AIRPORT DISASTER PREPAREDNESS IN A COMMUNITY CONTEXT

James F. Smith
Focus

• Relationships between airports and emergency management agencies (EMAs) for non-aviation disasters
• Natural disasters, pandemics, and industrial accidents in study
• Terrorism excluded to avoid SSI
• Giving and receiving aid
Purpose

• Seek
  – Patterns of cooperation and coordination between airports and their EM partners
  – Trends in airport emergency planning
  – Best management practices (BMPs)
  – Innovative preparedness measures
  – Potential for mutual aid among regional airports and with EMAs on a scale larger than a city or county and smaller than national

• Test multihazards perspective
• Provide a partial snapshot of preparedness in late 2008
• Disseminate results to airports and emergency managers
• Suggest areas for further study
Previous Studies

- 2007-2008 papers by Smith, Waggoner, Rabjohn, Bachar, and Hall on NIMS/ICS at airports during disaster-related operations
- Papers by de Neufville group at MIT on regional coordination of airports for passenger operations
- ACRP study on CBRNE planning and preparedness
A Note on Point of View

• “All airports are alike. Parts 139 and 1542 make them like cookie-cutters. Airports are totally interchangeable.”

• “Place in the community, ownership, geography, operational concepts, physical layout, acreage, legal environment, and history combine to make each airport unique.”
Which is it?

- Both are true.
- The combined truth is nowhere more evident than when airports and EMAs interact.
Hypothesis 1

• H1: Coordination and cooperation between airports and emergency management agencies is a powerful, cost-effective method of enhancing preparedness, mitigation, response, and recovery for multihazard disasters and catastrophes.
Hypothesis 2

• H2: Non-aviation disaster preparedness promotes airport preparedness for aviation-related disasters.
Hypothesis 3

• H3: Protection of airport continuity of operations and continuity of business is essential.

Or, if the airport can’t operate, it can’t be an asset for response and recovery.
Hypothesis 4

• H4: Airports in the same region can cooperate to adjust for difficulties in the wake of a disaster or catastrophe.
Methods

• How airports and EMAs got into study
• Questionnaire to airports
• Questionnaire to EMAs identified by airports
• Follow-up interviews
• Workshop in South Florida
• Quantitative analysis (factor analysis and multiple regression) on a few variables
• Qualitative analysis on many variables
Results

• 37 airports responded
  – 2 GA airports excluded from analysis
• 12 EMA partners responded
• Site visits to 10 airports
  • BTR, CLT, DFW, JAN, LAX, MCO, MEM, MSY, SFO & TPA
• South Florida workshop
## Airports Responding

<table>
<thead>
<tr>
<th>ANC</th>
<th>DEN</th>
<th>JAN</th>
<th>OAK</th>
<th>SFO</th>
</tr>
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<tbody>
<tr>
<td>ATL</td>
<td>DFW</td>
<td>LAS</td>
<td>ONT</td>
<td>SLC</td>
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<tr>
<td>AUS</td>
<td>DTW</td>
<td>LAX</td>
<td>ORD</td>
<td>TPA</td>
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<td>FLL</td>
<td>MCO</td>
<td>PHX</td>
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<td>MEM</td>
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<td>MIA</td>
<td>RSW</td>
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<tr>
<td>CLT</td>
<td>IND</td>
<td>MSP</td>
<td>SBN</td>
<td></td>
</tr>
<tr>
<td>CMH</td>
<td>JAC</td>
<td>MSY</td>
<td>SEA</td>
<td></td>
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</tbody>
</table>
Top 30 Pax Airports in Study

Figure 1. Airports in Study among Top 30 Passenger Airports

[Bar chart showing the total passengers for each airport among the Top 30 Pax Airports in Study.

Legend:
- Study
- Non-Study]
Figure 2. Airports in Study among Top 30 Air Freight Airports

Top 30 Freight Airports in Study
EMAs Responding

- Charlotte Mecklenburg (NC) OEM – CLT
- City of Austin (TX) – AUS
- City of Boston (MA) MOEP – BOS
- City of Brook Park (OH) FD – CLE
- City of Honolulu (HI) FD – HNL
- City of Oakland (CA) FD – OAK
- City and County of Denver (CO) OEM&HS – DEN
- East Baton Rouge Parish (LA) MOHS&EP – BTR
- Hennepin County (MN) – MSP
- Hickam Air Force Base (HI) ARFF – HNL
- Lee County (FL) – RSW
- Teton County (WY) – JAC
Airport Characteristics
Airport Operators

City department  14
Independent authority  11
Multijurisdictional authority  7
County department (includes SFO and MIA)  5
Port authority  4
State-owned  2
Federal non-military  0
Military  0
Private  0
Budgetary Independence

Totally independent  12
Subject to general oversight  18
Subject to line-item approval  3
Subject to “taxes” on non-139/1542 revenues  0
Independent bonding authority  9
Final control of concessions revenues  13
Final approval of contracts  12
No response  1
EMA Partnership Characteristics
Mutual Aid Partners

Fire department 32
Police department 30
EMS department 27
American Red Cross 26
Emergency management agency (EMAs) 24
Airlines 19
State agencies 19
Airport groups 17
Search and rescue 15
Other federal agencies 15
Tenants 14
Air National Guard 13
Other nongovernmental agencies 13
Multiagency coordination entities (MACs) 11
Other DOD 9
Private providers of emergency services 8
Statewide mutual aid pact 3
Other airports 2
## Military Aid to Civil Authority

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
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</thead>
<tbody>
<tr>
<td>Have MACA agreement</td>
<td>19</td>
</tr>
<tr>
<td>MACA agreement used in &lt;24 months</td>
<td>17</td>
</tr>
<tr>
<td>Have exercised with military</td>
<td>19</td>
</tr>
</tbody>
</table>
Airport-EMA Relationship Type

- Airport acts as ESF in disasters  25
- Airport is its own MAC  22
- City, county, or state department and fully integrated into city, county, or state EMS  20
- Informal cooperation  18
- Mutual aid pact  18
- Airport has EOC and acts independently  16
- Fully integrated as ESF(s) in local EOC  14
- Statewide EMS or mutual aid  10
- Airport relates to EMAs only for aviation and terrorism and is otherwise isolated from outside EMA/MAC function  2
### Partners in Planning, Training, Drilling & Exercising*

<table>
<thead>
<tr>
<th>Organization</th>
<th>Count</th>
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</thead>
<tbody>
<tr>
<td>PD</td>
<td>34</td>
</tr>
<tr>
<td>FD</td>
<td>34</td>
</tr>
<tr>
<td>EMS</td>
<td>34</td>
</tr>
<tr>
<td>TSA</td>
<td>33</td>
</tr>
<tr>
<td>FAA</td>
<td>32</td>
</tr>
<tr>
<td>Red Cross</td>
<td>29</td>
</tr>
<tr>
<td>Hospitals</td>
<td>28</td>
</tr>
<tr>
<td>CDC</td>
<td>26</td>
</tr>
<tr>
<td>Sheriff</td>
<td>26</td>
</tr>
<tr>
<td>State agencies</td>
<td>25</td>
</tr>
<tr>
<td>Mass transit</td>
<td>24</td>
</tr>
<tr>
<td>Adjacent governments</td>
<td>23</td>
</tr>
<tr>
<td>Other DHS</td>
<td>21</td>
</tr>
<tr>
<td>Adjacent EMAs</td>
<td>20</td>
</tr>
<tr>
<td>DOD</td>
<td>15</td>
</tr>
<tr>
<td>Regional govt organizations</td>
<td>15</td>
</tr>
<tr>
<td>Other airports</td>
<td>15</td>
</tr>
<tr>
<td>FEMA</td>
<td>14</td>
</tr>
<tr>
<td>National Guard</td>
<td>14</td>
</tr>
<tr>
<td>Adjacent MACs</td>
<td>12</td>
</tr>
<tr>
<td>ATF</td>
<td>11</td>
</tr>
<tr>
<td>Air National Guard</td>
<td>11</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>10</td>
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<tr>
<td>Local military base</td>
<td>10</td>
</tr>
<tr>
<td>NORTHCOM</td>
<td>6</td>
</tr>
<tr>
<td>National Guard NERF-P</td>
<td>5</td>
</tr>
<tr>
<td>Mobile Hospitals/DMATs</td>
<td>2</td>
</tr>
</tbody>
</table>

*Local health department not queried
## COOP Sub-Plans

<table>
<thead>
<tr>
<th>COOP-related plan</th>
<th>n</th>
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<tbody>
<tr>
<td>Quarantine</td>
<td>28</td>
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<tr>
<td>Decontamination</td>
<td>25</td>
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<tr>
<td>Damage assessment</td>
<td>25</td>
</tr>
<tr>
<td>Repair plans</td>
<td>22</td>
</tr>
<tr>
<td>Alternate transport modes</td>
<td>14</td>
</tr>
<tr>
<td>Alternate use of regional airports</td>
<td>12</td>
</tr>
</tbody>
</table>
Current Plans
Average airport has 8.6 current plans.

Employee Notification 21
Communications 18
Triage 18
Airport EOC 16
Personnel Access for Emergencies 15
Emergency Vehicle Access to Airport 15
Medical Evacuation 15
Pandemic 16
Incoming Logistical Aid 11
Reception Center 11
Engineering Assessment 10
Chemical Decontamination 10
Airport Backup BEOC 10

Employee Shelter and Feeding 9
Regional Airport Coordination 9
Airport Evacuation 9
Emergency Repair 8
Emergency Intermodal Capabilities 8
Replacement Employees 8
Mobile Hospital Operations 8
Radiological Decontamination 8
Morgue (including Ice Supply) 7
Damage Assessment 7
Biological Decontamination 7
Reunification Center 7
Aid Provision Logistical Hub (Redistribution of Aid) 5
Repatriation Center 4
## CDC Presence at Airport

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Coop planning with CDC</th>
<th>Have pandemic plan</th>
<th>Plan &lt;12 months old</th>
<th>Exercise &lt;24 months</th>
<th>COOP plan for pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarantine Office</td>
<td>13</td>
<td>92%</td>
<td>100%</td>
<td>69%</td>
<td>77%</td>
<td>92%</td>
</tr>
<tr>
<td>No Office</td>
<td>22</td>
<td>59%</td>
<td>59%</td>
<td>36%</td>
<td>32%</td>
<td>68%</td>
</tr>
</tbody>
</table>
# Mobile Hospital Pre-siting

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Off-airport</td>
<td>3</td>
</tr>
<tr>
<td>On-airport</td>
<td>5</td>
</tr>
<tr>
<td>No plan reported</td>
<td>27</td>
</tr>
</tbody>
</table>
Inventory of Current Plans

Final report lists airports with plans created within past 12 months and exercised within past 24 months.

Correlations
Independent Variables
(2007 data)

Total passengers
% international passengers
Total freight
Total operating budget
UASI threat risk
Number of AAAE members
AAE certified managers
Dependent Variable

Current plans

= 

Number of plans at each airport less than 12 months old and exercised within 24 months
Factor analysis results

Component 1 – 39.4% of variance in current plans
  Ops budget, intl pax, UASI, tot pax
Component 2 – 25.0% of variance in current plans
  AAAE, AAE, tot pax
Component 3 – 14.5% of variance in current plans
  Total freight, AAE
Four other components account for remaining
  21.1%
Regression Model

Multiple linear regression of 3 factor components against Current Plans
Not significant at 5%
Suggestive that total operating budget closely correlates with Current Plans
Other variables in Component 1 are strongly collinear with total operating budget
Regional Cooperation and Coordination

- Relationships are critical
- Succession planning
- Parallel links need “diagonal” awareness
- Regional emergency communications connectivity to include airports
- SEADOG
- Index E ARFF (Aircraft Rescue Fire Fighting) Fire Chief Association
- Florida’s statewide emergency management mutual aid agreement
- Coordinating role of county EOCs
- NIMS and ICS are operational standard
- Aviation cooperation among airports
- Federal agencies and airlines key partners
- Role of state and county health departments
- Training, drilling, and exercising at levels above the basic requirements
- Credentialing EMA personnel for airport access
- Fiscal concerns
Conclusions

• Statistical model
• BMPs
• Innovative preparedness measures
• Characteristics of airports successful in emergency planning
• Bottom line
Statistical analysis

• Total operating budget is main variable but is not significantly correlated to the number of current plans.
• Total passengers, international passengers, and AAAE/AAE are collinear with total operating budget.
• Total freight correlates differently than the passenger-related variables.
BMPs (I)

- Cooperative planning with EMA and other mutual aid partners
- Joint training with mutual aid partners and other EMAs
- Frequent drills
- Realistic drills
- Using real incidents for training and drills
- Airport involvement as asset in non Aviation community drills
- Aggressive after-action reviews (AARs) for real incidents, drills, and exercises
BMPs (II)

• Formal NIMS and ICS training at all levels within the organization, including refresher training
• Succession planning
• Drills and exercise that test succession by removing key employees
• “Wickering in” senior management during training, drills, and exercises
• Pre-siting as many disaster response facilities outside the airport as possible
Innovative Preparedness Measures

- Establish remote EOC during disaster evacuation. (MSY-DFW exercise in 2008)
- Utilize training CDs compiled from surveillance tapes during real incidents. (JAN)
- Establish frequent, regular meetings of operations and emergency managers.
- Integrate GIS into EM and EM communications. (8 in use, 13 under development).
- Institute cooperative pandemic planning with CDC, state health department, local health department, and airport. (FL airports, MSP)
Characteristics of airports successful in emergency planning (I)

• Sense of community
• Stability of staff
• Top-down support and leadership
• Ongoing cooperation with surrounding EMAs
• Frequent realistic drills and exercises
• Use of real events as training and drilling opportunities
• Aggressive use of AARs and innovative use of documentation of incidents
Characteristics of airports successful in emergency planning (II)

- Presence of EM position (not tested in this study)
- Active in Index E Chiefs association (where applicable)
- Active in SEADOG or WESTDOG
- Presence of CDC and interactive planning with health agencies
- Cooperative relationship with TSA (not tested in this study)
- Greater proportion of international passengers
- Large operating budget.
Bottom line

• U.S. airports have generally been aggressively planning for disasters beyond Part 139, either in advance of Advisory Circular 150/5200-31B or in anticipation of it.

• Airport managers have a deep understanding and appreciation that good working relationships with surrounding emergency management agencies are essential to airport preparedness.

• Airports’ needs for surge capacity during disaster response can be met through wise mutual aid agreements made effective through joint training, drilling, and exercising.

• Preparedness for non-aviation disasters carries over as preparedness for aviation disasters and terrorism.
Suggestions for Further Study
Regional Cooperation and Coordination
Expansion of SEADOG/WESTDOG Concept to Rest of Country
Sharing of Plans among Airports
Differences between Fire/EM and Law Enforcement Backgrounds in Determining Airport Emergency Management Approaches and Use of NIMS/ICS
Improvement of NIMS/ICS Implementation
EMA and Credentialing for Airfield Access in Disasters
Coordination of Communications among Networks
GIS Applications for EM Communications and Coordination between Airports and EMAs
Off-Airport Pre-Siting of Response Facilities
Extension of SMS to EM
2009 Research

• Expansion of SEADOG/WESTDOG Concept
  – New England

• Regional Cooperation and Coordination
  – Minnesota

• Methods to Improve NIMS/ICS Implementation
For the details