Identifying and Planning for Special Populations During a Natural or Man-Made Disaster

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Purpose

To identify resources and locate vulnerable populations during a disaster.

Background

- Past disasters revealed the need for a systematic method of identifying vulnerable populations in the event of a disaster.

  – Santana/Granite Hills School Shootings, 2001
  – San Diego County Firestorms, 2003
  – Hurricane Katrina Evacuees, 2005

Background

- **The Santana/Granite Hills school shootings in 2001 changed the way EMS looked at mass casualty events.**

  - **Victims who were minors presented numerous challenges, specifically parental notification of status and destination.**
  - **In response, an on-site patient information coordinator role was established to relay information to parents at the scene.**
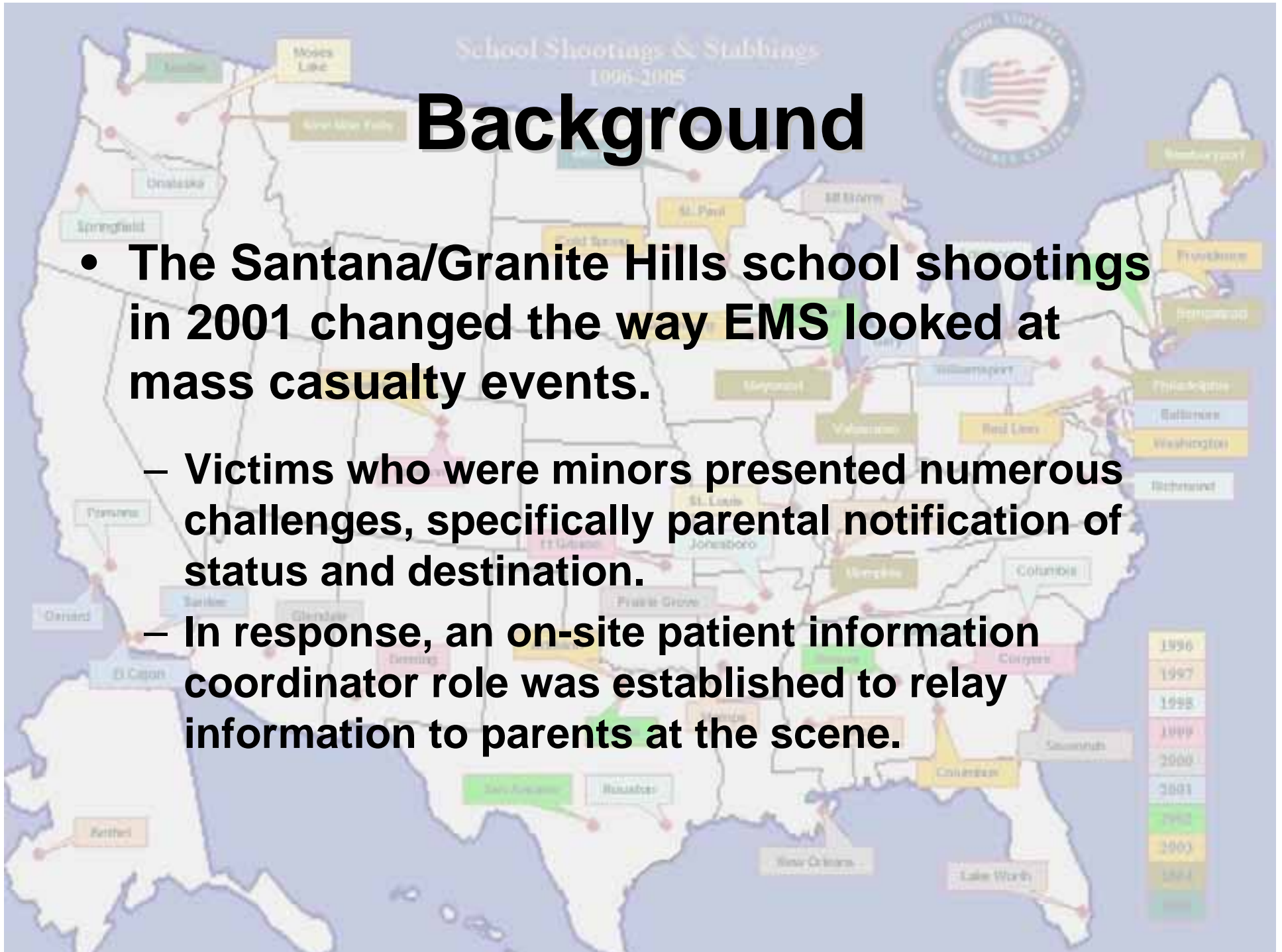
Background

- **In October 2003, the worst firestorm in San Diego history ran rampant through the County.**

  - **Individual facility evacuation plans were not coordinated at a regional level**
  - **Facilities relied heavily on the 9-1-1 system for transportation.**

Background

- **Hurricane Katrina in 2005 brought to local attention the pockets of previously unidentified vulnerable populations.**

  - Specifically home health care facilities and related transportation issues
  - Reinforced the need for regionally coordinated evacuation plans.

Planning for a Disaster

Lessons learned from past disasters prompted the development of a more comprehensive plan in preparation for future events.

Planning for a Disaster

This plan included:

- The creation of a list of current resources, including emergency response personnel and emergency care facilities.

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3. The use of available tools such as GIS to produce maps.

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Planning for a Disaster

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5. The preparation of multiple scenarios for the evacuation or deployment of aid to identified high-risk populations in the event of a known or probable disaster.

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Planning for a Disaster

Using GIS and a needs assessment tool created from lessons learned from past disasters, detailed information on vulnerable populations is now immediately available to public health practititioners in an interactive mapping format.

Needs Assessment Tool

- **Capacity** - Total capacity of the facility (excluding staff)
- **Occupied** -   Total occupancy of the facility (excluding staff)
- **Staff** - Total number of staff
- **Patient:Staff** - Patient to staff ratio
- **<5 yrs** - Number of people <5 years
- **<18 yrs** - Number of people <18 years (including staff)
- **18-64 yrs** - Number of people 18-64 years (including staff)
- **65+ yrs** - Number of people 65+ years (including staff)
- **Bed-ridden** - Infant, child or adult due to age or disability
- **Wheel-chair bound** - Unable to walk and self-transport
- **Special needs** - Medical equipment (i.e., IVs, oxygen), infant car seats, etc., necessary for transportation
- **Ambulatory** - Able to walk and transport without special assistance
- **Schedule** - Facility hours of operation

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Needs Assessment Tool Demographics

Zip Code = 12345	<5 yrs	<18 yrs	18-64 yrs	65+ yrs
Total Population	1,000	3,000	5,000	2,000
White	550	1,800	2,500	1,300
Black	75	300	400	100
Hispanic	250	650	1,600	300
Asian/Other	125	250	500	300

- Available at the census tract, zip code, or community level.
- Community level data is maintained as a large dbf file which is imported into GIS
  - Obtained directly from the census (SANDAG)
  - Includes age, race/ethnicity, language, income, transportation, etc..

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Needs Assessment Tool
Facility Information

Zip Code = 12345	Capacity	Occupied	Staff	Patient: Staff	<5 yrs	<18 yrs	18-64 yrs	65+ yrs	Bed Ridden	Wheel-Chair Bound	Special Needs	Ambulatory	Schedule
Residential Care Elderly													
Facility One	40	35	7	5:1	0	0	5	37	5	10	10	17	24hr/7day
Facility Two	75	60	15	4:1	0	0	12	63	12	15	17	30	24hr/7day
Group Home													
Facility Three	20	20	5	4:1	2	6	19	0	0	0	4	21	24hr/7day
Day Care													
Facility Four	12	12	4	3:1	8	12	3	1	3	0	8	8	6am-6pm
Elementary School													
Facility Five	n/a	500	40	25:2	8	492	32	8	0	10	10	520	7am-4pm

- Licensed facility information available through state website
- Non-licensed facility information more difficult to obtain and must be updated continuously
  - Small group homes
  - Private residential care facilities

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Using GIS During a Disaster

- ArcView version 9.2
- Needs assessment data is imported into GIS for real-time updates at various geographic levels
- Used to maintain current facility status
- Facility contact information maintained in ArcView and available upon request
- Ability to map disaster areas and view surrounding communities that may be affected.
- Maps shared across multiple agencies and operations centers

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GIS Layers

Vulnerable Populations

Schools / Child Care Facilites
- Day Care Facilities
- Elementary Schools
- High Schools
- Colleges

Detention Facilities
- Youth Detention Facilities
- Jails
- Prisons

Hospitals
- Emergency Hospitals
- Medical Hospitals
- Mental Hospitals
- Trauma Centers

Other Medical Facilites
- Council of Community Clinics
- Licensed Medical Facilities
- Residential Care Facilities - Elderly
- CMS Clinics
- Skilled Nursing Facilites
- Adult Residential Care Facilities
- Group Homes

Other Facilities
- Single Residence Occupants - Elderly
- Major Employers
- Homeless Shelters

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GIS Layers

Additional Layers

Geographic Layers
- Parks
- Canyons
- Indian Reservations
- Aerial Photos
- Lakes
- Floodplanes
- Census Tracts
- Subregional Areas

Transportation
- Roads
- Public Transit Routes

Community Facilities
- Libraries
- Recreational Centers
- Community Places
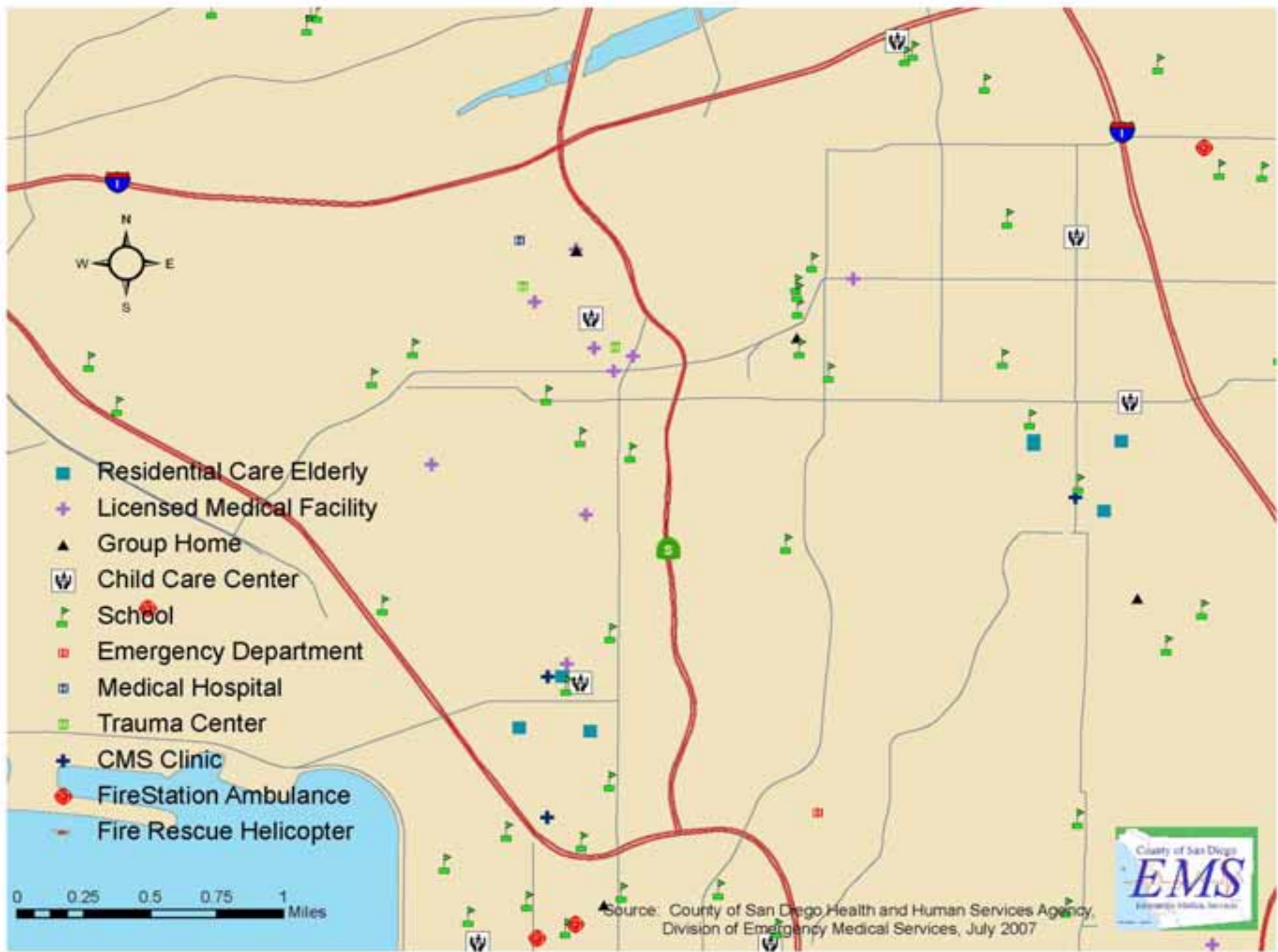- Postal Facilites

Population Demographics
- Age
- Race/Ethnicity
- Average Household Size
- Poverty Level

Emergency Personnel
- Police Stations
- Fire Departments
- Fire Rescue Helicopters
- Fire Stations
- Ambulance Service Stations
- Operations Centers
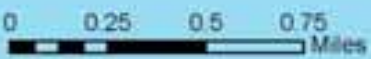
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Legend

- ■ Residential Care Elderly
- ✚ Licensed Medical Facility
- ▲ Group Home
- 👶 Child Care Center
- 🚩 School
- ▫ Emergency Department
- ▪ Medical Hospital
- ▫ Trauma Center
- ✚ CMS Clinic
- ● FireStation Ambulance
- — Fire Rescue Helicopter

0   0.25   0.5   0.75   1
Miles

Source: County of San Diego Health and Human Services Agency,
Division of Emergency Medical Services, July 2007

County of San Diego
EMS

Facility ID: 011
License: Status: Licensed
Agency Name: Facility One
Address: 1111 XXX St.
City: San Diego
Zip: 12345
Phone: xxx-xxx-xxxx
Capacity: 40
Occupancy: 35
Staff: 7
Patient-Staff Ratio: 5:1
Age - <5 yrs: 0
Age - <18 yrs: 0
Age - 18-64 yrs: 5
Age - 65+ yrs: 37
Bed-Ridden: 5
Wheel-Chair Bound: 10
Special Needs: 10
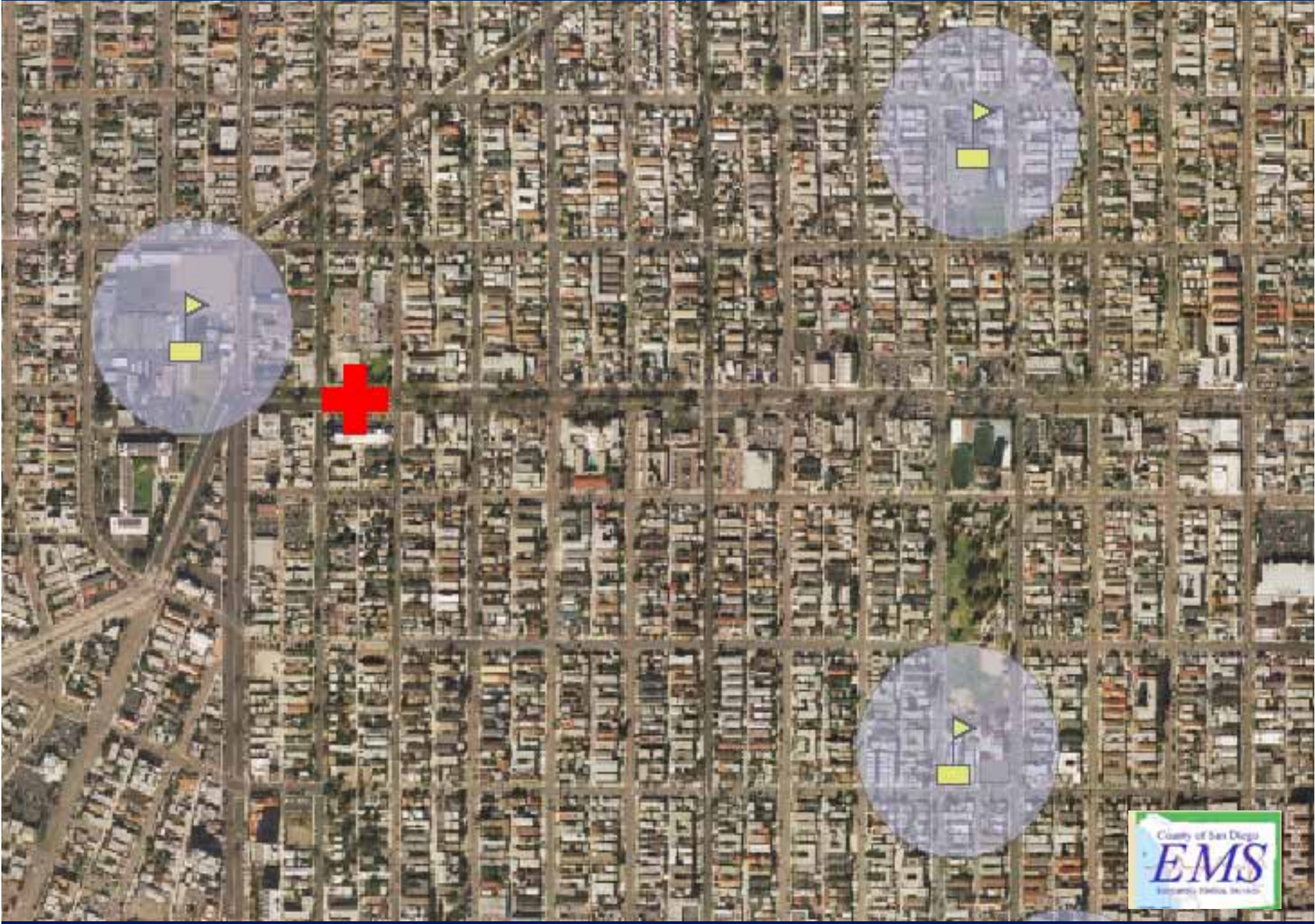Ambulatory: 17
Schedule: 24 hours / 7 days

ZipCode: 12345
Total Population: 10000
Age <18 yrs: 3000
Age <5 yrs: 1000
Age 18-64 yrs: 5000
Age 65+: 2000
Primary Language Spoken: 75% English, 20% Spanish

✚ **Licensed Medical Facility**
■ **Residential Care Elderly**
▲ **Group Home**
ꙍ **Child Care Center**
⚑ **School**

0   0.25   0.5   0.75
▬▬▬▬▬▬▬▬ Miles

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County of San Diego
EMS

Conclusions

- This tool has been successfully used in the Medical Operations Center (MOC) during disaster training drills in preparation for a medical related disaster.

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- Maps can be shared across various response agencies and organizations using WebEOC, a web-based emergency management communications system using real-time information sharing.

- A GIS trained geographer and/or demographer is able to:
  - Identify the physical location of vulnerable populations
  - Identify the population impact of a large-scale event
  - Plan and implement scenarios

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  - There is a monetary cost involved
  - The cost is minor compared to the potential benefit to the public's health and safety.

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- A well-known, comprehensive plan to identify vulnerable populations gets people to think about disaster who normally are not involved in disaster planning.

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COUNTY OF SAN DIEGO
HEALTH AND HUMAN
SERVICES AGENCY

PHS

Public Health Services

Emergency Medical Services