HURRICANE HARVEY FLOOD RECOVERY

PUBLIC/PRIVATE DAMAGE RECOVERY AND DEBRIS REMOVAL OPERATIONS

HARRIS COUNTY ENGINEERING DEPARTMENT – MAY 31, 2018
AGENDA

- **Overview**
- **Public Damage Recovery**
  - Overview
  - Buildings
  - Road & Bridge
  - Traffic Signals / Comms
  - Parks / Rec Facilities
- **Private Damage Recovery**
- **Debris Removal Operations**
OVERVIEW

HARRIS COUNTY, TEXAS

County Seat - Houston, TX
Population 4,589,928 (2016)
1,777 SQ MI
OVERVIEW

- 1,500 CHANNELS – 2,500 MI
- FLAT TERRAIN, CLAY SOILS
- 48 INCHES RAINFALL ANNUALLY
HURRICANE HARVEY OVERVIEW

- 1,000+ Year Flood Event
- 27 Trillion Gallons over 6 days (TX and LA)
- 33 Inches average depth (over 1,800 sq mi)
- 24+ Rain Gauges over 40 Inches (7-Day)
- Max Rainfall 47.4 Inches (HC)
  - 60.58 Inches (Nederland, TX)
- $125 Billion Damage
  - Katrina ($108B) - Maria ($99.5B) - Sandy ($71.4B) - Irma ($50B)
- Pre-Event Disaster Declaration (Individual Assistance - Federal/State/Local)
ORGANIZATION

- HCED Organization
- Public Damage Assessment
- Private Damage Assessment
- Debris Operations
- Communication/Operational Support
  - Call Center
  - GIS
  - Timesheets
  - Liaisons
PUBLIC DAMAGE RECOVERY
PUBLIC DAMAGE RECOVERY

OBJECTIVE:

- **Assessment and Repair Harris County Facilities and Infrastructure**
  - Buildings, Traffic Signals, Roads, Bridges, Parks, Etc.
- **Tracking of Inspection, Funding, Repair Work, FEMA/FHWA Reimbursement**
PUBLIC DAMAGE RECOVERY
IMMEDIATE ACTIONS

72 hours
All 900+ traffic signals were inspected and in safe condition

5 days
13,556 lane miles and 836 bridges were inspected for damage

6 days
All 180+ Harris County operated buildings were assessed for damage and all damaged structures were already repaired or in proposal process for repairs

2 weeks
All road washouts and damaged bridges were repaired to safe working conditions
# Public Damage Recovery

- **Master Spreadsheet for Tracking Damages / Repairs / Reimbursement**
- **Started with 10 Items - grew to 445**
- **Tracked repairs for all clients (Precincts, HCTRA, CSD, FPM, Fleet Services, Library, etc)**

## Damages Identified → Inspection/Assessment → Competitive Bid On-Call Contracts → Work Completed → Apply for Reimbursement

<table>
<thead>
<tr>
<th>Labor Key: MAA</th>
<th>Reimbursable Items</th>
<th>Address</th>
<th>City</th>
<th>Zip</th>
<th>Length</th>
<th>Described Damage</th>
<th>Approx. Cost</th>
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<td>240904</td>
<td>Rusk Rd</td>
<td>Houston</td>
<td>77005</td>
<td>26.294088</td>
<td>Bridge sustained critical damage</td>
<td>20,000.00</td>
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<td>3 C</td>
<td>240905</td>
<td>Northcliffe Bayou Drive and Loop School Rd</td>
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<td>77005</td>
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<td>Bridge sustained critical damage</td>
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<td>240906</td>
<td>Briarwood Rd at Mason Creek</td>
<td>Katy</td>
<td>77494</td>
<td>29.438705</td>
<td>A bridge over a road at Mason Creek</td>
<td>20,000.00</td>
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<td>240907</td>
<td>362000 Rd at South Yates Creek</td>
<td>Clay Rd</td>
<td>Houston</td>
<td>77086</td>
<td>29.302379</td>
<td>After the water had receded, there were lines</td>
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<td>240908</td>
<td>Wichardi Dr NW at Greens Bayou</td>
<td>Wichardi Dr</td>
<td>Houston</td>
<td>77064</td>
<td>29.109625</td>
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<td>7 C</td>
<td>240909</td>
<td>Campaign Dr at Eagle Creek</td>
<td>Hunters Creek</td>
<td>Houston</td>
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<td>29.302379</td>
<td>The bridge bank at the northeast corner</td>
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<td>North Rd at South Yates Creek</td>
<td>Clay Rd</td>
<td>Houston</td>
<td>77086</td>
<td>29.302379</td>
<td>A bridge over a road at Mason Creek</td>
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*Note: All damages are critical and require immediate attention.*
PUBLIC DAMAGE RECOVERY

INITIAL EVALUATION / INSPECTION (SAFETY)

- Reports from Constituents, Employees, Clients, Officials, Etc.

BUILDINGS
- Roof Leaks
- Standing Water
- Ceiling Tiles Destroyed
- High Water Damage
- Fence Damage
- Sublevel Flooded

ROAD & BRIDGE
- Bridge Sustained Erosional Damage
- Road Washout
- Depression in Roadway
- Pedestrian Rails Destroyed
- Fallen Trees in Roadway
- Sinkhole

TRAFFIC SIGNALS
- Signal Heads Damaged
- Controller Cabinet Misaligned/Flooded
- Signal in Red Flash

PARKS
- Debris/Sewage on Surface
- Concrete Pads Destroyed
- Benches Destroyed

COMMON:
- Area Flooded, Inaccessible, Evaluation Not Possible
PUBLIC DAMAGE RECOVERY

APPLICATION PHASE – 30 DAYS POST-HURRICANE

- FEMA Kickoff Briefing
- 60 Days to Identify Damages
- Assessments 75% Complete (Addicks/Barker remaining)
PUBLIC DAMAGE RECOVERY
BUILDINGS & EQUIPMENT
PUBLIC DAMAGE - DOWNTOWN

DOWNTOWN ESTIMATE:
REMEDICATION – $50M
MITIGATION – $25M
TOTAL – $75M
Outlying Facility Estimate:
Remediation - $25M
Mitigation – $25M
Total - $50M
PUBLIC DAMAGE RECOVERY BUILDINGS

- **Jury Assembly – 1201 Congress Avenue**
- **Criminal Justice Center – 1201 Franklin Street**
- **Annex 21 (Wilson)**
- **Annex 27 (Peden)**
Criminal Justice Center – 1201 Franklin Street

- District Attorney Offices
- Criminal Courts
PUBLIC DAMAGE RECOVERY

Criminal Justice Center – 1201 Franklin Street

What Happened:

• 21-IN Flooding (Basement) / 2-in 1ST Floor
• Water Pump Control Boards Damaged (Basement)
• Flooding on 21 Floors
• 150,600 SF Damaged
PUBLIC DAMAGE RECOVERY

Criminal Justice Center – 1201 Franklin Street

Solution:

• Continuity of Government / Personnel relocation
• $70M + repairs
• Timeline (next slide)
• Status (next slide)
# PUBLIC DAMAGE RECOVERY

## CJC Current Status

- 8 floors have a high level of damage
- 11 floors have some damage
- 2 floors have minimal damage
- 3 elevators are operational
- 2 are semi-operational
- 10 are non-operational
JURY ASSEMBLY – 1201 CONGRESS AVENUE

- 33,000 SF
- THREE FLOORS (MAJORITY SUB LEVEL)
- DISTRICT CLERK
- TUNNEL ACCESS (SUBMARINE DOORS)
PUBLIC DAMAGE RECOVERY

JURY ASSEMBLY – 1201 CONGRESS AVENUE

WHAT HAPPENED:

• 10-FT FLOODING – STRUCTURE AND TUNNELS
• FLOODING THROUGH UTILITY VAULT
• DAMAGED MEP / ELEVATORS / AUDITORIUM / FIRE ALARMS etc
• 31,000 OF 33,000 SF DAMAGED (94%)
PUBLIC DAMAGE RECOVERY

JURY ASSEMBLY – 1201 CONGRESS AVENUE

SOLVING THE PROBLEM:

• ENTIRE LOWER FLOOR REMOVED/REPLACED
• IMPROVE TO CURRENT CODE
• ESTIMATED 14 MONTH DURATION
• JURY ASSEMBLY RELOCATED
• $20M+ REPAIR COST
• DESIGN PENDING AS OF MAY 2018
ANNEX 21 (WILSON)

- 16-FT FLOODING / 52,000 SF (BASEMENT AND SUB-BASEMENT)
**PUBLIC DAMAGE RECOVERY**

**Annex 27 (Peden)**

- **17-ft Flooding / 39,000 SF**
PUBLIC DAMAGE RECOVERY

SUMMARY

- Downtown Facilities – $75M
- Outlying Facilities – $50M
- Facilities Total – $125M
- Contents and Furnishings (10%) – $12.5M
- Disaster Related Engineering /Architecture Fees - $10M
- Temporary Relocation, Leases and Moving - $5M

- **Total Estimate** – $152.5M

- **Why does this take so long?**
  - Insurance, Federal Relief Finds, Desired Improvements, Complex Mechanical Systems, ETC
PUBLIC DAMAGE RECOVERY
ROAD & BRIDGE

- 146 DAMAGED ROADS / BRIDGES
- COSTS OVER $38M (ONGOING)
- LESS THAN $50,000 COST VS MAJOR REPAIR COST
PUBLIC DAMAGE RECOVERY

- **146 Damaged Roads as of 9/25**
- **Costs over $38M (Ongoing)**
- **Less than $50,000 Cost vs Major Repair Cost**
HCED ACCOMPLISHMENTS

ROAD AND BRIDGE

- Organized Effective Evaluation Teams followed by HCED PM/Contractor Repairs
- Quickly repaired 12 washed out roads and 32 flood damaged bridges (approx. 90 days)
- Inspected and repaired a total of 73 Roads
- Inspected 886 bridges in a 2 week timeframe
- Most Notable included:
  - Lynchburg Ferry ($10 million)
  - Market Street: ($1.8 Million)
  - Garrett Street: ($950K)
  - Clay Road over South Mayde Creek: ($310K)
HCED ACCOMPLISHMENTS

Market Street
Section of Road (250’ x 200’)
Four-way intersection washed out.
Roadway re-open 120 days later
HCED ACCOMPLISHMENTS

Garrett Street
2 Sections of Road
Total Area (300’ x 25’) Washed out
Repaired in less than 90 days
Cost: $928,000
HCED ACCOMPLISHMENTS

Louetta Rd. over Seals Gully (K124-00-00)

- Erosion at Embankment
- Exposed and Undermined Abutment Piles
- Debris Build Up
HCED ACCOMPLISHMENTS

Ella Blvd. over Seals Gully
(K 124-00.00)

- Exposed Piles at Bridge Abutment
- Erosion at Embankment
PUBLIC DAMAGE RECOVERY
TRAFFIC SIGNALS / COMMUNICATIONS
PUBLIC DAMAGE RECOVERY
TRANSPORTATION ASSET SUMMARY

- 1,300+ CENTERLINE MILES OF ROADS MAINTAINED
  - AADTs up to 50,000 VPD
  - MAJORITY ARE LOCAL ROADS
  - WIDE RANGE OF AGES, ORIGINAL DESIGN CRITERIA
- 800+ BRIDGES
- 2 FERRY BOATS AT LYNCHBURG
- 900+ TRAFFIC SIGNALS
- 500+ SCHOOL ZONE FLASHERS
- 250 MILES +/- OF FIBER OPTIC CABLE FOR ITS AND SIGNAL OPERATIONS
- 8 MAJOR COMMUNICATIONS HUB BUILDINGS

NOTE: THIS LIST DOES NOT FULLY INCLUDE HARRIS COUNTY TOLL ROAD ASSETS
DAMAGE ASSESSMENT FORMS

PRELIMINARY DAMAGE ASSESSMENT
(INFRASTRUCTURE DAMAGE - PUBLIC PROPERTY)

COUNTY: HARRIS  PRECINCT:  ID NUMBER:

STREET ADDRESS:

Electrical Power Status
Active  Outage

Cause of Damaged
Water  Wind  Fire  Other

Damaged Infrastructure
Electrical Service Assembly  Controller Cabinet
Controller Unit  Ground/Pull Box(es)
Comduct  Wires  Mast Arm(s)
Luminaire Arm(s)  Canopy System
Signal Head(s)  PED Signal Head(s)
PED Push Button(s)  Luminaire Head(s)
Sign Light  Signs
Mounting Hardware  Fiber Optic Cable
Message Cable  Splice Enclosure
CCTV Camera  Other
Other

Damage Category
(Choose one box only)

Not Functional, Not Repairable (Destroyed)  $1,000 - $10,000
Not Functional, But Repairable (Major Damage)  $10,000 - $25,000
Functional with Light Damage (Minor Damage)  $25,000

Estimated Repair Cost
< $1,000

Detailed Information

Describe the damage:

Describe adverse impact on essential facilities and services:

Name of Assessor:  Date:

Traffic Signal Reconnaissance and Reporting

Purpose: To observe damaged Harris County traffic signal locations and report. Please take into account your safety and accessibility.

Link to Traffic Signal Locations:
- Map of Harris County Traffic Signal Locations
  - [http://traffic.houstontrans.com/signallmap/](http://traffic.houstontrans.com/signallmap/)
- List of Harris County Traffic Signal Locations
  - [Attached File]

Set of Instructions:
- Observe existing traffic signals and identify any potential damage issues with the following questions:
  - Is the signal flashing red? Yes or No
  - Is the signal operating and functioning? Yes or No
  - Is the current water level above the line depicted below on controller cabinet? Yes or No
  - Is there a water mark above the line depicted below on controller cabinet? Yes or No

Traffic Signal Controller Cabinet:

Damage report:
- Damage reports should be emailed to [TrafficDamage@hncpd.org](mailto:TrafficDamage@hncpd.org) with identified location and pictures (if available)
- Immediate safety hazards should be reported by phone to 713-881-5213
HCED ACCOMPLISHMENTS

TRAFFIC SIGNALS / COMMUNICATIONS

- Inspected over 900 signals in 4 days
- Inspected 347 communication locations in 2 weeks
- Replaced 58 damaged signal cabinets
- Repaired/Replaced 95 damaged communication locations
- Completed $4 Million in repairs
PUBLIC DAMAGE RECOVERY

PARKS

- Parks / Recreational Facilities
- 116 Damaged
- Trail Systems, Lift Stations, Buildings,
- $9.3M Damage
PUBLIC DAMAGE RECOVERY - SUMMARY

• **Emergency Protective Measures (Prior to Hurricane Landfall)**
  - **Traffic Signals Funding** ($4 mil)
  - **Strategic Placement of Mobile Water Pumps**
  - **Roof Checks and RTU Tie Down Checks**
  - **Tunnel Flood Doors Inspection and Testing**
  - **Facility Flood Doors Inspection and Testing**
  - **Placement of Sandbags and Barriers**
  - **Schedule Planning for 24/7 Manning**
  - **Strategic Vehicle Placement**
  - **Strategic Placement of Supplies and Radios**
  - **Thousands of Overtime Hours** ($10 mil)

• **$15M Cost**
PUBLIC DAMAGE RECOVERY - SUMMARY

Cost Summary

- **Category A: Debris Removal** - $110M
- **Category B: Emergency Protective Measures** - $15M
- **Category C: Roads and Bridges** - $38M
- **Category D: Water Control Facilities** - $33M
- **Category E: Building and Equipment** - $152.5M
- **Category F: Utilities** - $50,000
- **Category G: Parks, Rec. Facilities, and Other Facilities** - $9.3M

**All Categories: Total Estimate - $358M**
PUBLIC DAMAGE RECOVERY - SUMMARY

REPAIR / REIMBURSEMENT – ONGOING

MASTER LIST / TRACKER – 445 FACILITIES ISSUES DURING REPAIR: STREET / BUILDING NAMES

- 1310 PRAIRIE
- ANNEX 44
- ANDERSON CLAYTON BUILDING
- COTTON EXCHANGE

- MASTER LIST & TRACKER = ONE PROJECT, PM, & CONTRACTOR
PUBLIC DAMAGE RECOVERY - SUMMARY

LESSONS LEARNED

(*) IDENTIFIED INSPECTION TEAMS PRIOR TO LANDFALL (P.E. + DRIVER)

(*) ON-CALL CONTRACTS (COMPETITIVE BID CONTRACTS, LABOR CONTRACTORS, MATERIAL, ETC)

(*) MASTER LIST / TRACKER

- ONE PROJECT, PM, & CONTRACTOR

(*) TRACKING SOFTWARE - REQUIREMENT

(*) IDENTIFY FACILITY OWNERS FOR REIMBURSEMENT

(*) PUBLIC INFORMATION RELEASE
PRIVATE DAMAGE RECOVERY
PRIVATE DAMAGE RECOVERY

- **Purpose** — Identify Flooded Structures (Private & Commercial) and determine Extent of Damage
  - Sequence for Reimbursement
  - Issue Permits for Home Repair
  - Visibility of Government
  - Create Records of Flood Damage
    - Backup for Insurance / FEMA Claims
  - Refer Constituents to Charity / Emergency Organizations
  - Substantially Damaged Homes / Floodplain Management
PRIVATE DAMAGE RECOVERY

- PHASE I – VISUAL ASSESSMENTS (HOUSE COUNTS)
  - DEPTH OF FLOODING FROM FINISHED FLOOR
  - OPERATIONS TEAM & 150+ INSPECTION TEAMS
  - CRISISTRACK / MOXTRA
- PHASE II – DAMAGE ASSESSMENTS / RSDE / PERMITTING
  - FEMA RSDE CALCULATOR
- CALL CENTER
- QA/QC
- SUBSTANTIAL DAMAGE
PRIVATE DAMAGE RECOVERY

PHASE 1 – VISUAL ASSESSMENTS (HOUSE COUNTS)

• ASSIGNMENTS BASED ON 3 LAYERS:
  • 100/500 YR FLOODPLAIN
  • HISTORICAL FLOODING DATA
  • INUNDATION LAYER / RIVERINE FLOODING (HCFCD)

• ADDITIONAL METHODS:
  • SELF REPORTS
  • FEMA CLAIMS
  • PRIORITY CALLS

• CRISIS TRACK – INSTANT REPORTS – DAILY REPORTS % OF
  TOTAL EXPECTED
  • EXPECTED 50-80,000 FLOODED HOMES, 15,000 AS OF 9/16 = 19%
    COMPLETE, ETC
  • 30,000 FLOODED HOMES
PRIVATE DAMAGE RECOVERY

• PHASE I – VISUAL ASSESSMENTS (HOUSE COUNTS)
  • NO CHANCE OF SUBSTANTIAL DAMAGE
    • **Automatic Permit & No Inspection**
      • $50,000+ / Less than 18”
      • $150,000 - $300,000 / Less than 36”
      • $300,000+ / Less than 8-ft
      • 2 Story / Less than 8-ft
  • **500,000+ Homes checked for damage**
PRIVATE DAMAGE RECOVERY

• CRISISTRACK – Tasks and Assignments
• Electronic RSDE Forms
PRIVATE DAMAGE RECOVERY

- CRISISTRACK
PRIVATE DAMAGE RECOVERY

• PHASE II – DAMAGE ASSESSMENTS / RSDE / PERMITTING
  • RESPONSE TIME 20 MINUTES
    • VS Scheduling during 2016 TAX DAY FLOODS
  • FEMA RSDE CALCULATION
  • PERMIT ISSUED 1-2 DAYS AFTER INSPECTION
  • CALL CENTER FOLLOWUP IF NECESSARY

• OPS PROJECTIONS BASED ON HISTORICAL DATA / CURRENT WORKFLOW
  • 10 Inspection per Team-Day x 50 Teams = 500 Inspections per Day
  • 7 Inspection per Team-Day x 150 Teams = 1,050 Inspections per Day
PRIVATE DAMAGE RECOVERY

• RESULTS
  • Issued 29,191 Permits
  • 250+ Substantially Damaged Homes
• QA/QC
• SUBSTANTIAL DAMAGE
  • 250+ Homes, Ongoing Discussion
• Voluntary Buyout Program
PRIVATE DAMAGE RECOVERY

LESSONS LEARNED

(+) SOFTWARE TRACKING FOR PH 1 VA AND PH 2 DA
(+) COMMUNICATION (MOXTRA)
(+) D.A.R.E. DEVELOPMENT FOR 2018/2019 FLOOD EVENT
(+ ) ANNUAL TRAINING
(+ ) PUBLIC INFORMATION RELEASE

(-) MULTIPLE PLATFORMS (CT, MOXTRA, ePERMITS, DEBRIS TRACKER, ETC)
(-) PRE-SEASON TRAINING (3/20/2018)
DEBRIS REMOVAL OPERATIONS

- **FEMA Public Assistance Debris Management Guide – 2007**
- **FEMA encourages State and local governments to take a proactive approach to coordinating and managing debris removal operations. Communities with a debris management plan are better prepared to:**
  - **Restore public services**
  - **Ensure public health and safety in the aftermath of a disaster**
  - **Receive the full level of assistance available to them from FEMA and other participating entities**

- **FEMA Debris Guide: framework and eligibility requirements for reimbursement under FEMA Public Assistance Program – 90% FEMA / 10% State for Harris County**
DEBRIS REMOVAL OPERATIONS

ELIGIBILITY FOR FEMA PUBLIC ASSISTANCE PROGRAM REIMBURSEMENT

• **Work**
  - Required as a result of disaster event
  - Located in designated disaster area
  - Legal responsibility of applicant

• **Public Interest**
  - Eliminate threats to life / public health / safety
  - Eliminate threats of damage to public/private property
  - Ensure economic recovery

• **Reasonable Cost**
  - Fair and reasonable costs
  - Historical / published data / similar work / FEMA rates

• **Environmental Considerations**
  - NEPA
  - Clean Water Act
  - NHPA
  - Executive Orders

• **Other Federal Agencies**
  - FHWA
  - USACE
  - EPA
  - HUD
# DEBRIS REMOVAL OPERATIONS

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<th>November 2017</th>
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- **Contractor:** DRC
- **Monitor:** TetraTech
- **Harris County Operations Teams:**
  - 25 Harris County Inspectors (QAQC)
- **Goal:** Debris Removed by Thanksgiving
- **10 DMS Sites**

- **Resources and Personnel:**
  - 200 Certified Haulers / 300 Units
  - One Monitor (TetraTech) per Hauler (DRC)
    - Real-Time Tracking
  - Precinct Road and Bridge Crews
  - Local Contractors
DEBRIS REMOVAL OPERATIONS

**Total Debris Hauled**

1,183,511 CY

**$40M**
DEBRIS REMOVAL OPERATIONS

- **Hauler (Knuckleboom Trucks) and Units**
  - 60-100 CY per Large Unit / 10-15 CY per Small Unit / 1 CY per TxDOT Hauler
  - 35 CY Average per Debris Pile = Multiple Trips per Truck for one structure
DEBRIS REMOVAL OPERATIONS

- **Debris Management Sites (DMS)**
  - **Store, Reduce, Segregate, Process**
    - **Debris before Final Disposal**
  - **Flexibility (Public Use)**
  - **Recycling / Reduction / Separation**
  - **Expedition of Debris Collection / Removal**
- **DMS Site Identification and Contracts – Ownership, Size, Location, Environmental Concerns**
- **Permitting and Monitoring**
DEBRIS REMOVAL OPERATIONS
HARRIS COUNTY DEBRIS REMOVAL

Attention Property Owner: At this time your Hurricane Harvey storm debris is not able to be picked up due to it being past the public right of way and/or obstructed by a fence. Please have all Harvey Debris out on the public right of way (at the curb) by November 5th 2017. The final Harvey debris pick up will be between the week(s) of November 6th and November 13th, 2017.

ALL HARVEY DEBRIS MUST BE SEPARATED INTO PILES BY TYPE*

*Appliances, Construction, Electronics, Vegetative, and
*For Household Hazardous Waste, call 713-274-3880

Separating Your Debris

1. NO PICKUP ZONE: Heaps of debris are too high to be picked up. Please do not block any public roadways. It is your responsibility to pick up your debris.
2. NO PICKUP ZONE: Debris are placed in mattresses or other objects that cannot be picked up.
3. NO PICKUP ZONE: Garbage bags are not picked up.
4. NO PICKUP ZONE: Large items over 3 feet in any dimension are not picked up.

Separando Sus Escombros

1. ZONA QUE NO SE RECIBE: Montones de escombros son demasiado altos para ser recogidos. Por favor no bloquee ninguna carretera pública. Es su responsabilidad recoger sus escombros.
2. ZONA QUE NO SE RECIBE: Escombros están colocados en colchones o otros objetos que no pueden ser recogidos.
3. ZONA QUE NO SE RECIBE: Bolsas de basura no son recogidas.
4. ZONA QUE NO SE RECIBE: Objetos grandes de más de 3 pies en cualquier dimensión no son recogidos.
DEBRIS REMOVAL OPERATIONS

• **Challenges**
  - **Constituent / Client Expectations**
  - **Private / Gated Communities / HOA / Right of Entry**
  - **HHW**
DEBRIS REMOVAL OPERATIONS

LESSONS LEARNED

(*) MANAGEMENT TEAM PLANNING / MONITORING / CONTROLLING
(*) COMMUNICATION (MOXTRE)
(*) TRUCK CERTIFICATION AND STAGING (PINEMONT FACILITY)
(*) PUBLIC INFORMATION RELEASES

(*) PRE-IDENTIFIED DMS SITES
(*) EVENT TOO LARGE FOR PLANNED APPROACH (CONTRACTORS, FACILITIES, ETC)
(*) COMPETITION WITH ADJACENT EVENTS
(*) PUBLIC INFORMATION RELEASE
HURRICANE HARVEY FLOOD RECOVERY

• **Harris County Engineering Department**
  • Jonathan D. Steiber, P.E., CFM (Private Damage) – Construction Programs
    • [Jonathan.Steiber@hcpid.org; 713-274-1495](mailto:Jonathan.Steiber@hcpid.org)
  • Aubrey D. Semien II, P.E., CFM (Public Damage) – Facility Property Management
    • [Aubrey.Semien@hcpid.org; 713-274-3670](mailto:Aubrey.Semien@hcpid.org)
  • Danielle Cioce, MS, PMP (Debris Operations) – Watershed Protection Group
    • [Danielle.Cioce@hcpid.org; 713-274-3762](mailto:Danielle.Cioce@hcpid.org)