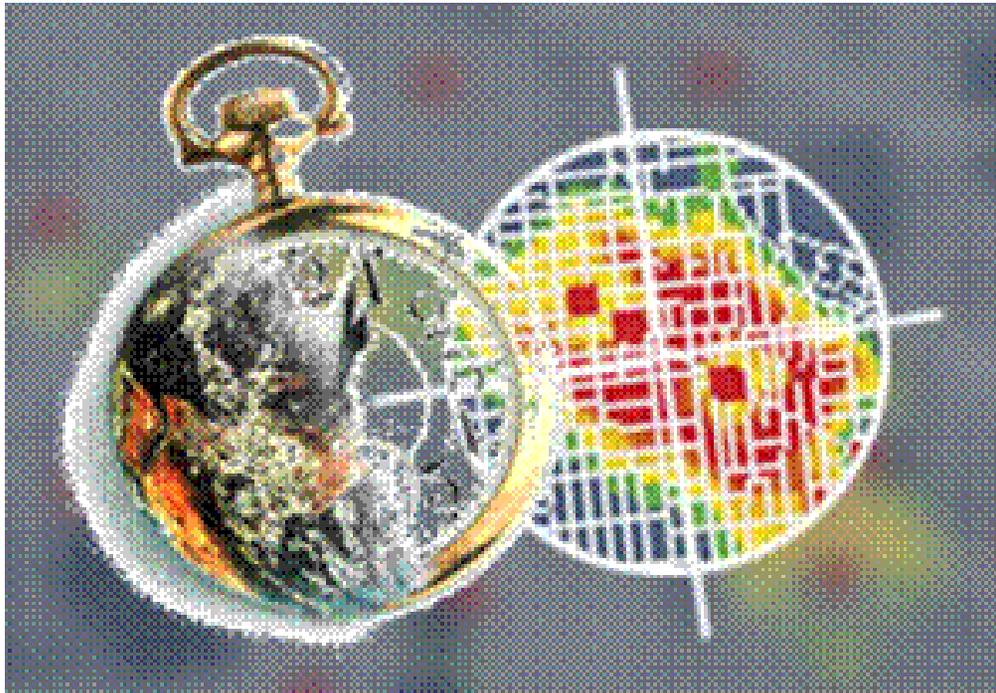




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Geographic Profiling Military Capabilities



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GWOT Strategy

Thomas P.M. Barnett, The Pentagon's New Map – War and Peace in the Twenty-First Century, April 2004

Globalization seemed to be remaking the world, but meanwhile the US military seemed to be doing nothing more than babysitting chronic security situations on the margin. Inside the Pentagon, these crises responses were exclusively filed under the new rubric “military operations other than war,” as if to signify their lack of strategic meaning....

But changing “bad” states to “good” ones requires that we generate some broadly accepted definition of what a good state is, meaning a government that plays by the security rules we hold dear – like “Don’t harbor transnational terrorists within your country” and “Don’t seek weapons of mass destruction.” Enunciating that rule set is the most immediate task in this global war on terrorism, and promoting the global spread of that security rule set through our use of military force overseas (e.g. preemptive war against regimes that openly transgress the rule set) is our most important long-term goal in this struggle.

My Comments

But military conflict continues with attempts to rebuild the infrastructure of an occupied country after warfare, where we become “occupiers” instead of “liberators” when insurgent groups attempt to regain or replace the former regimes. The US military was unprepared for this level of resistance when rebuilding another nation there. Nation rebuilding should therefore become a coherent part of the future global war on terrorism strategy.

Our Enemy

Insurgent groups and their leadership are terrorists ...

Source: Newsweek 2/7/2005



Beyond Baghdad

Resistance fighters, both domestic and foreign, continue to operate throughout the country.



IN IRAQ (1/19/05)

ABU GHRAIB
Drawn by tribal ties, Fallujans fled here when their city was under siege. Now the area around the notorious prison has become an insurgent stronghold.

GAZALIYA
Clerics at the local Mother of All Battles Mosque are strongly pro-resistance and have attracted many insurgents to this once quiet neighborhood.

AADAMIYA
The cluster of Sunni neighborhoods where Saddam and his sons hid before skipping town; it's the most fiercely pro-resistance area in Baghdad.

HAIFA STREET
Hoping to tame this bustling stretch of road—it's Zarqawi's main stomping ground—the 82nd Airborne recently set up a firebase. Attacks still continued.

SADR CITY
Formerly a hotbed of insurgent activity, this massive Shia slum has been peaceful since August and recently was an election-eering stronghold.

AL DOURAH
Insurgents have focused on hunting down the many gov't collaborators who live in this diverse area; it's also the site of constant clashes with U.S. patrols.

AMIRIYAH AND AL JIHAD
Brimming with old Baathist housing, these areas now serve as the launchpads for attacks on the Airport Road, where 55 Coalition officials died last year.



Ten Most Wanted

This new list of resistance leaders was released by U.S. and Iraqi authorities last week.

1. IZZAT IBRAHIM AL-DURI: Former vice chair of Saddam's Revolutionary Command Council: \$10 mil. reward.



2. ABU MUSSAB AL-ZARQAWI: May have been captured and released by mistake last fall: \$25 mil. reward.



3. ABD AL-BAQI ABD: The former Baath Party bigwig now recruits and funds resistance fighters.



4. SABAWI IBRAHIM AL-HASAN: Saddam's adviser and half brother is now thought to be hiding in Syria.



5. RASHID TAAN KAZIM: Ex-Baathist has reportedly offered recruits up to 3 million dinars to attack U.S. forces.



6. MUHAMMAD RAJAB AL-HADUSHI: He's the former director of Saddam's Presidential Guard.



7. NAJIM ABDULLAH ZAHWAN KHALIFA UJAYLI: Did he flee Fallujah amid U.S. assault?

8. MUHAMMAD KHALAF SHAKARA: Led attacks by a group aligned with Zarqawi.

9. ABU AYYUB AL-MASRI: Another Zarqawi ally, he may have been in Fallujah during Operation Al Fajr, too.



10. ABU ANAS AL-IRAQI: This explosives expert may now be operating in Mosul or Samarra.



Definitions

Q: What is **Geographic Profiling (GP)?**

A: GP describes spatial and temporal behavior patterns from cases of repeated and related **events toward finding **who**-actors, **what**-mode, **where**-place, **when**-date-time (MPDT), and regardless of **why**, within an optimal search of **suspect-locations**; as within law enforcement and police investigation of serial crimes.**

Q: What are the potential GP **Military Capabilities?**

A: For **countering terrorist and insurgent actions within continued conflict while rebuilding a country after warfare, with uncommon rules-of-engagement and unconventional warfare where current COA-TDA tools fail.**

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Partnerships



Swiftsure
Spatial Systems Inc.



Texas State University
SAN MARCOS

- **Satisfy requirements of Marine Corps (HQMC-IE,MCIA), SOF (EBO-PSYOPS,CA), Stryker Brigades (PIR), MP, security firms (SOC-SMG for example) employed by US Army; plus INSCOM-IDCE, NGIC, FBI, DOJ, ATF, DHS, Border Patrol.**
- **The NTA team supported review and design of tools that now assist police investigations of serial crime (including assault, murder, arson, and robbery) to find military capabilities of countering terrorism and insurgency activities.**



Geographic Profiling Software

A Methodology for Evaluating ...

- Rigel <http://www.geographicprofiling.com/>
- CrimeStat <http://www.icpsr.umich.edu/CRIMESTAT/>
- Dragnet http://www.i-psy.com/publications/publications_dragnet.php
- Predator <http://www.drmauricegodwin.com/geoprofile.htm>



Asymmetric Warfare

Predictive Intelligence Analysis Capabilities for Special Operations Forces

Objective: Deploy and sustain toolkit to USASFC for collection, analysis, and dissemination of **actionable geospatial intelligence** and **improved situational awareness**.

Asynchronous Software Kit

? **GeoProfiling** ?
Suspect
Prioritization

**Analyst's
Notebook**
Analysis

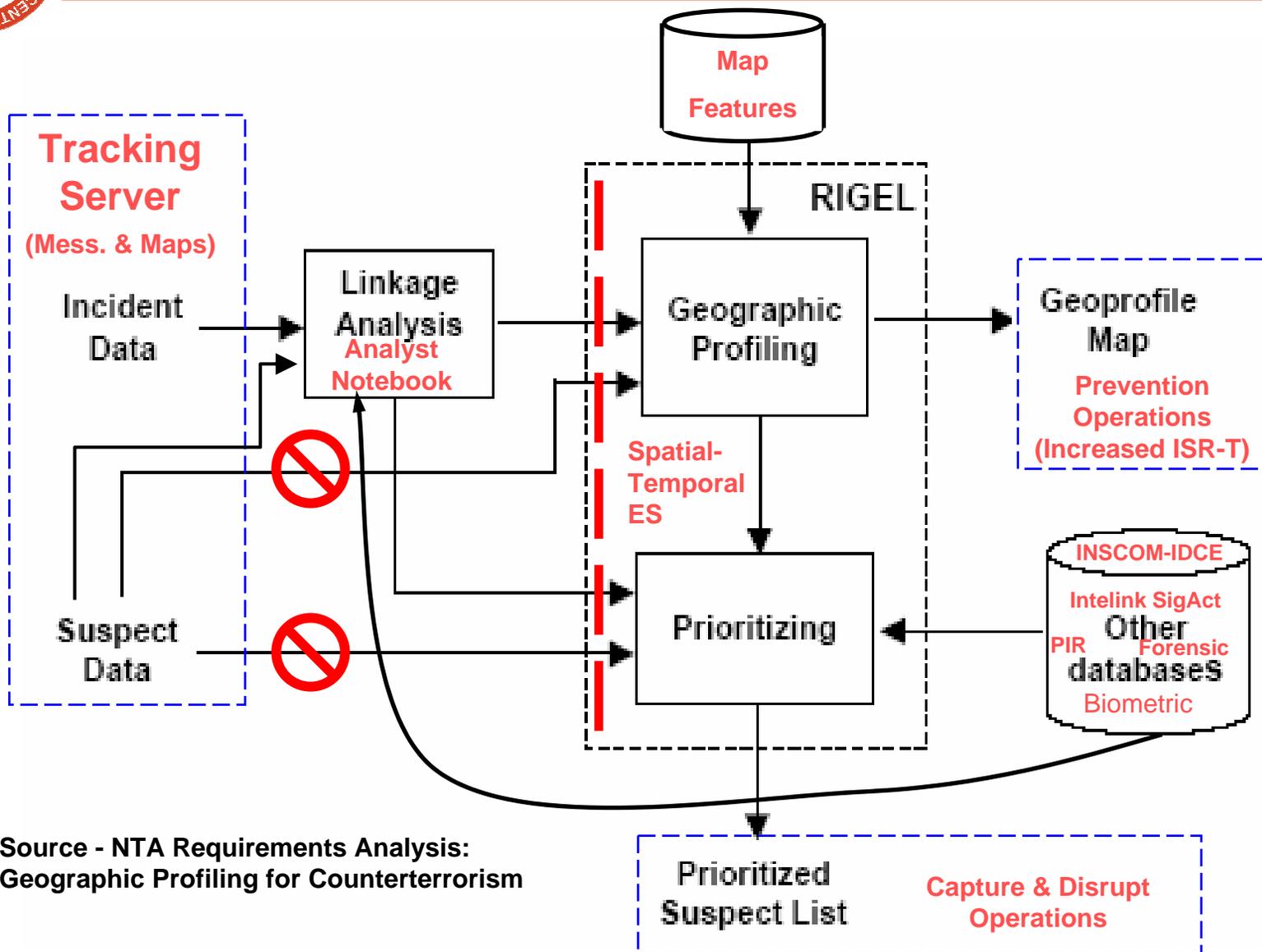
Pathfinder
Message
Handling

Orion Magic
Catalog

ArcGIS - Spatial display and analysis
(plus 3d, Spatial, Tracking, and Military Analyst extensions)

Impact on SOF:
Superior knowledge of the terrain and environment improves the warfighter's effectiveness. Provides a common relevant operational picture.

Dataflow



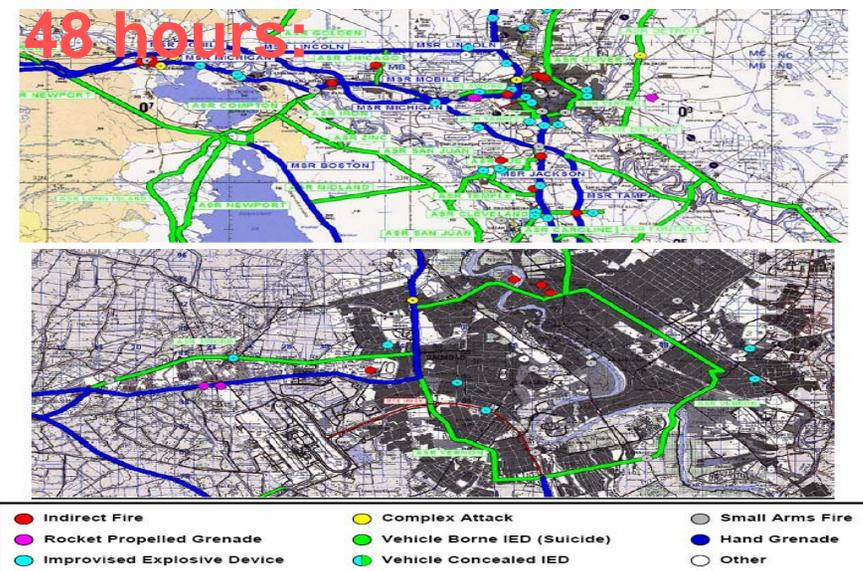
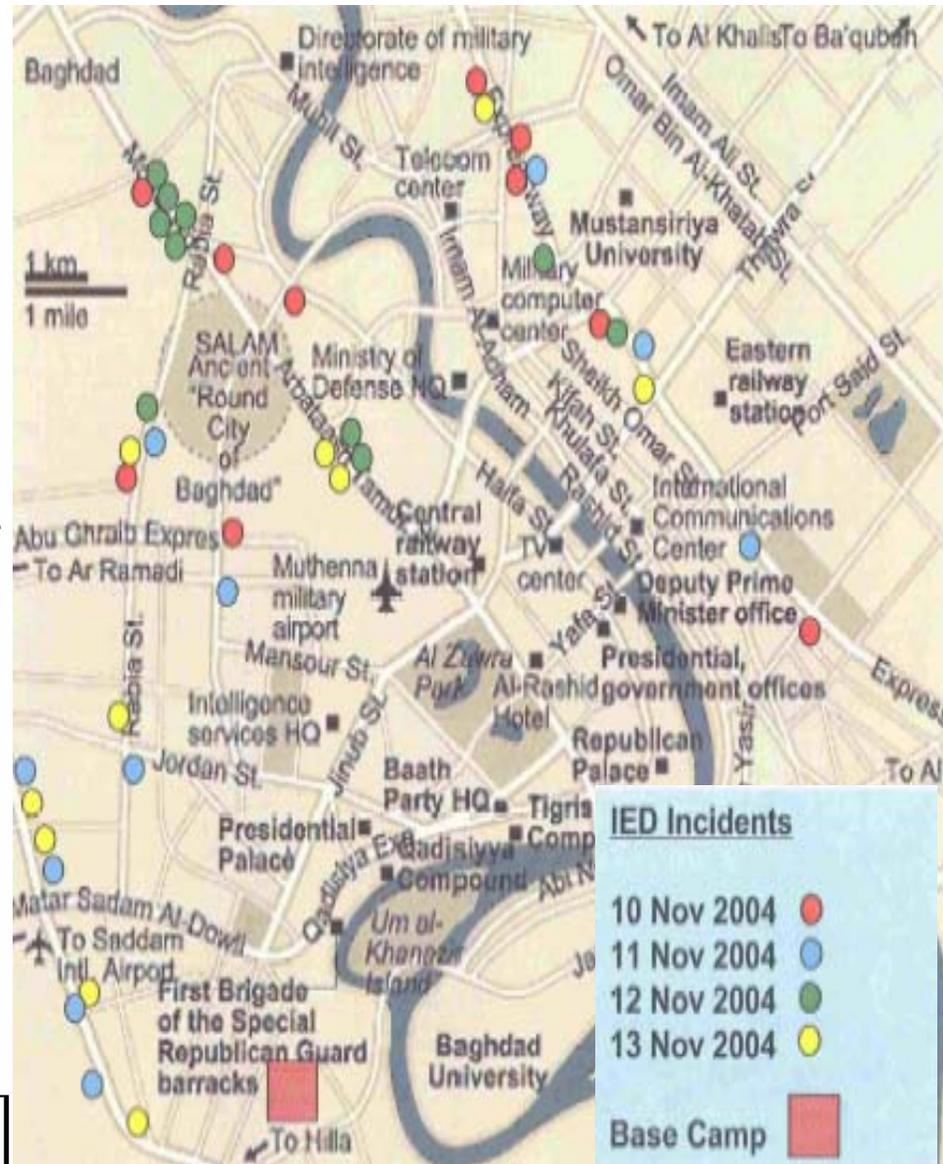
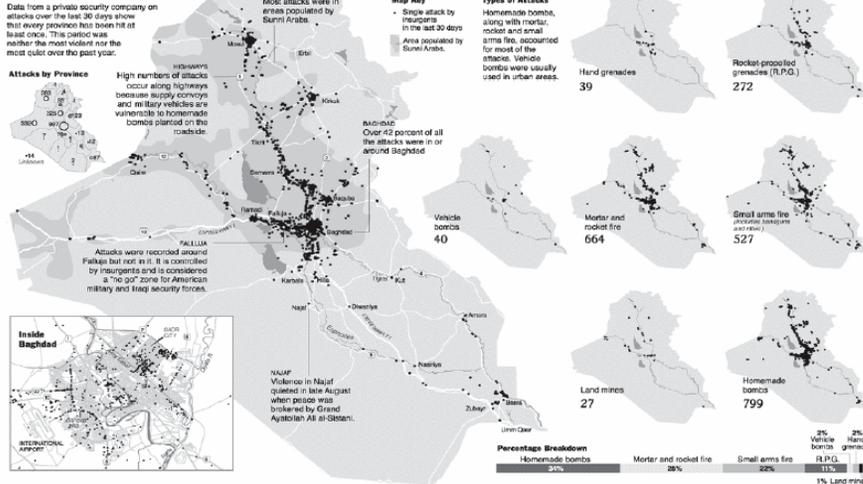
Source - NTA Requirements Analysis:
Geographic Profiling for Counterterrorism

Notional Datasets



Source – NTA Requirements Analysis: Geographic Profiling For Counterterrorism

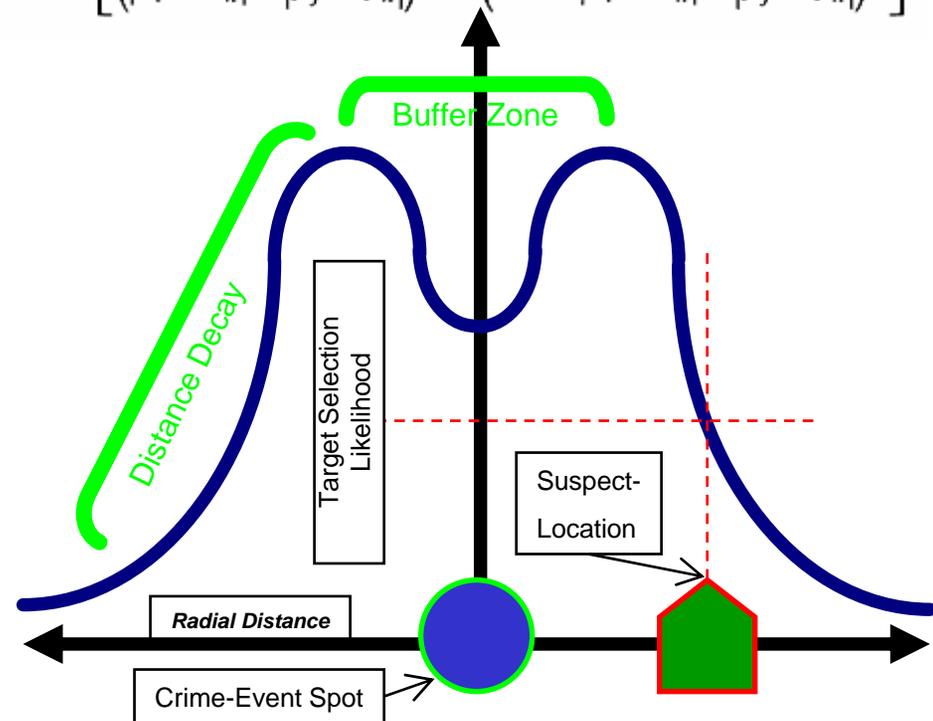
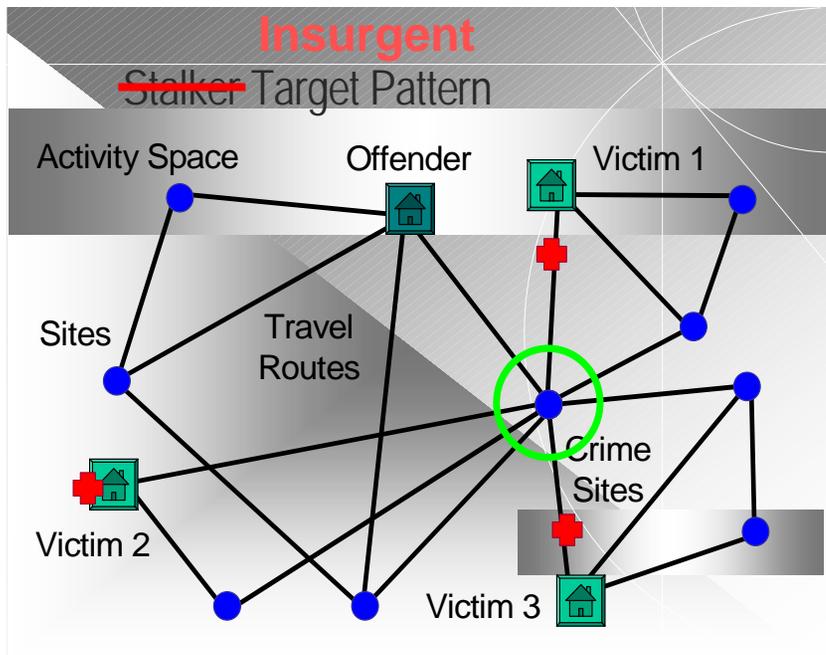
30 Days, 2,368 Attacks



ISR Focus Zones

Optimally search hunting area for suspect-locations given knowledge of perpetrators or offenders activity space.

$$p_{ij} = k \sum_{n=1}^c \left[\frac{\phi}{(|x_i - x_n| + |y_j - y_n|)^f} + \frac{(1 - \phi)(B^{g-f})}{(2B - |x_i - x_n| - |y_j - y_n|)^g} \right]$$



Travel Demand



Figure 10.3:

Journey to Crime Travel Demand Functions Five Mathematical Functions

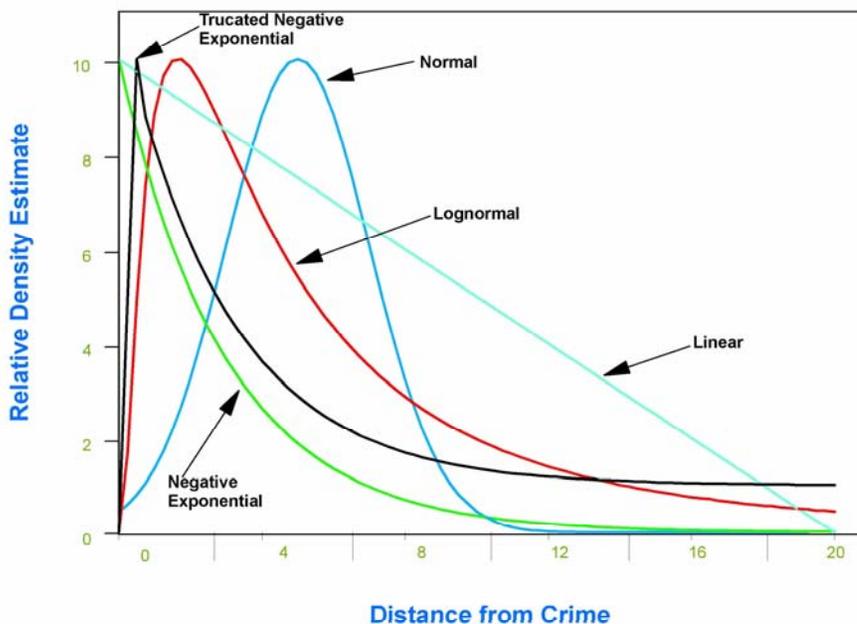
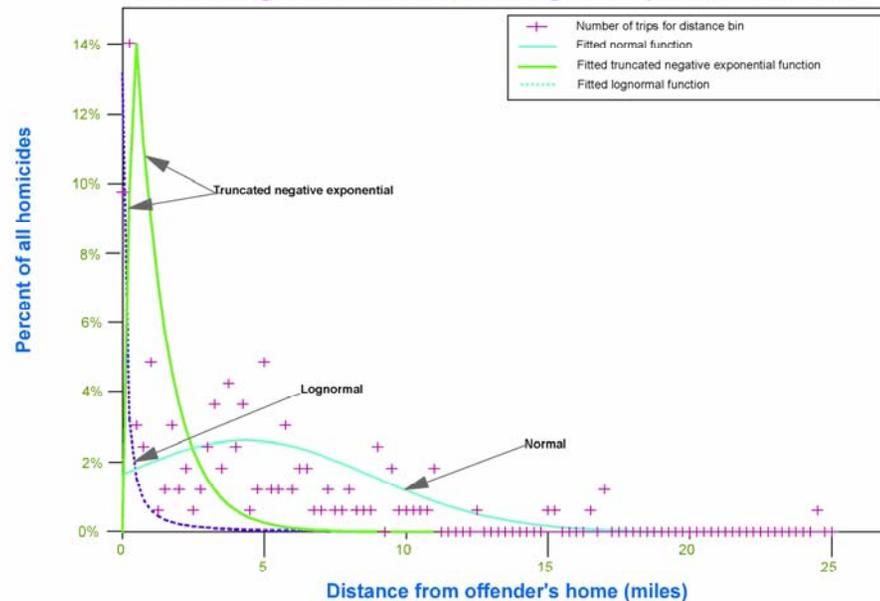


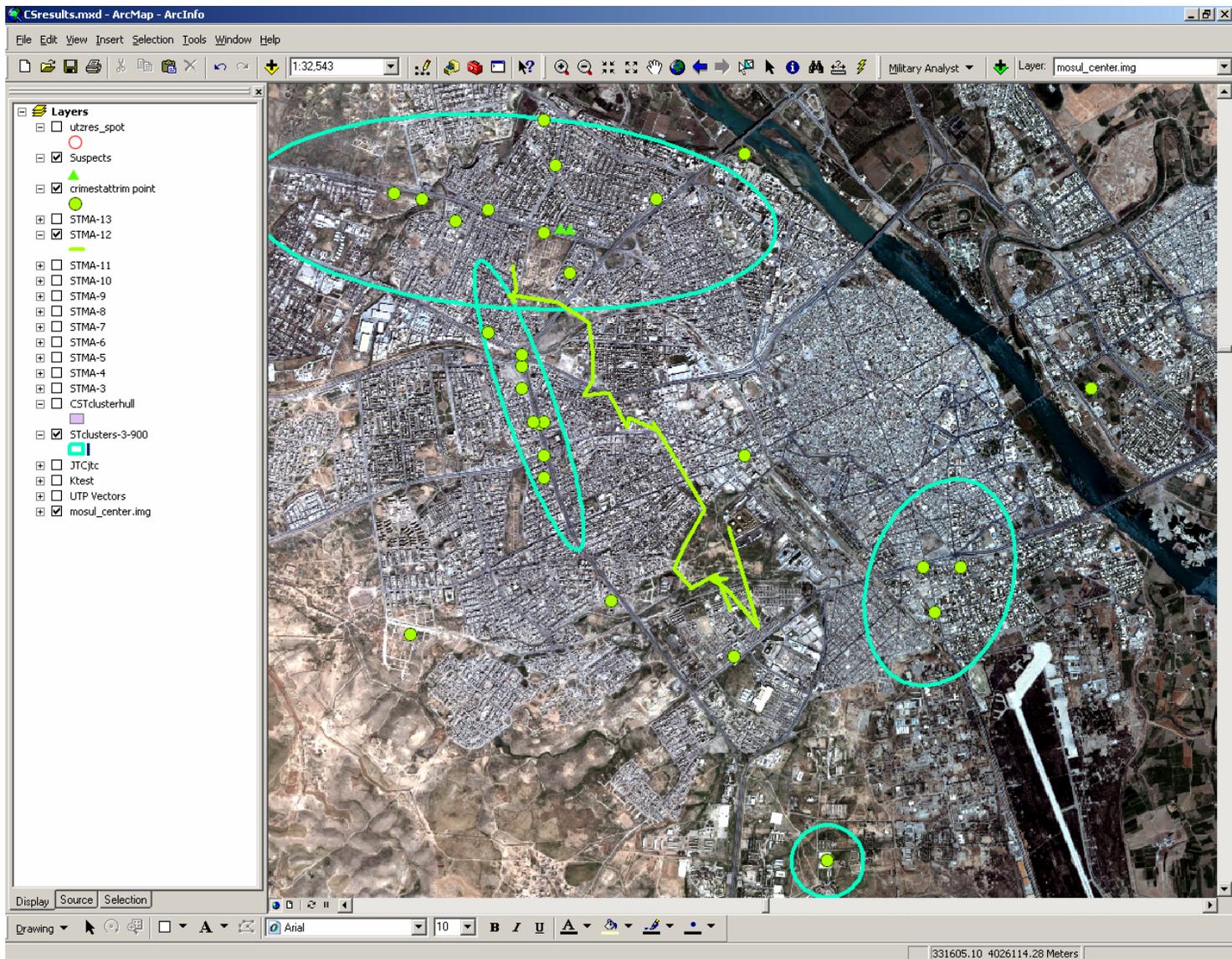
Figure 10.8:

Journey to Crime Distances: Homicide Normal, Lognormal, and Truncated Negative Exponential Functions



- Source: CrimeStat III, Chapter-10, Journey to Crime Estimation.
- Travel Demand functions derived from actual Baltimore Police databases.
- Assume spatial and temporal behavior of insurgents mimic actual criminal J2C.

Space-Time Clustering





MPDT Requirements

- ✓ A series of five (5) or more Mode-linked and related events.
- ✓ Places for the events converted to coordinates.
- ✓ Dates and Times possibly related to travel-journey distance.
- ✓ Known or probable solution to test Geographic Profiling.

Marines Solved Case

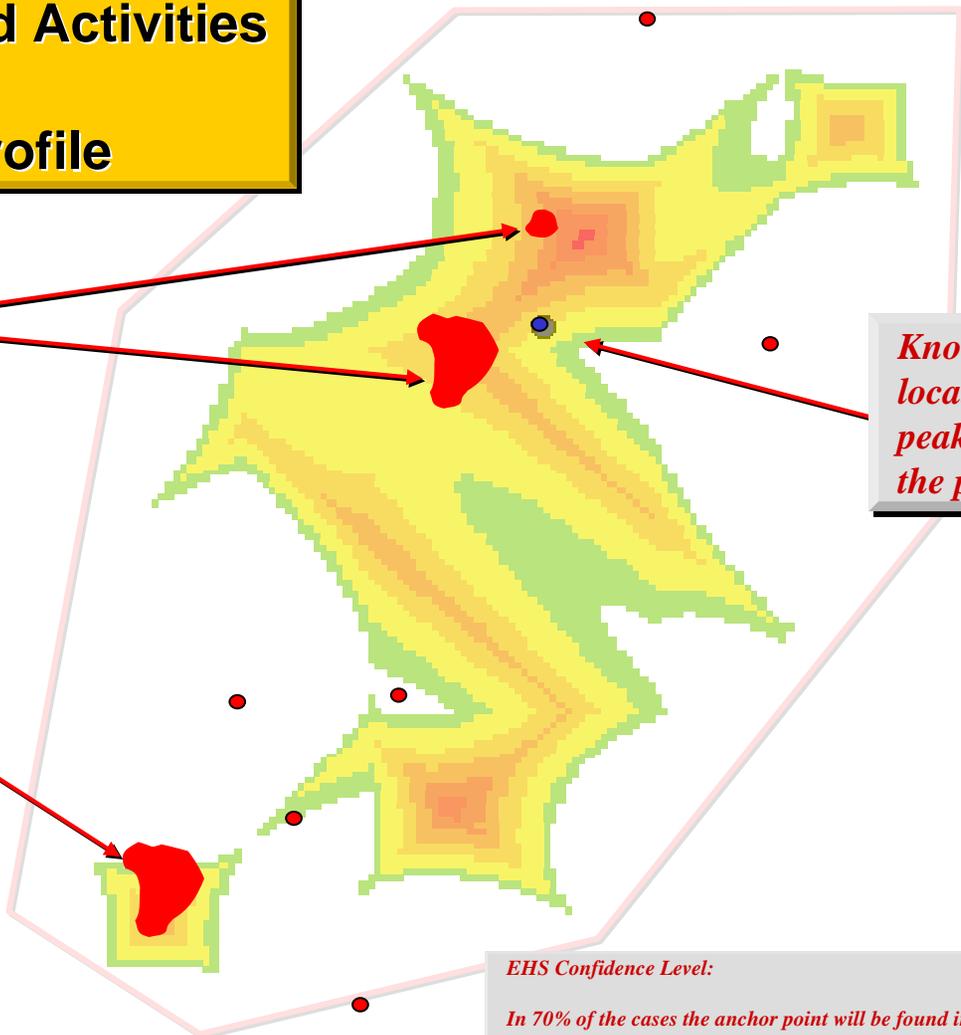


Suspect Location and Activities versus Peak 14% of Profile

Areas of significant suspicious activity

Area of suspicious activity

Known suspect location is in the peak 8% region of the profile.

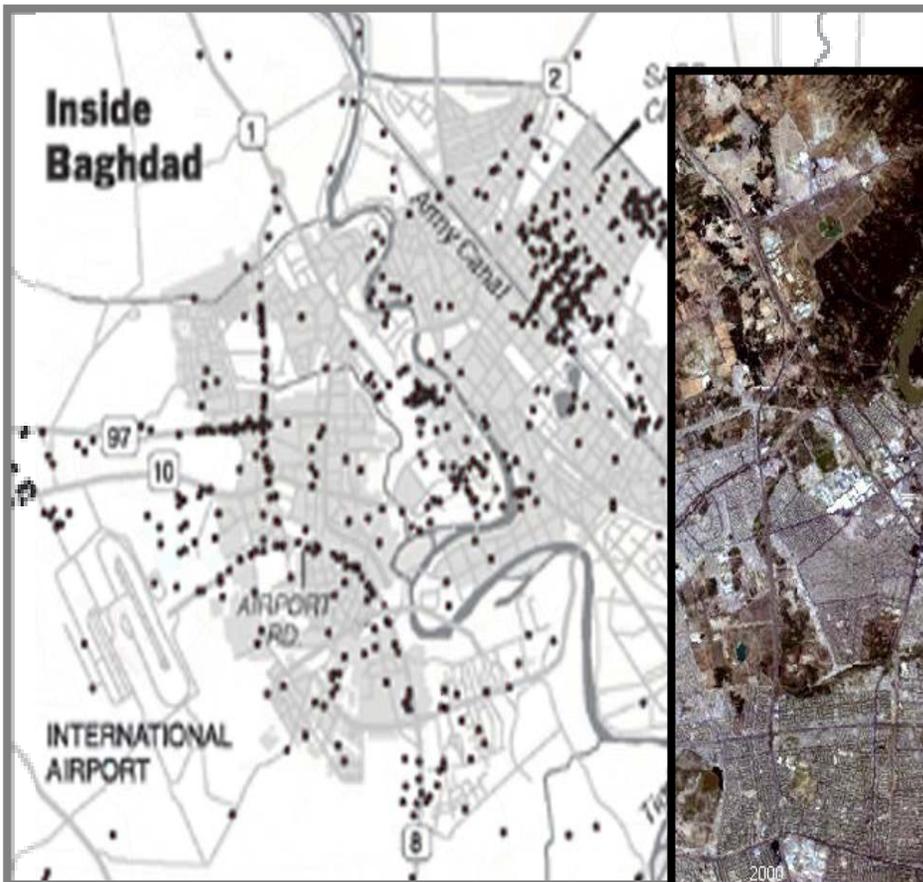


Statistics	
Number of Crimes:	8
Number of Sites:	5
Hunting Area:	2.04 sq. miles
EHS Confidence Level	70 %
Expected Hit Score:	13.9 %
Hit Score Area:	0.28 sq. miles
Hit Score Std Dev:	8.71 %
Hit Score Std Dev Area:	0.18 sq. miles

Close

EHS Confidence Level:
*In 70% of the cases the anchor point will be found in the top 13.9% of the area
In this profile – this equates to 0.28 sq mi out of a hunting area of 2.04 sq mi.*

Baghdad Maps

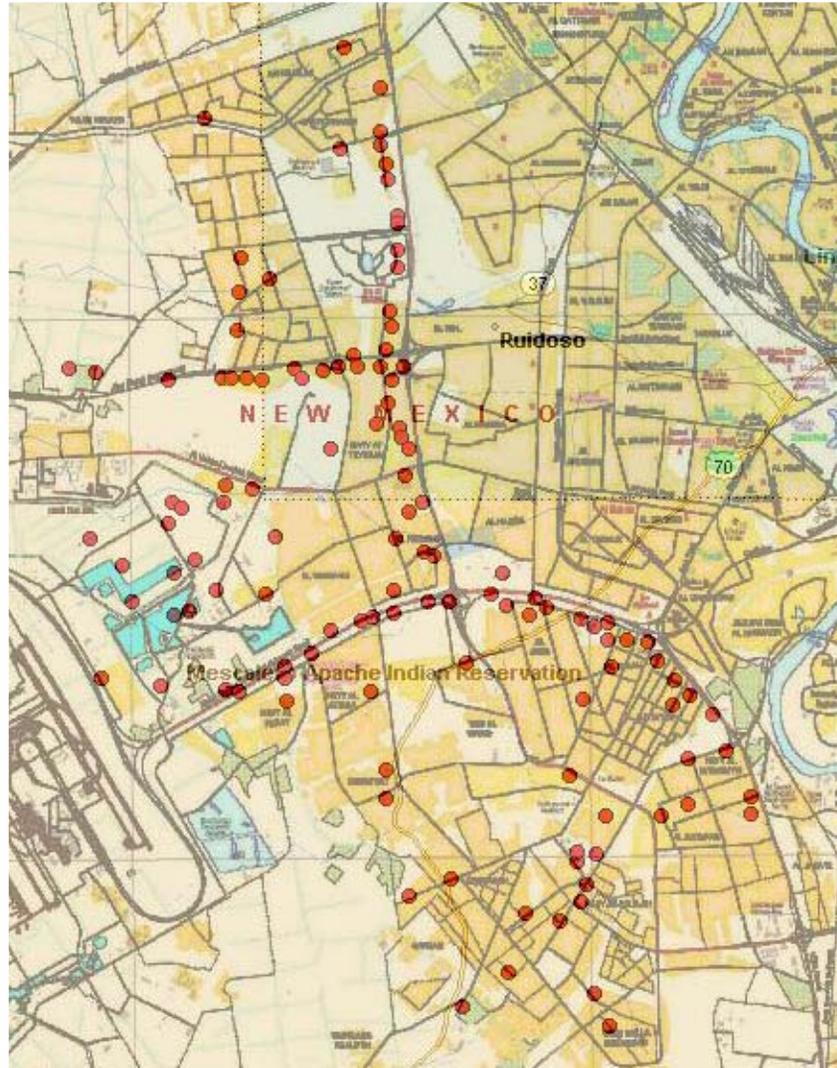


(September 2004)



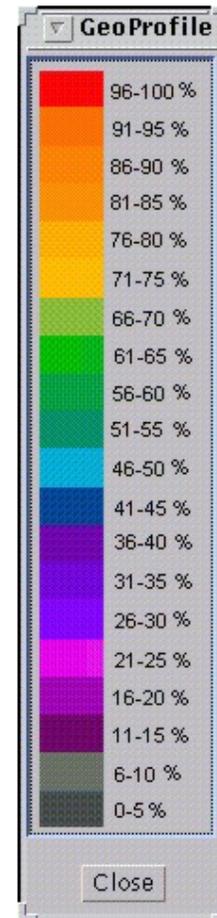
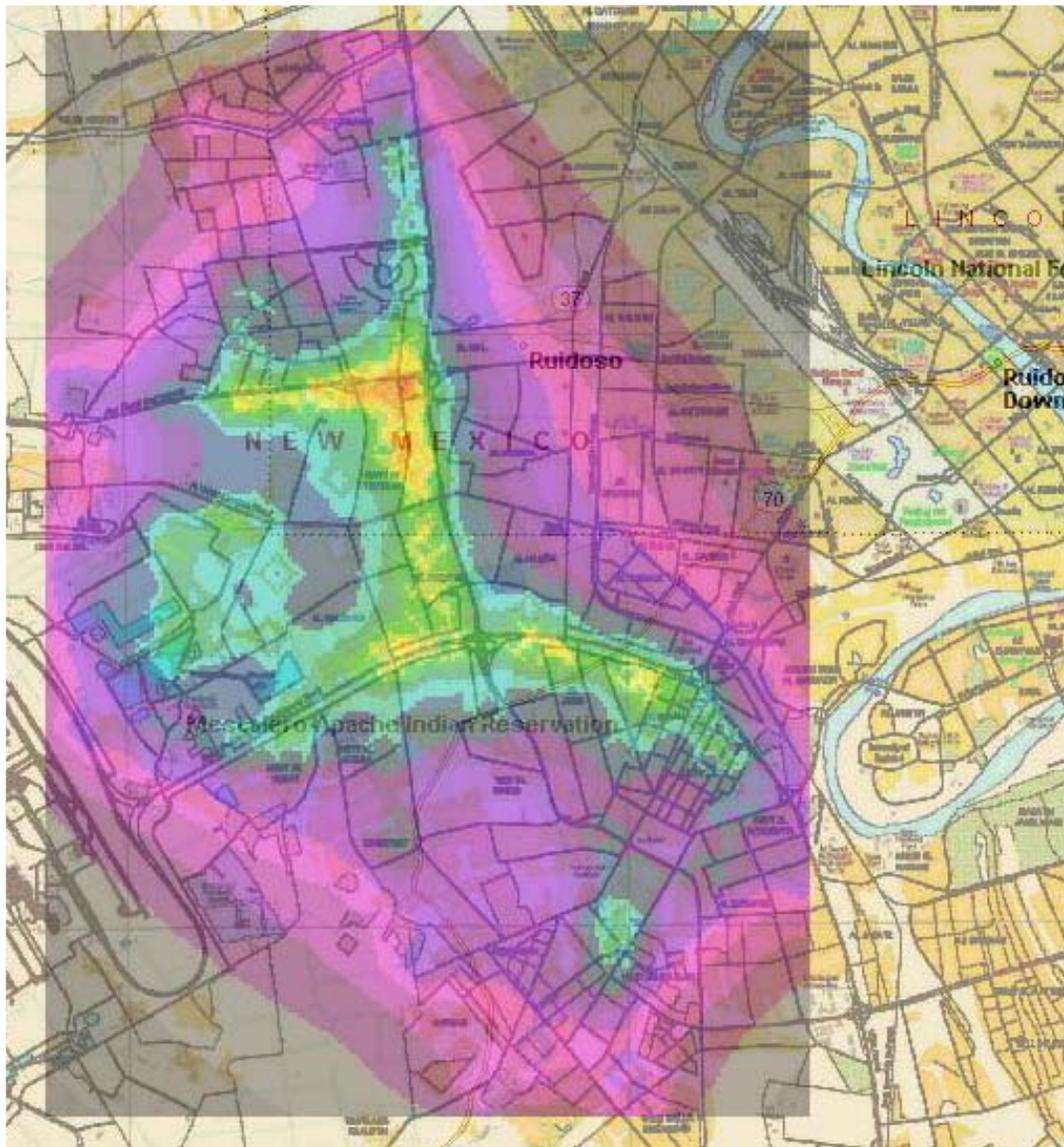
Source: Special Operations Consulting, Security Management Group (SOC-SMG)

Airport Road Attacks



Source: Special Operations Consulting, Security Management Group (SOC-SMG)

Airport Road Geographic Profile





Fallujah Geography

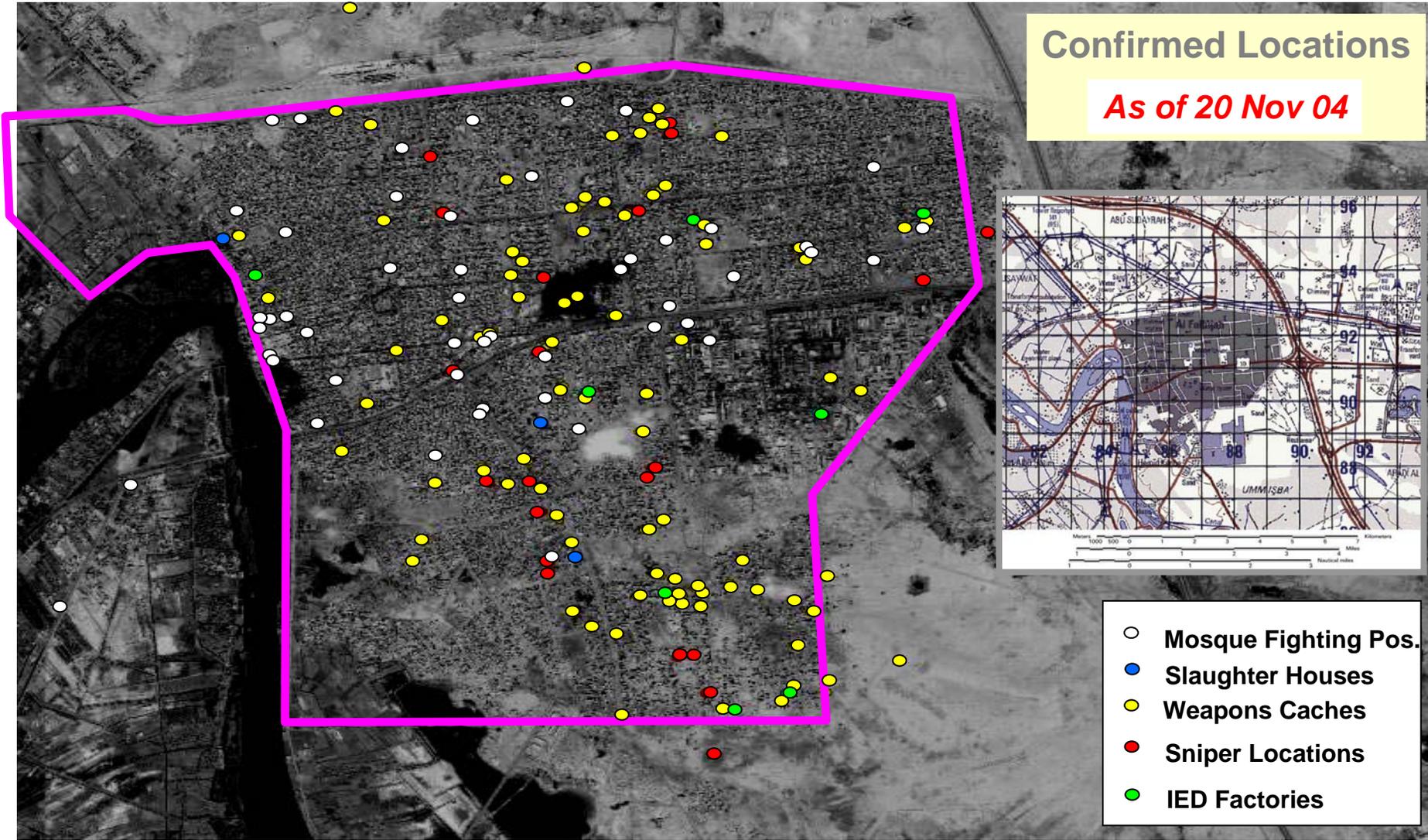
- Fallujah urban area roughly 20 square kilometers.
- Average city block = 100 X 200 meters.
- About 1,000 city blocks in Fallujah.
- 3 out of every 5 Mosques had fighting positions (60 total).
- 653 total IEDs found in Fallujah.
- 772 IEDs on average found monthly in Iraq (July to Oct.).
- 11 IED factories found.
- 3 slaughter houses found.
- 1 out of every 5 blocks had a weapons cache – 203 total.



Fallujah Suspect-Locations

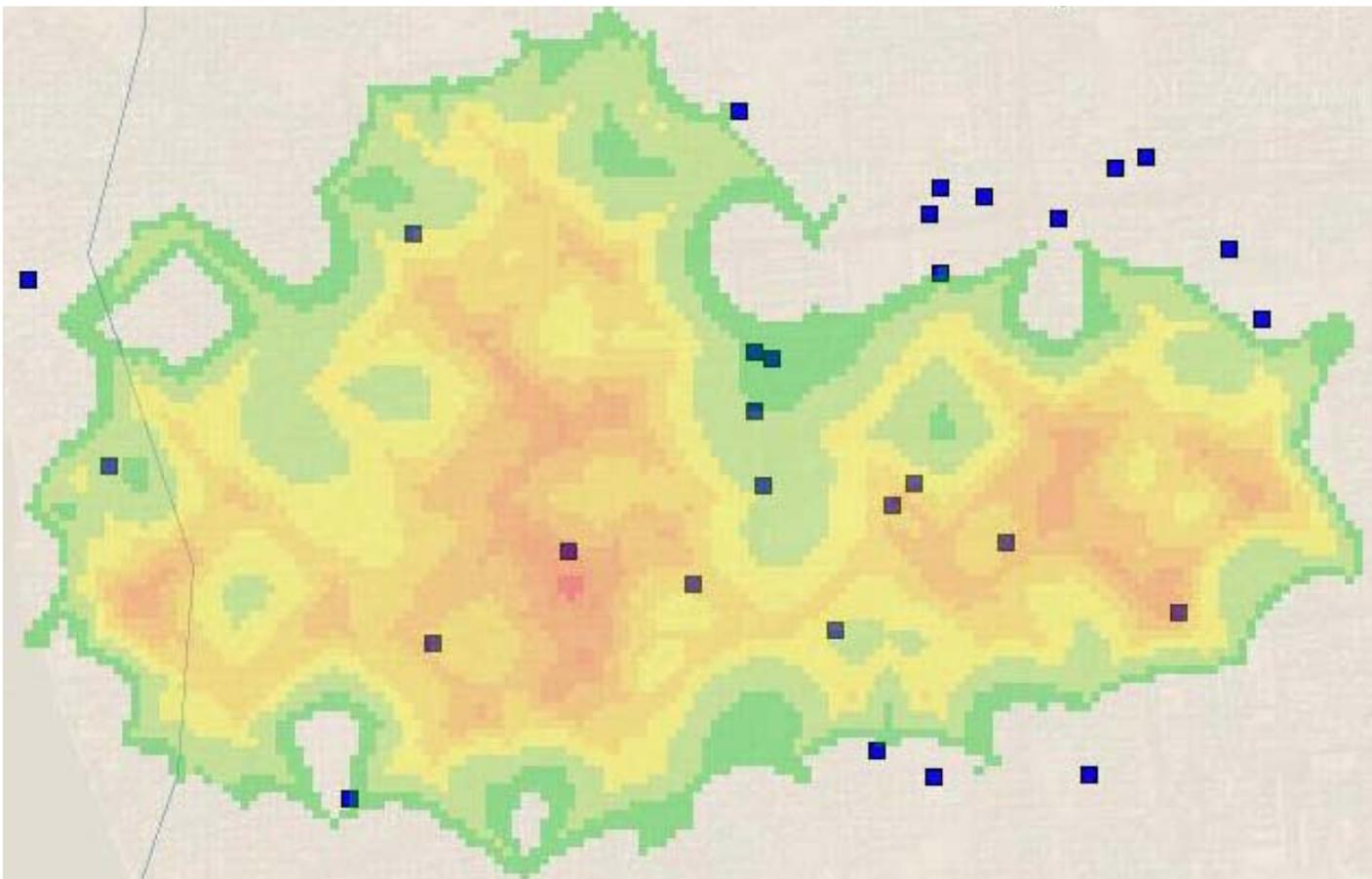
	Location Type (IMEF Reporting Through November 20 th 2004)	 Total
	Mosques	100
	Mosques used as Fighting Positions / Weapons Caches	60
	Hospitals Used as Defensive Positions	3
	Improvised Explosive Device (IED) Factories	11
	Slaughter House/Torture Chambers	3
	Number of Major Weapons Storage Areas	203

Fallujah Maps

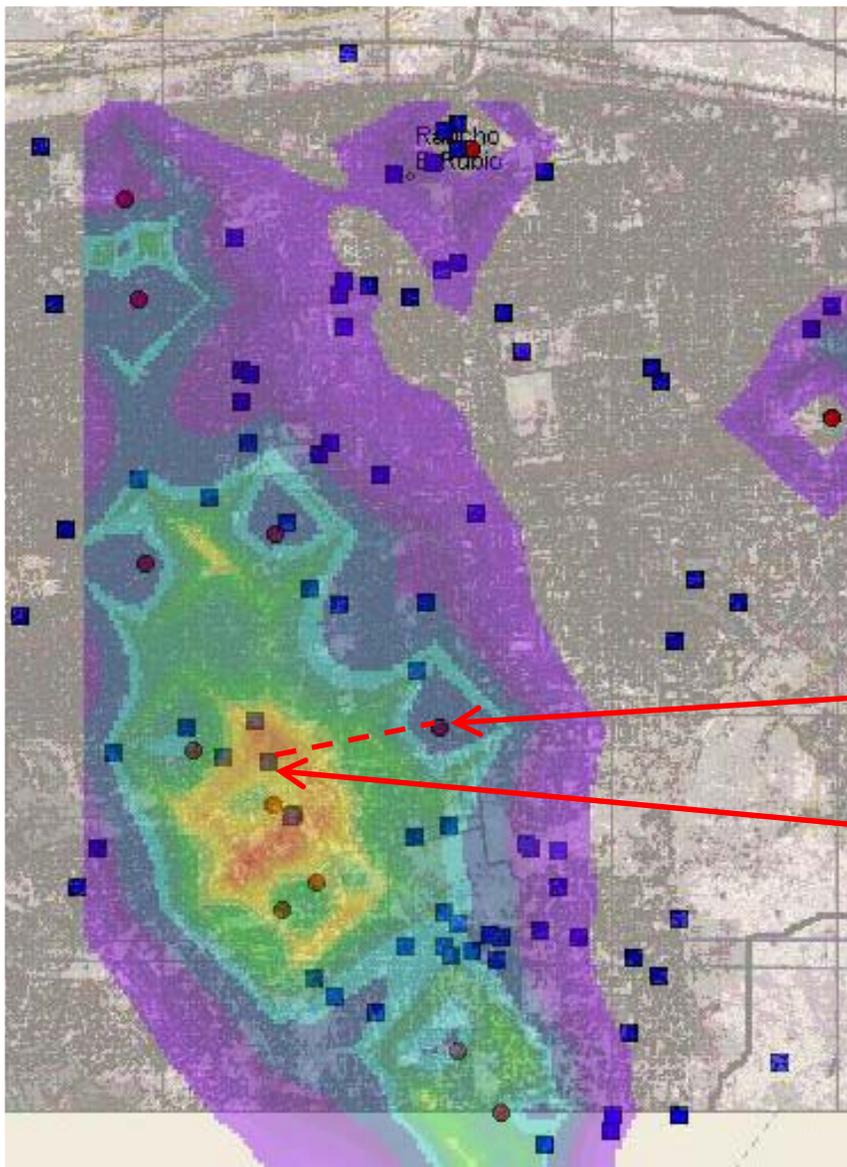


Fallujah Mosque Fighting Positions

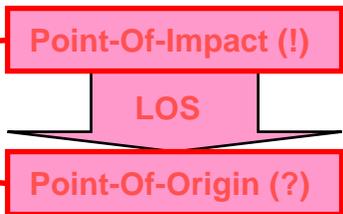
Median CGT Weapons-Cache Hit Score = 37.3%



Fallujah Sniper Events



Median CGT Hit Score = 34.4%





Evaluation Plans

Intents:

Immediate -

- ✓ Refine Usability + Utility for Soldiers & Commanders.
- ✓ Define IO formats and content for DM within CS.
- ✓ Share data and products with ABCS-GIS subsystems.

Eventual -

- ✓ Integration with other ASK system components.
- ✓ Scalability of comm' & comp' given operations tempo.
- ✓ Web-based information distribution capabilities.



Comments Or Questions

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or call **703-428-6519** with related
concerns.