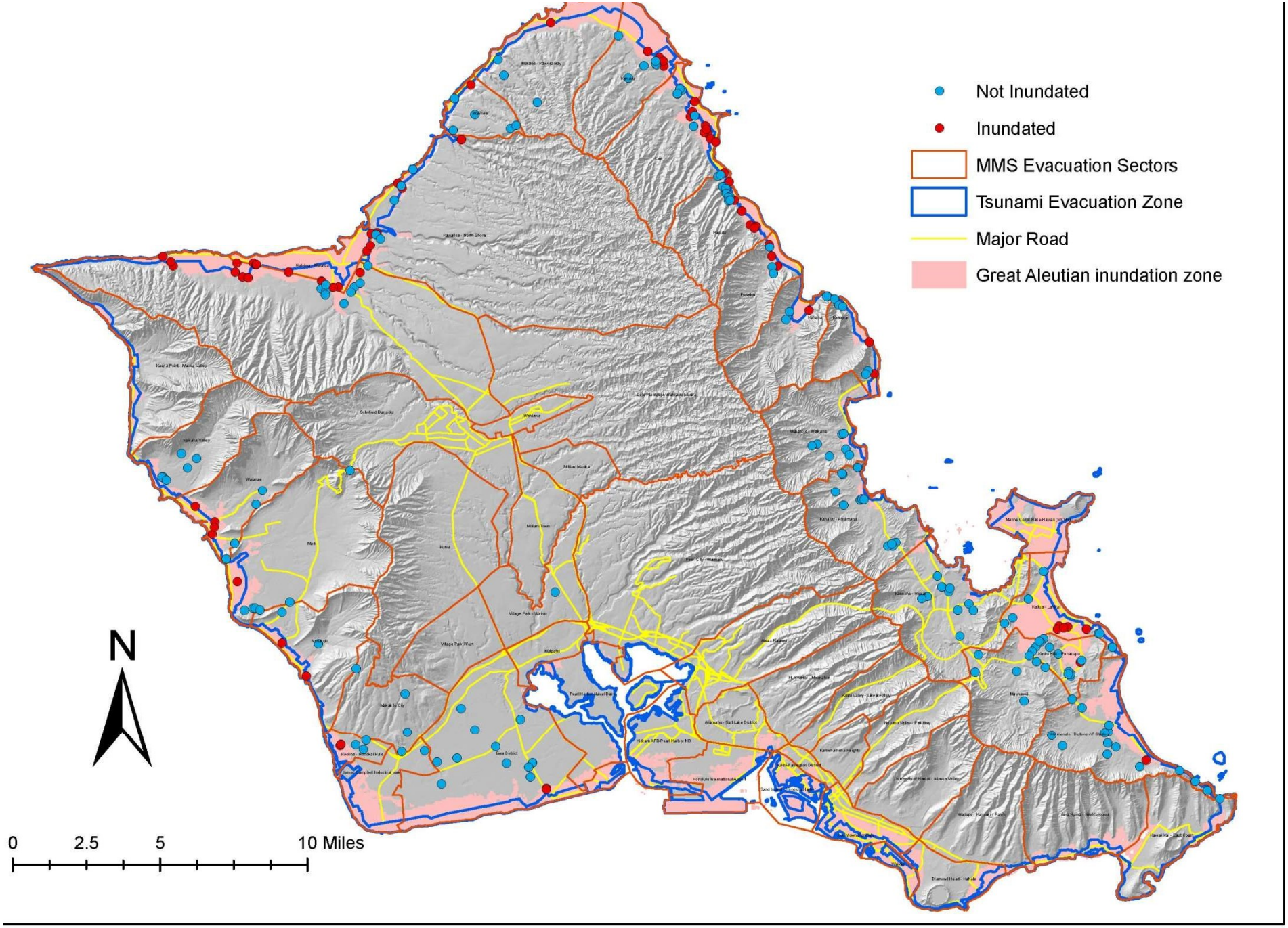
O'ahu Coastal Communities Evacuation Planning Project

Plan Design Enable

DEPARTMENT OF EMERGENCY MANAGEMENT
CITY AND COUNTY OF HONOLULU
STATE OF HAWAII



Oahu Coastal Evacuation Planning - Refuges and Locations

Scope of Work

Task 1

Conduct gap analysis

Task 2

Field work for geographic area evacuation route plan(s)

Task 3

Plan development for geographic area evacuation route plan(s)

Task 4

GIS mapping

Task 5

Public Outreach

Task 6

Prepare report and recommend further actions

Task 1 Conduct Gap Analysis

- Delineate coastal communities (COMPLETED)
- Participate in early community meetings & consultation with EPCs & NBs (COMPLETED)
- Assessed community preparedness (COMPLETED)
- Evaluated existing DEM established shelters- potential use for refuges (COMPLETED)
- Identified potential refuges- comprehensive range of alternatives (COMPLETED)
- Initially worked with 2010 tsunami inundation & evacuation zone (COMPLETED)
- Integrated Great Aleutian scenario as “guidance” in gap analysis (COMPLETED)

Vulnerability Assessment

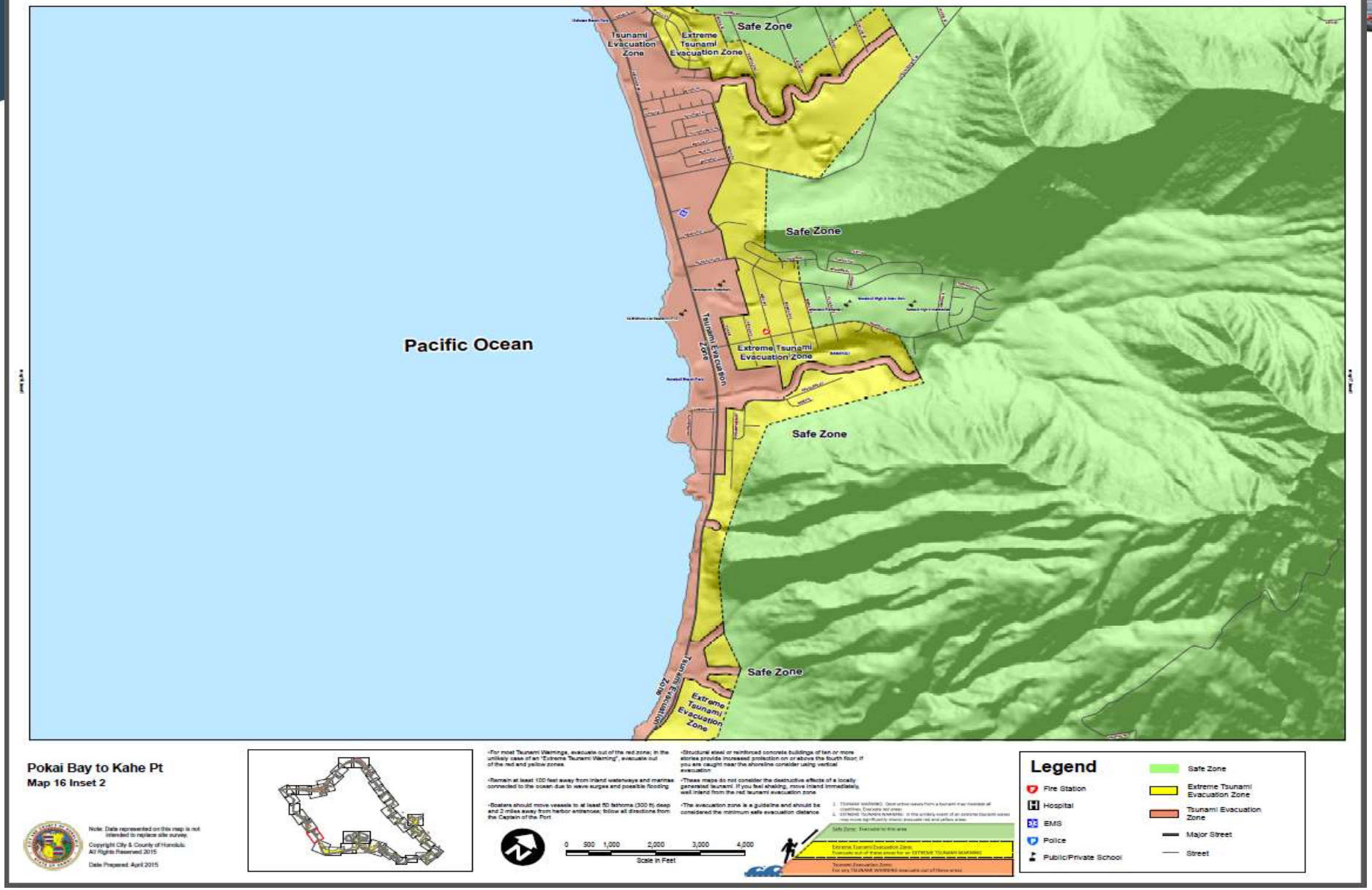
- # of People who need to evacuate:
  (80,000 TEZ ; 300,000 XTEZ)
- People have forgotten the Natural Warning Signs of a Tsunami:
  – FEEL the earth shake, drop, cover & hold
  – SEE the ocean recede or act unusual
  – HEAR the roar of the ocean - like a jet aircraft

  MOVE QUICKLY INLAND OR VERTICAL
- Study results recommended vertically evacuating to the 4th floor or above in buildings with 10 stories or more.

Behavioral Analysis

- Anticipate more people will evacuate
- Estimate 1 in 5 households will need to evacuate
- Approximately 85% of households will drive one or more vehicles to evacuate.
- Approximately 20% of households will evacuate with their pets

Map 16-2 – Pokai Bay to Kahe Pt



Task 2 Field Work for Evacuation Nānākuli

- Nānākuli High School & Intermediate- excellent location, ample parking, volunteers in place
- Makakilo Elementary- limited parking and distance from evacuation area
- Adjacent Māʻili community has no viable options existing as assigned elementary school is in the inundation zone- assume aggregate overflow to NHS
- Identified potential refuge- Camp Timberline in Pālehua Heights- distance and traffic into Kapolei is an issue

Refuge Selection Criteria

- Emphasis on existing shelters or co-location with shelters;
- Emphasis on publicly (C & C) owned facilities;
- Outside XTEZ;
- Ample parking to justify its use;
- Tried to keep evacuations to refuge trips local;
- Identified 55 potential locations on Oahu; and
- Limit potential for long term isolation, where possible.

Task 3 Plan Development for Evacuation- Nānākuli

Task 3 Plan Development for Evacuation- Nānākuli

2012 Nānākuli Community Group									
	2012 Total Population	2012 Total Occupied Households	Participation %	Evac Population	Evac Households	Total Vehicles	Evac Vehicles @ 1.5/HH	Evac Pop to Refuges	Evac Veh to Refuges
2010 TEZ Zone Only	731	162	100	731	162	357	243	227	75
XTEZ Zone Only	1,320	292	84	1,109	245	646	438	344	136
Both Zones	2,051	454		1,840	407	1,003	681	570	211

Task 3 Plan Development for Evacuation- Nānākuli

Task 4 GIS Mapping

Finalized community groupings relative to projected refuge assignments & evacuation routing

Identified and assigned major evacuation routes and signage placement

Cleaned up data files and created final ArcGIS geodatabase files.

- Confirm methodology for capacity calculations
- Agreement to approach for aggregate demand
- Agreement to methodology for unconventional but viable refuge spaces (side of dirt roads, fields, other “up mauka” zones

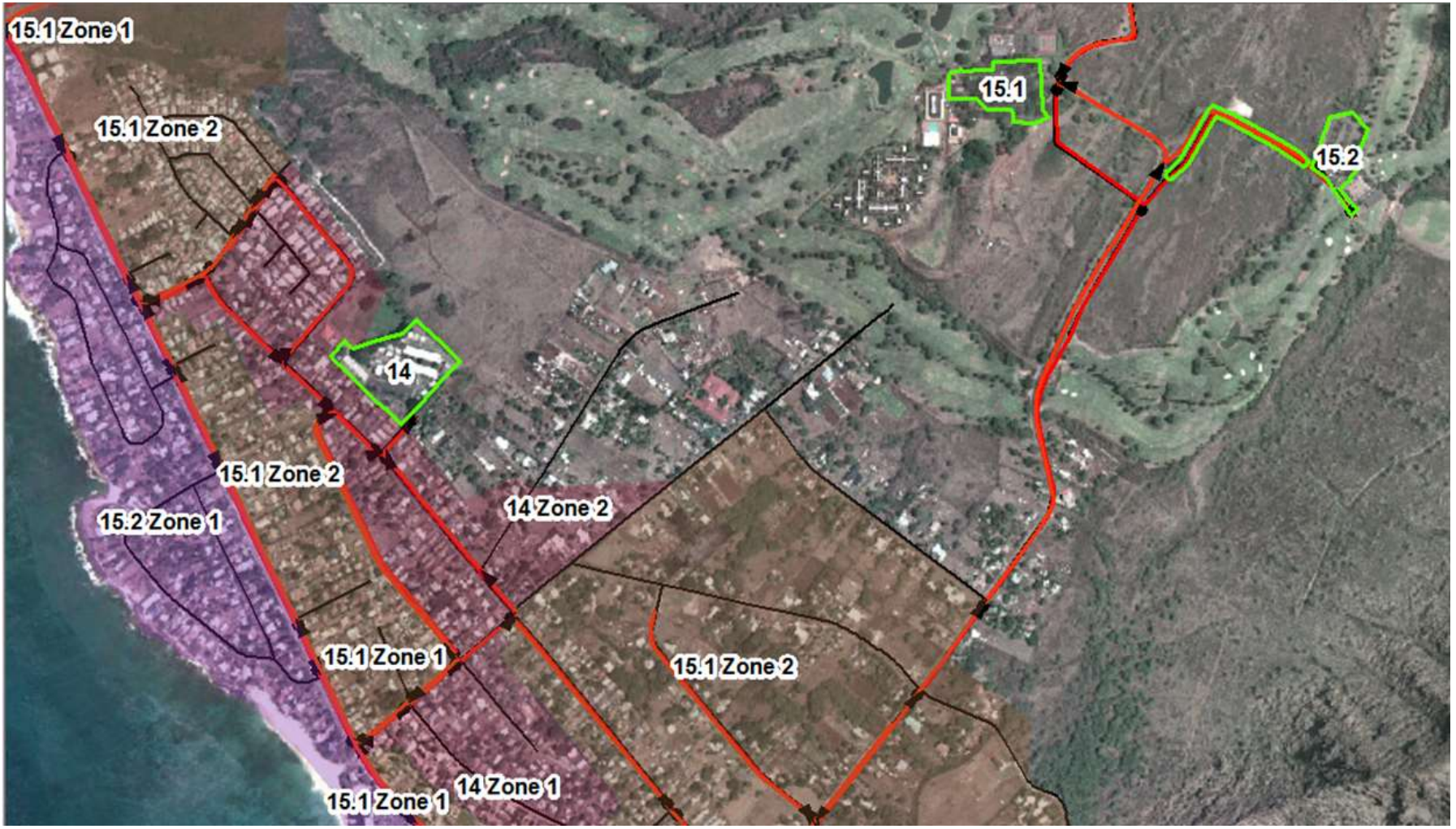
Evacuation Route Mapping

- Tried to avoid crossing evacuation streams;
- Minimize trip distance to refuge, if possible;
- Maximizing the use of right turns from origin to destination;
- Follow up refuges along extension of routes;
- Each roadway broken into segments for loading points and intersections; and
- Each segment has assigned hourly directional service volume, peak background traffic and other road characteristics.

Evacuation Route Mapping

- Some roads have two way evacuation route traffic;
- Each refuge zone has its own assigned routing;
- Some overlap of evacuation routes from refuge zones to refuges; and
- Evacuation routes only address refuge zones to refuges for populations seeking refuges, all other trips (e.g., friends and family, etc.) will take whatever route they choose to.

Evacuation Route Mapping



Evacuation Route Signing

- Sign emphasis - **to get evacuees to the Safe Zone refuges**, all other evacuation trips (e.g., friends and family) will use their own routes anyway.
- Emphasis on mapping strategically placed signs (e.g., at turns, refuge entrances, etc.);
- Support the evacuation routes and refuge assignment zones
- Tried to use existing vertical infrastructure for sign placement
- Signs will also inform drivers upon entering or exiting a designated 2010 Evacuation Zone or XTEZ

Evacuation Route Signing

Task 5 & 6 Public Outreach, Report Preparation, & Recommendations

Compiled list of major stakeholders, such as private landowners, to be consulted- DEM to initiate initial consultation

Coordinated meetings with government and NGO partners to seek input to proposed refuges, routes, and locations

Prepared Final Report

Final Product

- Completed evacuation populations calculations for all coastal communities in the Leeward, North Shore and Windward areas
- Finalized capacities of Tier 1 and Tier 2 proposed refuge sites
- Completed calculation of evacuation clearance times
- Completed proposed signage placements
- Received GIS shapefiles and research study files
- Completed 15 Scheduled Public Outreach Meetings