

- 3 Crews with 17 employees arrived from District 03, to clear trees from US 90, US 61, LA 628 and LA 632.

- Approximately 50 district employees reported to work, including our Business Manager, Linda Paternostro, our Training Specialist, Fred Stentz, and a construction inspector, James Brown who would prove to be invaluable as an inspector on emergency repair work.

- Brian Buckel, District Construction Engineer, provided support to Headquarters as did Fred Wetekamm, the District Bridge Maintenance Engineer. Steve Strength, the District Traffic Operations Engineer, worked at the EOC and Traffic Services. Chris Morvant, Assistant District Maintenance Engineer, helped coordinate storm cleanup and repair work in the district. Our District Administrator, Tom Payment, provided support at the EOC, while our current DA, Mike Stack, was stationed at the 17th Street Canal breach along with Justin Guilbeau, an Engineer Intern.

- District Maintenance crews continued to clear trees off of major evacuation routes.
DAY 3 (WEDNESDAY)

- Approximately 53 employees reported to work from Bridge City office, out of a possible 341 (162 employees worked out of Houma Sub-District.)
- 6 crews with 28 employees reported from District 03, to cut trees and clear roadways.

CRITICAL ISSUES

- Fuel running low
- Lack of food, water (ample ice provided by Houma Sub-District)
- Lack of Communication (no landline phone service, cell service undependable, mobile radios worked but overloaded)
- Lack of security
Day 4 (THURSDAY)

- District 03 delivered four 500 gallon fuel tanks.

- District moved Bridge City office to Houma Sub-district due to security threat. Did not move back until Monday, September 19th.

- Maintenance crews continued to clear trees and debris from roadways.
DAY 5 THRU 14

- Maintenance crews continued to work out of Houma Sub-District, Luling, Kenner and Marrero Maintenance Units.

- District received food, water and fuel from Traffic Services, District 61 and District 08.

- Power was restored to District Headquarters Friday, September 9th (Day 12).

- By September 11th, 14 days after Katrina made landfall, approximately 100 employees (out of a possible 341) had returned to work out of the Bridge City office.
DISTRICT 02
KATRINA
DAMAGES

Personnel and Property
Active Construction Projects
Emergency Repairs-Roadways
Emergency Repairs-Bridges
Personnel Losses

- District 02 Authorized Positions-----526
  (Currently 506)
- Prior to Katrina on Staff--------------504
- Current Filled Positions--------------460

Presently 46 employees below the authorized number for the District.
Personnel Losses

- 37 Employees still displaced by end of year.
- 13 Employees worked in other Districts. Some still remain.
- 34 Employees resigned or retired due to Hurricane Katrina.
Major Equipment Losses

- 11 Vehicles Lost
- 9 Variable Message Boards Damaged or Destroyed
- 3 Boats Damaged or Lost
Damage to Project Engineer Offices and District Headquarters

- Construction Gang 262 office in New Orleans was completely destroyed along with 7 vehicles (8 feet of water).

- Minor damage was done to District Headquarters, the Design Office and Construction Gang 232 office in Harahan.
Damage to New Orleans East Unit

- The Maintenance and Project Engineer Office in New Orleans East suffered damage due to minor flooding (1-2 feet), along with roof and siding wind damage ($500,000 estimate).
ACTIVE CONSTRUCTION PROJECTS

- 3 Projects suffered major damage and delays
- 2 Projects were suspended due to damage to the contractor’s Asphalt Plant
- 12 Projects suffered minor damage
Major Damage Rigolets

- SP 006-05-0076
  Rigolets Pass Bridge and Approaches suffered major damage to girders, pilings, detour roads and equipment.
  Also, there was major damage to the pre-cast supplier.

Contract Amount:
$50.5 million (Approximately $2.5 million in damages).
District Wide ITS suffered damage to a number of cabinets and towers due to water and wind. Most of the electronics were damaged by water.

Contract Amount:
$3.9 million
Major Damage I-10

- SP 450-15-0089
  I-10 Widening (17th Street Canal to Causeway) suffered damage to project records, trailers and equipment. Damage to the Asphalt Plant caused a delay in starting the project.

Contact Amount:
$65 million
Emergency Repairs Roadways

- La 23 in West Pointe a La Hache
- La 39 in Plaquemines Parish
- I-10/I-610 Clean Up
- US-90 Chef Pass to Rigolets
- US-90 Shoulder Repairs
Emergency Repairs La 23

- A washout on La 23 in West Pointe A La Hache has been repaired by force account at the request of Plaquemines Parish.
- Repairs completed ($163,000)
Emergency Repairs to La 39

- La 39 suffered a major washout due to a levee break. Temporary repairs were made by force account to make the north passable.

- Work Completed
- Estimated Cost $348,000.00
Emergency Repairs to US 90

- The shoulder on US-90 was washed out exposing a gas line and destroying several yards of guard rail. Repairs were made by force account.
- Repairs completed
- Estimated Cost $30,000
Emergency Repair Bridges, Tunnels, Locks, Underpass and a Pump Station

- Movable bridges, tunnels, locks, underpasses and a pump station were damaged by high water. A number of these have been repaired or in the process of being repaired.
- US-11 Bridge
- Chef Pass Bridge
- Rigolets Pass Bridge
- Houma Navigational Canal
- Belle Chasse Bridge
- Barataria Bridge
- Danzinger Bridge
- Yscloskey Bridge
- Harvey and Belle Chasse Tunnels
- Empire and Ostrica Locks
- Airline Underpass
- Pontchartrain Pump Station
Major Repairs on La 46

- This washout on La 46 in St. Bernard was caused by rushing water in the canal under our highway.
- Repairs completed ($390,000)
Major Repairs to Empire Bridge

- Washouts to the median barriers on the north side and damage from boats on the south side of the Empire Bridge on La 23 required repairs.
- Repairs completed ($600,000).
MAJOR REPAIRS TO LA 624

- One lane of roadway was washed out.
- Guardrail was pulled away from concrete support on bridge.
- Repairs completed ($107,000).
Major Repairs Still Required

- **La 23 in Sunrise**
  - This levee breach caused a 400-500 foot washout over 30 feet deep on La 23 in Sunrise.
  - The Corps is still working on the breach. Temporary repairs to open northbound roadway completed ($305,000).
Major Repairs Still Required

- LA 300 in St. Bernard
  - Shoulder embankment washed out causing a major drop-off from roadway.
  - Estimated cost $225,000
District 02 Trailer City

CAMP DOTD

--30 Trailers in District 02 parking lot.
--11 employees stayed in a hotel until trailers were ready.
In Summary

- The District lost Personnel, Equipment and Property.
- Several active Projects were damaged or delayed.
- There were at least 13 damaged roadway repair projects.
- There are 8-10 Moveable Bridges that required some repairs.
- Tunnels, locks, an underpass and a pumping station required repairs.
CONTRA FLOW

- DISTRICT PERSONNEL WORKED CONTRA FLOW UNTIL SUNDAY, AUGUST 28 AT 9:00PM
- 15 VARIABLE MESSAGE SIGNS, 989 CONES AND 69 BARRICADES WERE DEPLOYED IN DISTRICT 62 FOR CONTRA FLOW
WST 10 Days No Power
BellSouth No Phone
FEMA No Help
Red Cross No Help
KATRINA STORM DAMAGE

- ALMOST EVERY STATE HIGHWAY IN DISTRICT 62 WAS BLOCKED BY TREES
- ROADWAY SHOULDERS WERE WASHED OUT
- MOVABLE BRIDGES WERE DAMAGED
- BRIDGES WERE DESTROYED
ROADWAY CLEARING

- MORE THAN 200 DISTRICT 62 EMPLOYEES WORKED TO CLEAR ROADS
- OVER 150 EMPLOYEES FROM OTHER DISTRICTS WERE BROUGHT IN TO HELP CLEAR ROADS
- OVER 75 PIECES OF HEAVY EQUIPMENT WERE USED
- ROADS WERE CLEARED AND OPENED TO THE PUBLIC AND EMERGENCY VEHICLES WITHIN 5 DAYS
ROADSIDE CLEARING

- ROADSIDE RIGHT OF WAY CLEARING CONTINUED WITH DISTRICT CREWS
- OVER 20,000 LEANERS AND HANGERS WERE REMOVED BY DISTRICT FORCES
CONTRACTOR DEBRIS PICKUP

- DEBRIS PICKUP WAS PERFORMED BY DRC CONTRACTORS
- OVER 90 DOTD INSPECTORS MONITORED THE PROJECT
- OVER 2.2 MILLION CUBIC YARDS OF DEBRIS HAVE BEEN PICKED UP AT A COST OF $84 MIL
- OVER 40,000 LEANERS AND HANGERS WERE CUT
TRAFFIC SIGNS
AND SIGNALS

DISTRICT CREWS, WITH THE HELP OF STATEWIDE EMPLOYEES AND EMPLOYEES FROM OTHER DISTRICTS, REPAIRED OR REPLACED 338 TRAFFIC SIGNALS AND OVER 8800 SIGNS
LA 1077 BRIDGE

THE BRIDGE ON LA 1077 IN ST. TAMMANY PARISH WAS REPLACED BY DISTRICT FORCES
HURRICANE RITA

- 36 DISTRICT 62 EMPLOYEES WERE SENT TO LAKE CHARLES TO HELP WITH RITA DAMAGES
- WATER, FOOD, ICE, AND 14 PIECES OF HEAVY EQUIPMENT WERE ALSO SENT
- CREWS SPENT 5 DAYS HELPING DISTRICT 07 WITH CLEARING ROADWAYS
CURRENT STATUS

- ALL ROADS IN DISTRICT 62 HAVE BEEN CLEARED
- 100% OF TRAFFIC SIGNALS ARE OPERATIONAL
- HIGHWAY SIGNS ARE REPAIRED
- ALL MOVABLE BRIDGES ARE OPERATIONAL
- DEBRIS IS STILL BEING PUSHED TO THE STATE ROW
- OVER 17,000 TREES ARE DEAD OR DYING DUE TO WIND AND BEETLE DAMAGE
District 62 Thanks

Thanks to all the districts and statewide crews that helped us with recovery!!
ENJOY SOME LAGNIAPPE
AT 62 LA ROUX
Hurricane Katrina
District 03 Presentation
Hurricane Katrina

- Traffic control devices & message boards utilized along US-90 / I-49 & I-10 to assist in evacuation efforts.
- Coordinated efforts w/local OEP’s.
- District 03 forces assisted District 02 with initial clearing of roadways and also:
  - Sign & Signal repairs
  - Covering roof damaged buildings
  - Restoring of gates @ movable bridges
  - Trouble shooting electrical problems
  - Delivery of fuel & tanks
  - Suppling generators for buildings and bridges
    - Continue next slide
Dist 03 assistance to District 02 cont:

- Provided various materials as needed.
- Approx. 25 Maint. employees were assigned to work in District 02 the first 2 weeks after the storm.
- Approx. 6-8 traffic service personnel worked in Dist. 02 for a month.
Go Away Hurricane Rita!!!
Dist 03 Hurricane Rita

- Traffic control devices and message boards utilized at strategic sites for evacuation efforts.
- Coordinated with local OEP’s regular meeting attendance.

Hwy 90 St. Mary Parish
Garden City exit, Rescue
Vermilion, Iberia and St. Mary parishes had storm surge inundation of many state routes.

In addition, all 8 parishes had roadways blocked with trees, houses, cars and other debris.

Immediately following the storm, employees began clearing roadways.

Within 3 days, all roadways not still flooded were clear for vehicle passage.
As the water receded, evaluations of the conditions of the highways was immediately done to address emergency repairs.

- La 82, Pecan Island (as shown) roadway section partially eroded by surge and had to be immediately restored for recovery vehicles’ safe passage.

- Situations such as this were addressed through state forces and emergency contract forces.

La. 82 Vermilion Parish
Dist 03 Hurricane Rita

- Debris cleanup assessment and strategies performed by the District.
- Quantity of material present could be removed by utilizing in-house Maint. forces.

La. 319 St. Mary Parish
Dist 03 Hurricane Rita

- Hwy 82, Pecan Island, Vermilion Parish.
Dist 03 Hurricane Rita

- Tank Vessel, Hwy. 3147, Vermilion Parish.
Dist 03 Hurricane Rita

- Tombs on Hwy. La. 83 near port of West St. Mary.
Dist 03 Hurricane Rita

- Most severely impacted parish due to storm surge was Vermilion.
- This house was on the shoulder of Hwy. 35 south of Kaplan.

La. 35 Vermilion Parish
Dist 03 Hurricane Rita

- Storm surge inundated approx. a dozen state routes stretching from La. 14 in Delcambre to La. 82 in Pecan Island and routes in between.

La. 82, Pecan Island
Vermilion Parish
Iberia & St. Mary Parishes had significant sections of Hwy 90 becoming impassable with storm surge waters.
In all instances, state forces were on site providing and adjusting road closures as needed.
For a period of time there was at least one crew from each parish unit in District 03 working simultaneously in Vermilion Parish.

La. 82, Vermilion Parish
Dist 03 Hurricane Rita

- 8 Movable bridges were damaged to varying degrees by either storm surge or winds.

La. 3147 Humble Canal Pontoon
Vermilion Parish
Dist 03 Hurricane Rita

- Significant damage to roadway shoulders and underlying embankment materials had occurred along Hwy. 82.

La. 82, Vermilion Parish
Dist 03 Hurricane Rita

- Damage occurred in Vermilion parish, La. 82 from Cameron parish line east 20 miles to Little Prairie Bridge.

La. 82, Vermilion Parish
La 3147, Freshwater City road, an aggregate roadway, experienced considerable loss of its surfacing materials.
On the day of the mandatory evacuation on (SP 194-07-0058), La 82 south of Abbeville, contractor was backfilling 72” RCP. The bridge had been removed and the channel was open.

Immediately after the storm, contractor crews installed a temp. 30” arch metal pipe.

This was done to allow recovery vehicles access to that area of the parish.

La. 82 South of Abbeville
Vermilion Parish
Dist 03 Hurricane Rita

- To date: approx. 30,773 cubic yards of material have been removed from state right of ways by state forces.
- In addition approx. 603 cubic yards was removed from the Pecan Island area by the National Guard.
- Debris removal for the first pass is now 100% complete throughout the district.
Dist 03 Hurricane Rita

- All 8 movable bridges damaged are operational and are being repaired by contractor forces.
  - SP 240-03-0030, La. 83 Patout Br. $209,500
  - SP 055-07-0074, La. 14 Delcambre Br. $136,000
  - SP 397-03-0020, La. 330 Bayou Tigre Br. $158,000
  - SP 270-01-0057, La. 82 Little Prairie Br. $226,750
  - SP 055-30-0012, La. 14 By-Pass Br. $8,800
  - SP 055-06-0078, La. 14 Bussiness Br. $9,300
  - SP 194-07-0060, La. 82 Perry Br. $10,150
  - SP 857-66-0009, La. 3147 Humble Canal $195,625

Estimated Total Cost= $954,125
Dist 03 Hurricane Rita

- 4 Emergency Repairs to Roadways Completed.
  - SP 705-57-0006, La. 82 Rdwy Washouts,
    Proj Completed 9/29/2005 $32,128.47
  - SP 705-57-0005, La. 82 Backfill of Bridge
    Proj Completed 09/28/2005 $16,327.13
  - SP 705-57-0004, La. 3147 Agg Rdwy Repairs
    Proj Completed 10/06/2005 $67,931.29
  - SP 705-57-0003, La 3147 Agg Rdwy Repairs
    Proj Completed 10/31/2005 $67,460.32

Total Cost = $183,847.21
Dist 03 Hurricane Rita

- One Emergency Roadway Repair Contract is Ongoing.
  - SP 705-57-0007 La. 82 Agg Shld Repairs est. $996,997.60

- Contemplating adding 3 additional contracts for roadways that were inundated for sizable amount of time. Roadways are showing signs of deterioration.
  La. 91 & La. 3143 (South of Gueydan), La. 3147 (Freshwater City)

All Traffic Signals have been restored to operating condition.

Efforts continue throughout the district to straighten signage and signal heads.

Thank You.
Displaced Employees
EFFECTS OF HURRICANE RITA
DIST. 07 (2005)
Hurricane Rita
September 22, 2005
2 AM EDT Thursday
Current Location 24.8 N 87.6 W
Max Sustained Wind 175mph
Current Movement 9mph

National Hurricane Center Disclaimer: Depictions of forecast wind swaths are determined from radii that represent the maximum possible wind speed within each quadrant. Therefore, not all locations falling within a particular swath will experience the winds indicated by the swath.
Hurricane Rita
September 22, 2005
11 AM EDT Thursday
Current Location 25.4 N 88.7 W
Max Sustained Wind 165mph
Current Movement 9mph

Hurricane Warning
Trop.Storm Warning
Trop.Storm Watch
National Hurricane Center Disclaimer: Depictions of forecast wind swaths are determined from radii that represent the maximum possible extent of a given surface wind speed within each quadrant. Therefore, not all locations falling within a particular swath will experience the winds indicated by the swath.

Hurricane Rita
September 23, 2005
7 PM EDT Friday
Current Location 28.5 N 92.9 W
Max Sustained Wind 125mph
Current Movement 13mph
- Hurricane Warning
- Trop. Storm Warning

RITA #25 Strike Probabilities (Color=Ratio:Actual/Possible)
Holly Beach (before Rita)
Holly Beach (after Rita)
Holly Beach, LA
Cameron, LA
Hibernia Bank, Cameron, LA
Hackberry, LA
Roadway Damage
Roadside Debris
Isle of Capri Casino, Lake Charles, LA
Hibernia Bank, Lake Charles, LA
Lake Charles, LA
Cameron Storm Surge Debris Field, Big Lake, LA
NOAA Official Surveying Debris Field
Jerome Carter
Jerome Carter Home
Jerry Racca
Jerry Racca Home
David “Tiny” Morgan
District 62 Comes to Help
Gang 170 Design
Gang 510 Calcasieu Parish Maintenance
Gang 520 DeRidder
Gang 540 Jennings Maintenance
Gang 570 Creole Maintenance
Gang 580 Oberlin Maintenance
Gang 765 Herbicide
MOVABLE BRIDGE AND FERRY STATUS

Presented by:

Vincent Latino, Jr.
MOVABLE BRIDGES
OVERVIEW

- 152 Movable Bridges statewide
- 142 were in the affected area
- 52 were damaged to some degree
- Currently 1 is closed to marine traffic
- Approximately $22 million in damages
EXAMPLES OF DAMAGE

- Water damage to the electrical and mechanical systems
- Wind and water damage to operator houses
- Water and debris in mechanical and electrical systems
- Scour damage on the approaches (Chef Bridge)
Grand Chenier (Dist. 07)
Grand Chenier (Dist. 07)
Bayou Liberty (Dist. 62)
East Pearl (Dist. 62)
East Pearl (Dist. 62)
FERRY SYSTEM DAMAGE

- CCCD Ferry System in New Orleans.
- Monkey Island landing and vessel
- Cameron landings
- All back into full service (except for Monkey Island)
M/V BAILEY FERRY DAMAGE

The Monkey Island Ferry sunk in Lake Charles during the storm and the ferry barge was damaged.
The damage at this location was to the office and ferry landings.
FERRY RESCUE OPERATION IN NEW ORLEANS
Tuesday, August 30, 2005, 5 am – Received request to move two ferries from Plaquemine Ferry Landing in Plaquemine, LA to New Orleans to assist in rescue and recovery efforts.

Tuesday, August 30, 2005, 5 pm – Two ferries arrived in New Orleans.

Wednesday, August 31, 2005 – Started rescuing people out of St. Bernard.

Friday, September 2, 2005 – Sent three more ferries to aid in the rescue and recovery effort at the request of the USCG.


Sunday, September 4, 2005 – Discontinued rescue efforts (approximately 6000 people rescued with the ferries).

Monday, September 5, 2005 – Sent two landing barges from Reserve to New Orleans to set up car transportation service to St. Bernard via ferry in order to cross military and recovery vehicles.

Thursday, September 15, 2005 – Discontinued ferry service in New Orleans.

Friday, September 16, 2005 – All ferries back operating at normal locations.
SUMMARY

- Operated a maximum of 5 ferries and 2 landing barges during the emergency and recovery efforts.
- Transported approximately 6000 people across the river and out of St. Bernard.
- Provided water and first aid to public while being transported on ferries.
Transported rescue and emergency equipment across the river into St. Bernard.

Worked in direct cooperation with the U.S.C.G., National Guard, and local governments.
PROOF THAT EVERYONE AND EVERYTHING WAS EXHAUSTED
KATRINA & RITA
DEBRIS OPERATIONS
After the storm!
Where do you start?
Debris Field
First Pass Opens the Road and starts the Recovery!!!
LA 39 PLAQUEMINES
After the roads are open, you are just getting started!
Rigolets Bridge
BLACK BAYOU
KATRINA TIMELINE

- **8/29/05** – Katrina make landfall in Plaquemines Parish and rips through Districts 02 and 62.

- **8/30/05** – District forces start clearing roadways that are not flooded. Faxed bids to debris contractors for debris removal in Districts 02, 61, and 62. Bid by district.

- **9/2/05** – Districts have all roadways that are not flooded open for emergency traffic. Received bids from six debris contractors.

- **9/6/05** – Selected DRC of Mobile, AL as the contractor for District 02 and 62.
KATRINA TIMELINE (cont)

- **9/9/05** – Low bidder on District 61 contract withdrew bid and 2nd low bidder withdrew because of bond and insurance problems. Issued Notice to Proceed to DRC for debris removal in District 02 and 62.

- **9/12/05** – District 61 Maintenance forces start removing and hauling debris.
KATRINA TIMELINE (cont)

- **9/26/05** – District 61 removal contract re-bid.
- **9/28/05** – Bids opened for District 61 debris removal, Low bidder was Baton Rouge Tree Service (LA company).
- **10/5/05** – Issued Notice to Proceed to Baton Rouge Tree Service for debris removal in District 61.
RITA TIMELINE

- 9/25/05 – Rita makes landfall in Cameron Parish.
- 9/26/05 – District forces started clearing roadways of storm debris. Fax bid packages to six debris removal contractors for debris removal in District 07.
- 9/28/05 – Received bids and Asplundh Environmental was the low bidder for the debris removal in District 07.
- 9/29/05 – Districts have all roadways open for emergency traffic.
- 10/5/05 – Issued Notice to Proceed to Asplundh Environmental for debris removal in District 07.
Debris Removal and Disposal Questions

- In-house or Contract or a combination?
- FEMA Public Assistance or FHWA Emergency Relief Reimbursable?
- Eligible or Ineligible Debris?
- Leaners, hangers, stumps?
Debris Removal and Disposal

- Documentation needed for reimbursement (tickets, ticket summaries, reports, etc).
  - For each load of debris, one haul ticket is written at the loading area. The volume of the load is determined and ticket verified at the staging/reduction/disposal site.
Debris Removal and Disposal

It’s not simple!
Multiple Debris Streams
EMPIRE, LA
Debris Removal and Disposal

It’s not simple!

- Multiple Types (5) of Debris with separate disposal processes
What do you do with it after you pick it up?
## DOTD Disposal and Reduction Sites

<table>
<thead>
<tr>
<th>District</th>
<th>Certified Landfills</th>
<th>Temporary Staging &amp; Reduction Sites</th>
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<tr>
<td>02</td>
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<td>Total:</td>
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Debris Removal and Disposal

It’s not simple!

- Multiple Types (5) of Debris with separate disposal processes
- Finding and getting approval for Debris Disposal and temporary staging/reduction sites
Who owns this and how do we get it off our road?
Who’s responsible to remove it from the right-of-way?
Debris Removal and Disposal

It’s not simple!

- Multiple Types (5) of Debris with separate disposal processes
- Finding and getting approval for Debris Disposal and temporary staging/reduction sites
- Titled property (movable & previously immovable)
  - Owner identification
  - Insurance
  - Owner Notification
  - Responsibility
So what are the numbers??

- Over 3.6 million cubic yards of debris removed from DOTD roads and right-of-ways.
- At a total cost for all in-house and contacted debris removal and disposal work is approximately $132 million.
- And still counting!! Removal work continues in Districts 02, 07, and 62.
DEBRIS QUANTITIES

- 53,109 CY
- 779,683 CY
- 30,744 CY
- 45,697 CY
- 2,214,870 CY
- 480,524 CY
What did we learn from all of this?

- Be well prepared in advance!!!
  - DOTD has Retainer Debris Removal Contracts in place for all southern Districts
  - Each contract requires the submittal and preliminary approval of reduction, staging, and disposal sites
  - Development of Standard Operating Procedures for debris removal and disposal is underway