# ALPENA COUNTY-WIDE

# GEOGRAPHIC INFORMATION SYSTEM

# PLAN

### August 1997

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## Introduction

Development Trends and GIS
According to the 1990 U.S. Census, Alpena County has the largest county population in the northeast region with a population of 30,605. The economic base of the county is primarily retail and manufacturing with steady gains in the retail service industry. Alpena County is also experiencing the common trend within the U.S. of migration from the city to the surrounding area. Sprawl is an identified concern with significant residential and commercial growth occurring in nearby townships. Development is occurring in the coastal communities that contain significant sensitive areas. In addition, tourism and ecotourism, have been identified as major economic development opportunities for the eastern coastline of Michigan.

In order to meet the future needs, while maintaining and enhancing the natural resource based economy, it is essential that growth management planning principles be implemented. To maintain healthy communities while protecting vulnerable ecosystems, a long term growth management program is imperative. A greater understanding of the natural resources and the impacts associated with various development scenarios are key components of sustainable communities. Geographic Information Systems (GIS) provide the opportunity to graphically show and analyze the impacts associated with individual development and land use decisions. Additionally, GIS establishes the framework to analyze impacts in a larger context (beyond the individual development site), allowing for both spatial and temporal impact analysis. Use of this powerful tool will enable communities to make informed decisions and to move beyond the nation-wide trend of growth at the expense of natural resources such as surface water and groundwater.

Coastal Zone Management Program
The Northeast Michigan Council of Governments (NEMCOG) through past Coastal Zone Management projects, has inventoried and digitized resource information for Lake Huron coastal townships within its region. This information included MIRIS land use update, zoning, general soils, public-private lands, high risk erosion sites, coastal zone boundaries, development analysis, infrastructure, and ACT 307 contamination sites. As a part of NEMCOG's ongoing county planning assistance activities, meetings were held with local officials to discuss the information and demonstrate possible uses of the information through a GIS Program. Due to the high degree of interest in Alpena County, NEMCOG applied to the Department of Environmental Quality Coastal Management Program for grant funding to develop a local GIS framework for a coordinated local and regional planning effort.

The focus of the project is two-fold. The first aspect is to initiate a coordinated GIS program in Alpena county by a) organizing a local committee, b) conducting

educational sessions, c) conducting a needs assessment and d) developing a plan for implementation of GIS including regional information coordination. The second aspect of the project is to implement the GIS plan for land use planning and water resource protection by: a) developing an intra-county/agency agreement for GIS coordination and cooperation, b) providing information on equipment and supplies needed to establish a GIS office, c) organizing existing information for integration into the county-wide GIS program, and d) providing initial training for GIS implementation.

County-Wide GIS Coordination Committee
A county-wide coordinating committee was established based on interest from County departments, agencies and local governments. Letters of invitation were sent to the following: all Township Supervisors, Alpena County Commissioners, Alpena County Road Commission, Alpena County Equalization, City of Alpena, District Health Department # 4, Alpena Area Chamber of Commerce, Alpena County 911 Coordinator, Alpena County Sheriff Department, MSU Extension, Alpena County Drain Commissioner, and the Alpena County Soil Conservation District. Attendees at the initial meeting are listed below. Those present provided input during the development of the GIS Plan, data sharing agreement and needs assessment. At subsequent meetings, local area public utilities companies were also invited to participate. A GIS committee, made up of volunteers from these departments, agencies, local governments, and companies can take the lead in facilitating the coordinated GIS program county-wide. Each representative can assist in implementing the coordinated GIS program at their respective department/agency.

The following is a list of representatives who attended the first meeting :

Raymond Wegmeyer, Alpena County Commissioner, District 7
Joyce D. McLain, Alpena County Commissioner, District 4
Jere Gagnon, Alpena County Commissioner, District 5
Jeff Shea, Equalization Director, Alpena County
John Hodges, Asst. to Manager, City of Alpena
Rich Sullenger, City Engineer, City of Alpena
Bob Sevon, Assessor, City of Alpena
Brian Laurila, City of Alpena
Alan Bakalarski, City of Alpena
Scott J. Smith, Environmental Health Director, District Health Department # 4
Sue Zolnierek, District Health Department # 4
Jeff Hein, District Health Department # 4
Jim Peltier, 911 Coordinator, Central Dispatch
Brad Robert, Alpena County Sheriff's Department
Paul Wegmeyer, MSU Extension
Brian Sousa, Alpena Soil Conservation District

## County-wide GIS Program Structure

Alpena County and the City of Alpena will both develop separate GIS programs. The need to exchange data and have compatible data sets are priorities for both the City and County. Representatives from both entities will continue to meet to ensure program compatibility and eliminate duplication of efforts.

To facilitate the exchange and sharing of digital data between local, regional and state groups, a GIS Digital Data Sharing Agreement has been developed. Initially, the City of Alpena, County of Alpena and NEMCOG will sign the agreement. The Michigan Department of Natural Resources, through a memorandum of understanding with NEMCOG, will also be a participating member.

It is recommended that the City and County eventually use the same GIS Software. While CMAP software (currently used by the County) works well for digitizing and database management, the software lacks capabilities in specialized analytical applications and high quality final map production. A *windows* based GIS software package with the capability of add-on special-application modules would meet present and future GIS program needs. Choosing the same software will eliminate the difficulties and additional staff time associated with data transfer between different GIS software packages.

The selected software should be compatible with 911 emergency response software. The 911 Emergency Response program plans to develop an up-to-date computerized county-wide street map with an address range overlay. Specialized software can translate an address associated with a telephone number to a point location on a computerized, geographically referenced map. This will allow the dispatcher to direct the emergency response unit to the location. In the event of bridge or road closures, the dispatcher can select alternate routes resulting in the shortest possible response time. A direct link between the central dispatch computer and the County and City GIS computers would enable real time access to the most current map files. This direct link would eliminate the need to regularly transmit and update County and City computer map files on a separate central dispatch computer.

The District Health Department # 4 is planning to purchase *ArcView/ArcInfo* mapping software for in-house applications. They have a memorandum of understanding with the MDNR to use MIRIS files. A data sharing relationship will be established between the Health Department and NEMCOG to share regional GIS files. It is recommended that the County and City develop an agreement with the Health Department for data sharing, or to share in the cost of developing important data layers.

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**Alpena County**

Alpena County, through the Equalization Department, has purchased equipment and CMAP software. Work has commenced on digitizing the tax parcel information. The present approach is to train and use existing staff to digitize the tax parcel information. In the short term, scheduling user time would allow other County Departments and County related agencies to use the Equalization Department GIS.

County-Wide GIS Goals

- Provide technical assistance and information to support increased local coordinated land use planning and zoning efforts.

- Network with NEMCOG and MIRIS to provide increased data input capacity, analytical capability and a broad perspective within the region.

- Provide information and analytical tools for local units of government to make informed resource management decisions that will protect water, forest, wildlife and farmland resources.

- Identify and map natural resources, highly sensitive areas, and prime / locally important farmland and forest land.

- Develop and maintain a county-wide digital parcel layer with associated parcel information.

- Develop and maintain a county-wide digital road atlas with address ranges and roads classified by type and condition.

- Inventory and map infrastructure such roads, water, sewer and utilities.

- Monitor oil and gas development by inventorying and mapping wells, pipelines and processing facilities.

- Direct development to areas that have under utilized infrastructure and/or areas where impacts to resources will be minimal.

- Seek funding to develop a "touch screen" Geographic Information System at the Alpena Public Library for use by citizens and the business community.

- Investigate use of GIS by other county departments and county based agencies, such as Cooperative Extension Service and Alpena County Conservation District.

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## Short Term Objectives (complete within two years)

* Establish a separate GIS budget within the County operations budget.

* Purchase equipment (plotter) and software

* Use existing staff to implement GIS, digitize parcel layer and analyze equalization data

* Provide staff training for GIS and database software, allow staff to attend state and regional GIS conferences

* Adopt quality control standards and procedures including data accuracy standards

* Develop a data maintenance plan

* Establish fee structure for selling maps and data

* Collect Existing Data (NEMCOG, MIRIS, Local gov. and Agencies)

* Use MIRIS base files as initial base to build GIS layers

* Complete parcel digitizing and linking Equalization database

* Digitize political boundaries

* Develop up-to-date road network with address ranges for 911

* Map unimproved roads with GPS unit

* Establish an electronic link to Central Dispatch for real time access to digital maps

* Establish user protocol for outside users of GIS

* Investigate purchasing digital ortho-photos

* Apply for joint grant with the City to develop a Touch-Screen GIS station at the County Library.  Investigate local and state funding sources.

## Long Term Objectives (complete within three to five years)

* Implement procedures to assign addresses to new structures

* Acquire digital soils data of Alpena County from USDA

* Acquire MIRIS existing land cover/use updates from Townships, City and NEMCOG

* Digitize water wells with attribute data (Health Department)

* Acquire topography / elevation data with assistance of NEMCOG

* Develop digital wetlands maps from USDA soil survey, NWI maps and land cover/use

* Acquire digital watershed files for all streams that flow through Alpena County

* Map oil and gas development including pipelines, gas wells & production facilities

* Acquire GPS capability

* Complie and map economic & marketing data

* Continue ongoing staff training

* Investigate hiring GIS Specialist

* Investigate linking other County Departments such as Register of Deeds, Clerk, and Treasurer to the County-wide GIS

* Purchase Windows based GIS software (same as City) and convert all digital files

**City of Alpena**

The City of Alpena intends to purchase equipment/software and develop an in-house GIS program in 1997. A *Windows* based GIS software package will be used. Initially, one computer will be configured to operate the GIS and another computer, in the Engineering Department, will operate Autocad software. The GIS computer will be networked to the centralized computer to access database files. The City is investigating the development of a common, linked database where information from all departments is stored in a single database file. This approach will alleviate the task of continual update and conversion of department files into GIS compatible database files.

The City's first project will be to develop a GIS parcel layer with linked parcel records. A property line digital map layer was created as part of a Master Planning process. The property lines need to be updated to reflect current ownership conditions. The layer needs to be developed into a polygon format and have parcel identification numbers added. The parcel ID's will be the link between the map layer and the Assessors property database. Eventually, the engineering, planning and assessing offices would be linked to a centralized GIS system.

City of Alpena Goals

- Develop an integrated database of information associated with parcels which can be shared by all departments and the County.

- Purchase and implement GIS software to graphically depict the spatial arrangement of selected attributes from the common database.

- Expand the common database to take advantage of existing data on physical and social attributes on properties within the City.

- Monitor repairs and improvements to the municipal infrastructure for improving the replacement and expansion of facility systems.

- Monitor municipal services by type and location to identify methods for improving service delivery and efficiency.

- Monitor changes in existing land uses, development patterns, and population characteristics in the City to determine which areas will be impacted by these current trends, and the nature of the impact..

- Use GIS for modeling municipal infrastructure system improvements and delivery of services to identify the best options to optimize efficiency and/or quality.

## Short Term Objectives (complete within two years)

* Purchase equipment and software, set-up work stations in the planning, engineering, assessors and building/code enforcement offices.

* Train and use existing staff to implement GIS, and consider hiring temporary help and contracting for special services.

* Provide staff training for GIS and database software, allow staff to attend state and regional GIS conferences

* Adopt quality control standards and procedures including data accuracy standards

* Develop a data maintenance plan

* Collect Existing Data (NEMCOG, MIRIS, Local gov. and Agencies)

* Use MIRIS base files as initial base to build GIS layers

* Complete parcel digitizing and linking Assessor's database

* Develop integrated database of parcel information

* Develop up-to-date road network with address ranges for 911

* Digitize political boundaries

* Establish an electronic link to Central Dispatch for real time access to digital maps

* Purchase digital ortho-photos through joint effort with Michcon

* Begin digitizing infrastructure and building infrastructure attributes

* Import Census, existing land use, future land use and zoning digital information.

* Apply for joint grant with the County to develop a Touch-Screen GIS station at the County Library. Investigate local and state funding sources.

## Long Term Objectives (complete within three to five years)

* Complete facilities mapping

* Acquire GPS capability

* Acquire and map economic & marketing data

* Continue ongoing staff training

* Investigate hiring GIS Specialist

* Investigate linking other City Departments: City manager, Utility company, fire, police, public works, clerk/treasurer

* Input geographically-referenced data from Historic District Study

* Acquire digital soils data of Alpena County from USDA

* Acquire MIRIS existing land cover/use updates from Townships and NEMCOG

* Acquire topography / elevation data with assistance of NEMCOG

* Develop digital wetlands maps from USDA soil survey, NWI maps and land cover/use

* Acquire digital watershed files for all streams that flow through Alpena County

## Equipment

The two primary equipment items in a GIS office are the computer and plotter. The speed and data storage space available on personal computers has significantly increased in recent years. Compared to plotters, software and staffing, the computer is the least expensive component of a GIS program. Large format ink jet plotters can produce maps and graphics on 36" x 48" printing media. The output resolution can be up to 600 dpi and when operated with *Windows* based mapping software, a wide range of colors are available. While not used on a daily basis, the digitizer tablet is essential to input map data such as parcels and existing land cover/use. Another option is to have maps scanned and to use on-screen digitizing to create data layers.

Computers - The cost of a computer capable of operating GIS software can range from $2000 to $5000 depending on the manufacturer and components. Since the computer is the keystone of the GIS program, it is best to purchase a "name brand" system with a proven track record. The best sources of information on performance and reliability of computers, and the quality of technical support are PC computer magazines. Since there will be considerable effort to configure the computer, install specialized software and load existing map files, always buy the best and most powerful computer the budget can afford. The computer will likely be used for a number of years, and should have the ability to handle increased applications and file storage as the GIS program matures. Purchasing an inexpensive and less powerful computer will result in low efficiency and often results in the need to purchase new components or a new computer as the program matures. An old saying is still relevant to modern technology, "The sweetness of low prices never equals the bitterness of low quality."

Recommendations for minimum components:

166 MHz to 200 MHz Intel Pentium Processor
16 to 32 MB of RAM, minimum
High resolution color graphics card, 64-bit with 2 to 4 MB of RAM
2 to 4 GB (gigabyte) Hard Drive
17 to 21 inch, high resolution color monitor
12X CD-Rom
3.5" diskette drive
Data/Fax Modem (33.6/14.4)
Zip-drive or tape drive for backing-up data

Plotter - Large format color ink jet plotters are capable of producing high quality presentation graphics with a wide latitude of color choices. These plotters are much faster than the eight-pen plotters, which were developed for DOS based software. The eight-pen plotters either perform poorly or not at all with *Windows* mapping software. Ink jet plotters, on the other hand, work with DOS and *Windows* software.

There are a number of companies that produce large format ink jet plotters. It is recommended the plotter handle "A" to "E" size map sheets. The smallest "A" size is standard paper (8 1/2" x 11") and the "E" size is 36" x 48" paper. It is further recommended to purchase a potter that has the capability of using rolls of paper. This allows the plotter to print a number of maps sequentially without the operator having to load individual sheets. When choosing a plotter be sure to compare components (amount of print buffer RAM) between each manufacturer and the cost of operating (ink, paper, etc.).

Recommendations for minimum components:

Color and monochrome output
Minimum 300 dpi color output
Minimum 600 dpi monochrome output
Ability to print on A-E size paper
Roll paper feed with automatic paper cutter
32 MB of plotter buffer RAM (for E-size inkjet)
Refillable ink jet cartridges

Approximate Prices:
Hewlett Packard DesignJet 750C +     $6000
Calcomp TechJet 5536                 $5400
Encad NovaJet 4                      $6000

Digitizer - Digitizers are a special use item, that typically is not used on a daily basis. They receive high use during program start-up for encoding layers such as parcels and utilities. After these layers have been completed, subsequent digitizing is usually accomplished with screen digitizing or heads-up digitizing with a mouse. Depending upon the size of maps that will be digitized, a minimum 36" x 48" digitizer is recommended. Digitizers up to 44" x 80" are manufactured for larger size media.

Costs range from $1300 to $1700 for 36" x 48" digitizers

Scanner - If an important component of the GIS Program will be high volume and continual map encoding, a large format scanner may be justified. While these tend to be high ticket items ranging from $8,000 to $12,000, the increased efficiency will offset the purchase price. Scanners that will take 8 1/2" x 14" sheets are more affordable ranging in price from $300 to $700. These smaller scanners have many applications such as scanning photos and drawings of buildings that can be linked to GIS layers.

## Software

Along with the above equipment, software is needed to build a functioning GIS workstation. The GIS / computer mapping software is just one component of the

complete GIS workstation toolbox. Computer operating systems such as DOS, *Windows* (3.11, 95, or NT), and UNIX are common programs. Database programs include *dBase, Paradox, Access,* and *Oracle. Excel, Lotus* and *Quatro-Pro* are common spreadsheet computer programs. Word processing software with the ability to import graphics into documents are most useful when producing reports and studies with charts, tables and maps. *WordPerfect, MS Word* and *AmiPro* are three common word processing programs. Graphics software, while not required, can greatly enhance displays and documents. New computers are packaged with a bundle of computer programs, however additional software may be needed for the GIS workstation. The software and equipment can be purchased locally or from reputable mail-order vendors.

The selection of GIS software should be based on the community's needs and level of interest. The committee representatives have seen demonstrations of *C-Map, ArcView/ArcInfo, MapInfo* and Touch-Screen GIS systems. While it is not the intention of this project to recommend a particular software, certain guidelines should be considered when selecting GIS software.

1. Newer personal computers operate with *Windows* software, including Office Suites (integrated word processors, database, graphical and spread sheet programs). It is advisable to use GIS software that operates in *Windows* (3.11, 95 or NT). *Windows* based software tends to be easier to use and offers a wide range of map display options. The *Windows* software / inkjet plotter interface is superior and offers a wide latitude for graphical output.

2. It is recommended that the City and County eventually use the same GIS Software. While CMAP software (currently used by the County) works well for digitizing, inputing data, and database management, the software lacks capabilities for certain specialized analysis and high quality final map production. Different departments and agencies all using the same software will eliminate the difficulties and additional staff time associated with data transfer between different GIS software packages.

3. The software should meet both present and anticipated future needs. In its infancy, a county or city GIS program may have limited goals. As the program matures and the level of sophistication increases, the uses and applications will intensify. A *Windows* based GIS software package with add-on special application modules would meet present and expanded future GIS program needs.

4. The software and GIS files should be compatible with GIS activities at NEMCOG and the statewide MIRIS digital database.

5. The selected software should be compatible with 911 emergency response software. The 911 Emergency Response program plans to develop an up-to-date

computerized county-wide street map with an address range overlay.   A direct link between the central dispatch computer and the County and City GIS computers would enable real time access to the most current map files.  This approach would also require the County and City to use the same GIS software.

Below are price estimates for software commonly used in Michigan:

*C-MAP* - $495 (Government Agencies)  $695 (Regular Price)
*MapInfo Professional* - $1295,  additional charge for special modules
*ArcView* - $1195;  *PC ArcInfo* - $2995,  additional charge for specialized add-ons
*Calpier Corporation*'s *GISPlus* - $3000, *Maptitude* - $495  includes CD's with national coverage of Census and geographic files.
*Intergraph* - $11,000 for Microstation and full analytical software package

**Map Production and Publishing**

As the County-wide GIS program matures and data layers are created and refined there will be numerous opportunities to produce maps for internal use and for sale. It is important to note that the production of maps and map booklets does require certain skills and considerable staff time. To realistically undertake the production of the following maps, it would be necessary to either reallocate existing staff workloads or to hire a GIS/computer mapping staff person. However, for a program to be successful it must be 'input intensive and output driven'. In other words, in addition to continually adding and updating necessary information, it is extremely important to start producing maps during the program start-up phase. The following is a list of possible maps.

Tax Parcel Maps for distribution to Townships and Private Sector
County Road Map
Township and City Base Maps
County Plat Book
Zoning Atlas
Address Atlas
Commissioners' Districts
School Districts
Police and Fire Districts
Natural Resource Maps

**Needs Assessment**

A 'Needs Assessment Survey' was developed and distributed to agencies, departments and local units of government within Alpena County to gather input from the potential users of a Coordinated Geographic Information System (GIS) / Computer Mapping system. The surveys were initially distributed to representatives from the departments, agencies and units of government who attended the initial GIS planning meeting, in February 1997.

Fifteen surveys were distributed at the initial meeting and an additional 17 surveys were sent out to the Townships, the County commissioners and other agencies within the County. Eight surveys were returned, some of which represent collaborative efforts from different people / departments within a municipality or agency. A copy of the Needs Assessment report and the Survey form, with the response tally is included as **Appendix I** of this Plan.

Survey Findings
An extensive list of potential layers was provided in the survey, the respondents as a group were most interested in **soils data** and a **parcel map** with various data base information attached. The other features which were identified for use by a majority of the survey respondents (at least five) were: existing land use; political boundaries; topography; wetlands; watersheds; unimproved roads; and gas lines. See the attached tables for further details.

When asked the three most important mapping related activities required by the agency / department the following responses were given (the number of times the activity was listed given in parentheses):

| | |
|---|---|
| Parcel / database (3) | Oil and Gas Development Activity (2) |
| Land Use / Zoning (2) | Utilities Management (1) |
| Road / Street (2) | Agricultural Lands (1) |
| Natural Resource Planning (2) | Insect Control (1) |

Six of the respondents are considering GIS, the two townships that responded are not considering GIS. Of those considering GIS all but one have powerful enough computers, capable of running many of possible GIS applications. Only the Health Department is operating a UNIX based system, all other departments / agencies operate various IBM compatible Personal Computers (PC's). A wide range of database, word processing and spreadsheet programs are currently being used by respondents. There are plans by agencies/departments to purchase *Windows 95, MS Office, Internetware,* and *CAD Dispatch System* this year.

Six of eight returned surveys indicated an interest to participate in the implementation of a GIS program, and those six surveys represent ten people, since some of the

surveys were completed by two or three people. The Townships did not indicate a definite interest in participating.

The type of participation indicated by the respondents is indicated below:

Steering Committee Member (5)
Purchase / Use of Products and Services from another agency /department (2)
Data sharing with other agencies /departments (5)
Assist in development of a Data Maintenance Plan (4)
Receive Training (4)
Provide Training (2)

Application of Findings
The survey findings show a strong interest in GIS within agencies and departments located in Alpena County. Of the agencies / departments interested in GIS, almost all have or are purchasing the necessary computer system to run GIS applications. The Alpena County Equalization Department has purchased CMAP and the necessary equipment to commence parcel mapping. Other local units of governments and agencies do not have GIS software, therefore this is an ideal time for assessing the different uses / needs and choosing appropriate GIS software.

Many of the respondents indicated a willingness to be involved in a GIS steering committee. This steering committee will be involved in further discussions and options for implementing a coordinated GIS system based on the initial survey findings.

The majority of the survey respondents are interested in 'Data Sharing' with other agencies / departments. The common interest of many agencies / departments in certain layers of information could be used to determine the priority for establishing the base layers of information in a coordinated system. The parcel layer is a fundamental layer, upon which the other layers can be built. Soils and an accurate up-to-date road network are two additional important "front-end" map layers in developing a GIS.

Agencies and local units of government planning to use these layers of information should work out a cooperative arrangement to share the cost and expedite the process of development. Guidelines for the input of information will need to be established to ensure a pre-determined level of accuracy is maintained.

Alpena County Equalization Survey
Prior to initiating this project, the County Equalization Department sent a questionnaire to local units of governments, state and local agencies servicing Alpena County, engineering, surveying companies and utility companies. The intention was to assess the interest in a County-wide GIS. The questionnaire surveyed the level of interest in purchasing maps and data, which data layers the entity would be interested in, if they

were currently using GIS and if there would be an interest in sharing data. Seventeen questionnaires were returned. Below is a summary of the responses:

Townships - Of the three townships that replied, two expressed an interest in County-wide GIS Program. Both would be interested in purchasing maps, one would be interested in purchasing data.

Private Sector - Engineering, surveying and mortgage companies indicated their companies would use a County-wide GIS. All were interested in purchasing maps and digital data. The Alpena General Hospital did not feel they would use a County-wide GIS.

State Agencies - The Michigan State Police and Michigan Department of Transportation indicated an interest in using GIS and would purchase either maps or digital data. The Alpena County office of the Family Independence Agency did not feel they would use a County-wide GIS.

County - Alpena Central Dispatch, Cooperative Extension, Alpena County Library and Alpena County Airport feel they would use a County-wide GIS and would be interested in maps and digital data.

Utilities - Alpena Power Company and Presque Isle Electric and Gas Cooperative indicated an interest in a county program and would likely use maps and digital data.

GIS Layers - Respondents were asked to list data layers they would be interested in using. As found in the Needs Assessment conducted for this plan, there is a high interest in parcel information. Other layers that received a high score were environmental contamination sites / hazardous waste sites, house / structure addresses, soils, wetlands section corners, and zoning maps.

None of the respondents are currently using GIS, however Alpena Central Dispatch and Presque Isle Electric and Gas Cooperative are in the early stages of developing GIS/computer mapping. When asked whether they would be open to data sharing, eleven of the seventeen indicated yes to the question. In summary, there was a favorable response, indicating good support for a County-wide GIS program. Depending upon product availability and pricing there is an excellent opportunity to sell maps and digital data.

**Information User Groups**

The types of users can be segregated into three groups: internal users, external users and private users. The internal users group consists of cooperating members of the County-wide data sharing agreement. The external users group, consisting of other public entities who have not signed the data sharing agreement (such as public

education institutions, federal agencies and local governments) can have limited access to the GIS data layers, but the transfer and or purchase of the data should be arranged between the data owner and an interested party. The private user group (consultants, businesses, utilities, and general public) requesting information, data analysis and maps will pay incurred cost fees as determined by the data sharing members.

Initial Internal Users - Data Sharing Members will include Alpena County, the City of Alpena, the Northeast Michigan Council of Governments and the Michigan Department of Natural Resources (MIRIS Program).

Initial External Users - Schools, universities and colleges, Cooperative Extension Service, District Health Department No. 4, Consolidated Farm Service Agency, Rural Economic Community Development, Natural Resource Conservation Service, Alpena Soil Conservation District, Alpena County Road Commission, Alpena School District, and Townships that have not become a data sharing member.

Private Users - Realtors, engineering/survey firms, builders, commercial and industrial development companies, environmental and resource consulting firms, utility companies, forest industries, and the general public.

## Data Sharing Agreement

To facilitate the exchange and sharing of digital data between local, regional and state groups, a GIS Digital Data Sharing Agreement has been developed. Initially, the City of Alpena, County of Alpena and NEMCOG will sign the agreement. The Michigan Department of Natural Resources, through a memorandum of understanding with NEMCOG, will also be a participating member. The data sharing agreement defines data sharing members, data owners, data users, access and data transfer, ownership, and procedures for correcting errors in data. Use restrictions clearly define use of shared data and protect ownership of digital data. To become a Data Sharing Member a local unit of government/agency must have the appropriate representative sign the agreement. A copy of the Geographic Information System Data Sharing Agreement can be found in **Appendix II.**

## Data Standards

It is important to document data standards when developing new data layers. Agencies, units of governments and private firms, responsible for developing GIS data layers, have already established standards. Prior to developing data layers, whether in-house or contractually, review data standards established by regional, state or federal agencies. The data standards often include level of accuracy, data collection procedures, data input procedures, data layer and database organization, and classification systems. (MDNR standards available from NEMCOG on request)

## NEEDS ASSESSMENT SURVEY - FINDINGS
COORDINATED GEOGRAPHIC INFORMATION SYSTEM (GIS)
ALPENA COUNTY

A 'Needs Assessment Survey' was developed and distributed to agencies, departments and local units of government within Alpena County, to gather input from the potential users of a Coordinated Geographic Information System (GIS) / Computer Mapping system. The surveys were initially distributed to representatives from the departments, agencies and units of government who attended the initial GIS planning meeting, in February 1997. The following is a breakdown of the meeting attendees:

      County Board of Commissioners (3)
      County Equalization Department (1)
      County Sheriff Department (1)
      · Soil Conservation District (1)
      District Health Department #4 (3)
      City of Alpena (4)
      MSU Extension office (1)
      Central Dispatch (1)

Meeting Facilitators:
      Tom Kellogg,   Northeast Michigan Council of Governments
      Rick Deuell,    Mary Ann Heidemann & Associates

Although the supervisor from each of the Townships was invited to the meeting, no township representatives attended the initial meeting.

One purpose of the meeting was the presentation of an overview of GIS to stimulate a 'roundtable' discussion regarding the needs and possible GIS data uses by the interested departments, units of government and agencies attending this meeting. Fifteen surveys were distributed at the initial meeting and an additional 17 surveys were sent out to the Townships, the County commissioners and other agencies within the County. Eight surveys were returned, some of which represent collaborative efforts from different people / departments within a municipality or agency.

Survey Findings

Each of the survey questions is presented below, followed by the a brief discussion of the responses received for the corresponding question. An overall discussion of how these findings will be used to develop a GIS implementation plan appropriate for Alpena County, and implications of the findings are presented at the end of this section.

*1.  Which of the following map features would you (or your department) use if available either on a Geographic Information System (GIS) / Computer Mapping system or as maps?*

In response to question number one, which provided an extensive list of potential layers, the respondents as a group were most interested in **soils data** and a **parcel map** *with various data base information* attached.  The other features which were identified for use by a majority of the survey respondents (at least five)  were:  *existing land use;  political boundaries; topography; wetlands; watersheds; unimproved roads; and gas lines.*  See the <u>attached tables</u> for further details.

*2.  Are you interested in using /purchasing maps prepared by another agency/department?*
        **<u>Yes</u>            No**

The half of the respondents indicated they would be interested in using / purchasing maps (hard copy) prepared by others, two respondents indicated they would not be interested and two surveys had no response to this question.

*3.  Please list the three most important mapping related activities required by your agency / department.*

Following are the responses to this question, with the number of times the activity was listed given in parentheses:

| | |
|---|---|
| Parcel / database (3) | Oil and Gas Development Activity (2) |
| Land Use / Zoning (2) | Utilities Management (1) |
| Road / Street (2) | Agricultural Lands (1) |
| Natural Resource Planning (2) | Insect Control (1) |

*4.  Are you considering GIS for use in your agency/ department?*  **<u>Yes</u>    No**

Six of the respondents are considering GIS, the two townships are not considering GIS.

Of those considering GIS all but one have powerful enough computers, capable of running many possible GIS applications.  The County Equalization department has since purchased a pentium personal computer (PC).  Prior to the implementation of any GIS plan, the machines to be used for GIS will need to be examined in more detail to determine if each has the available capacity necessary for the chosen GIS applications.  Only the Health Department is operating a UNIX based system, all other departments / agencies operate various IBM compatible PC's.

5.    *Please list the software, if any, your agency/department uses for the following applications.*

Following are the responses to this question, with the number of times the software was listed given in parentheses:

| | | | |
|---|---|---|---|
| *GIS / Graphics:* | WP Presentations (1) | C-MAP (1) | |
| *Database:* | Microsoft Access (2) | PCfile (1) | Blue Ribbon (1) |
| | dBase 5.0  (1) | dBase Approach (1) | |
| *Word Processing:* | Wordperfect (5) | MS Word (3) | Lotus Word (1) |
| *Spreadsheet:* | Excel (3) | Lotus (2) | QuattroPro (1) |

6.    *Please list any software your agency/department is likely to purchase this year.*

The additional software listed were:

| | | | |
|---|---|---|---|
| Windows 95 | MS Office | Internetware | CAD Dispatch System |

7.    *Would you be interested in participating in the implementation of a Coordinated County GIS/Computer Mapping Program?*   ***Yes***_ *No*

Six of eight returned surveys indicated an interest to participate in the implementation of a GIS program, and those six surveys represent ten people, since some of the surveys were completed by two or three people.  The Townships did not indicate a definite interest in participating, one township responded with a question mark and the other specified not interested.

The type of participation indicated by the respondents is listed below:

> Steering Committee Member (5)
> Purchase / Use of Products and Services from another agency /department (2)
> Data sharing with other agencies /departments (5)
> Assist in development of a Data Maintenance Plan (4)
> Receive Training (4)
> Provide Training (2)

*8. Other comments regarding implementation of a Coordinated County GIS / Computer Mapping Program?*

The City of Alpena would like more specific information on GIS software and implementation.

The MSU Extension office, has space available and the ability to connect with MSU for support, however does not currently have a computer system to run GIS applications.


General Comments

The returned surveys provided a good cross-section of the needs from the various agencies and departments serving the County and City of Alpena. However, there was a very limited response from the Townships. Alpena County is comprised of eight township units of government, they are: Alpena, Green, Long Rapids, Maple Ridge, Ossineke, Sanford, Wellington and Wilson.

All eight of the townships were contacted twice. Despite efforts to get responses from the Townships, only two surveys were returned from the eight Townships within the County. Some of the possible reasons for the low township response rate may include the lack of understanding of GIS and its possible uses, limited budgets (personnel and computers) at the local township level, and the timing of the survey. The survey was distributed in late February and was due back in early March. For many of the local townships this time period fell during one of their busiest times, during the budgeting process and during the time when assessments can be protested to the Board of Review.

The townships which responded are probably typical of the limited level of interest from the more rural Townships. Sanborn Township indicated they would be interested in using maps and being able to request particular information on a map. Ossineke Township is 'not interested at this time' in using / purchasing maps. Neither of these townships will be establishing and maintaining GIS at the Township level in the near future. The only township which is more likely to establish a township GIS, is Alpena Township, surrounding the City of Alpena. Alpena Township has experienced significant growth in recent years, and has a much larger budget than the other townships within the County.

Additional contacts have been made to public utilities operating within the County, and the initial responses have been positive. The utilities were contacted after the initial meeting, and most have expressed an interest in attending future meetings and being involved in data sharing as a coordinated GIS is implemented in Alpena County.

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## Application of Findings

The survey findings show a strong interest in GIS within agencies and departments located in Alpena County. Of the agencies / departments interested in GIS, almost all have or are purchasing the necessary computer system to run GIS applications. None of the respondents have GIS software up and operating, therefore this is an ideal time for assessing the different uses / needs and choosing appropriate GIS software.

Many of the respondents indicated a willingness to be involved in a GIS steering committee. This steering committee will be involved in further discussions and options for implementing a coordinated GIS system based on the initial survey findings.

The majority of the survey respondents are interested in 'Data Sharing' with other agencies / departments. The common interest of many agencies / departments in certain layers of information could be used to determine the priority for establishing the base layers of information in a coordinated system. The parcel layer is a fundamental layer, upon which the other layers can be built. Various options for inputing this and other layers should be further considered, such as cost share options, timeframes for implementation and use.

The agencies most interested in particular layers of information may be willing to participate in, or support (with computer access, labor, financial assistance) the creation of those layers. Guidelines for the input of information will need to be established to ensure that a pre-determined level of accuracy is maintained.

**Geographic Information System Data Sharing Agreement**
Alpena County-Wide Coordinated GIS Program

Purpose
County of Alpena and the City of Alpena are in the early stages of implementing a GIS program. The Northeast Michigan Council of Governments (NEMCOG) has implemented a regional GIS program. Information has been developed for Alpena County and is available upon request. Certain townships in the county with active planning programs have used this information and with the assistance of their planning consultants have "built" additional GIS layers such as updated land use, future land use, zoning, and parcel maps.

With a high level of interest and the potential numerous users of the information, a County-wide coordination and collaboration effort is essential. The framework for instituting this effort will be the formation of a GIS Digital Data Sharing Agreement. Users include Alpena County, City of Alpena, Northeast Michigan Council of Governments and Michigan Department of Natural Resources.

Other potential users may include Townships in Alpena County, Alpena County Cooperative Extension Service, Alpena County Conservation District, Alpena County Road Commission and District Health Department No. 4.

Provisions
Data Sharing Members - Initially, data sharing members will include Alpena County, City of Alpena, Northeast Michigan Council of Governments and Michigan Department of Natural Resources. In order to be a participating member, local units of government and agencies must sign and agree to all terms of this agreement. Due to the interest in using existing data and developing new layers of data, members will be both Data Owners and Data Users. Provided there is a consensus between the founding members of the Data Sharing Members, other local units of government and agencies may be invited to participate in the County-wide coordination and collaboration effort.

While not signing this document, the Michigan Department of Natural Resources (MDNR) will function as a Data Sharing Member. The MDNR provides MIRIS digital files to local communities via a Memorandum of Understanding with NEMCOG. This information is provided at no direct cost to local communities with the understanding that communities will reciprocate by providing enhanced files and new layers to the NEMCOG and MDNR.

Data Owners - Local units of government and agencies will develop new layers of digital data, for example tax parcel maps, wells, road networks, and utilities. Ownership of the data will be retained by the entity that developed the data. The Data Owner will be responsible for creating, maintaining and distributing the data. Information associated with the data such as source, level of accuracy, and date of creation will be provided to the Data Users.

Data Users - Local units of government and agencies, as data sharing members, will have access to digital data provided by other members. This Shared Data may include tax parcels, utilities, zoning, existing land cover/use and MIRIS base files. Data Users will follow use restrictions as stated in this agreement.

Access and data transfer - Data Sharing Members will have access and use of digital data developed by other members. A member requesting data should complete and sign a Data Transmission Agreement/Order Form that lists files requested, anticipated uses, and confirms ownership and use restrictions of the data. Arrangements for transferring data, such as data format and media, along with possible costs associated with the data transfer will be worked out between each member.

Ownership - The ownership of the Shared Data will be retained by the agency/department that created the data and the use of the data will be subject to the use restrictions listed below.

Errors in data - If a Data Sharing Member discovers errors in the Shared Data, the Data Owner will be notified of the error, and if necessary, a map depicting the error will be transmitted to the data owner.

Use Restrictions
Members using Michigan Resource Information System (MIRIS) files provided through a Memorandum of Understanding between the Michigan Department of Natural Resources and NEMCOG agrees to follow all provisions of the Memorandum of Understanding.

The Data Owner will retain all ownership of the digital data it has generated. When a Data Sharing Member makes a correction to the Shared Data, the Data Owner still retains ownership of that Shared Data.

When a Data Sharing Member adds a significant amount work or information to the shared data, the Data Sharing Member may become "co-owner" of the new "value-added data set" after consultation and agreement with the Data Owner. It would be advisable to initiate this consultation and agreement prior to commencing the "value-added data set' work activity.

Furthermore, when a Data Sharing Member creates a data set that is derived from or based upon Shared Data, but is itself substantially and inductively different, the Data Sharing Member my become sole "owner" of that new data set after consultation and agreement with the Data Owner. It would be advisable to initiate this consultation and agreement prior to commencing the data set work activity.

The members may only use Shared Data in support of its public service functions, including: planning purposes, implementation and interpretation of scientific research and tabular information, the generation of new data sets, and the creation of hard copy maps, charts, and reports, providing that proper citations and credits are listed.

Members are not authorized to rent, distribute, give or sell any Shared Data for profit making. Only the Data Owner has the authority to distribute and sell digital data owned by that member. The Data Sharing Member should request, in writing, to have the Data Owner distribute digital data to another entity that is not a part of this Data Sharing Agreement. This would include but not be limited to Members' consultants, universities, state agencies, and federal agencies. When data is distributed to nonmembers the Data Transmission Agreement/Order Form should be signed by all parties involved. Further, the Data Owner may charge the cost of reproduction and distribution of the digital data.

A Data Sharing Member may not use Shared Data in any way that misrepresents the integrity, quality or accuracy of Shared Data, as stated by the Data Owner in the accompanying data set documentation.

A Data Sharing Member is required to protect Shared Data from unauthorized use by employees or associates of the Data Sharing Member, or by others not associated with this agreement, Therefore, no employees or associates of the Data Sharing Member may use Shared Data for Personal or Private gain.

Termination of Membership
Any participating member of the GIS Data Sharing Agreement may terminate membership at any time. A written notice of termination will be sent to all participating members. Additionally, digital data not owned by the terminating member will be returned to the department/agency (Data Owner) that has ownership of the data. Conversely, participating members will return all data owned by the terminating member upon notification of termination.

Signatures          Dated: _____


_____          _____


_____          _____


_____          _____

# DATA TRANSMISSION AGREEMENT / ORDER FORM

I, _____ , acting on behalf of _____ am

requesting the following geographic data files from _____ :

_____          _____

_____          _____

_____          _____

The geographic files I have requested shall be used for the following purpose(s):

_____          _____

_____          _____

_____          _____

and I understand that the use is restricted to that purpose. Furthermore, any geographic data

files obtained are the property of _____ and shall not be loaned, sold or otherwise transferred to any individual, firm, organization, or agency, nor used for any other

than the stated purpose(s) without written permission from _____ .

Signed:

_____          _____
User                                                              Date

_____          _____
Authorized Agent                                          Date

_____          _____
Data Owner                                                  Date