June 30, 1993 Final Status Report

1991 LCMR WORK PROGRAM

I. GIS CONTROL POINT INVENTORY

PROGRAM MANAGER: DON YAEGER
LAND MANAGEMENT INFORMATION CENTER
DEPARTMENT OF ADMINISTRATION
330 CENTENNIAL BLDG.
ST. PAUL, MN. 55155
(612) 297-2490

A. M.L. 91, Ch. 254, Sec 14, Subd 10(f) Appropriated: $175,000
Balance: 0

This appropriation is to the Commissioner of Administration to produce a statewide inventory of known public land survey control points using data from all levels of government.

B. During the biennium ending June 30, 1993, the data collected by projects funded under this section that have common value for natural resource planning and management must conform to information architecture as defined in guidelines and standards adopted by the Information Policy Office. In addition, the data must be provided to and integrated with the Minnesota Land Management Center's geographic data bases with integration costs borne by the activity receiving funding under this section.

C. Match Requirements: none

II. Narrative

The Public Land Survey (PLS) is the basis for all land ownership records in the State. Since the Survey was done, records of known survey control points have gradually deteriorated. Records are very decentralized in federal, state, county, local and private offices. This proposal is to establish a central information file and a plan for long-range maintenance and retrieval of the information. This proposal is NOT a remomumentation program; but rather an organized approach to building a centralized inventory of KNOWN Public Land Survey control points. It will be done in cooperation with surveyors in all levels of government, as well as the state's surveyors' associations.

III. Objectives

A. Developing the Plan.

A.1. Narrative: The first three months of the biennium will be used to design a plan for the system.

A.2. A study group would be formed to (1) analyze the present status of PLS records, (2) review efforts in other states, (3) develop a plan for data collection, (4) decide on a location for the data base, (5) develop a plan for future operations, and (6) outline a pilot study. The study group would be composed of people from each level of government and the private surveyor community.

A.3. Budget: a. Amount Budgeted: $35,000
b. Balance: 0

A.4. Timeline: 3 months July 91 / Sept 91

Review Group meetings	*********	****
Plan development	**********	**********
Final plan		****

A.5. Status: On May 29, 1991, the first of nearly a dozen meetings of the project's advisory committee was called by the Land Management Information Center (LMIC). Meetings have been held on a 2 to 3 week schedule since that time. The advisory committee membership is listed at the end of this report.

The committee identified four work items for the biennium with the major emphasis on the GIS Control Point Inventory process. The primary data input to the Inventory is the Public Land Survey section corners as digitized from the 1:24,000 USGS topographic maps. This data was collected at LMIC over the last decade using several technology changes. It was decided that a 'best possible' data set was needed. Therefore, LMIC has completed a review and up-date of this data for input to all future Inventory data sets. LMIC is also looking as completing a section corner file for the 1:100,000 USGS quad maps for regional and statewide mapping. The committee also identified the need for a better system to track and organized 'real world' PLS data as collected by field surveyors. Finally, LMIC is working with MnDOT to expand the access to a geodetic data base used primarily by surveyors.

The committee spent several months attempting to determine the informational content and classifications that should be in the Inventory. The process was difficult because the committee recognized that the data base must have enough information to be useful and yet simple enough to the built and used. During this investigation, the committee discovered a pilot project being done by the Minnesota DNR in Houston County. Originally, this DNR inventory process was thought to be more complex than needed for only a "GIS Control Point Inventory". However, continued investigation led the committee to determine that this DNR pilot, with some modification and enhancement could serve a great many users including the GIS community. Therefore, a contract has been written between LMIC and DNR Engineering to refine and test the existing pilot inventory in additional counties. The goal of this

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effort is to build a complete system and data package.

As result of this effort to build an inventory system which will serve a wider audience than simply the GIS community, Objectives A and B from the original proposal have been combined and the time table has been extended slightly. The revision and completion of a test version of the inventory in Houston County has been completed.

In June, 1992, the pilot system was sent to the five test counties. DNR staff is providing training for the test counties. The counties will test the system for approximately six weeks and then meet with the advisory committee to discuss results. After this pilot, a final version of the software will be completed. The plan is to provide basic data and operating software to any county, state agencies or federal agencies who want to use it. Promotion and training will be proved in this effort. The resulting county and agency data will be transferred periodically into a state-wide centralized file for state-wide GIS mapping.

A.6. Benefits: The plan would lay out the framework for collection and management of the PLS data and would establish the standards for the state's database. The study would provide guidance for both public and private surveyors who wish to either contribute or use the data base.

B. Pilot Test Program.

B.1. Narrative: A six-month pilot test of the recommended plan would be done with cooperating surveyors from several levels of government.

B.2. Procedures: Study areas will be selected in portions of three or four counties to test the recommendations. These areas would likely be in urban, agricultural, forested and publicly-owned forest area. Data will be collected from all levels of government offices and from private surveyors willing to cooperate. A data file will be built and products (computer files and maps) delivered. The process will be reviewed and modified as needed. A final report documenting the pilot study's recommended process and products will be done for wide review by the surveying community.

B.3. Budget: a. Amount Budgeted: $40,000
b. Balance: $ 0

B.4. Timeline: 6 months Oct 91 / Mar 92

Pilot Study	**********
Final Report	******

B.5. Status: As stated above, Objectives A and B have been combined into one effort. Pilot testing of the inventory system will occur in the summer, 1992. Meetings between the pilot counties and the advisory committee are scheduled for July and early August, 1992. This will not

hamper the State-wide Implementation effort for the rest of the biennium.

In December, 1992, DNR reported the result of the pilot effort to the Committee. The major findings were (1) the counties were very interested using the system, (2) summer is the busy field season for their offices, so data input staff and time were limited, and (3) the counties were willing to spend more time working with the system during the winter of 1992-3. By doing this pilot, DNR staff was able to determine several improvements that could be added to enhance the system. DNR has also committed to enter all of their own surveying records in to this system. As a result, LMIC and DNR prepared a contract to be completed by June 30, 1993 for (1) final system enhancements, (2) data entry of many past DNR surveying records, and (3) continued staff support to work with interested counties.

B.6. Benefits: The pilot study will test the validity of the plan by collecting information from a variety of suppliers and developing products for a variety of users. The resulting plan, modified as needed, will be ready for state-wide application.

C. State-wide Implementation.

C.1. Narrative: With the completion of the organizational study and an evaluation of the pilot tests, the inventory can be expanded state-wide.

C.2. Data initially will be collected from willing contributors. Approximately 15-25 government agencies are likely initial contributors. It is hoped that a majority of this PLS information would be in an operational data base at the end of the biennium.

C.3. Budget: a. Amount Budgeted: $100,000
b. Balance: $ 0

C.4. Timeline: 15 months April 92 / June 93

Data base building and production	**********
Final report to LCMR	*****

C.5. Status: As of June 30, 1993, all three sections of the project are completed except for distribution of the final reports. Copies of all final reports will be submitted to LCMR by late July, 1993. The status of each section is as follows:

1. LMIC has completed revision and documentation of the PLS section corner data base digitized from the 1:24,000 USGS quad maps. Approximately 25% of the state was edited from the original data file created in the early 1980s, a 10+ page document of the projected is virtually complete and a system disk of the data and

tran[illegible]ation programs is in the final stages. Any remaining workwill be completed by LMIC during the first half of July, 1993. Free copies of the data base will be provided by LMIC to cooperating agencies and others interested in PLS data.

2. LMIC has completed digitizing the section lines and corners as shown on the 1:100,000 USGS quad maps. This effort also expanded previous digitizing from two other projects to complete the state. This database is designed to be use for regional (such as PRIM) and state-wide mapping projects displaying PLS data. Copies of the database and documentation will also be available from LMIC in mid-July, 1993.

3. DNR Engineering completed both the system and the documentation for the Control Point Inventory Database. This system is design to be the collection tool for 'real world' PLS data collected by field survey techniques. The plan is to distribute the system free to all Minnesota county surveyors, plus all other state and federal land managing agencies. As these agencies revise the basic data provided with the system, they would periodically be sent to St. Paul. The database will be maintained by DNR Engineering and housed at LMIC. The 140 page system documentation of schedule to be back from the state printing office by mid-July. Distribution of system and documentation should be completed by August 1.

C.6. Benefits: Major portions of a state-wide PLS control point data base would be in place. A process for adding additional data and delivering products would be tested and approved by the state's surveying community. The user community would be responsible for continuing the operation and maintenance of the system.

IV. Evaluation

The ultimate evaluation with the amount of use the data base receives over time. Initial reaction for the surveying community at all levels of government has been very positive. Expressions of support and offers to help on the review committee have been received.

V. Context

A. A tremendous amount of money is spent for land surveys by all levels of government and private surveyors. Many public agencies spend money to locate and record PLS control points. However, there has not been a coordinated effort to assemble this data in a state-wide computerized data base. With the explosion of GIS technology, such a data base is vital to insure data compatibility and integration.

B. Accurate PLS data is the fundamental element for the great number of Geographic Information Systems (GIS) being developed across the state. Many of these GIS data systems which have been, or are being, built with LCMR money. All of these studies will be better served with an

easy-access system for Public land Survey records. Because of new technological innovations, such as Global Positioning Systems (GPS), building this state-wide data base is now cost effective.

C. We know of no previous attempt to centralize information on PLS records statewide. As mentioned, a host of both public and private surveyors have collected data which is stored in a variety of places. In the past, LCMR has funded several studies which use PLS data, but not a central data base. It is hoped that the plan for this project can establish a long-range funding proposal so that no further LCMR funds will be required.

D. Not applicable.

E. Biennial Budget System Program Title and Budget: GIS Control Point Inventory, APID 16002:58-13, AID 084186.

VI. Qualifications

Program Manager:

Don Yaeger
GIS Data Specialist
Land Management Information Center

Degree in Geography, University of Minnesota

Over the past twenty years, he has worked on a great variety of projects using land records. He supervised a 1983 study and report on Minnesota Public Lands, partially funded by LCMR. He has also worked on or supervised other LCMR projects not specifically related to land records.

A review committee from the surveying community was be selected to oversee this project. This includes people from MnDOT, DNR, the State's Association of County Surveyors, and others. The membership list is attached.

VII. Reporting Requirements

Semiannual state reports will be submitted not later than January 1, 1992, July 1, 1992, January 1, 1993, and a final status report by June 30, 1993.

1991 RESEARCH PROJECT ABSTRACT
FOR THE PERIOD ENDING JUNE 30, 1993

This project was supported by the MN Future Resources Fund.

TITLE:	GIS CONTROL POINT INVENTORY
PROGRAM MANAGER:	DON YAEGER
ORGANIZATION:	LAND MANAGEMENT INFORMATION CENTER
LEGAL CITATION:	M.L. 91, Ch. 254, Sec 14, Subd 10(f)
APPROP. AMOUNT	$175,000

STATEMENT OF OBJECTIVES: The Public Land Survey (PLS) is the basis for all land ownership records in the State. Since the original Survey was done, records of known survey control points have gradually deteriorated. Records are very decentralized in federal, state, county, local and private offices. This proposal was to produce digital files of the PLS as represented on the most commonly used maps in the state. This proposal was to also establish a central PLS information file and a plan for long-range maintenance and retrieval of the information. These digital files are compatible with and integrated into the Minnesota Land Management Information Center's data bases.

OVERALL PROJECT RESULTS: A project guidance committee was formed from the surveying community at the state, local and federal level. It identified several work items for the biennium with the major emphasis on building an on-going GIS Control Point Inventory process. The primary data input to th Inventory is the Public Land Survey section corners as digitized from the 1:24,000 USGS topographic maps. LMIC completed a review and up-date of this data for input to all future Inventory data sets. LMIC also completed a digital section corner file from the 1:100,000 USGS quad maps for regional and statewide mapping. The committee identified the need for a better system to track and organize more precise PLS data as collected by field surveyors using world coordinate location systems. During this investigation, the committee discovered a pilot project being done by the Minnesota DNR in Houston County. Originally, this DNR inventory process was thought to be more complex than needed for only a "GIS Control Point Inventory". However, continued investigation led the committee to determine that this DNR pilot, with some modification and enhancement could serve both the surveying and the GIS communities. Therefore, a contract was written between LMIC and DNR Engineering to refine and test the existing pilot inventory in five additional counties. After the pilot, a system for state-wide used was completed and is now available.

PROJECT RESULTS USE AND DISSEMINATION: Both of the PLS digital data bases are available for clients of LMIC and are sold at a very nominal costs to other users. The data disk of PLS from the 1:24,000 quads maps also includes a series of geographic coordinate conversion programs developed by LMIC. The system developed by DNR Engineering is being given free to every county, MnDOT, two national forests, and any other public agency in Minnesota who conducts land survey. A plan is being formulated to periodically transfer any new land survey data to a central data base at LMIC after quality assurance review by DNR Engineering.