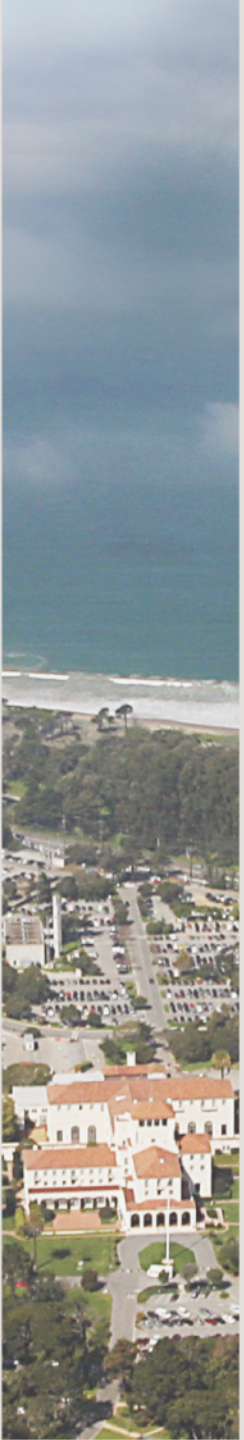

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California Homeland Security Consortium

Sam Walker, Chairman
Representing the
Monterey County Fire Chiefs Association

Monterey, California
WWW.NPS.EDU

Objective

- Significantly improve regional emergency response capability by providing operationally useful prototypes

- Demonstrate a potential broader model for cooperation between Federal, State, Regional and Academic resources to improve emergency response capability

Roles and Responsibilities

Department of Homeland Security

- provide funding, project guidance, oversight management, fiscal control

California Homeland Security Consortium

- represent the interests of the regional emergency response community
- define problems and requirements to improve response capability
- select the best ideas to help solve the problems
- supervise the conduct of the research
    - routinely review and evaluate
- evaluate the results
- implement the successful results

Naval Postgraduate School

- organize and support California Homeland Security Consortium
- conceive solutions to emergency response problems
- define research necessary to achieve solutions
- execute and deliver solutions

Operational Model

- Department of Homeland Security provided funding to the Naval Postgraduate School
- NPS sought advice from the community on how to construct a representative “voice” of the California regional emergency response community
- Membership recruited exclusively from nominations from the community
  - County/city administration
  - Law enforcement
  - Fire protection
  - Emergency services
  - NGO (Red Cross)
- Organization named “California Homeland Security Consortium” established to:
  - represent the entire regional emergency response community
  - define the highest priority problems needing attention
  - select research efforts most promising to contribute to problems
  - serve as the customer with commitment to utilize research results
  - regularly evaluate the progress of the research
  - evaluate the research results
  - implement successful research results

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California Homeland Security Consortium (CHSC) Board Members

Last Name	First Name	Organization	Title	Telephone	Email
Bauman	Lew	Monterey County	County Administrative Officer	(831) 755-5113	baumanl@co.monterey.ca.us
Bloxham	Buddy	CAL Fire	Battalion Chief	c: (831) 236-5659	buddy.bloxham@fire.ca.gov
Craft	Gary	DA's Office	Chief District Attorney Investigator	(831) 755-5257	craftga@co.monterey.ca.us
Collins	Sherrie	Office of Emergency Service	Emergency Services Manager	(831) 796-1901	collinssl@co.monterey.ca.us
Maguet	Lynda	American Red Cross Monterey Bay Area Chapter	Emergency Services Manager	(831) 424-4824 x.5007	maguetl@usa.redcross.org
Meurer	Fred	City of Monterey	City Manager	(831) 646-3760	meurer@ci.monterey.ca.us
Monarque	Chuck	Mo Co Sherriff's Office	Captain	(831) 755-3803	monarquec@co.monterey.ca.us
Perlstein	William (Bill)	CHP	Captain	(831) 796-2100 c: (831) 236-9381	wperlstein@chp.ca.gov
Rodriguez	Edmundo (Eddie)	Marina Police Dept.	**CHSC Co-Chair** / Chief	(831) 884-1235	erodriguez@ci.marina.ca.us
Schmitt	Kirk	EMS	Emergency Medical Services Director	(831) 755-4964 c: (515) 299-0727	schmittke@co.monterey.ca.us
Walker	Sam	CALFIRE	**CHSC Chair** / Deputy Chief, State and Federal Programs	(916) 653-8362 c:(530) 306-1988	firetechresearch@gmail.com

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Project Selection

Aug. 26, 2010 — First Consortium meeting – problems identified

Identify priority issues for local First Responders

Recruited all Deans to solicit 800 faculty for solution ideas

Sept. 30, 2010 — 44 proposals from all 4 schools, 12 departments, 2 institutes reviewed by Consortium

October 21, 2010 — 5 projects selected

Individual members took ownership of projects to provide oversight and assure operational effectiveness

December 2010 — Proposals submitted to DHS

March 2011 — DHS funding provided

Spin Off from CHSC Operational Model

ISSUE: Technology transfer of products produced by the California Homeland Security Consortium to the private sector

- Operational prototypes will be delivered to the participating organizations but products are not available beyond prototype stage for further use
- Even if prototypes were available, the high cost would be a barrier to broader application
- Monterey County Administrator has directed an effort to team economic development, job creation, and the technical results of the Consortium
- Concept:
  - Establish County non-profit organization as interface between government technology and the private sector – a federal technology gateway
  - Non-profit would facilitate technology transfer and market to private sector
  - Private sector would commercialize CHSC products resulting in local job creation and mass production prices for the emergency responders

Summary

- Consortium became the voice of the regional emergency response community
  - Identified highest priority problems by consensus
  - Determined the best ideas to address these problems by consensus
  - Volunteered their time to direct researchers to produce useful product
  - Routinely evaluated research progress by consensus
  - Actively managed resources, terminate project early that met objectives
  - Reallocated resources by consensus
  - Will promote technology transfer among their regional and national peers
  - Will train their employees to assure operational use of results

- Continuation of experiment will build cohesion and leadership of federal/state/local partnership to significantly improve emergency response capabilities
  - More aggressive technology advances
  - From small region to encompass broader community

Project Summaries

1. Lighthouse – Longley:

Field data collection and network analysis to help combat gang violence modeled after Afghanistan experience focusing on:

- improving community resilience, enhancing local defense initiatives, & improving local forces' ability to respond to violent and criminal activity.

- deliverables include hardware, software and training for law officers

2. Independently Powered Command, Control & Communications (IPC3) – Barreto, Steckler:

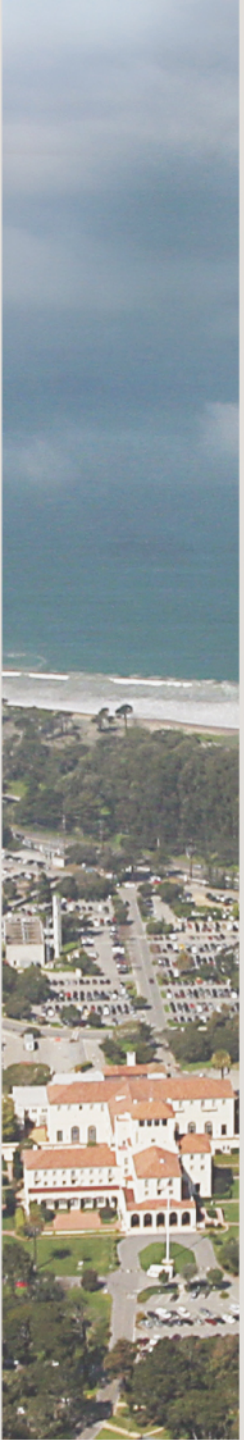
- Prototype independently powered C3 system operational w/no infrastructure

3. Spatio-Temporal Event Mgmt Architecture (STEMA) – Dobrokhodov et al:

Integrated wide-scale surveillance system for criminal forensics:

- back-tracking vehicles through time to aid in crime attribution

- real-time video for better situational awareness, greater spatial coverage



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LIGHTHOUSE

Illuminating social networks to help navigate the human terrain

Carrick Longley
Captain, US Marine Corps
Naval Postgraduate School

Monterey, California
WWW.NPS.EDU

CHSC Project Description

- Objective: determine if field data collection and network analysis can help *combat the gang violence problems in California* through the **Monterey County Counter-Gang Task Force**

- Leveraging military concept to improve community resilience, enhance local defense initiatives, and improve local forces' ability to respond to violent and criminal activity
  - tested in Afghanistan; Massachusetts State Police – Special Gang Unit; Colombian Special Forces

Related activities

- Deployment of Lighthouse to Afghanistan in support of Special Operations Task Force – 13
- Collaboration with:
  - Massachusetts State Police – Special Gang Unit
  - Colombian Special Forces
  - Anti-corruption Task Force - Shafafiyat

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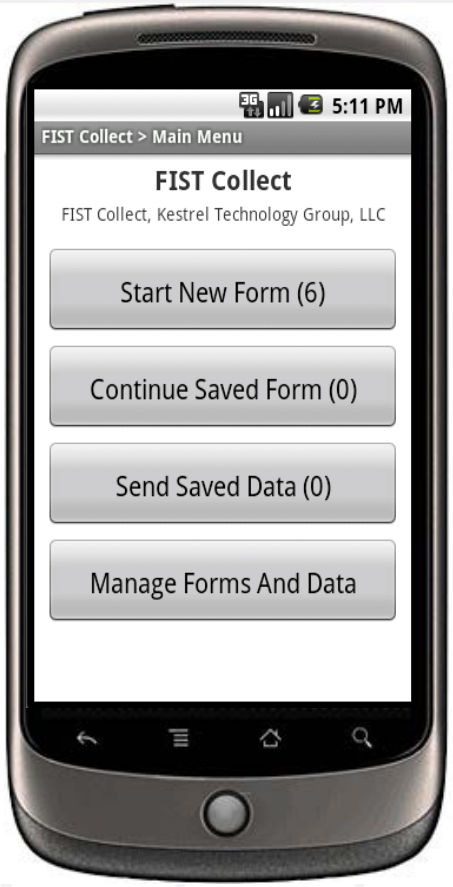
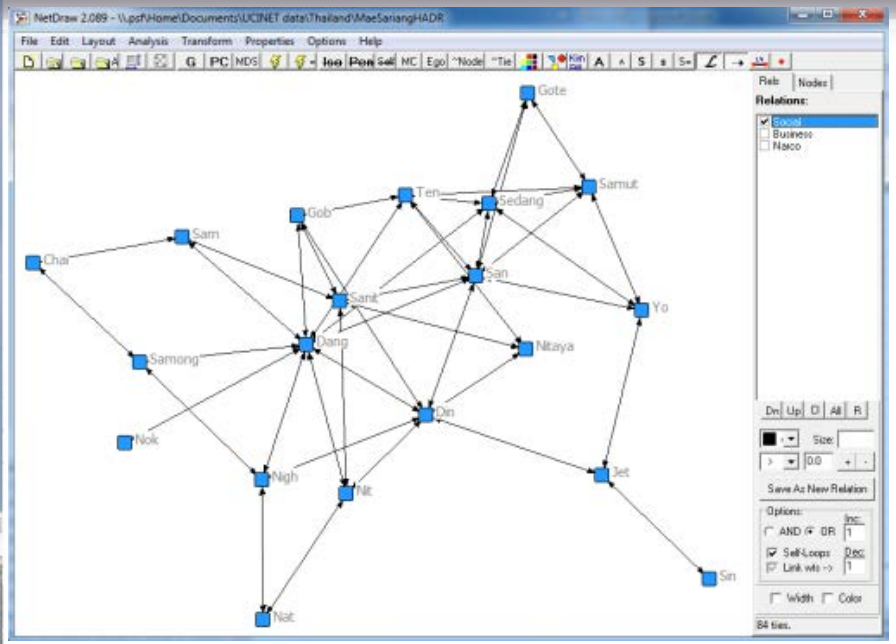
Initial Data Collection

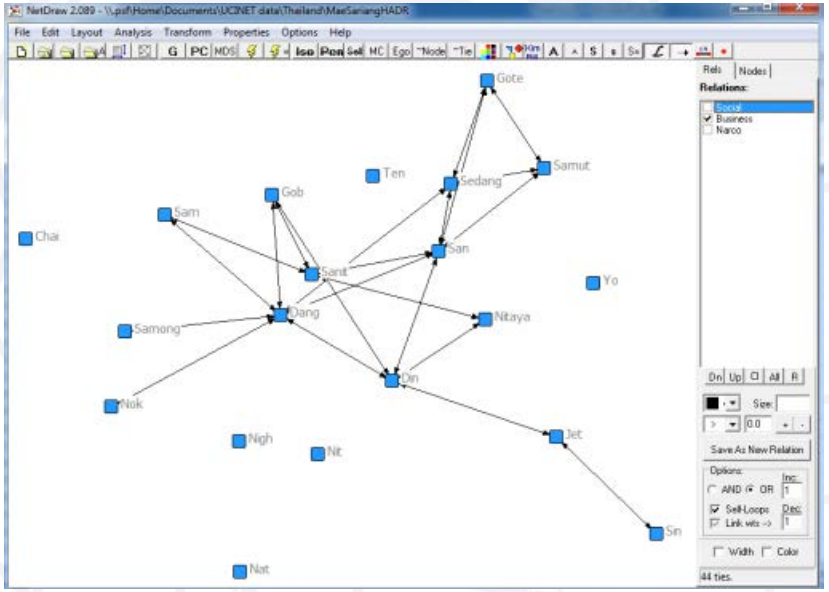


Initial data collection begins with operators using *Collect* to identify key individuals, networks, and critical infrastructure

Dynamic Network Analysis



Identifying gang members with influence in a city based on centrality metrics

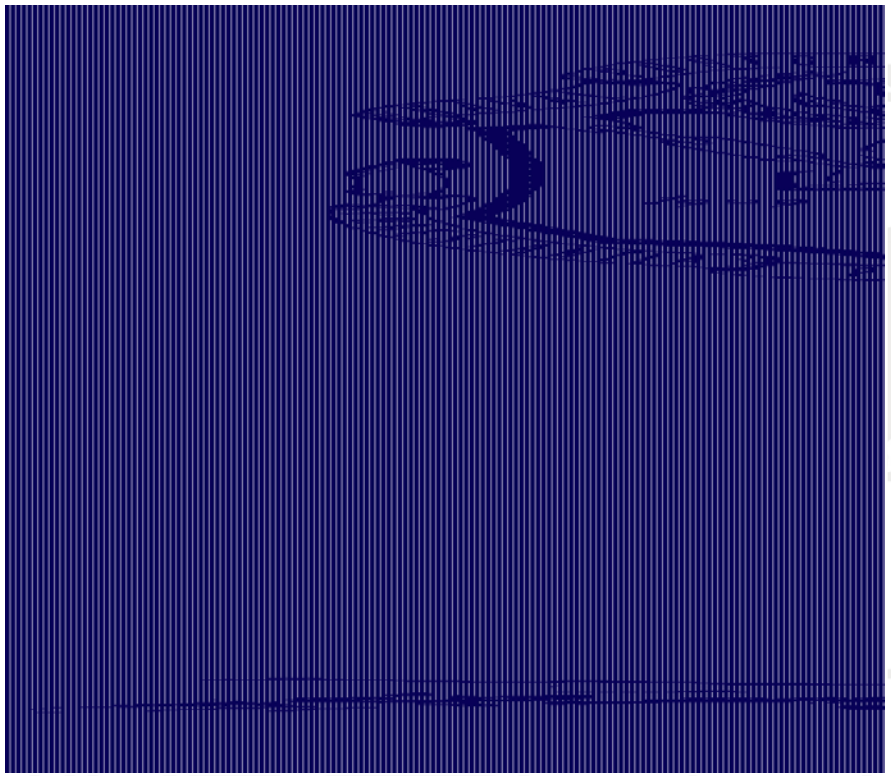


Deliverables

1. Determine local requirements for intelligence practices, information interface, and concept of operations
2. Customized collection form based on law enforcement information requirements.
3. System demonstration and use.
4. Training package on geospatial, link analysis, and social network analysis using ‘best of breed’ analytic software packages to maximize return on investment.
5. Unlimited access to and use of Lighthouse
   - 20 smart phones on long term loan for Lighthouse implementation
   - Full source code of all of Lighthouse for incorporation into future systems (if desired)

IPC3

Independently Powered Command, Control, and Communications For First Responders



Albert Barreto and Brian Steckler, NPS Faculty

IPC3

- The Problems:
  - No power
  - No fiber/copper or other local comms infrastructure
  - No push-to-talk radio comms to speak of
  - Cellular service mostly jammed / overwhelmed
  - SatPhone service mostly jammed / overwhelmed
  - Not enough satellite equipment suites available
  - No Internet access (web, email, VOIP)
  - No technical people resources available

The Solution: A Hastily Formed Network…..

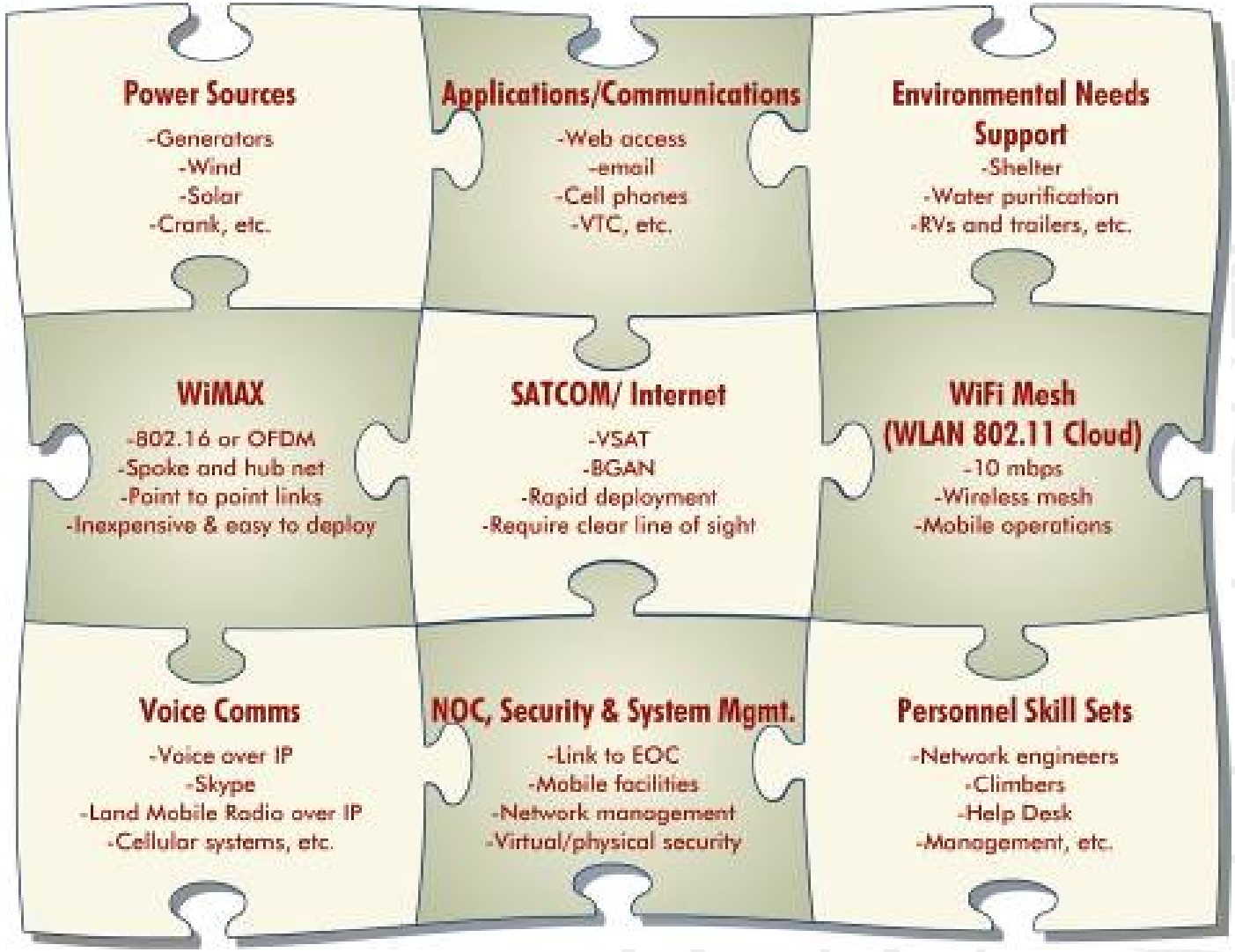
IPC3

Solution:

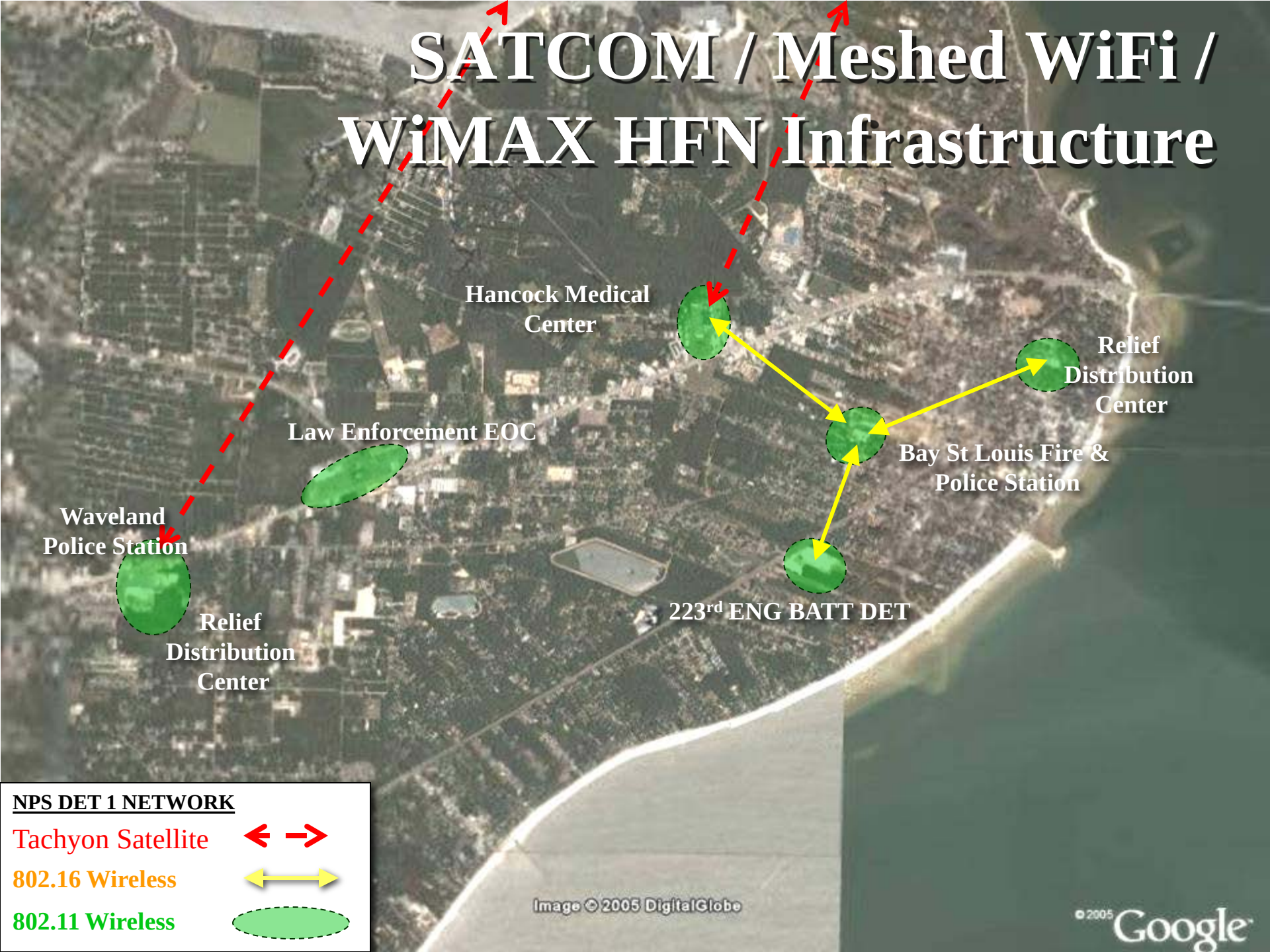
1) **A combination of scalable, easily deployed, and dependable wireless, land-based and satellite (Internet) communications systems including wind, solar, hydrogen fuel cell, and generator power sources.**

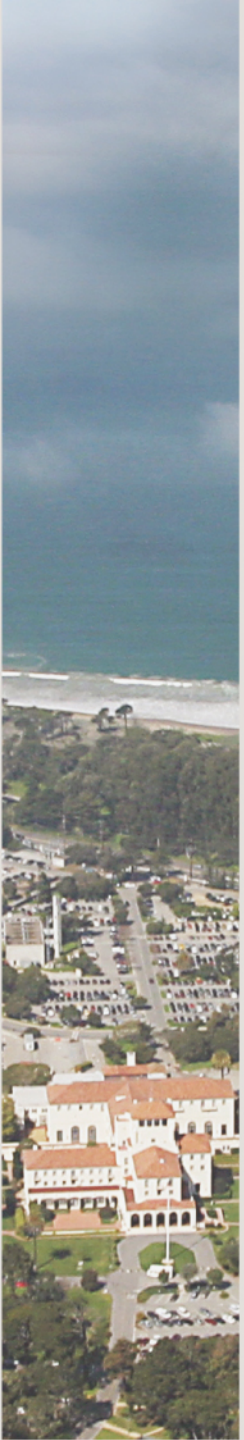
2) **A ruggedized virtual network and data center server system to host customer primary applications and localized data until normal operations are restored.**

Hastily Formed Networks Puzzle



SATCOM / Meshed WiFi / WiMAX HFN Infrastructure





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Spatio-Temporal Event Management Architecture (STEMA)

PI: Vlad Dobrokhodov

Co-PI: Michael Clement

Team: Mathias Kölsch

Kevin Jones

Timothy Chung

Monterey, California

WWW.NPS.EDU

Motivation

- Law enforcement is facing problems in surveillance of gang activity – they are pervasive, distributed, and it is difficult to track ***who*** is ***where*** doing ***what***.

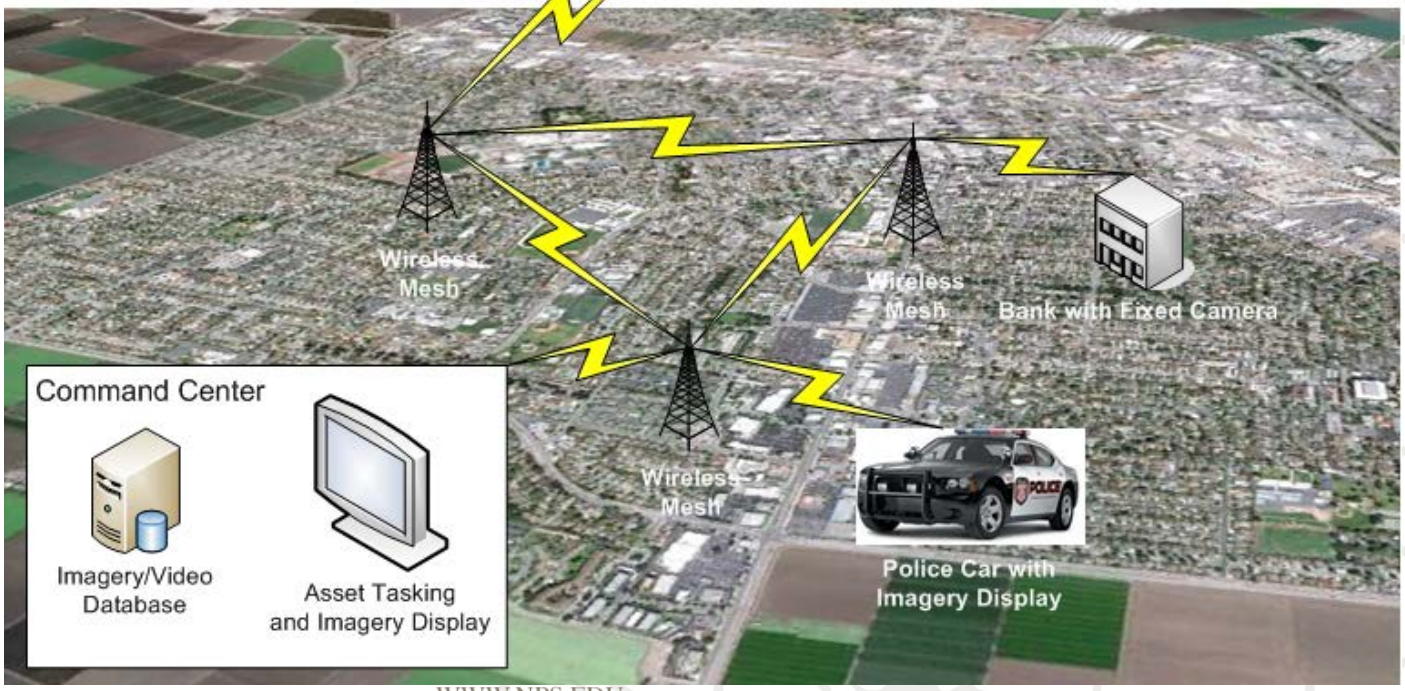
- Military is facing similar issue with insurgents and other in-theater guerilla fighters - very different than isolated incidents involving large forces.

- Adopting a different model of surveillance, where having tagged ("signed with a note") , searchable imagery/video over time provides more value than at-the-moment full-motion video.

Proposed System

1. Video and imagery sources
   - Manned and Unmanned Aerial Assets
   - Fixed and mobile sources on ground (traffic cameras, banks, et cetera)
2. Geo-referencing and time synchronization
   - Ability to search and replay
   - Live and stored imagery available at command center and from law enforcement vehicles
3. Planning and tasking software for aerial assets
4. Wireless Mobile Ad Hoc Network (MANET)

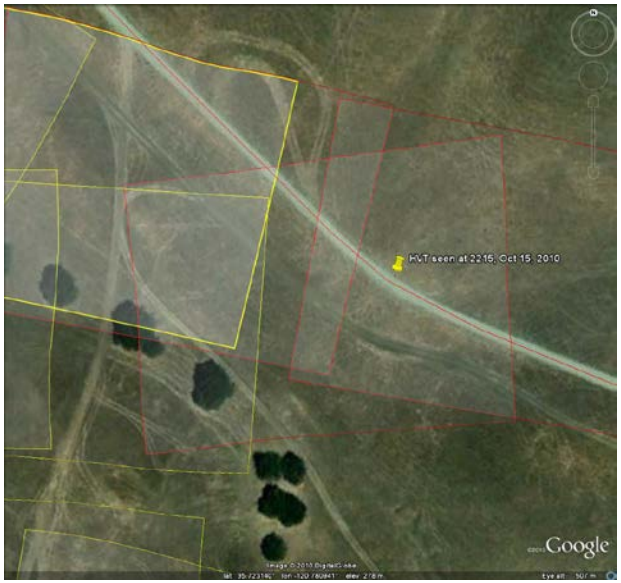
Aircraft with Gimbaled Camera



Develop=> Live Intuitive Data Retrieval, Client Software

- **All data is archived in a common database shared by all players**
  - Video: ground-based, aerial, dash cams, etc.
  - High resolution still imagery: aerial

- **Data display options:**
  - Ordered lists – thumbnails, linked video, images, archived data
  - Geographic display – graphical interface like Google Earth with all data overlaid on the map.
    - –Simple push-pins, lines and polygons mark the location of archived data.
    - – Intuitive representation of time when the data was retrieved (color coding)
    - –Link to archived video, imagery, and data files for simple mouse-click retrieval



2D and 3D data retrieval clients

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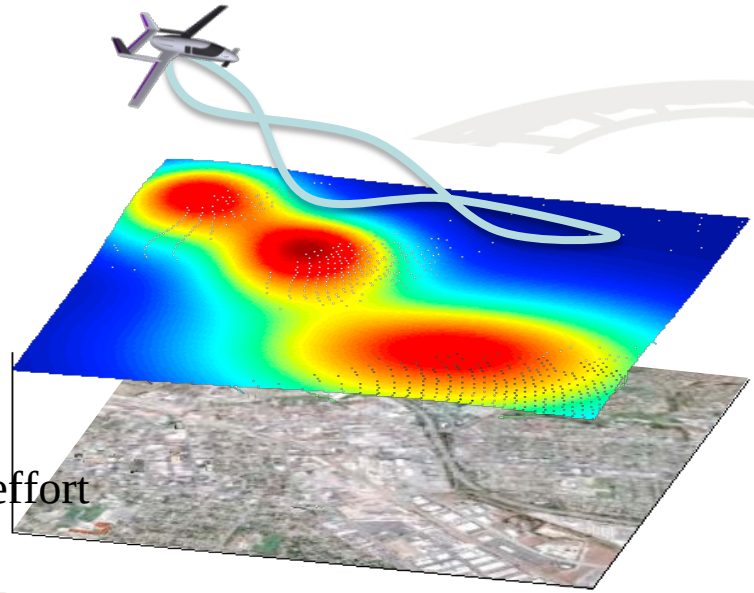
Situational Awareness for Surveillance and Interdiction (SASIO), Software

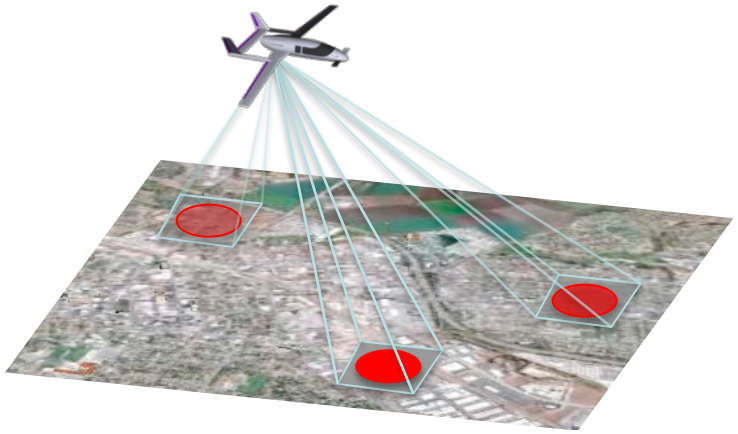
***SASIO** provides **high-level planning** for integrated:*

Optimized surveillance patrol

- Persistent surveillance requires optimized patrol
  - Minimize time between revisits while maximizing coverage
  - Feed STEMA with most high-value data
- Geo-spatial models for identifying incident "hot spots"
  - Inform which areas require greater observation effort
  - Higher frequency and higher spatial resolution



Optimized incident assignment and tracking



- Possible requests for targeted observations among multiple incidents
  - Prioritize requests and assign sensor to targets of interest

Deliverables

1. **Mobile sensor platform including:**
   - High resolution camera, stabilized platform
   - Inertial Navigation System solution for precise image localization
   - Wireless network link for data download and remote sensor control
   - Task management onboard computer
2. **Mobile Ad Hock Network components with management software**
3. **Situational Awareness for Surveillance and Interdiction (SASIO) software**
4. **STEMA processing platform (software + hardware) including:**
   - Media storage
   - Spatial database
   - 2D and 3D viewers (clients)
5. **“Getting Started” manuals and training sessions**

California Homeland Security Consortium (CHSC)

- CHSC has demonstrated:
  - Sharing and collaboration across emergency response communities – achieved "voice" of first responders
  - Consensus on the highest priority threats
  - Collectively managed the development of counters to these threats
  - Improvement to public safety and criminal justice operational capabilities and readiness
    - Alternate EOC capability/Gang network penetration
    - Enhanced GIS mapping/Austere interop comms
  - Multi-agency interactive training and exercises
  - Potential to serve as a state and national model

Proposal to partner with CALEMA

- Expand regional CHSC to statewide
  - Mechanism to achieve unlimited leverage on Federal technology available to California first responders
  - Utilize Monterey County model for technology transfer
- Demonstrate statewide capability as national model
  - Potential partnership w/ Feds - DHS S&T, FEMA, etc
- FY 2010 funding = $2M
- First deliverable = top 10 requirements
  - More permanent structure = better results