The Basics of Storm Mitigation
– Good Urban Forest Management

Purdue Road School
March 10, 2010
Presented by Davey Resource Group

The Calm

The Storm!
The Calls!!!

“About the time we think we can make ends meet, somebody moves the ends”

– Herbert Hoover

If Only......

A brief survey indicated these were the “lessons learned” after storms.

What could I have done differently?

- Had a Emergency Response Plan
- Had an inventory of resources and contacts
- Handled PR better
- Kept better records for accounting

What’s the solution?

Good, basic urban forest management program

Emphasize tree risk management

Goals:

- Increase Public Safety
- Increase Tree Health & Sustainability
- Increase Inter-Agency Coordination
- Increase Public Awareness
Prevention & Readiness
What can you do:
- Before
- During
- After
- Tools

“Before” Tasks to Manage Risks
Planting
Plant storm-resistant species

“Before” Tasks to Manage Risks
Maintenance
Training Pruning
“Before” Tasks to Manage Risks

Maintenance
Preventive Maintenance
7 to 10 year cycle

“Before” Tasks to Manage Risks

Inventory

“Before” Tasks to Manage Risks

Training
Hazard Identification
Risk Assessment
“Before” Tasks to Manage Risks

Inspection & Monitoring

Create an Emergency Response and Recovery Plan - 6 Steps

1. Assemble a team
2. Assess your urban forest
3. Assess your other resources
4. Know the roles and procedures of all key players
5. Determine funding needs
6. Perform public relations
Emergency Response Plan Tasks

Task 1
Assemble a team
- Urban Forester
- Public Works
- Safety
- Utility Company

Emergency Response Plan Tasks

Task 2
Assess your urban forest
- General characteristics
  - Condition
  - Species
  - Size
- Critical areas

Emergency Response Plan Tasks

Task 3
Assess other resources
- City staff and equipment
- Utility company resources
- Contractors
- GIS information
- Wood waste storage/processing areas
Emergency Response Plan Tasks

Task 4
Know the roles and procedures of all key players
- Local government
- Utility companies
- County government
- State government
- Federal government

Task 5
Determine funding needs
- Sources and access
- Costs of hazard reduction and wood waste processing
- Purchasing protocols and contracts

Task 6
Perform public relations
- Educate the citizens about your emergency response services
- Make contact with local TV and newspaper reporters
- Prepare emergency PSA and notices
Interim Solutions

Don’t have the time, money, or resources to do a full-fledged Emergency Response Plan?

At least have these things...

Create a Contact List

<table>
<thead>
<tr>
<th>Key Staff and Partner Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
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<tr>
<td>--------------</td>
</tr>
<tr>
<td>President</td>
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<tr>
<td>CFO</td>
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</tbody>
</table>

Create an Equipment Inventory

<table>
<thead>
<tr>
<th>Equipment Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Chain Saw</td>
</tr>
<tr>
<td>Tractor</td>
</tr>
<tr>
<td>Loader</td>
</tr>
<tr>
<td>excavator</td>
</tr>
<tr>
<td>crane</td>
</tr>
<tr>
<td>truck</td>
</tr>
<tr>
<td>crane</td>
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<td>truck</td>
</tr>
</tbody>
</table>
Have a Response Priority System:

In general, the priority ranking of storm call response follows:

- Trees down, injured people caught in a car or home.
- Trees down blocking street on priority list.
- If multiple priority streets are blocked, locations nearest to emergency facilities to be removed first.
- Trees split or hanging, which have a high probability of falling, causing personal injury or property damage.
- Public trees that have fallen and are at rest on homes.
- Trees or branches that have fallen and are blocking driveways.
- Trees or branches that have fallen and are blocking non-priority streets.
- Trees or branches that have fallen and are at rest on a shelter or comfort station.
- Trees or branches that have fallen and are blocking sidewalks.
- Trees or branches that have fallen and are at rest in lawns or tree lawns.

Plan Response By Storm Category:

Class I – Storm Mitigation Procedures

- Urban forestry staff receives calls/reports from citizens and city agencies.
- Urban forestry staff inspects and determines appropriate mitigation; utility companies are called as required.
- Urban forestry staff and/or contractors immediately resolve damage and dispose of debris.
- Urban forestry staff performs a final inspection, completes a storm damage form, and files a report in the urban forest database.

Detail Response By Storm Category:

Class II - Storm Mitigation Procedures

- Urban forestry staff assesses damage and communicates with Public Works, Public Safety, and utility companies to determine the extent of the damage.
- Urban forestry staff secures approval from the director/city manager to create a partial ECC and coordinate with other departments.
- Urban forestry staff and Public Works coordinate and create a partial ECC located at a facility to receive calls/reports and to coordinate mitigation response. Urban forestry assigns a staff member to be present at the ECC facility during the initial storm clean-up to assist the city’s customer service staff.
- Urban forestry secures regional debris disposal sites as needed.
- Urban forestry staff inspects damage, determines mitigation levels and needs, and sets work priorities.
Detail Response By Storm Category:

Class II - Storm Mitigation Procedures
– contd.
• Urban forestry and Public Works combine sufficient and appropriate personnel and equipment resources under the guidance of the City Forest Manager.
• Urban Forestry, Public Works, and contractual staff resolve damage, process debris on site, where appropriate or transports debris to storage site.
• Urban Forestry staff makes final inspection, completes the storm damage form and updates the storm damage database, and reports to Public Works the locations and costs of storm mitigation from private property.
• Debris is processed appropriately.

Detail Response By Storm Category:

Class III - Storm Mitigation Procedures:
• Urban forestry staff assesses damage and immediately communicates with Public Works, Public Safety, utility company to determine the extent of the damage.
• Park staff communicates the severity of damage to the Director.
• Urban forestry and other city agencies communicate with the City Manager the need to mobilize a full EOC.
• Full EOC is mobilized and is operational. Urban forestry assigns a staff member to be present at the EOC facility during the entire storm clean-up to assist the EOC staff and department representative.

Detail Response By Storm Category:

Class III - Storm Mitigation Procedures:
• Urban forestry staff assesses damage and immediately communicates with Public Works, Public Safety, utility company to determine the extent of the damage.
• Park staff communicates the severity of damage to the Director.
• Urban forestry and other city agencies communicate with the City Manager the need to mobilize a full EOC.
• Full EOC is mobilized and is operational. Urban forestry assigns a staff member to be present at the EOC facility during the entire storm clean-up to assist the EOC staff and department representative.

• Urban forestry secures regional tree debris disposal sites as needed.
• Urban forestry staff inspects tree-related damage, determines mitigation levels and needs, and sets work priorities.
• Urban forestry, Public Works, and other city agencies combine sufficient and appropriate personnel and equipment resources under the guidance of the Urban Forester to mitigate tree-related situations.
**“During” Tasks to Manage Risks**

- Inspection & Supervision
- Emergency Command Center
- Communication

**“After” Tasks to Manage Risks**

1. Public Relations
2. FEMA Reporting
3. Wood Waste Utilization
4. Updating Inventory
5. Training

**“After” Tasks to Manage Risks**

**Public Relations**

- Publicize contacts and phone numbers
- Work with the media to send useful messages
- Tell the public how they can help
- Promote professional damage assessment
Reporting and Updating the Inventory
- Keep accurate tree damage records
- Keep accurate financial records
- Update your inventory

Wood Waste Utilization
- Monitor your yards
- Contract as needed
- Recycle or sell products

Training
- Damage Assessment
- Tree Risk Assessment
- Tree Loss Valuation
- Safe Work Practices
Don't Despair!

You Can Do It!

Resources

- USFS Storm Damage Assessment Protocol
- Trees and Ice Storm Guide
- USFS Urban Tree Risk Management Guide
- FEMA Debris Management Guide
- Urban Forestry & Storm Damage Consultants
- Arboricultural Industry Resources
- State and Federal Resources
i-tree Storm Damage Utility

http://www.itreetools.org/applications/sdap.shtm

USFS Urban Tree Risk Management Guide

http://www.na.fs.fed.us/spfo/pubs/uf/utrmn/

Trees and Ice Storms Guide

http://www.ag.uiuc.edu/~vista/abstracts/aicestorm.html
Chapter 2

PRE-DEADSEL PLANING

Major natural disasters can generate enormous volumes of debris in short periods of time. Debris clearance, removal and disposal operations must be implemented quickly to expedite recovery operations and to protect public health and safety of the local population. However, the speed of initial debris clearance, removal and disposal operations depends upon the depth of pre-disaster planning by local, tribal and State Emergency Managers.

http://www.fema.gov/government/grant/pa/index.shtm

More Help:

Consulting urban foresters
http://www.asca-consultants.org

Davey Resource Group
http://www.davey.com/DRG

Treelink database
http://www.treelink.org/docs/res_weather.php

More Help:

State Offices
State coordinator for urban and community forestry – Pam Louks, urbanforestry@dnr.IN.gov
www.in.gov/dnr/forestry
State emergency office – Indiana State Emergency Management Agency
www.ai.org/sema/index.html

Federal Resources
Storm Damage Resource Center
http://www.umass.edu/urban/icestorm/v
Storm Damage Assessment Protocol

**i-Tree Storm**

Developers:
- USDA FS, Northeastern Area, Center for Urban & Community Forestry
- Davey Resource Group

Storm Damage Assessment Protocol Utility

- Standardized method to assess widespread storm damage in a simple, credible, and efficient manner immediately after a severe storm.
- Adaptable to various community types and sizes, and provides information on the time and funds needed to mitigate storm damage.

What’s this all about?

- Easy and accurate estimate
  - Tree storm damage
  - Costs for recovery
- Data quality and integrity
- Simple method
- Quick reporting

Context of use

- Planning
  - Framed by overall natural disaster plan
    - FEMA funding: Pre-Disaster Mitigation Program
    - Tree Emergency Plan Worksheet (Burban)
- Recovery
  - First 24 hours
  - Response to state emergency agency

Pre-storm setup

- Create random sample
  - Before emergency!
    - Use electronic or manual means
  - Measure tree density and size class
    - Within ROW
    - Also 50’ back from ROW edge
- Take final steps
  - Pre-Storm report form: useful estimate
  - Storage for future use
Pre-Storm Sampling

Post-storm work
- Revisit sample segments
  - Record for all trees within 50’ of ROW
  - Choose method of estimating debris (by segment)
    - Indirect by average crown loss class
    - O-25%, 26-50%, etc.
    - Historical records form basis
    - Loss category images available from FS
  - Direct as CY of debris
    - Hazard pruning by size class
    - Hazard removal by size class
- Paper or PDAs
- Enter data, report results

Spreadsheet
- Estimator built as Excel® spreadsheet
  - 6 worksheets
    - Home/ReadMe – navigation, help
    - PreStorm Data – setup data
    - PreStorm Analysis – preliminary analysis
    - PostStorm Data – damage data
    - PostStorm Analysis – report form
    - Codes, lookup tables – functional elements
Reporting Procedure

- Estimation
  - Starts with field data
  - Uses local costs
  - Scales up with simple formulas
- Calculation page = report
  - Credibility
  - Ease, speed

Validation

- Sampling indicated on report
  - Means of random sampling
  - Percent of street miles sampled
- Numbers derived right on sheet
  - Debris
  - Pruning, removal
- Local costs shown

For All Your i-Tree Needs:
www.itreetools.org

Storm Damage Assessment Protocol

i-Tree Storm
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