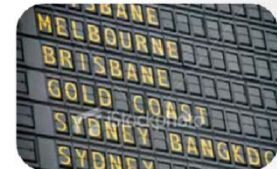# Emergency Response for Demand Response Transportation Systems

Trapeze Rapid Response

Tony Kendall

Introduction

- Every transit system deals with a variety of incidents which impede regular service (from accidents to floods).

- Demand Response agencies must react in a dynamic manner to ensure customer safety, satisfaction and operational efficiency.

- It is critical to be able to respond quickly and efficiently in the face of adverse operational conditions.

Disruption and Emergency Types

- A **general service disruption** is one which significantly affects regular operation of transit in that the affected area is either temporarily unusable or severely compromised. These require DR vehicles to avoid the interference zones. Examples include:
  - Major traffic accidents
  - Road closures
  - Protests/Rallies
  - Parades and planned events
- A **localized emergency** is one which may require evacuation / avoidance from a neighborhood to elsewhere within the service area. Examples may include:
  - Toxic gas leak from a rail car or plant
  - Broken water main
  - Widespread/Suspicious Power Outage
  - Bomb Threat
  - Tornado
- A **regional disaster**, by contrast, is one that affects the entire service area. Regional disasters are, of course, the most serious. Examples may include:
  - Hurricane
  - Earthquake
  - Volcano
  - Major terrorist attack
  - Homeland Security Advisory
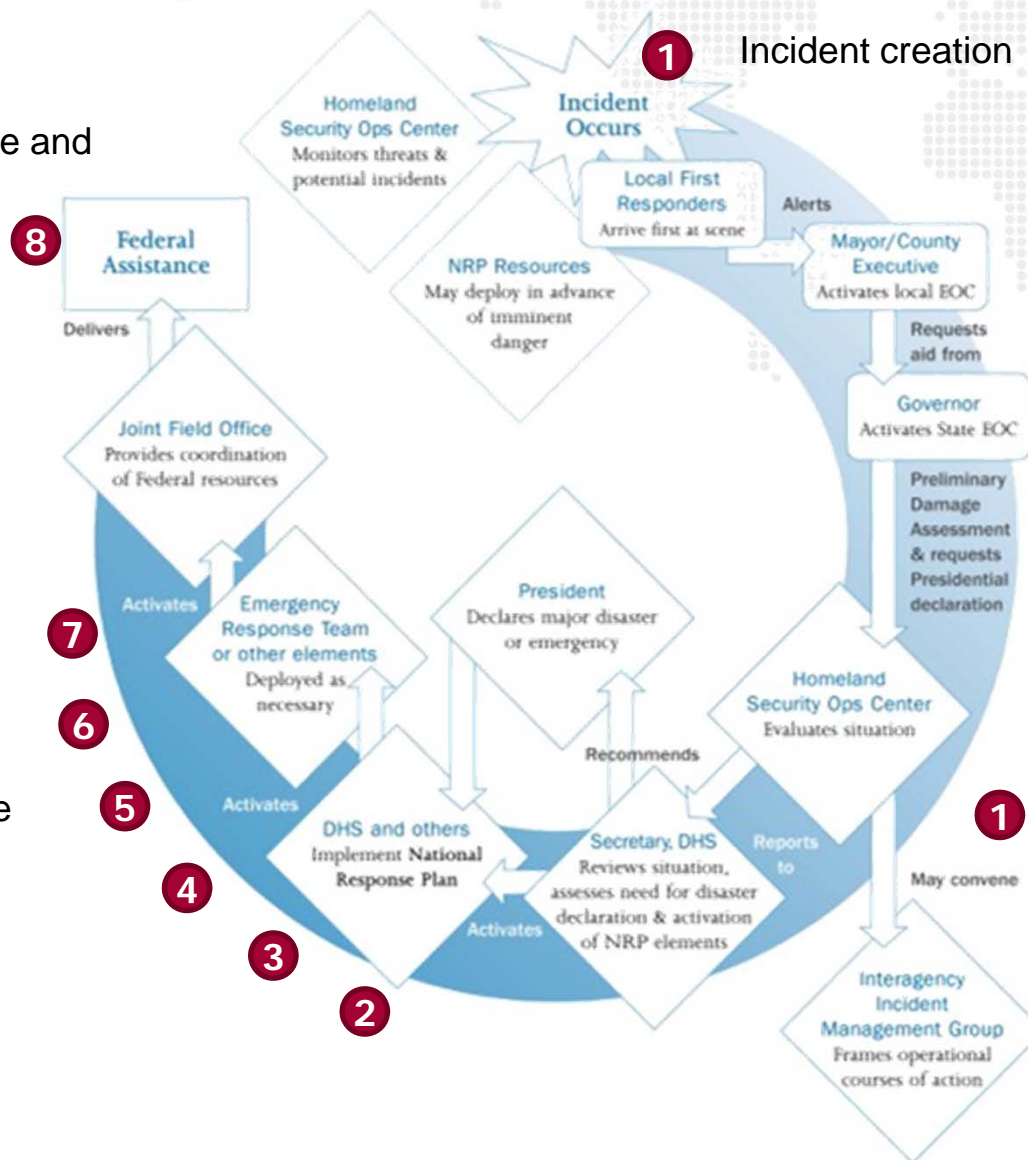
Frequency vs. Complexity
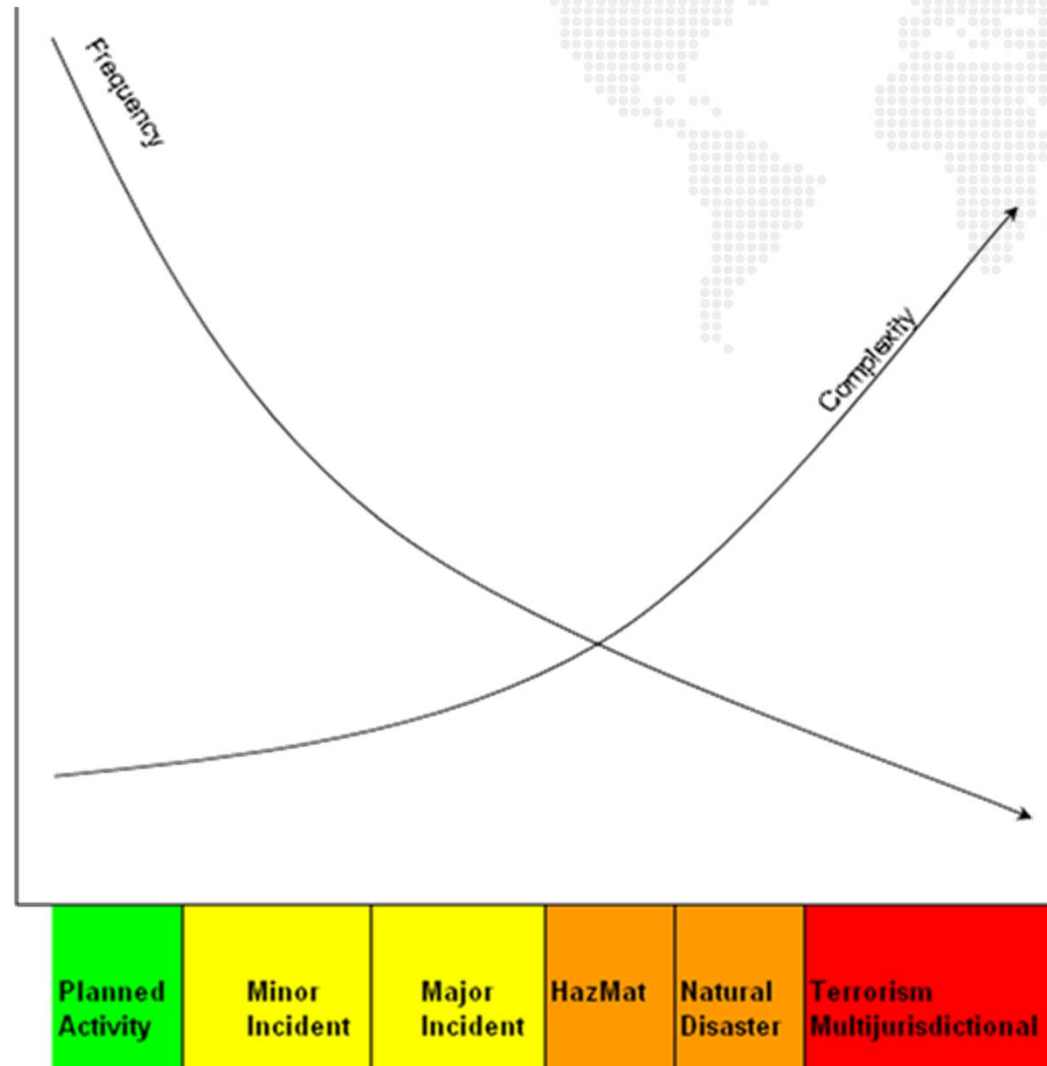
National Response Framework

TCRP Paratransit Emergency Preparedness Handbook:
Capabilities Assessment

Addressed	Not Addressed	N/A	PREPAREDNESS – Paratransit Activity	Index
			1. PLANNING	
			a) Resource Capability Assessment	
❏	❏	❏	Critical assets (personnel & vehicles) & assessed capabilities & limitations have been identified.	Sect. 3.A.1
❏	❏	❏	A capabilities assessment has been shared with local emergency management & first responders.	Sect. 3.A.1
			b) Emergency Support Function #1 (ESF-1) – Transportation Coordination	
❏	❏	❏	Participation with emergency management in planning for the use of paratransit resources to support emergency response & recovery is encouraged.	Sect. 3.A.2
			c) Interagency Coordination	
❏	❏	❏	Regularly participates in Local Emergency Planning Committee (LEPC) meetings.	Sect. 3.A.3
❏	❏	❏	Participates in Urban Area Strategic Initiative (UASI) meetings.	Sect. 3.A.3
❏	❏	❏	Participates in local or regional emergency planning & preparedness activities.	Sect. 3.A.3
			d) Essential Material Supply	
❏	❏	❏	Have contingency plans for ensuring access to fuel, power & other resources essential to the continuity of paratransit operations.	Sect. 3.A.4
			e) Duplication of Emergency Service Obligations	
❏	❏	❏	Resources are not over extended through existing agreements & paratransit emergency response commitments are realistic & achievable.	Sect. 3.A.5
❏	❏	❏	Has a system for prioritizing paratransit response to multiple requests for assistance during community emergencies.	Sect. 3.A.5
			f) Emergency Operations Plans	
❏	❏	❏	Management solicits & reviews guidance on paratransit emergency preparedness from appropriate local, state, and/or federal entities.	Sect. 3.A.6
❏	❏	❏	Management solicits advice about lessons learned from other paratransit providers that have responded to emergencies & disaster incidents.	Sect. 3.A.6
❏	❏	❏	Safety plan is up-to-date.	Sect. 3.A.6
❏	❏	❏	Security plan is up-to-date.	Sect. 3.A.6
❏	❏	❏	Emergency operations procedures are up-to-date (including protocols for paratransit drivers, dispatchers, mechanics, supervisors, managers, etc.).	Sect. 3.A.6

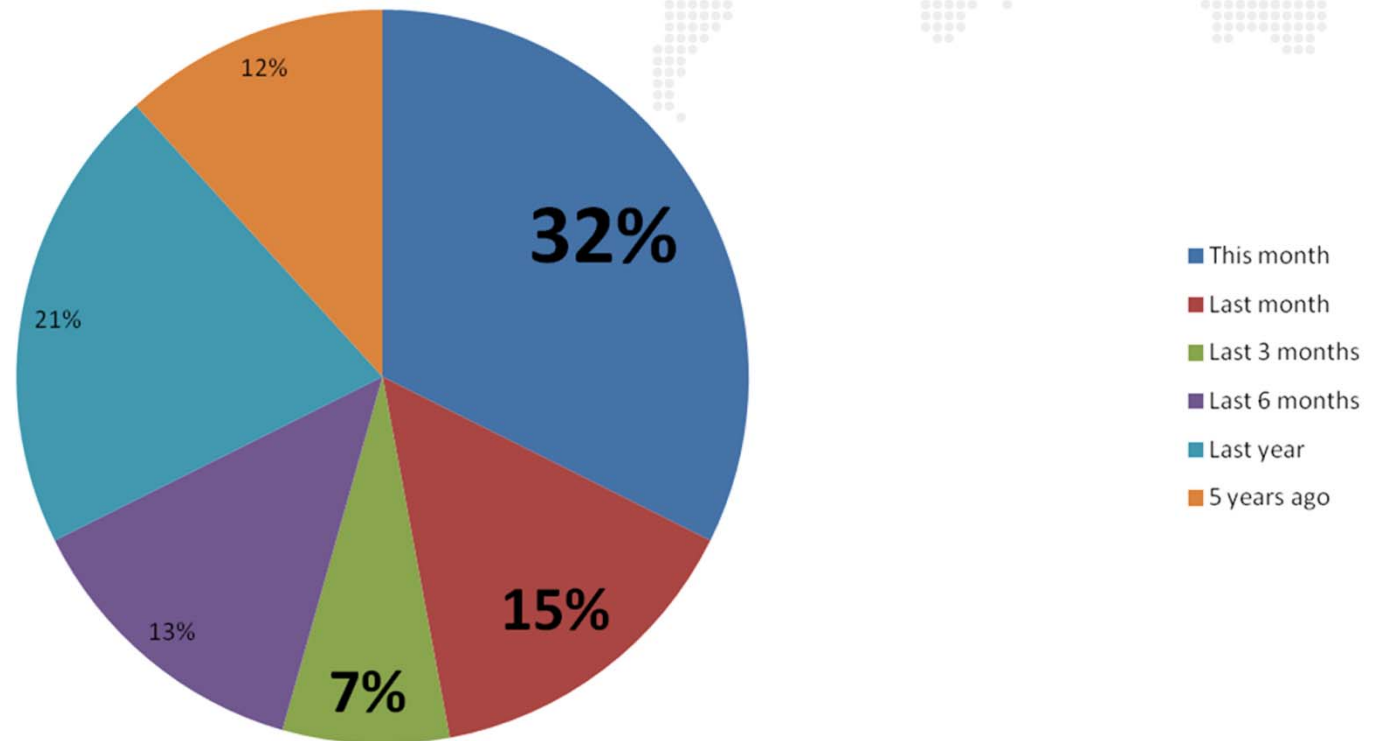# Joint Field Office Established for Natural Disasters
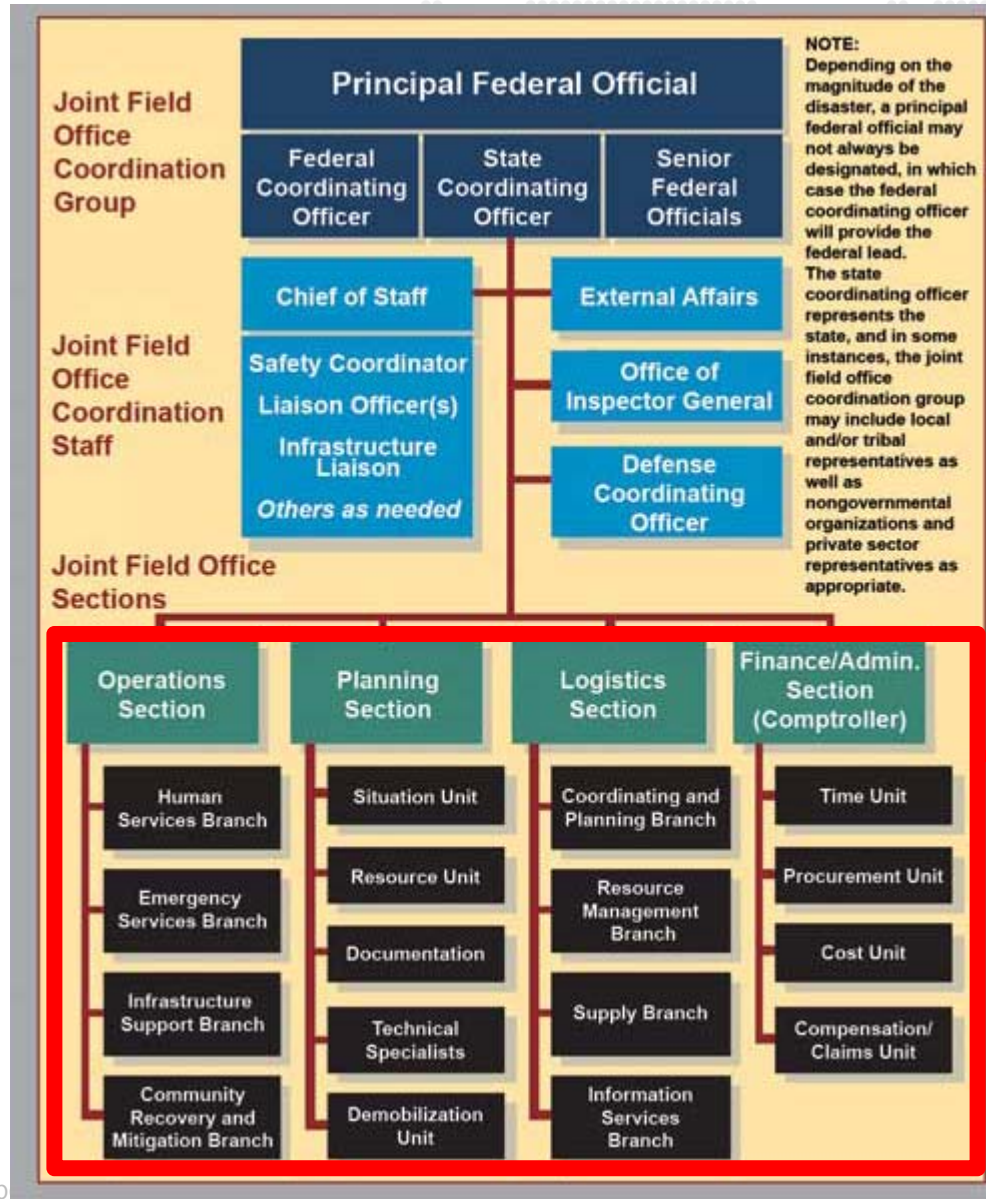
Helps Integrate the Joint Field Office Sections

Frequency for Surveyed Transit Agencies

When was the last expected or unexpected disruption that impeded your service?

Legend:
- This month — 32%
- Last month — 15%
- Last 3 months — 7%
- Last 6 months — 13%
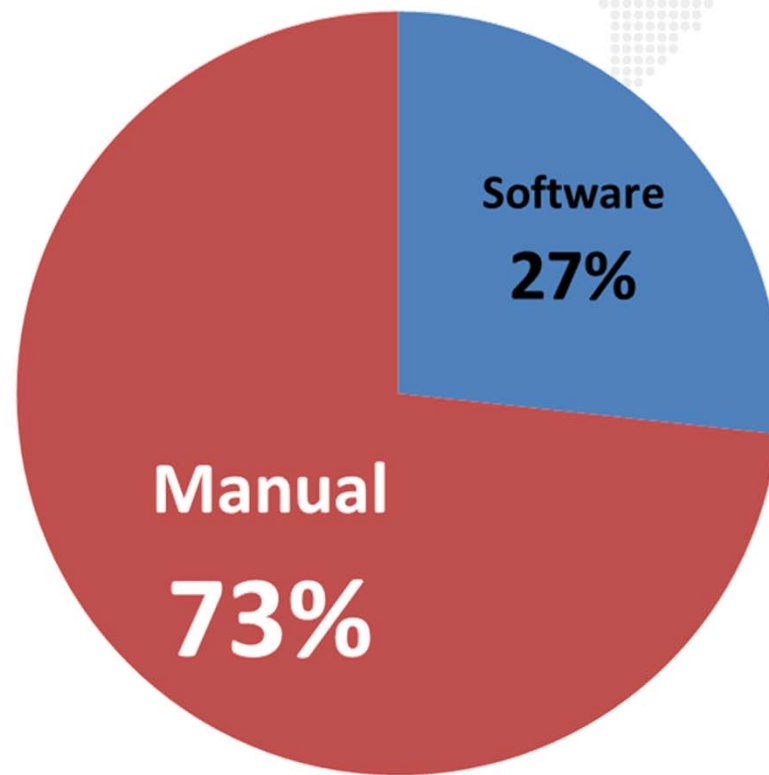- Last year — 21%
- 5 years ago — 12%

Trapeze Interest Gauging Survey – 63 Respondents

Manual Response Prevalence

Trapeze™

When there is an service disruption, do you use Software to resolve the issue (or is it done manually)?

Software
27%

Manual
73%

Trapeze Interest Gauging Survey – 63 Respondents

TO SOLVE THESE PROBLEMS:
TRAPEZE RAPID RESPONSE

Decision Support System for Demand Response Emergency Management

- **Map-Based** Emergency and Incident Management
- Emergency Intelligence and **Dynamic** Response
- Emergency Communications and **Evacuation** Requests Processing
- **Reporting** and Tracking for **Federal Reimbursement**

Example Incident

Water-main break forces evacuations in South Philadelphia

July 24, 2012 | By Jennifer Lin, Inquirer Staff Writer

A major water-main break near 21st and Bainbridge Streets in Philadelphia on Sunday night forced the evacuation of three to four blocks of residents, city officials said.

Homes in a wider swath of South Philadelphia and Center City lost all or most of their water pressure.

Water in the area of the break was shut off as evacuees were being taken to the E.M. Stanton School at 17th and Christian Streets by the American Red Cross of Southeastern Pennsylvania.

Around 8 p.m., neighbors began reporting seeing steam coming up through manholes, followed by gushing water.

Raheem Foster, 32, who lives in the neighborhood, said he saw steam rising from a half-dozen manhole covers. He said the water started coming up "like a river going down 21st Street."
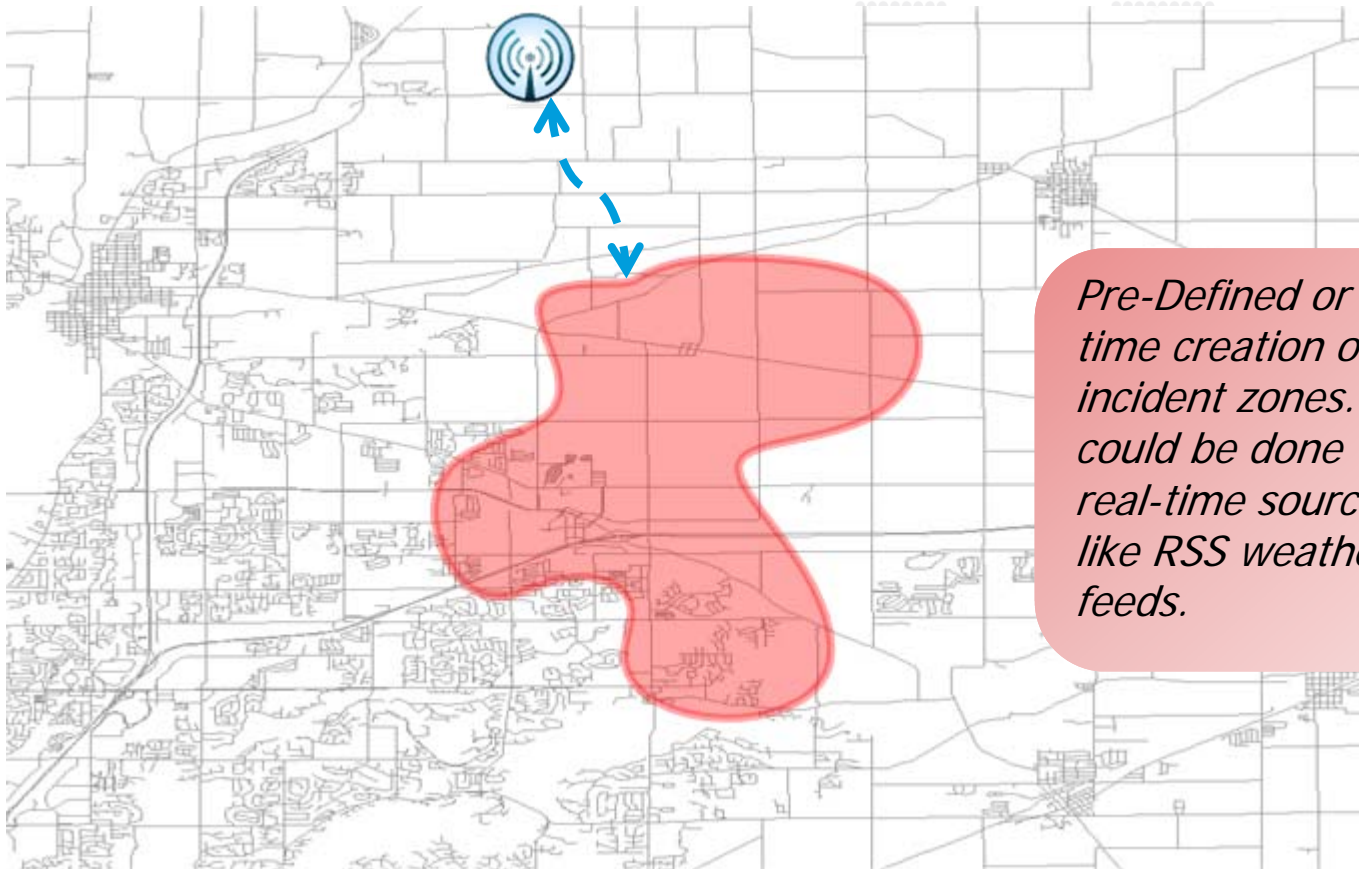
Image 1 of 2 — View Gallery

A broken water main at 21st and Bainbridge Streets about 8 last night forced evacuation... (ELIZABETH ROBERTSON / Staff...)

Step 1 – Define the Incident Area

Pre-Defined or real-time creation of incident zones. This could be done via real-time sources like RSS weather feeds.

Potential Incident Mapping Process

Trapeze™

① Respond

② New Active Incident

Active

Incider
SH012
F014
FF013
H003
T001

Incident Name	Water1
Incident Type	Broken Water Main
Incident Date	03/05/12
Incident Time	From Now To

Breadth
- ⦿ Local
- ◯ Polygon
- ◯ Regional

Radius (Local Only)   1.5   Km

Evacuation/Avoidance Route(s)
36th Street   Add
Broadway

Action
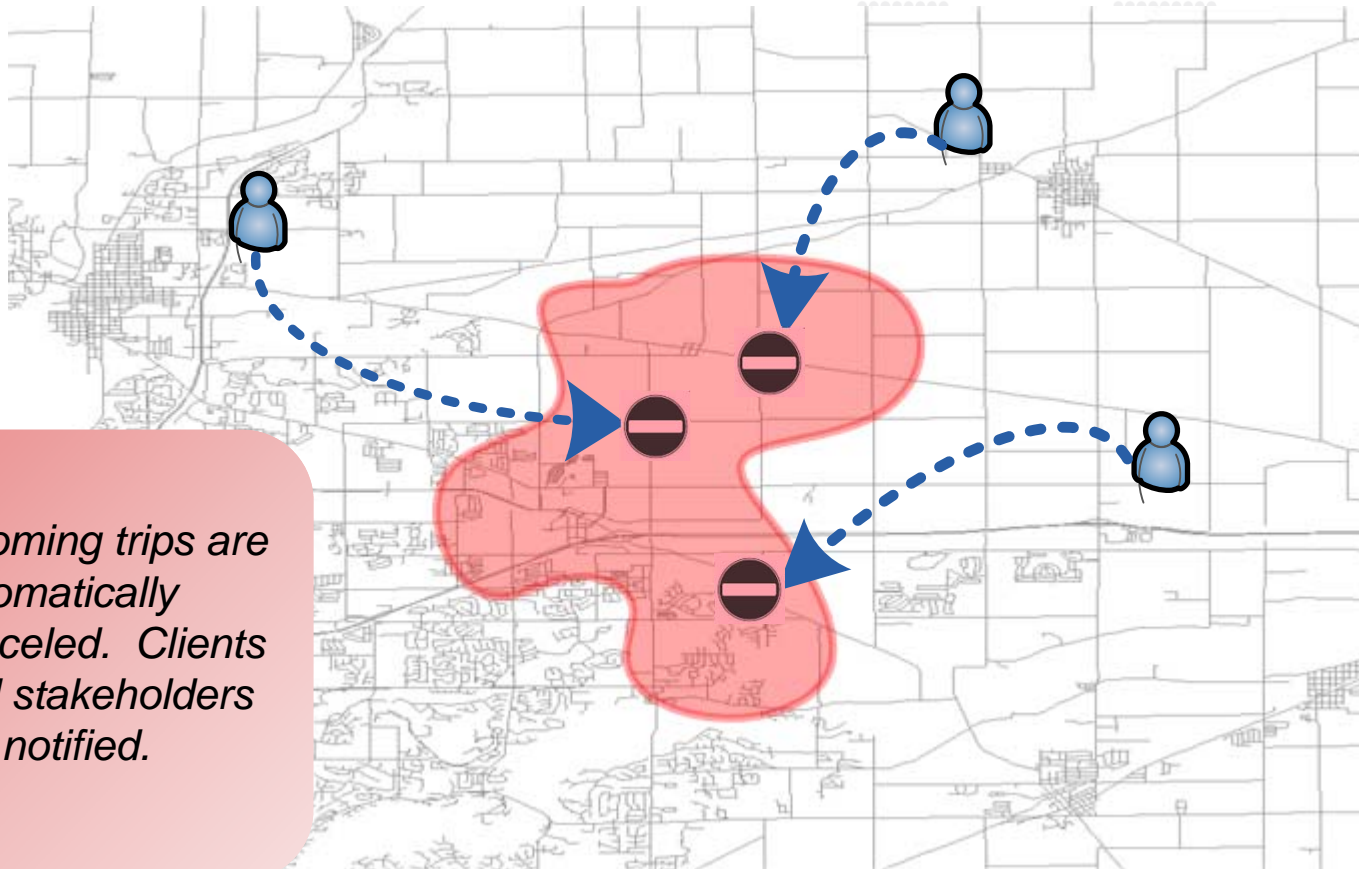- ⦿ Close Area
- ◯ Slow Area Down   80   %
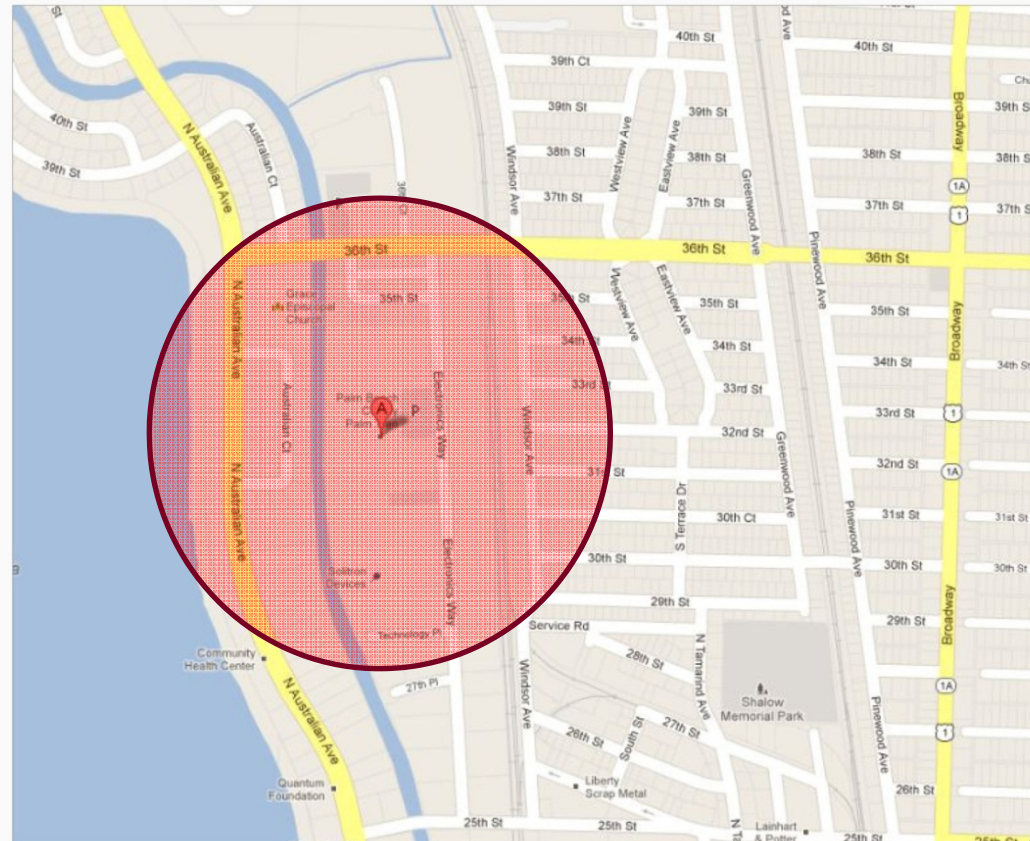
Create Scenario   Create Live Incident   Cancel
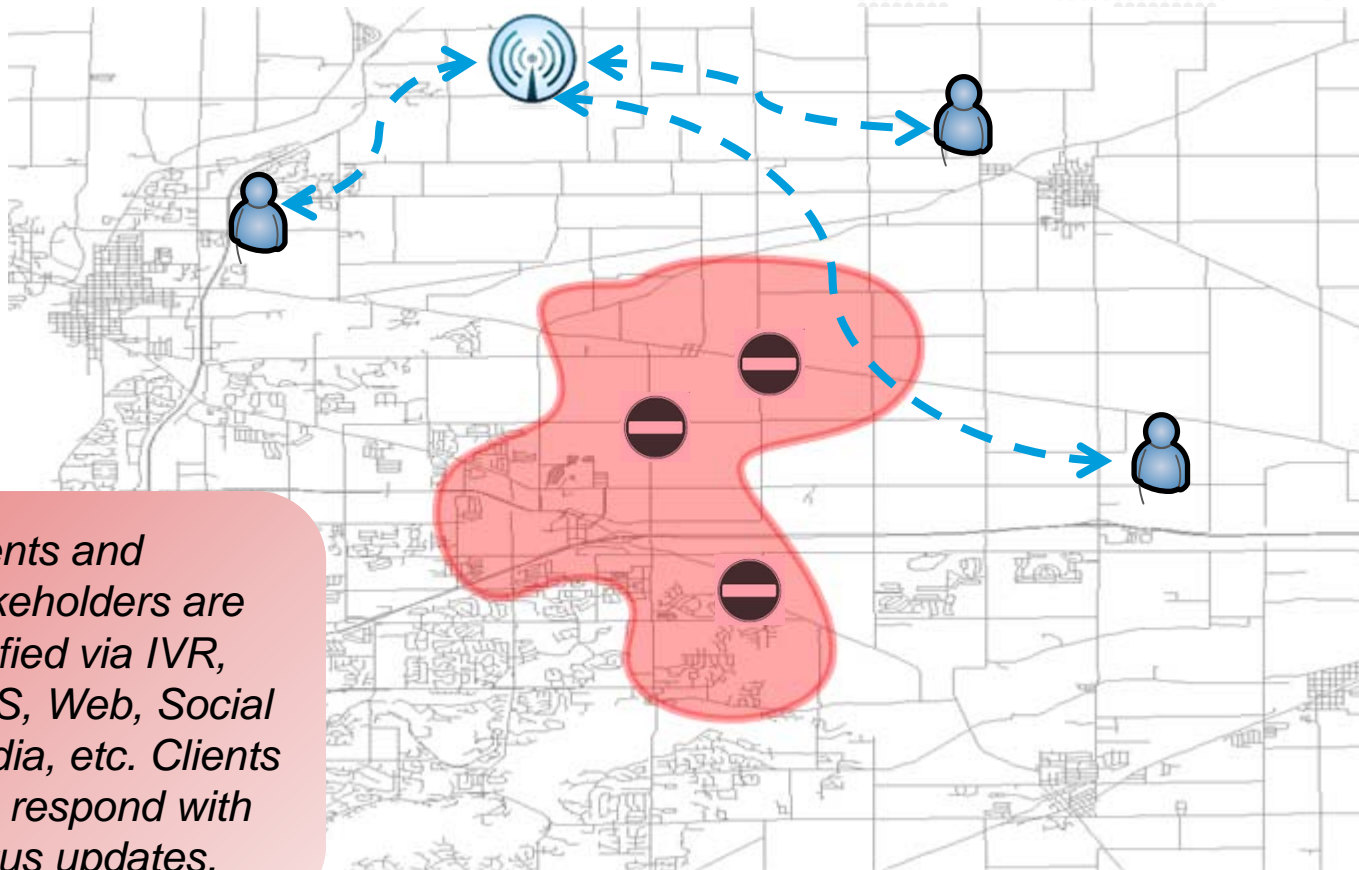
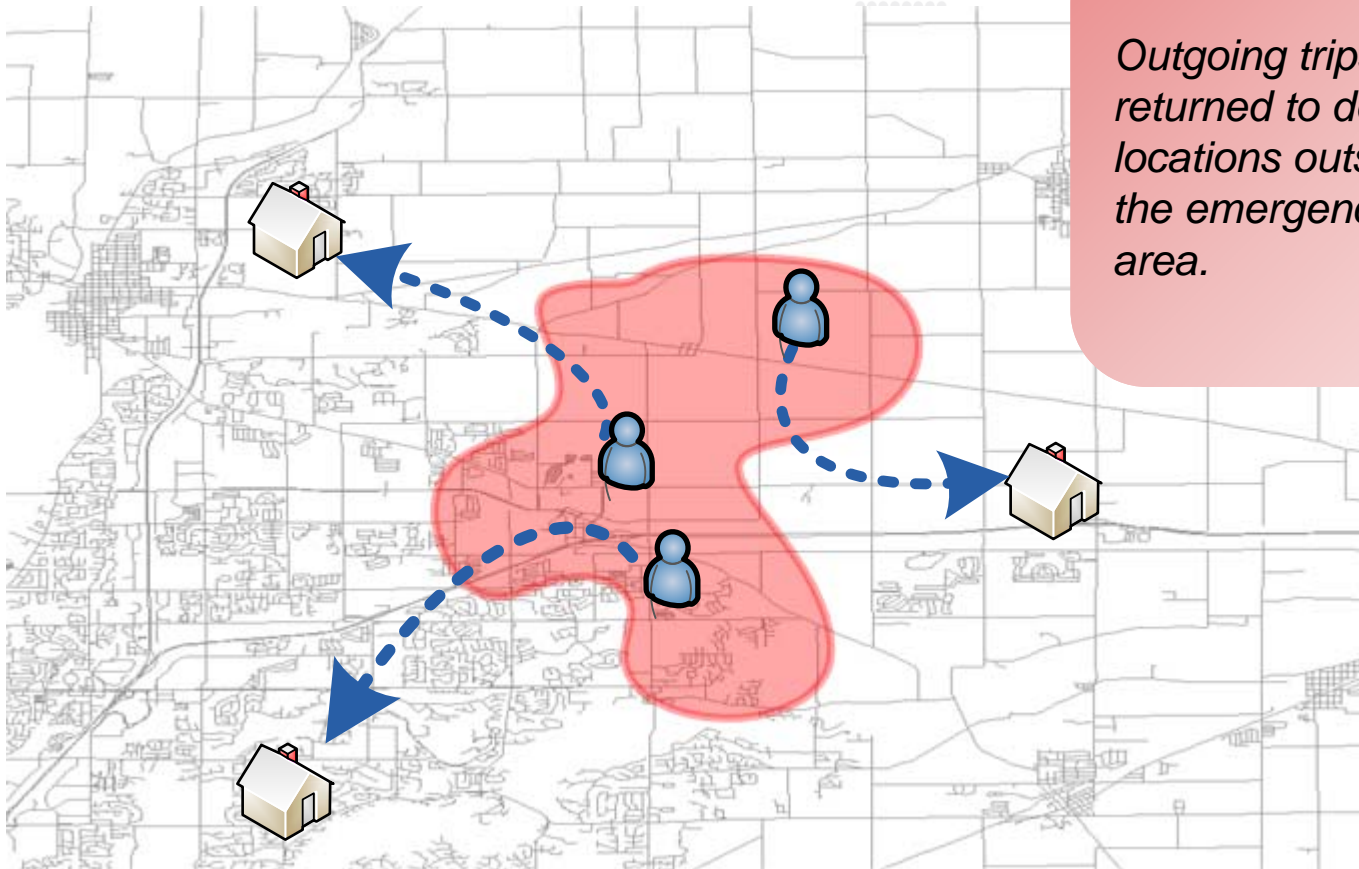# Step 2 – Auto Cancel Inbound Journeys

Incoming trips are automatically canceled. Clients and stakeholders are notified.

Step 2 – Auto Cancel Inbound Journeys

Clients and stakeholders are notified via IVR, SMS, Web, Social Media, etc. Clients can respond with status updates.

Step 3 – Get Clients Home

Outgoing trips are returned to delivery locations outside of the emergency area.

Step 4 – Destination Within Disaster Area (riders already enroute)
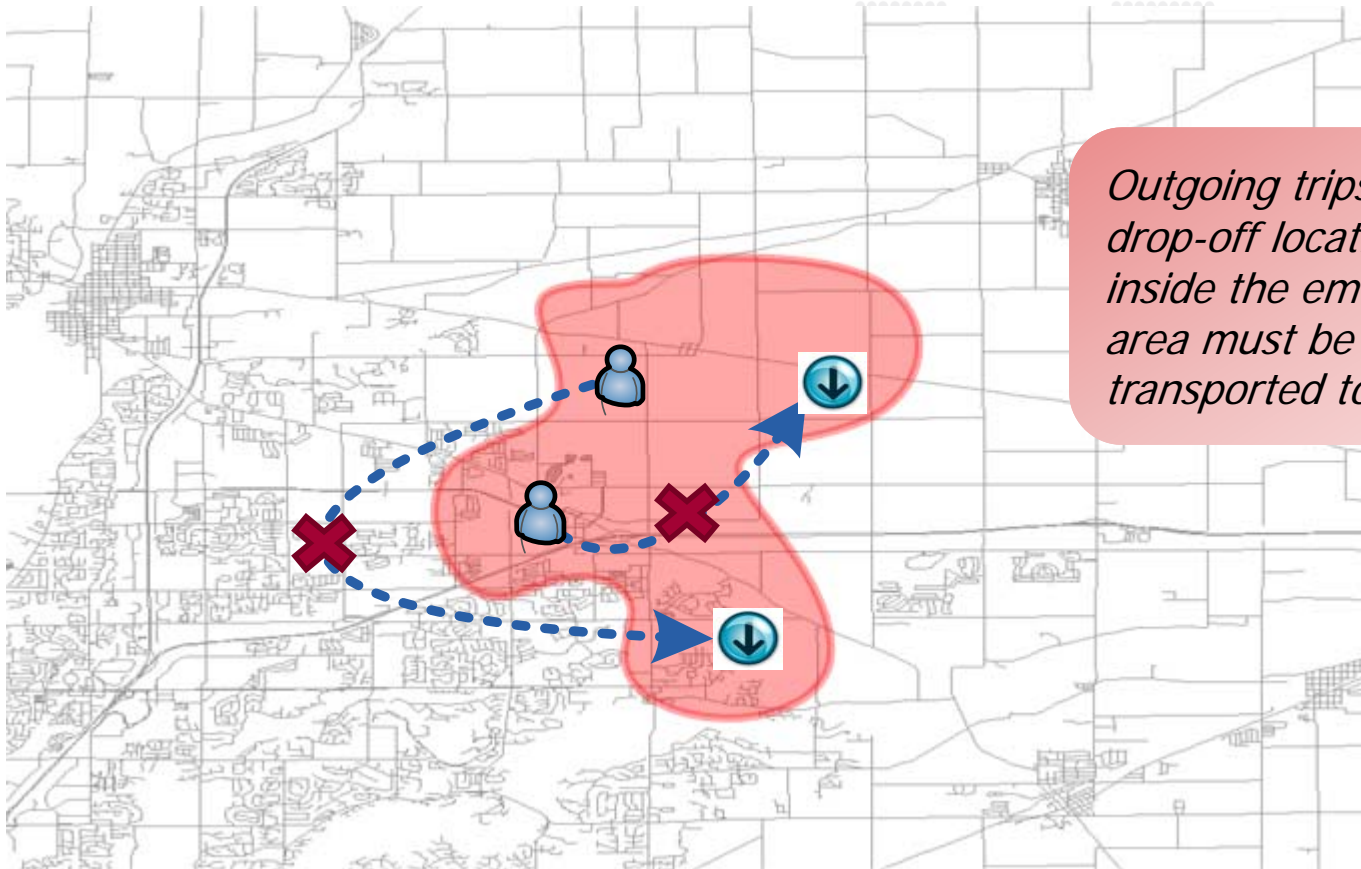
Outgoing trips with drop-off locations inside the emergency area must be transported to safety.

Step 5 – Reroute to Shelters (includes clients with home affected)

Incident Management
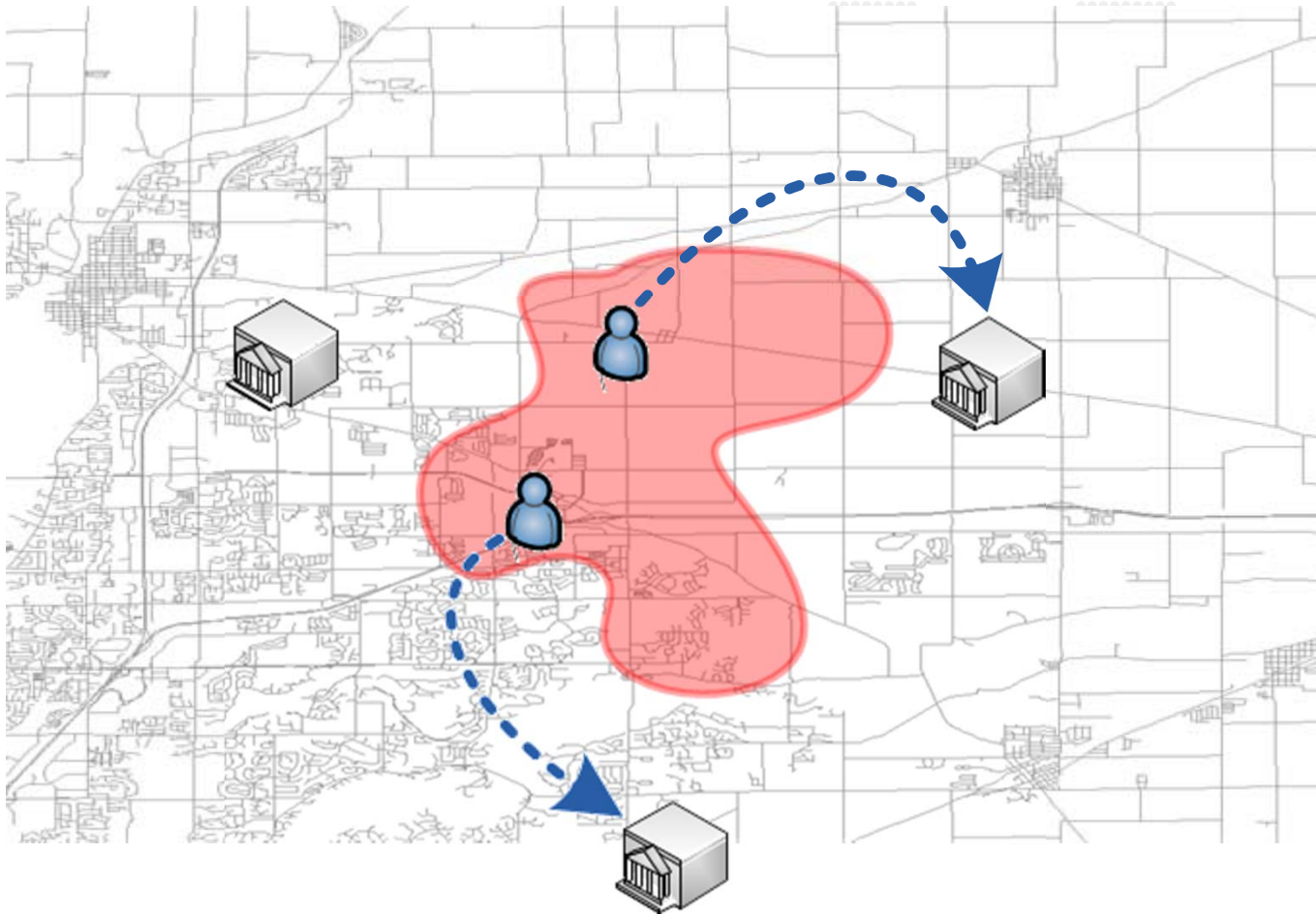
Analyze Incident | Water1

Start Date: 2010/03/05   Start Time: 09:12

Incident Type: Broken Water Main   Location/Polygon: Polygon 2   Evacuation Route(s): Pinewood Ave

Local/Regional: Local   Radius: 1.5 km   Status: Notifying

| Affected Clients (85) | Affected Runs | | | | | | Select All |

Last Name	First Name	Space Required	Status	Home Address	Destination	Current Location	Home Affected?	Select
Smith	Mary	Ambulatory	Evac. Planned	45 S Terrace Drive	Wellness Center	Home	Yes	○
Dean	John	Wheelchair	Notifying	108 20th St	Community Health	In Vehicle	Yes	◉
Richards	Jason	Scooter	Cancelled	89 Division Ave - Appt 202	Grace Church	Home	No	○
Brown	Suzanne	Scooter	Notified Late	244 South St	Walgreens	Home	No	◉
Alvarez	Juan	Ambulatory	Evac. Planned	3481 Spruce Ave - Suite 8	Good Samaritan Hospital	All	Yes	○

Show on Map   Send Notification   Make Evacuation Plan   Cancel Trips   Close

August 29, 2013   20

Map-Based Incident Management

Filter

🚌	Evacuating	☑
🚌	On Way Out	☑
🚌	Safe	☑

Real-time views on map with visual information for holistic map-based management.
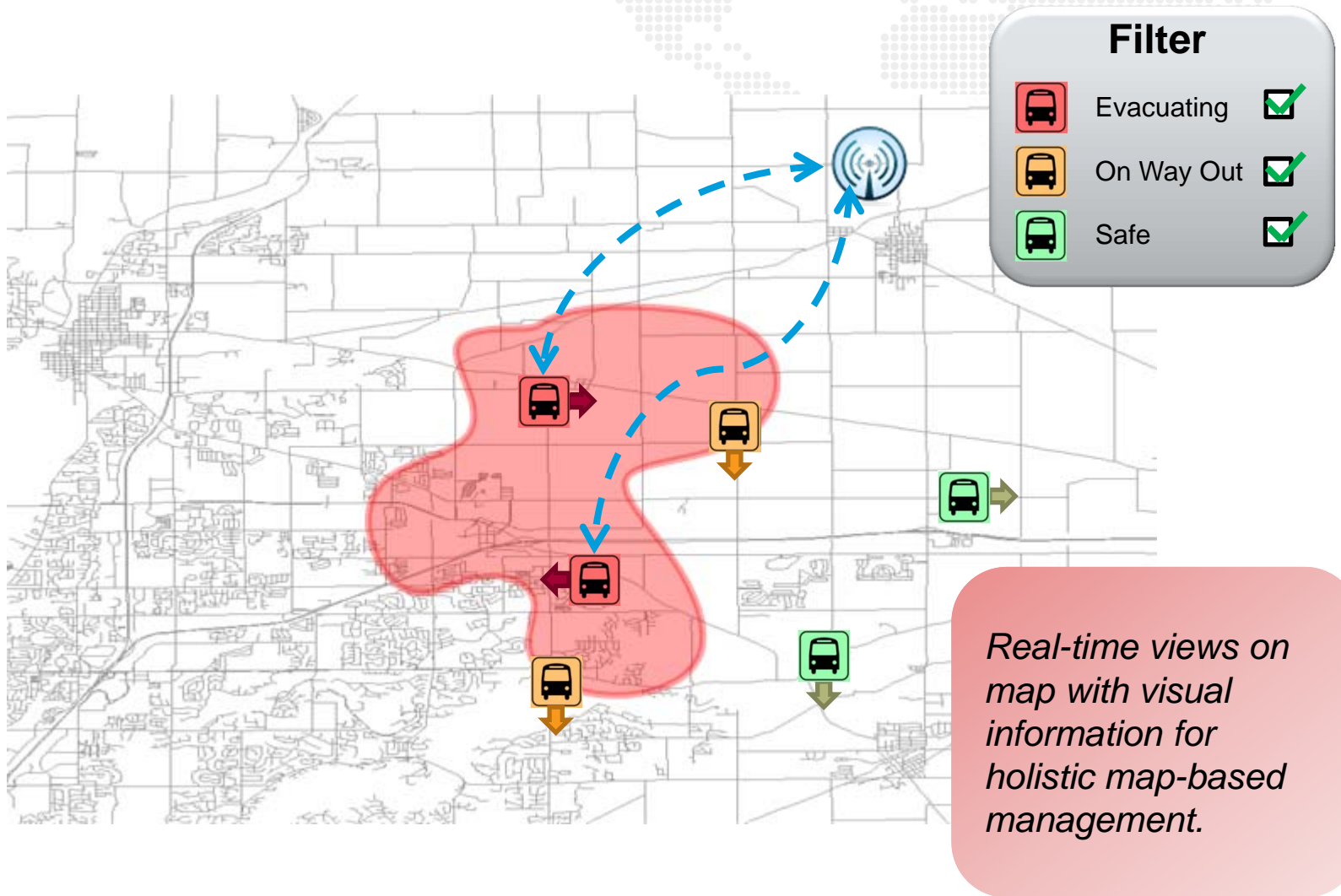
Potential Incident Management Process

Manage Vehicle | 0258

Driver: Anne Dawson   Status: Evacuating

Incident Type: Broken Water Main   Location/Polygon: Polygon 2
Local/Regional: Local   Destination: Pinewood

Clients On Board (5)

| Last Name	First Name	Space Required	Status	Home Address
Smith	Mary	Ambulatory	Evac. Planned	45 S Terrace Drive
Dean	John	Wheelchair	Notifying	108 20th St
Richards	Jason	Scooter	Cancelled	89 Division Ave - Appt 202
Brown	Suzanne	Scooter	Notified Late	244 South St
Alvarez	Juan	Ambulatory	Evac. Planned	3481 Spruce Ave - Suite 8

Message All   Message Driver   Message Individual   Close
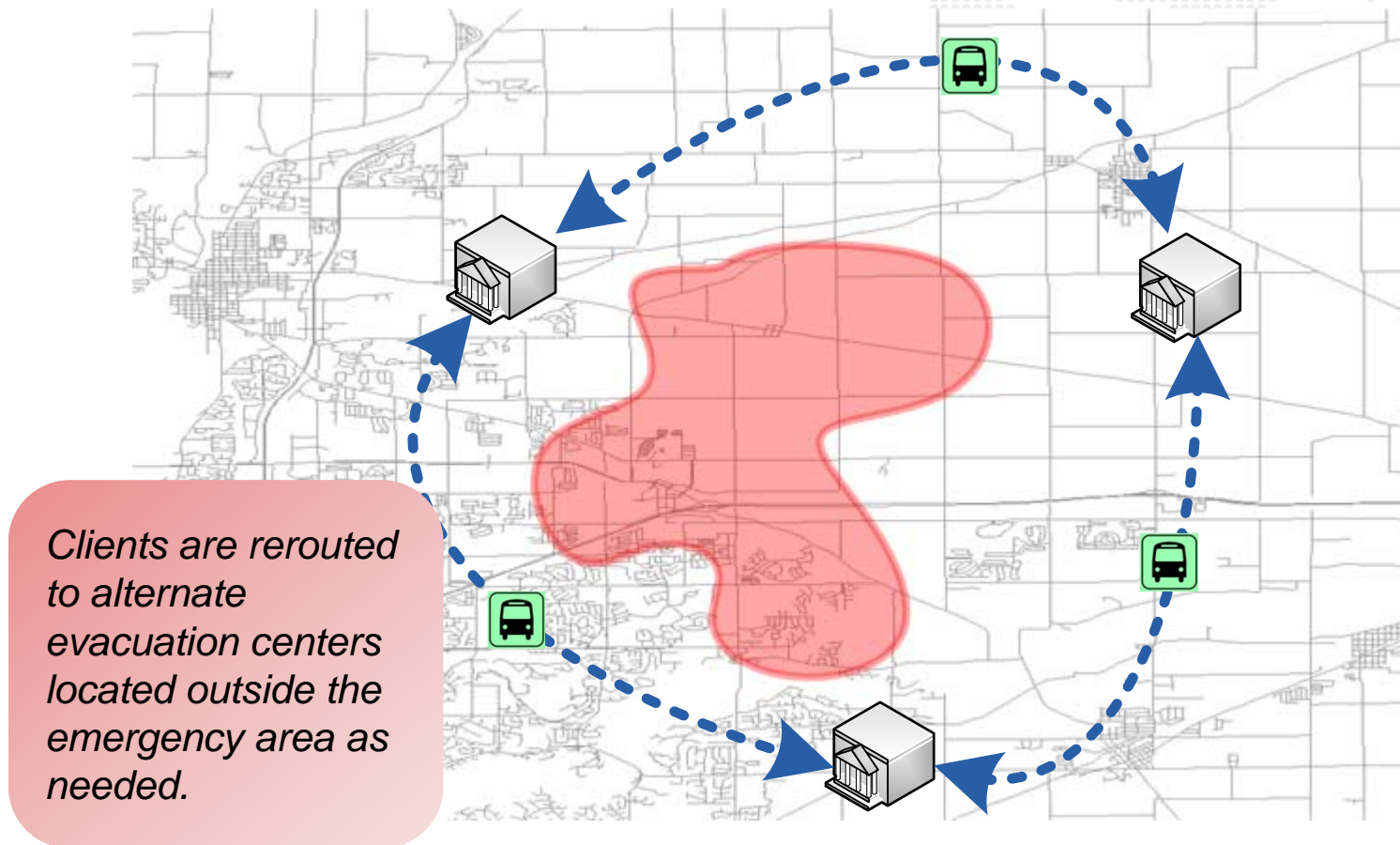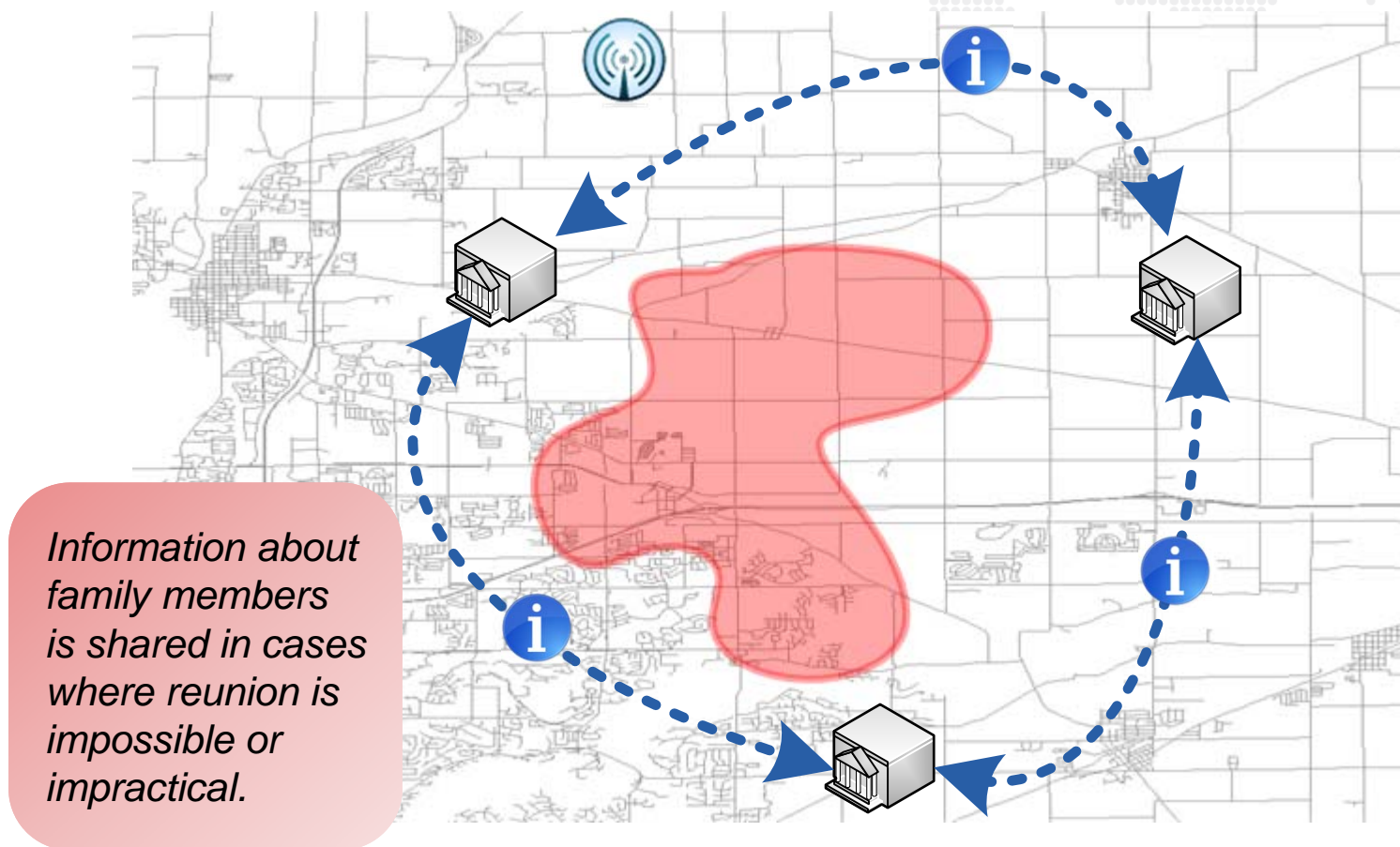
Filter

Evacuating ☑

On Way Out ☐

Safe ☐
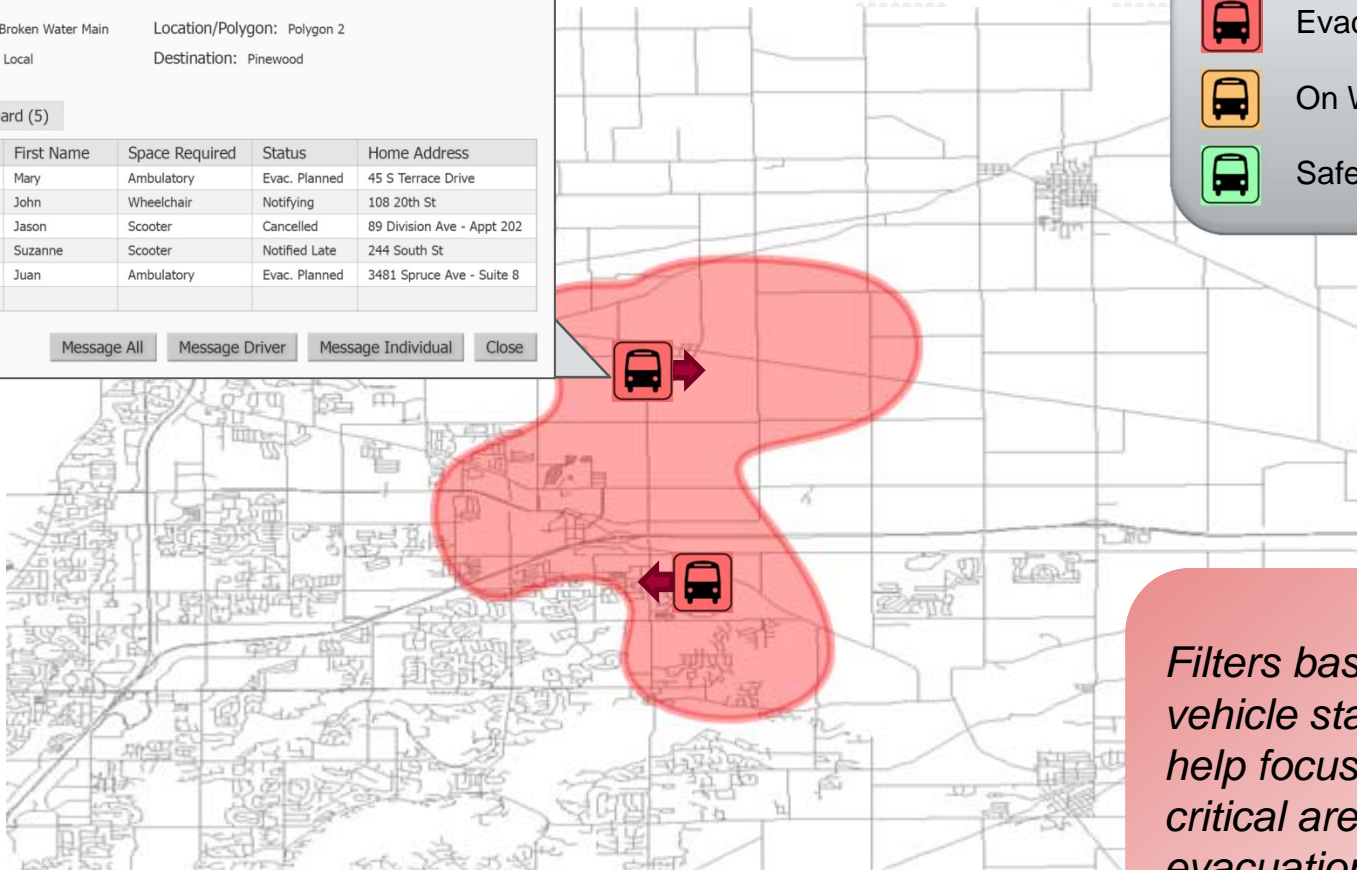
Filters based on vehicle status can help focus on certain critical areas of the evacuation.

Step 6 – Inter-Shelter Movement
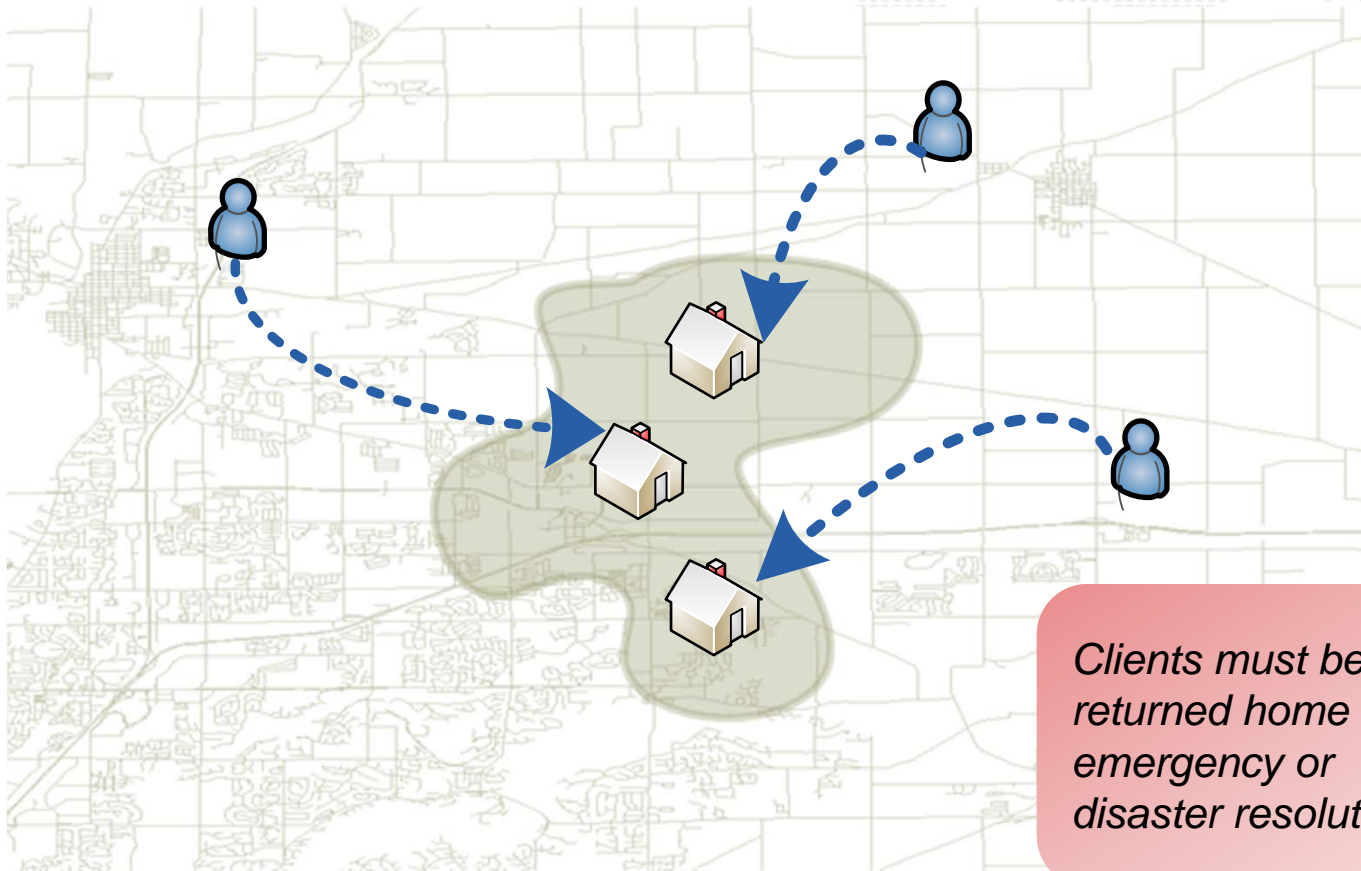

Clients are rerouted to alternate evacuation centers located outside the emergency area as needed.

Step 6 – Inter-Shelter Communication

Information about family members is shared in cases where reunion is impossible or impractical.

Step 7 – Return Clients Home

Clients must be returned home upon emergency or disaster resolution.

Step 8 – Reporting and Reimbursement

$
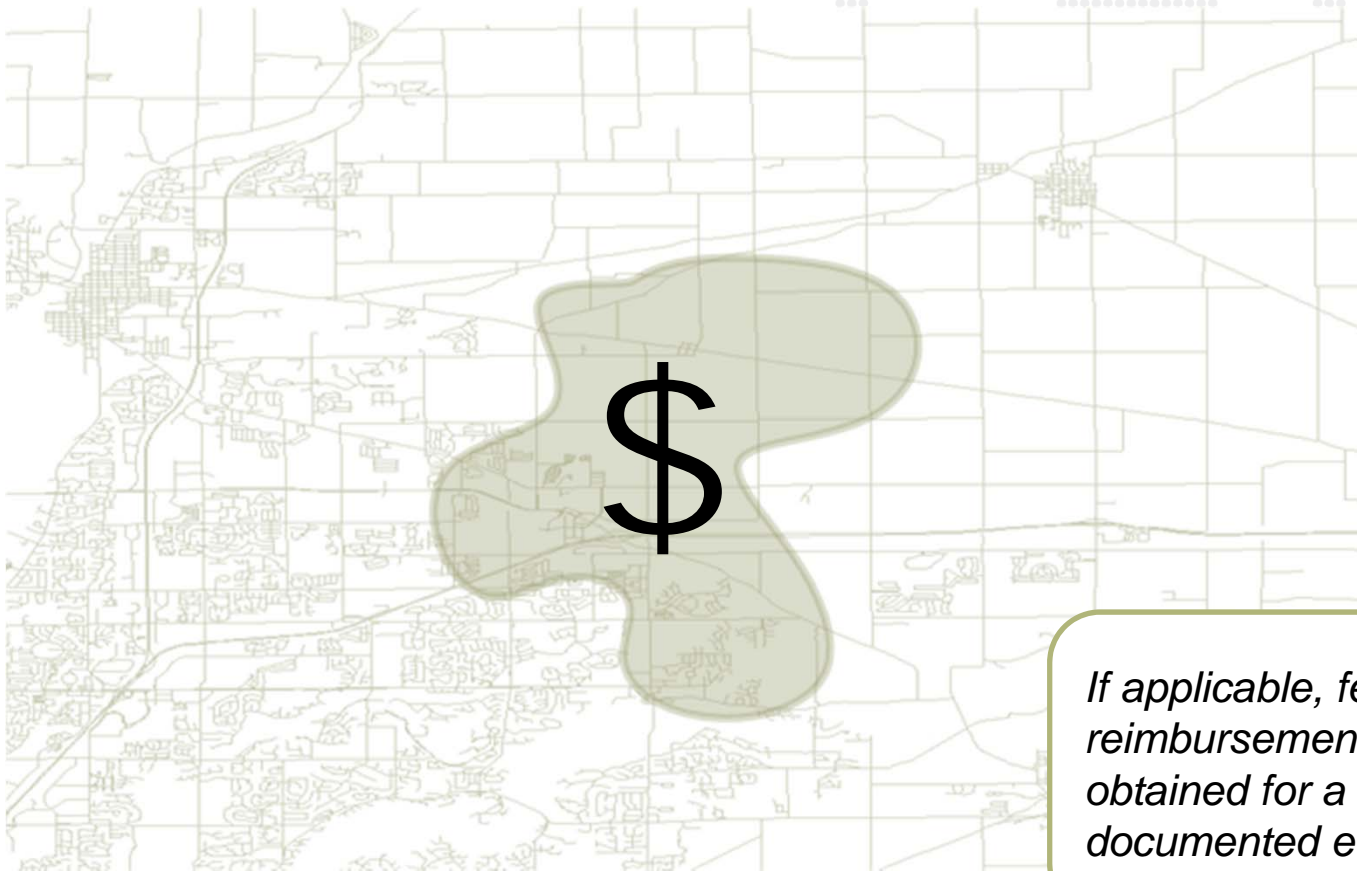
> *If applicable, federal/state reimbursement can be obtained for a well documented evacuation.*

Why is it important?

- **TCRP Report 150:** Paratransit Emergency Preparedness Handbook – *Officially Released*

- **MAP21**: PUBLIC TRANSPORTATION EMERGENCY RELIEF PROGRAM SECTION 5324

- Recent events: Hurricane Sandy/Isaac/shootings, etc

- New recommended APTA SSI protocols for security

  - Standard for First Responder Familiarization of Transit Systems

  - Standard for General Guidance of Transit Incident Drills and Exercises

    http://aptastandards.com/Documents/PublishedStandards/Security/tabid/329/language/en-US/Default.aspx

How does it help agencies?

- Gives agency a visual, **holistic view** of how the Demand Response system is responding to the emergency, and highlights critical areas

- Streamlines operations and allows for focused tasks on critical stakeholders and assets

- Keeps agency "in the know" of the system, making them more ready for unexpected events

- Allows agencies to **plan ahead** with "What-If" scenarios

- **Automates** communication process with stakeholders (clients, drivers, shelters)

- Automates the logistical planning for client pickups and vehicle routes

- Permits agencies to store audit information about the response effort for **maximum federal reimbursement**

Thank you!

Youtube- Trapeze Rapid Response
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