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*A Strategy for Enhancing*
*The Design and Analytical Potential*
*of*
*Mapping*
*in*
*Criminal Justice Operations & Research*

Final Report
For
NIJ Grant# 97-LB-VX-0002

By

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## Purpose & Goals

The purpose of this project was for the Principal Investigator to work on site with the National Institute of Justice's Crime Mapping Research Center (CMRC) staff to advise and train staff in: learning the basic concepts of geography and cartography; using cartographic and spatial analytic applications in criminal justice; conducting research and developing specific mapping applications; disseminating information about mapping and spatial analysis; and networking with the organizations providing resources for mapping and spatial analysis. The goals of this collaboration were to increase the utility of computerized mapping for criminal justice, and to position NIJ as an authority and source of guidance in mapping and spatial analysis in criminal justice.

This project is commonly known as a Visiting Fellowship. This fellowship, however, was different from others on two accounts. This was the first Visiting Fellowship in the newly created Crime Mapping Research Center and second the role of the fellow was to be, ostensibly, different from previous NIJ fellowships. Previously, visiting fellows pursued their own research projects or agendas. For this one, the fellow would assume the roles of teacher and advisor and work with CMRC staff.

The on-site phase of the fellowship began on 2 June 1997, and ended on 21 August 1997. Prior to the on-site phase, fellowship funds were used to purchase computer hardware and software for use by the fellow and the CMRC. Among these purchases included two Dell Latitude laptop computers and the ESRI's Spatial Analyst and Network Analyst extensions.[i]

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## Achievement of Purpose or Objectives

*Training* – Beginning in mid-June 1997, seminars were offered on Tuesday and Thursday mornings from 8:00 AM to 9:30 AM. The seminars were intended for the personnel and student interns affiliated with the CMRC, but other NIJ personnel attended as well.

Three texts were purchased and given to CMRC personnel. The first book, *Mapping It Out* by Mark Monmonier was to provide a basic overview of concepts and techniques of cartography. The second book, by Keith Clarke, entitled *Getting Started with Geographic Information Systems* served to provide the novice with a basic orientation to geographic information systems. The third book, another by Clarke, *Analytical and Computer Cartography* was to give the CMRC staff a glimpse of how mapping is routinely employed in spatial disciplines for analytical purposes. Augmenting the texts would be lecture notes, and exercises with mapping software and from the Internet.

The intent was to present a series of integrated seminars whereby the topics for a particular seminar would depend upon the knowledge acquired from a previous seminar. It was understood that there was not enough time to make the CMRC staff experts in cartography and spatial analysis, but there was sufficient time to give the staff an overview of the major topics and techniques in this field.

Time was the factor that severely hampered the presentation of systematic integrated information for the seminar. During the on-site phase it was still business as usual for the NIJ and CMRC personnel. This meant they had to pursue their normal duties and the time for attending the seminars, which was voluntary, had to be taken from one's personal life time budget rather than professional life time budget. Therefore, attendance was not consistent because people had to travel, go on vacation, and attend other work related meetings.

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Sometimes, the attendees at two consecutive seminars were completely different. This, state of affairs meant that the presentation of systematic integrated information was not possible, thus the seminars switched to different topical areas (e.g., how to construct maps for serial offenders).

The facilities were not conducive to teaching. The seminar location was a large table in an open area not an enclosed room which I shared with a secretary, and two interns.[ii] Therefore, the seminars had to be scheduled early before the other users of this space arrived for work and the attendees had to direct their attentions to their normal duties. The accommodation problem was perhaps unavoidable, since the setting was temporary housing for NIJ.

Finally, another obstacle to conducting the seminars and pursing other objectives for the fellowship was that I, unlike the other visiting fellows was not allowed access to the Internet by means of my own account. Many of my lectures had been planned with Internet resources in mind. Furthermore, I know the HTML language and could have helped NIJ and the CMRC with web site construction, but it was impossible. Later, I was given the username and password of a former employee whose account was still active, but it was too late during the on-site experience to be anymore than marginally effective.

This experience is filled with ironies. At my university I am constantly complaining about ill-prepared students who consistently skip class. At NIJ, I encountered some of the brightest students I will ever have – but they could not come to class. I was brought to NIJ to instruct and advise about mapping, a revolutionary graphical innovation in criminal justice, but was formally denied access to another graphical innovation – the Internet. At my university, I am emphatic about the condition and quality of my classrooms. I take full control and responsibility for my classroom, because I want the best learning environment possible for my students. At NIJ – I had no control whatsoever. Finally, I am, according to assessments by my

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peers, and students a tough, but fair, and very effective teacher. This experience, however, was very humiliating.

*Advising* -This portion of the fellowship involved working individually with CMRC and NIJ personnel. A sample of these activities include showing someone how to map and retrieve census data using Maptitude; helping an intern install STAC for a paper that was going to be presented at an international conference; and conferring with a CMRC employee about different clustering algorithms.

Another facet of advising pertained to fielding external inquiries. For example a police department wanted to know what it needed in order to start crime mapping. While another example would be a faculty member from a junior college who wanted to know what would be needed to equip a GIS lab. Apparently, his administrators had found some extra money at the end of the fiscal year so he, in short order, had to come up with a shopping list.

Following the on-site phase, I attended several meetings during 1997 and 1998, called by U.S. Attorney Charles Grace and Assistant U.S. Attorney Bruce Reppert of the Southern District of Illinois. The purpose of the meetings was to discuss the possibility of regional crime mapping across the Illinois side of the St. Louis Metropolitan Area. This effort is on going.

*Conducting Research* - Research conducted during this time consisted mostly of testing new mapping software. For example, the Multi-Criterion Evaluation module of IDRISI was used to ascertain which day of the week produced the most reported crimes across 958 census block groups in Bronx County, New York from October 1995 - October 1996. The routing module in Maptitude and the Network Analyst extension for ArcView were used to simulate a series of origin and destination trips across several blocks in downtown Baltimore. The purpose of this exercise was to determine if the simulated commuting patterns corresponded to the spatial

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patterns of drug related crimes observed by John Eck of the Washington-Baltimore HIDTA. Another research project was utilizing ArcView and its Spatial Analyst extension for analyzing the spatial distribution and density of recovered stolen autos in relation to the location of auto chop shops in the Baltimore area. Finally, a search was conducted with the help of a reference librarian at the Library of Congress to find any historical evidence of crime or police mapping. One report was found that came from the Washington, D.C. Metro Police Department. This report, dated around 1966, pertained to the police department adopting a mapping-reporting strategy emanating from the St. Louis, Missouri, Police Department. Some of the products of these efforts were included in presentations for the first annual Crime Mapping Conference in Denver, October 1997.

*Disseminating Information & Networking* - During the fellowship there were numerous instances where information dissemination and networking occurred. Some of these events overlap with advising. While on site, I demonstrated mapping techniques to a: White House Intern; United Nations Scholar; and a group of criminology students from Germany. I met with officials from the Baltimore Police Department; Baltimore County Police Department; Washington Metro Police Department; the Police Foundation, and the Association of American Geographers. Furthermore, I participated in NIJ's annual Research & Evaluation Conference.

Finally, another effort at information dissemination that I could not achieve while on-site was the preparation of web pages linking users to sites pertaining to how to map a map. These web pages were assembled with the help of a graduate assistant after my return to my university (see Attachment A).

## Achievement of Goals

Achievement of the first goal, *increase the utility of computerized mapping for criminal justice,* cannot be not be assessed for lack of a formal evaluation mechanism. The second goal, *to position NIJ as an authority and source of guidance in mapping and spatial analysis in criminal justice,* has been achieved. The contribution of this fellowship towards achieving this goal is so miniscule or negligible compared with the massive contributions made by NIJ's own efforts. NIJ has achieved this goal by promoting mapping research and applications. I would say their efforts have made them an international authority on mapping and spatial analysis in criminal justice.

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[i] These items were ordered during late May 1997. Delivery of the software was almost immediate, but the computers did not arrive until mid-July. The reason for this tardiness was solely because of inept performance of purchasing personnel at Southern Illinois University at Carbondale.
[ii] Colleagues from other universities who passed through NIJ and saw me in the open area still kid me today by asking about my *NIJ Internship* or my *Visiting Flunkeeship.* Furthermore, the research director of a local foundation saw me in this open area and immediately offered me my own office at his suite of offices. I declined, thinking this might be a conflict of interest

Attachment A

**SIU**

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Carbondale

# *Cartographic Resources on the World Wide Web*

●Cartography (how to make a map!)
http://acorn.educ.nottingham.ac.uk/ShellCent/maps/
A web site dedicated to helping the user understand how to make maps easy to read using the following divisions: Relief: Depicting a Surface on a Map; Map Typography; Eye Movements & Maps; and Other Map Symbols.

http://www.utexas.edu/depts/grg/gcraft/notes/cartocom/cartocom.html
An excellent introduction to mapmaking. This web site is broken down by a table of contents which makes locating information very easy.

http://www.geosys.com/cgi-bin/genobject/cartography/tig5444
A brief synopsis of the history of cartography.

http://www.wolfenet.com/~brainkid/map_make.html
A web site designed to teach you how to make maps by providing basic information about map making!

http://district.moundsview.K12.MN.US/Schools/ID/GeoNet2/Lessons/Lessons.html
This web site is a teaching aid to help students learn the techniques of making choropleth maps.

http://loki.ur.utk.edu/ut2Kids/maps/map.html
A brief synopsis of how what steps a mapmaker takes when creating a new map. This site provides only the most basic of information about cartography.

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●Cartographic References
http://www.lib.utexas.edu/Libs/PCL/Map_collection/Cartographic_reference.html
Cartographic references outlined in a "Table of Contents" format including such information as gazetteers, distance calculator, time zones, sun and moon rise/set calculator, tides, postal and zip codes, map projections, bibliographies, glossaries, and guides.

http://www.mapinfo.com/mapworld/magazine/magazine.html
A on-line magazine produced by Map Info dedicated to all aspects of cartography, including geographic information systems, global positioning systems, and much more!

http://guran1.iko.unit.no/gis/gisen.html
An excellent source for interactive references, including reports for "real time" activities. This web page also includes excellent links to additional cartographic resources.

http://www.maproom.psu.edu/dcw/
A database of boundary and layer files of individual countries in Arc/INFO format.

http://mapping.usgs.gov/
An abundance of mapping information resources provided by the United States Geological
Survey.

http://dizzy.library.arizona.edu/users/mount/jack41.html
A brief guide to understanding map scales.

http://cml.rice.edu/~lanius/pres/map/
An excellent resource for learning the mathematics involved in mapmaking and reading. This
site also contains links to other Cartography resources.

http://www.lib.utexas.edu/Libs/PCL/Map_collection/glossary.html
Glossary of cartographic terminology.

http://www.census.gov/ftp/pub/geo/www/tiger/
U.S. Census TIGER homepage. (TIGER) Topographically Integrated Geographically Encoded
Reference. An index of street maps across the United States based on U.S. Census information.

http://www.geo.ed.ac.uk/agidict/welcome.html
Searchable dictionary database of GIS terms.

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●Cartographic Software
http://www.esri.com/
Arc/INFO and ArcView.

http://www.autodesk.com/solution/gis/gis.htm
AutoCAD and Autodesk.

http://www.idrisi.clarku.edu
IDRISI.

http://www.mapinfo.com/
MapInfo.

http://www.maptitude.com
Maptitude.

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●Symbology
http://www.lib.utexas.edu/Libs/PCL/Map_collection/usgs1.jpg
Dams, canals, buildings, tanks, wells, mineral deposits, quarry, mine, campsite, landmark, rock
or coral reef.

http://www.lib.utexas.edu/Libs/PCL/Map_collection/usgs2.jpg
Roads, trails, railroads, bridges, tunnels, power lines, labeled landmark.

http://www.lib.utexas.edu/Libs/PCL/Map_collection/usgs3.jpg
Control stations, road fork, elevations.

http://www.lib.utexas.edu/Libs/PCL/Map_collection/usgs4.jpg

**Political boundary lines.**

● http://www.lib.utexas.edu/Libs/PCL/Map_collection/usgs5.jpg
**Contour lines, waterways, surface areas, well/spring, mine dump, vegetated areas.**

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●**Geography Departments (selected) in the United States**
http://www.csun.edu/~hfgeg003/
**California State University, Northridge.**

http://www.ssc.msu.edu/~geo/
**Michigan State University**

http://www.geog.ucsb.edu/
**University of California, Santa Barbara.**

http://www.cfm.ohio-state.edu/
**Ohio State University.**

http://www.geog.psu.edu/
**The Pennsylvania State University.**

http://www.utexas.edu/depts/grg/main.html
**University of Texas.**

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● ●**Link Sites**
http://kartoserver.frw.ruu.nl/HTML/staff/oddens/oddens.htm

http://guran1.iko.unit.no/gis/gisen.html

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● **Criminal Justice Statistics**
http://www.ojp.usdoj.gov/bjs/
**Bureau of Justice Statistics.**

http://www.ncjrs.org
**United States Justice Department.**

http://www.albany.edu/sourcebook/
**Sourcebook of Criminal Justice Statistics 1995.**

### The Crime Mapping Research Center
http://www.nlectc.org/cmrc/
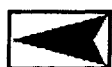
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● Maintained by *Professor James L. LeBeau & Krista Joyner* (1/98)