GIS for Emergency Response Analysis: Performance Measuring and Deployment Planning in EMS

Presented by
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Montgomery County Hospital District
• Montgomery County Hospital District EMS serves the citizens of Montgomery County and adjacent areas.
• 1100 Sq Mi just north of Houston, Texas.
• Population > 410,000
• Growing at nearly 6% annually
• 40,000 incidents annually
• 26 Units daily
Many agencies fall short on the geography.

Each is dependant on the other to produce usable information.
Geospatial

Definition: pertaining to the geographic location and characteristics of natural or constructed features and boundaries on, above, or below the earth's surface; esp. referring to data that is geographic and spatial in nature
• Network Analyst
  – Depends on a reliable, routable street network dataset.
Actual Typical Usage

- Geographic Standard Deviation
- Shape, size, and orientation all have meaning
Details of a Unit

- AVL Data – Where do they go?
- SDE of Actual Responses – Where are they used?
• Subtle differences can be discovered
Service Areas of Hospitals
Characteristics of the County

- Current Response Zones
- Population Density
- Street Density
- Response Density
When are we busy?

Time of Day (Temporal) Distribution

Hour of Day / Day of Week

Priority 1 & 2 Temporal Distribution
MCHD’s Deployment Methodology

- Performance last quarter
  - Fractal compliance by zone
- Review of Post Plan
  - Compare actual usage versus planned
  - Count of post moves
  - Distribution of calls by medic
- Review last deployment objectives
  - Were objectives met?
  - How effective was the method?
• Set new objectives
  – Geographic coverage issues
  – Demand coverage issues
  – Balancing work load
    • Post moves versus call volume
• Propose new methods
  – Changes must consider 3 items:
    • Crew morale
    • Performance gain
    • Financial impact
• All emergency calls
• Red is high density, green is low
Exception Raster

- Density of calls that did not meet response time requirements
Compliance Raster

- Percent compliance
- Red indicates low compliance
• ArcGIS Explorer Demo