DC GIS Steering Committee

September 15, 2005

Barney Krucoff, GIS Director
Office of the Chief Technology Officer
Barney.Krucoff@dc.gov
The Training Report

Tim Abdella
Geospatial Education Director
Tim.Abdella@dc.gov
Objective

- Improve the quality and lower the cost of GeoSpatial Education provided by the District of Columbia to its personnel

- Fulfill DC GIS Service Line Mission
Meeting the Objective

- Custom Classes
- Center for Workforce Development
- Marketing
- Web Site
- Online Training
- e-Newsletter
- Student Registry
- Doctors Office
- Semi-Annual Report
Custom Classes

• The Center for Workforce Development (CWD)
  – 3 GIS Courses offered for FY 2006
  – CWD coordinates training programs and activities for District government agencies and employees, including senior executives, middle managers, supervisors, and front line employees.

• Agency & Programs
  – Specific training classes to meet the needs of end users utilizing GIS Centric Applications in their daily Business Process.

• General Workshops
  – Focused half day training sessions
  – 1 Offered weekly - hopefully
  – Intended for moderate – advanced users
  – Always looking for suggestions
Introduction to DC GIS using ArcGIS I

- Customized introduction to ESRI ArcGIS 1 focused on DC data and applications, the foundation for becoming a successful ArcView®, ArcEditor™, or ArcInfo™ user. This course covers fundamental GIS concepts as well as how to query a GIS database, manipulate tabular data, edit spatial and attribute data, and present data clearly and efficiently using maps and charts.

Offered:
» October 26-27
» November 9-10
» January 30-31
» February 27-18
» May 25-26
» June 21-22
» July 27-28
The course is a boot camp for professional GIS analysts focuses specifically on how the District of Columbia applies the technology. Students are expected to be proficient in ArcGIS software.

Offered:

» October 20
» December 9
» January 10
» February 1
» May 16
» June 7
» July 18
» August 15
» September 12
Managers Overview of DC GIS Services and Applications

- The course is aimed at DC government managers who want a better understanding how the programs they supervise can utilize the DC GIS, but are themselves not hands on users of the system.

Offered:

- October 18
- November 30
- December 8
- January 26
- February 16
- May 4
- June 28
- July 20
- September 14
Important Notes:

- Opportunity to go mainstream
- Must keep classes 75% full

Course Registration:

- Select Classes
- Get Supervisor Approval
- Complete the Standard Training Authorization Form 1
- E-mail to Training Coordinator for his/her review and signature
- Confirmation of enrollment in the course will be emailed to you
- Notify CWD if you can not attend within 3 days of the class
- For more information about CWD, call (202) 727-1523
- All Information will be on DC GIS Training Website

http://www.dcop.in.dc.gov

Click on:
Training and Development
Agency & Programs

• Introduction to GIS using the VPM Maintenance Application
  – Focused on the business process
  – Including fundamental GIS Theory
  – With real-world example exercises
  – Deliverable through small classes or on-line tutorials
  – Sensitive to AutoCAD terminology and work-flow process

• Introduction to GIS using the MAR Maintenance Application
  – Similar goals as above

• Using GIS for Analysis in the Public Safety Sector
  – How to use ArcGIS in conjunction with Spatial Analyst
  – Focused on the needs of: Police, Fire, EMA, etc.
General Workshops

Potential Classes – Any Ideas?

• Advanced Geocoding - using the MAR
• Customizing the interface:
  – DCGIS extensions
  – Adding Tools and Developer Samples
• Enhancing Analysis using:
  – Data Queries & Definitions
  – Symbology
• Enhancing Analysis using Spatial Analyst
• Enhancing Analysis using Model builder and Geoprocessing
• Advanced Cartographic Design
  – Templates
  – Layer Tips and Tricks
  – Labeling & Annotation
• DC GDB Defined
  – Federated data model & Standards
  – feature IDs and MAR IDs
• A Comprehensive review of the DC’s Vector Property Map
Marketing

• **CWD Course Flyer**
  - Single page
  - GIS Courses with descriptions
  - Schedules
  - How to register
  - Use to keep enrollment up

• **Online Training Flyer**
  - Single Page
  - Highlighted ESRI Virtual Campus Classes
  - How to get Credits
  - DC GIS On-line tutorials
Additional Notable Items

• Web Site
  – Dedicated training section

• Online Training
  – ESRI Virtual Campus Credits
  – DC GIS Class Material for download

• e-Newsletter
  – Monthly publication
  – Archived on the Web Site

• Student Registry
  – Data Base of Official Record

• Doctors Office
  – Weekly Forum for User Q&A

• Semi-Annual Report
  – Progress and Goals
Q&A

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Office of the Chief Technology Officer
441 4th Street, NW
Washington, DC 20001
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202-727-4946 Office
716-308-0000 Cell

Thank you
News Items

• Specifications for DC GIS Web Services now online
  – Demo 1: www.dcgis.dc.gov
• Master Address Repository in production
• New Mobile Video Web Service (Thank you OTR!)
  – Demo 2: www.dcgis.dc.gov
• New DCGIS.DC.GOV coming soon
• DC GIS Shirts
News Items

• Quarterly sub meter resolution satellite imagery
  – Vendors: SAIC/Digital Globe
  – Satellite: Quick Bird
  – Coverage: DC boundary plus 500 feet
  – Mission Windows
    • October - November 05 (Natural Color)
    • February - March 06 (Natural Color)
    • June - July 06 (Color Infrared)
    • September - October 06 (Natural Color)
News Items

• OP Tools
  – Significant progress has made
  – Why so important
    • Everybody uses the same datasets.
    • Map symbolology consistent.
    • User does not need to know where to find the data.
    • No need to create an SDE account for every CITRIX user.
    • No need to manually connect to database.
    • Easy to use
    • Tim will teach your staff how to use it!
  – Demo 4
The Data Report

Mario Field
DC GIS Data Team Lead
Mario.Field@dc.gov
Updated DC GIS Data

- Zoning (OZ)
- Overlay Zoning (OZ)
- Planned Unit Development (OZ)
- Existing Land Use (OP)
- Generalized Land Use (OP)
- Senior Service Network
- Correctional Halfway House
- D&B Business
- University
- DC Quadrant
- Public Housing
- Address Point
Emergency Data Committee
(in process)

- FCC Tower (AM, FM, Cellular, etc.)
- FAA Airport
- FAA Heliport
- Fire Service Area
- Underground Storage Tank
- Leaking Underground Storage Tank
- Above Ground Storage Tank
- NCR Land Cover
- NCR Elevation
Emergency Data Removed

- Controlled Intersections
- EMA Hospitals, Schools, Nursing Homes, Hospitals, Recreation Facilities and Senior Centers
- Military Areas
- DC Atlas Emergency Module Offline
- EMA does not support some layers
- Others replaced by more accurate and up-to-date layers
- Archived
Current DC GIS Data Update

- Recreation Area
- Red Light Camera
- Street Tree
- Street Centerline
- Routing
- Metro Line
- Metro Station
- Street Trees
- School Attendance Zone
- Collaborative Area

» September 2005 publication
DC GIS Planimetric Update Project

Mario Field, DC GIS Data Team Lead
Andrew Freckman, Earth Data Maryland
• Planimetric layers created from 1999 photography.
• Missing key buildings and streets
• Missing new and expanded residential housing
• Latest complete Orthophoto from 2002
Planimetric Update

Map updates are needed citywide
Planimetric Update

- Establishment of geodetic control
- Acquisition of new color aerial photography
- Aerial triangulation
- Photogrammetric mapping of select planimetric layers
- Production of true color digital orthophoto imagery
- Quality Assurance and Quality Control
- Metadata development
Planimetric Update

Schedule:

Aerial Triangulation 8/2005 – 10/2005
Pilot Area 10/2005
MrSID Orthophoto 12/2005 – 1/2006
Planimetric Update

Layers:
• Building
• Bridge and Tunnel
• Curb
• Hydro Centerline
• Metro Station Entrance
• Obscured Area
• Railroad
• Street Centerline
• Road
• Sidewalk
• Wooded Area
• Geodetic Control

• Orthophoto
Deliverables:

• Aerial Photography
• Project Work Plan
• Aerial Acquisition Plan
• Ground Control Report
• Aerial Triangulation Report
• Planimetric Data
• Metro Station Entrance
• Digital Color Orthophotos
• Digital Color Orthophoto MrSID mosaic
• Metadata
DC GIS
Review of 2005 and Outlook for 2006

Barney Krucoff
GIS Director
DC GIS Mission and Goals
Established December 2004

The OCTO GIS groups helps agencies improve the delivery of services by efficiently utilizing Geographic Information System technology.

FY 2005 Goals:
• Institutionalize Success
• Provide foundation geospatial services
• Expand support for emergency management
• Continue to improve the Districts geospatial databases
• Expand GIS support for schools and social services
**Review of 2005 DC GIS Goals**

**Institutionalize success**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop and maintain a master plan including inventories of:</td>
<td>Published <em>Strategic Plan for DC GIS FY 2005-2006</em></td>
<td>Will publish updated version by December 2005.</td>
</tr>
<tr>
<td>- Data</td>
<td>- revitalized catalog</td>
<td></td>
</tr>
<tr>
<td>- Hardware</td>
<td>- have systems plan</td>
<td></td>
</tr>
<tr>
<td>- Software</td>
<td>- incomplete</td>
<td></td>
</tr>
<tr>
<td>- Applications</td>
<td>- incomplete</td>
<td></td>
</tr>
<tr>
<td>- Projects</td>
<td>- incomplete</td>
<td></td>
</tr>
<tr>
<td>Clarify responsibilities among departments</td>
<td>- Federated model adopted</td>
<td>Not yet fully realized now works in slow motion</td>
</tr>
<tr>
<td></td>
<td>- Private streets initiative helping workflow</td>
<td></td>
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</tbody>
</table>

*Published Strategic Plan for DC GIS FY 2005-2006*
### Review of 2005 DC GIS Goals

**Goal Institutionalize success (cont.)**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish an operating budget for OCTO GIS</td>
<td>- Remains an issue for OCTO overall</td>
<td>- Plan to ask for 2007 increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reorganization of OCTO is likely</td>
</tr>
<tr>
<td>Establish an annual review of the plan</td>
<td>- More meetings</td>
<td>- Detailed plan review in December</td>
</tr>
<tr>
<td></td>
<td>- Regular reports</td>
<td>- DCGIS.DC.GOV will have presentations and minutes</td>
</tr>
<tr>
<td></td>
<td>- Agency presentations</td>
<td></td>
</tr>
<tr>
<td>Standardize operating procedures for data and application maintenance</td>
<td>- Federated model</td>
<td>- More worked is need in this area</td>
</tr>
<tr>
<td></td>
<td>- Data, systems, development teams in place</td>
<td>- Standard editing tools</td>
</tr>
</tbody>
</table>

## Review of 2005 DC GIS Goals

### Goal Institutionalize success (cont.)

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand training program and hire a full time training director</td>
<td>- Tim Abdella, onboard</td>
<td>- Think about the customized training your agency needs.</td>
</tr>
<tr>
<td></td>
<td>- CWD course schedule</td>
<td></td>
</tr>
<tr>
<td></td>
<td>established</td>
<td></td>
</tr>
</tbody>
</table>
# Review of 2005 DC GIS Goals

**Provide foundation geospatial services**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formalize the enterprise architecture</td>
<td>- Plan is in place</td>
<td>- Implementation FY 2006</td>
</tr>
<tr>
<td>Deploy OpenGIS Services</td>
<td>- In process in conjunction with WACOG</td>
<td>- Most important for use outside DC Government</td>
</tr>
<tr>
<td>Metadata Service</td>
<td>- In process</td>
<td>- Working with DOH</td>
</tr>
<tr>
<td>GIS services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Address Lookup (MAR)</td>
<td>- In production</td>
<td></td>
</tr>
<tr>
<td>- Locator Map</td>
<td>- In production</td>
<td></td>
</tr>
<tr>
<td>- Report by polygon</td>
<td>- In production</td>
<td></td>
</tr>
<tr>
<td>- Point in Polygon</td>
<td>- In production</td>
<td></td>
</tr>
<tr>
<td>- Nearest</td>
<td>- Not started</td>
<td></td>
</tr>
</tbody>
</table>

[http://dcgis.dc.gov/webservices.shtm](http://dcgis.dc.gov/webservices.shtm)
## Review of 2005 DC GIS Goals

### Provide foundation geospatial services

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidate backend systems to point where there is one production database running ArcSDE 9+ and one running Oracle Spatial</td>
<td>- Not started</td>
<td>- Still an important goal</td>
</tr>
<tr>
<td>Employ ArcGIS 9 data integrity rules</td>
<td>- Not started</td>
<td></td>
</tr>
<tr>
<td>Move to enterprise licensing of GIS software</td>
<td>- In negotiations with ESRI</td>
<td>- October 28 deadline for FY 2006</td>
</tr>
</tbody>
</table>
## Review of 2005 DC GIS Goals

### Expand support for emergency management

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire a full time GIS Manager for EMA</td>
<td>- Joshua Jack</td>
<td></td>
</tr>
<tr>
<td>Assemble and check critical infrastructure data</td>
<td>- Underway</td>
<td></td>
</tr>
<tr>
<td>Clarify EMA on-call support and adequately equip and train staff</td>
<td>- Ongoing</td>
<td></td>
</tr>
</tbody>
</table>
## Review of 2005 DC GIS Goals

### Expand support for schools and social services

<table>
<thead>
<tr>
<th><strong>Objective</strong></th>
<th><strong>Status</strong></th>
<th><strong>Comment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hired GIS analyst to support the DCPS facilities office</td>
<td>- Jeng Funtanilla</td>
<td></td>
</tr>
<tr>
<td>Assisted Department of Human Services</td>
<td></td>
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<tr>
<td>Good working relationship with HSMP</td>
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</tbody>
</table>
**Review of 2005 DC GIS Goals**

**Major Data Projects and Acquisitions**

<table>
<thead>
<tr>
<th><strong>Objective</strong></th>
<th><strong>Status</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Planimetric Update</td>
<td>- Underway</td>
</tr>
<tr>
<td>Public land inventory with GSA, NPS</td>
<td>- In negotiations</td>
</tr>
<tr>
<td>Master Address Repository</td>
<td>- In production, (tools for DCRA still to be deployed)</td>
</tr>
<tr>
<td>Vector Property Map</td>
<td>- Delayed, due December 2005</td>
</tr>
<tr>
<td>Street Spatial Database (Centerlines and more)</td>
<td>- In production (DDOT) with:</td>
</tr>
<tr>
<td></td>
<td>- Turn restrictions</td>
</tr>
<tr>
<td></td>
<td>- Updated theoretical address ranges</td>
</tr>
<tr>
<td></td>
<td>- Maintenance tool under development</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>- Oblique images</td>
</tr>
<tr>
<td></td>
<td>- Building images</td>
</tr>
<tr>
<td></td>
<td>- Elevation (DEM)</td>
</tr>
<tr>
<td></td>
<td>- Regional base map</td>
</tr>
<tr>
<td></td>
<td>- Satellite images</td>
</tr>
<tr>
<td></td>
<td>- Businesses</td>
</tr>
<tr>
<td></td>
<td>- Pictometry (in production)</td>
</tr>
<tr>
<td></td>
<td>- Mobile Video OTR (in production)</td>
</tr>
<tr>
<td></td>
<td>- LIDAR from NGA (available)</td>
</tr>
<tr>
<td></td>
<td>- Navtech (in production)</td>
</tr>
<tr>
<td></td>
<td>- Ongoing SAIC/Digital Globe (coming)</td>
</tr>
<tr>
<td></td>
<td>- Dun and Bradstreet (under review)</td>
</tr>
</tbody>
</table>
## FY 2006 Data Acquisition?

### Major Geospatial Datasets Not In DC GIS Inventory

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address Units (apartments, bays, suites)</td>
<td>- Possible for FY 2006, not scoped</td>
</tr>
<tr>
<td>Public Lands and Parcels Outside of Squares</td>
<td>- In negotiations, research well underway, targeted for FY 2006</td>
</tr>
<tr>
<td>DC Facilities (owned and leased) and DC Functions</td>
<td>- Possible for 2005, not scoped</td>
</tr>
<tr>
<td>DDOT Assets</td>
<td>- Work with DDOT</td>
</tr>
<tr>
<td>Rights of way</td>
<td>- Work with DDOT</td>
</tr>
<tr>
<td>Utilities (Conduits)</td>
<td>- Electric - Gas - Communications - Sewer - Steam (Underway) - Water</td>
</tr>
<tr>
<td></td>
<td>- Discuss</td>
</tr>
</tbody>
</table>
## FY 2005 Development Projects

### What we are doing

<table>
<thead>
<tr>
<th>Objective</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAR Web Services</td>
<td>In production, ArcGIS Geocoder in development</td>
</tr>
<tr>
<td>Mapping Web Services</td>
<td>Some in production</td>
</tr>
<tr>
<td>Map making: OP Tools to DC GIS Tools</td>
<td>Nearing production</td>
</tr>
<tr>
<td>Vector Property Map Maintenance and Query Tools</td>
<td>Final changes</td>
</tr>
<tr>
<td>MAR Maintenance Tool</td>
<td>Final changes</td>
</tr>
<tr>
<td>Neighborhood Notification Tool for EMA</td>
<td>Final changes</td>
</tr>
<tr>
<td>Improvements to the Emergency Information Center</td>
<td>Final changes</td>
</tr>
<tr>
<td>Integration of ARCGIS with service request center (DPW)</td>
<td>On going</td>
</tr>
<tr>
<td>Standard editing tools</td>
<td>Not scoped</td>
</tr>
</tbody>
</table>
ESRI Enterprise License

- In negations no better than 50/50 chance of a deal
- Would cover:
  - Desktop Software
  - Server Software
  - Some professional services
  - Some training credits
  - User conference registrations
DC GIS Additional Goal
For Fiscal 2006

• Significantly increase the user base of the DC GIS
  – Train 300 New DC GIS users
  – Equip those users with
    – Standard software (ESRI enterprise license)
    – Standard tools for map production and simple data creation. (DC GIS Tools)
    – Make it easier for them to find the data they need (DCGIS.DC.GOV / Geospatial Portal)
Geographic Profiling Analysis
Metropolitan Police Department

- Office of the Superintendent of Detectives
  - Special Investigations Branch
    - Criminal Intelligence and Tactical Crime Analysis Unit

- ASSISTANT CHIEF
- Commander
- Captain
- Civilian Supervisor
Diana M. Havlin

- Senior Crime Analyst, Criminal Intelligence and Tactical Crime Analysis Unit
  - Responsible for intelligence analysis, tactical crime analysis, geospatial analysis
- We have 9 civilian crime analysts and several sworn analysts working at MPD HQ and in each district station
- One contract GIS Analyst
- One intern

- Diana.Havlin@dc.gov
- 202-727-8013 (direct)
Definition of Terms

- **Tactical Crime Analysis** — systematic analytical processes that assist in police operations. Involves identifying and tracking crime series’, crime trends, analyzing geospatial patterns of criminal behavior.

- **Crime Pattern** — a set of crimes containing similar patterns in MO, target, or geospatial location.

- **Crime Series** — a set of crimes determined to be related.

- **MO vs. Signature** — MO is the practical method an offender uses to increase the likelihood of success. Signature is the behavioral aspect of the crime not necessary for completion of the offense.

- **GP vs. GPA** — GP used in all types of serial cases. GPA used in serial property crimes only.
Geographic Profiling Analysis

- Investigative methodology that uses the locations of a connected series of crimes to determine the most probable area of offender residence.
- Based on theories of environmental criminology and social psychology
- Underlying spatial structure – buffer zone theory, least effort principle.
Suitable Crimes

- Serial property offenses
  - robbery, arson, burglary, auto theft, vandalism
- Multiple location crimes
  - telephone calls, credit and ATM cards
- Valid link analysis
- Valid geographic modeling of the travel distance to crime sites for a particular type of crime, criminal, and geographic area
Winter 2004: The Central Crime Analysis Unit submitted a grant proposal to obtain funding for geographic profiling software and training

Grant includes funding for:

- Two week training course provided by ECRI
- RIGEL Analyst software
- Additional computers
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Criminology</td>
<td>Geography of Crime</td>
<td>Geography of Crime</td>
<td>Linkage Analysis</td>
<td>Geographic Profiling</td>
</tr>
<tr>
<td>Administration; Introduction; Course and Student Expectations</td>
<td>Geography of Crime - Aggregate</td>
<td>Search Exercise</td>
<td>Linkage Blindness and Analysis</td>
<td>Geography and Criminal Investigation; Questions to Consider</td>
</tr>
<tr>
<td>Behavioral Geography; Mental Maps; Awareness and Activity Spaces (Exercise)</td>
<td>Offender Patterns and Hot Spots</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Environmental Criminology - Rational Choice Theory (Exercise)</td>
<td>Search Exercise Debriefing</td>
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<tr>
<td>Environmental Criminology - Routine Activity Theory (Exercise)</td>
<td>Crime Attractors and Generators</td>
<td>Cancer Linkage Method</td>
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<tr>
<td>Environmental Criminology - Crime Pattern Theory</td>
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<tr>
<td>Place, Space, and Time</td>
<td>Cell Location Methods</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Geography and Criminal Investigation; Questions to Consider</td>
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<tr>
<td>Final Examination</td>
<td></td>
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<tr>
<td>Course Evaluation; Information on Week Two Training Program</td>
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</table>
Why geographic profiling?

- Abandons use of offender motive as the factor driving the investigative process
- Assist in tactical operations. In order to be useful, a geoprofile must....
Investigative Strategies

- Patrol and surveillance
- Police record databases
- Task force suspect lists
- Sex offender registries
- DNA dragnets
Need for geographic profiling at MPD:

- Major function of the Criminal Intelligence and Tactical Crime Analysis Unit (CITCAU) is to identify, track, and assist in solving serial crimes.

- CITCAU recently moved from OOD to SIB/OSD and hired 9 civilian crime analysts.

- As a result, the number of crime series’ identified will increase, as will the need for a tool to assist in crime series investigations.
Mask Robbery Series
Freeway Phantom Serial Murders

- Six victims, linked by MO and fiber
- At first glance, spatial analysis not apparent
Victim Three – Brenda Faye Crockett
Geoprofile – All Sites
Geoprofile – All Sites -Top 4%
Round Table Discussion