

1993 Mapping Project Abstract

For the period ending June 30, 1995

This project was supported by the Minnesota Future Resources Fund

JUL 05 1995

Title: Rural County Use of the National Aerial Photography program
Program Manager: Richard D. Walter
Organization: Houston County
Legal Citation: M.L. 1993, Chapter 172, Section 14, Subdivision 8(b)
Approp. Amount: \$90,000.00

STATEMENT OF OBJECTIVES

- 1) Establish a County GIS Committee to develop and focus the needs of Houston County with respect to geographic information.
- 2) Select a test area of Houston County for initial digitizing in which the accuracy and usefulness of the digital maps can be evaluated and specification modified.
- 3) Develop a digital planimetric base map for the entire county from the experiences and responses to the pilot study.
- 4) Evaluate the digital maps for quality, accuracy, and usefulness in a rural county and compile this information into a final report that others considering digital maps can use as a resource.

RESULTS

The county participated in the early stages of the 1991 National Aerial Photography Program (NAPP) flight effort by providing target ground control. Pilot project areas in the county were chosen to stereo-digitize planimetric features for review by the county's GIS Committee. As a result, county wide base features digitized by the contractor have accuracy levels that can be easily used by surveyors. The accuracy of the data being generated by the contractor was compared to survey and GPS data entered separately into the GIS. The results of that comparison were extremely exciting.

A single county-wide mapping system creates a common data base that all county offices can access. This technology along with the LCMR funding, aided in creating a GIS in Houston County. This effort is fostering greater cooperation and support, among and between county offices, state and federal agencies, and the general public.

PROJECT RESULTS USE AND DISSEMINATION

The decision to develop accurate county-wide base maps using the National Aerial Photography Program (NAPP) and Geographic Information System (GIS) technology is proving to be highly successful in Houston County. With the funding support from the Minnesota Future Resources Fund, the county has created a GIS function under the direction of the County Surveyor. This GIS function is intended to provide support to numerous county activities (surveying, zoning, highways, property assessments, parks, cultural resources, emergency services, and utilities). Some of the uses for this data included: right-of-way platting with the County Highway Department; private surveyor support in the county; map updates with county fire departments; parcel maps for real estate agents; discussion of a E911 system; and data exchange with the Minnesota Department of Natural Resources and the Minnesota Department of Transportation.

Date of Report: 07/01/95

LCMR Final Workprogram Update Report

I. Project Title: L1-11 Rural County use of National Aerial Photography Program Flight.

Program Manager: Richard D. Walter, PLS
Agency Affiliation: Houston County Surveyor's Office
Address: 304 South Marshall Street
Caledonia MN 55921
Phone: (507) 724-5814

A. Legal Citation: M.L. 93 Chpt. 172, Sect. 14, Subd. 8(b).

Total Biennial LCMR Budget: \$90,000
Balance: 0

Appropriation Language as drafted 7/27/92: This appropriation is from the future resources fund to the commissioner of administration for a contract with Houston County to evaluate the quality of digital planimetric map products and the effectiveness of national aerial photography program products in meeting the needs of Houston County users and to assist other counties in the future use of the products. This project must comply with the data compatibility requirements set forth in subdivision 14.

B. LMIC Compatible Data Language: During the biennium ending June 30, 1995, the data collected by the 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. Data review committees may be established to develop or comment on plans for data integration and distribution and shall submit semiannual status reports to the legislative commission on Minnesota resources on their findings. In addition, the data must be provided to and integrated with the Minnesota land management information center's geographic data bases with the integration costs borne by the activity receiving funding under this section.

C. Status of Match Requirement: N/A

II. Narrative: Various public agencies will work on a cooperative effort to evaluate the quality and accuracy of producing digital planimetric maps of Houston County. These maps will include physical and cultural features that are visible from the 1991 NAPP flight such as roads, trails, residential and larger buildings, field and vegetation outlines, major utility lines, and shorelines. These digital maps will be compared against traditional rectified photographs and existing methods of data collection. From this comparison a report will be generated to assist other rural counties in their pursuit of digital mapping.

III. Statement of Objectives:

- A. Establish a county GIS committee to develop and focus the needs of Houston County with respect to geographic information system.
- B. Select a test area of Houston County for initial digitizing in which the accuracy and usefulness of the digital maps can be evaluated and specifications modified.
- C. Develop a digital planimetric base map of the entire county from the experiences and responses to the pilot study.

D. Evaluate the digital maps for quality, accuracy, and usefulness in a rural county and compile this information into a final report that others considering digital maps can use as a resource.

IV. A. Title of Objective: Establishment of County GIS Committee

A.1. Narrative: Houston County has established a GIS committee. This committee consists of officials at all levels of government and interested private agency personnel. Committee members will work to focus the needs of Houston County within the framework of GIS. They will also pursue additional funding sources.

A.2. Procedures: The GIS Committee will meet on a regular basis to formulate and review guidelines for developing our digital planimetric mapping and GIS system. The committee will continue to meet during and after the biennium of the LCMR grant to assure that the mapping and information systems are consistent with the needs of Houston County. In addition to the LCMR funds, this committee will cultivate funding sources within Houston County and from other public and private agencies.

A.3. Budget:

Amount Budgeted: \$2,450.00/in kind (by County and others on committee)
Balance: 0

A.4. Timeline: 7/93 1/94 6/94 1/95 6/95

A.5. Status: Houston County's GIS Committee has met on 3 occasions, discussing various aspects of our developing GIS. We have had presentations by vendors of products available. Discussion has also centered around data which would be beneficial, data which has been digitized, and the means of integrating data. The Houston County GIS Committee last met on May 25, 1994. This committee meeting was attended by County Commissioners, Township Officers, Don Yeager (LMIC), and various County Departments (Auditor, Highway, Recorder, Zoning, Data Processing). At this meeting, the Committee discussed the Horizons, Inc. data accuracy and the recent start with parcel base mapping. The committee was content with the status of Houston County's GIS and Horizons, Inc.'s pilot data accuracy. Houston County's GIS Committee met on October 12, 1994 to discuss the status with Horizon's Inc. and county base map data. Daryl Sather from Horizons, Inc. stated the digitizing of the county is moving along and should be complete around January 1995. As of December 15 we were notified by Horizons, Inc. that the base map data will be completed in January 1995. This is to allow adequate time for sound base map data. The Houston County GIS committee will continue to meet on a regular basis, therefore completing this objective.

A.6. Benefits: Houston County will benefit from this committee because the need for accurate mapping will be coordinated with the individual needs of each agency. It will also benefit from developing additional funding sources to continue progress on a GIS system.

B. Title of Objective: Quality of Photography for Rural Application-Pilot Study

B.1. Narrative: The GIS committee will select two areas within Houston County for initial mapping. These areas will have different degrees of relief, have substantial control established, and have importance to the various participating agencies.

B.2. Procedure: Houston County will contract with Horizons, Inc. of Minnetonka, Minnesota to provide planimetric base maps on mylar and in digital format. The base maps will be compiled from the 1991 NAPP flight. The committee will monitor the work of Horizons, Inc. and evaluate the usefulness of what is being produced. This will allow for minor changes, additions, or deletions, that are in line with LCMR guidelines, before the entire county is mapped.

B.3. Budget:

Amount budgeted: \$11,410.00 LCMR

Balance: \$ 0

B.4. Timeline: 7/93 1/94 6/94 1/95 6/95

Production

Review

B.5. Status: Hardcopy planimetric maps have been received from Horizons, Inc. and are being reviewed. Digital files are forthcoming. Houston County has purchased and installed a Sun workstation and will be receiving ARC/Info in the near future. On 1 Mar 1994 the Houston County GIS Coordinator - Christopher Hildrum - began working in the county. The SUN SPARCstation has been configured and ARC/Info installed. A plotter (HP DesignJet) and laser printer (HP Laserjet) were also added to the system. Digital files and hardcopy maps from Horizons, Inc. along with existing survey data were utilized in control point checks. Horizontal control points were checked from the field and then verified using ARC/Info's COGO package. The results of the horizontal checks were better than the stated mapping accuracy of +/- 10 feet. In both pilot areas we measured accuracies ranging from 1.1 to 52.1 feet off of "true" locations. Of the total 13 horizontal checks, only two were outside the mapping accuracy. These discrepancies may be attributed to problems associated with the actual location on the NAPP photography. Vertical control points were also checked using known locations and survey measurements provided by the County Surveyor against the spot elevations from Horizons, Inc. The results of the vertical checks were better than the stated mapping accuracy +/- 10 feet. In both pilot areas measured accuracies ranged from -1.8 feet to +3.5 feet off the true elevation. This makes the mapping accuracy almost 1/2 the +/- 10 feet as required. Of the 9 vertical checks there were no errors. The LCMR Staff received several copies of maps which had been produced by Houston County. These maps included: 1)Caledonia Pilot Features, 2) Mound Prairie Pilot parcel base, and 3)Features vs Parcels map. Horizons, Inc. has received payment of \$11,410.00 for the pilot study and Houston County by letter will request reimbursement of these funds through Don Yeager, LMIC. The pilot study data accuracy has been accepted by the GIS Committee and therefore completes the objective.

B.6. Benefits: A pilot study allows Houston County to view an area of the county at a scale and in a format that is representative of the final product, but that will give Houston County the time and opportunity to make slight modifications or additions to the complete set of base maps.

C. Title of Objective: Quality of photography for Rural Application- Entire County

C.1. Narrative: The county GIS committee will, upon review and acceptance of the pilot study, expand the contract to cover the entire county. During this time the county will also work to integrate this project into the daily operations of the participating agencies.

C.2. Procedure: Once Houston County is satisfied with the results of the pilot study, it will expand its contract with Horizons, Inc. to include digital planimetric mapping of the entire county at a 1" = 400' scale. In the interim between the initial contract and the delivery of the maps, Houston County will be working with all concerned agencies to promote this project and ensure its accuracy and usefulness to each. It is during this time that the necessary computer hardware, software, and accessories will be purchased so that training and use can begin soon after delivery of the product begins.

C.3. Budget: \$78,590 LCMR

Balance: 0

C.4. Timeline: 7/93 1/94 6/94 1/95 6/95

Begin project delivery

Complete project deliverable

C.5. Status: Based on the pilot project data accuracy and acceptance by the GIS Committee, Horizons, Inc. has been authorized to complete the digital planimetric maps of the remainder of the county. Check plots have been received for the eastern 1/3 of the county and quality reviews are being made. Due to the time needed to complete the base map data accurately, the deliverable product will be received at the end of January, 1995. Houston County received digital planimetric maps of the entire county in March, 1995. Throughout the course of receiving and reviewing the data, Houston County was impressed with the accuracy of the data. This completes the objective.

C.6. Benefits: Houston County will benefit from having the entire county digitized by having accurate base maps of physical features that have immediate uses, upon which a geographic information system can be built. By including the various end users of the project in the planning and review, these maps should prove helpful to the most applications and users.

D. Title of Objective: Evaluation and Final Reporting

D.1. Narrative: As the work under this proposal nears completion, Houston County will evaluate the database that has been created and document its usefulness in a final report. This report will prove useful to other rural counties and agencies that are planning to develop a GIS.

D.2. Procedure: The GIS committee will perform a survey of users and proposed users of the digital planimetric mapping. This will be developed by the program manager and Horizons, Inc. into a final report that will document the success of this proposal. Some of the aspects of this project that will be documented are how the data was created, the features that are included in the data, uses for the data, the delivered products - mylar and digital, how the future need for maintaining the databases will be

