NYS TUG HILL COMMISSION
GIS STRATEGIC PLAN
2008

PREPARED BY THE COMMISSION'S GIS TEAM

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Executive Summary

The Tug Hill Commission has been a leader in the North Country in Geographic Information Systems (GIS) since obtaining its first system in the early 1990's. Over the years the Commission has made a point of staying current with hardware and software, enabling us to provide mapping and data analysis support for our projects and to our communities. GIS services are an integral part of the Commission's program and support all three of the program areas (natural resources, planning, and community development). The Commission's GIS strives to keep GIS software, hardware, and data current and maintained; promote and maintain working relationships with other GIS professionals and communities interested in pursuing GIS; and provide ample opportunities for staff development and training for all those using GIS.

Below is a summary of recommendations and issues staff identified during the strategic planning process. They are expanded upon in the text of the plan.

Outreach/Education

- The thram.org web-based GIS platform is a useful tool to deliver GIS and relevant data to our communities. Upgrades to the interface to make it more user-friendly, and the addition of other mapping applications, will be considered as necessary.
- The Tug Hill GIS Cooperative is a valuable concept and should be reexamined in order to adjust it to the needs of today's North Country agencies and groups.
- A community or organization that borrows the Tug Hill Commission GPS unit should be encouraged to join the Tug Hill GIS Cooperative.
- The Tug Hill User Group should continue providing networking, education, and outreach to its members.
- The Commission should continue to sit on the State Agency Advisory Group to the New York State GIS Coordinating Body.

Work Balance

- Requests for Commission GIS services originate from two sources: Commission projects undertaken by staff for communities in the Tug Hill region and projects undertaken by communities themselves. Generally demand from both sources is manageable and does not put a strain on what the Commission can provide in a timely fashion with a quality product. However, when demand is such that mapping/GPS requests must be prioritized, requests that support Commission projects should be considered first priority.

Technical Assistance

- The Commission will work with its circuit riders and staff to find the best and most efficient ways of informing local officials about the types and options of geospatial technologies that exist and how they can be applied in their local communities.

Software

- Current annual maintenance costs are $9,000/year.
- Another ArcView floating license may be needed if the increased number of staff using GIS creates too many conflicts for the existing licenses. The addition of an ArcView license would cost $1500 upfront and add $500 to the annual maintenance fee.
- All office computers should be upgraded to Office 2007, to maintain compatibility with the GIS software. As ESRI continues to upgrade their software, we will have to keep track of this for possible future Microsoft Office upgrades.
- The Commission has purchased a license of Manifold GIS to explore and compare it to other GIS products based on functionality and technical support. If the findings come back positive for Manifold GIS, then the Commission may want to look at slowly making the transition from their current GIS software to Manifold.

Hardware

- Another data server or more memory for the existing server will be needed within two years. A new server would cost between $2000 and $5000.
- The GIS team's desktop computers should be evaluated to make sure they are adequate to running ArcView. They may need to be upgraded to have more processing speed and random access memory.
- The Commission's GPS request system should be formalized for staff, local government officials, and other users to comply with. A database to store requests in should be created, similar to the GIS request database.

Staff Development

- Staff should attend the annual NYS GIS Conference, the Northeast ARC Users (NEARC) Conference (when nearby), and the NYS GIS Summit as time and funds permit.
- Program staff should follow procedures as far as organizing and documenting their GIS use and the products they create. Cartographic standards and map archiving procedures (both developed and approved by the GIS team) need to be followed so work is standardized and efforts are not duplicated. Also necessary is that any data created and/or edited by program staff is submitted to the GIS specialist before it is added to the Commission GIS datasets.
- The GIS request form should be updated and redistributed to staff, since the number of GIS users has increased and not everyone regularly submits request forms.
- The GIS Specialist is responsible for map production, technical support, training, system maintenance, GPS program, system design, database administrator duties, programming, analysis, coordinating, and managing GIS components. As more staff use GIS software, demand increases on the GIS Specialist for technical support, software upgrades of all systems, addition of new datasets, more procedures to keep data and maps centralized, training of staff, and more coordinating duties. GIS interests are and will continue to be an annual priority. In the future another part-time or full-time staff person may be needed to support GIS and database needs.

Data

- The intermediary custodian agreement that municipalities must sign before accessing thram.org states that the Commission will act as the primary custodian on behalf of the municipality to collect and distribute data owned by the municipality to other data sharing cooperative members; and that the Commission will act as the secondary custodian on behalf of the municipality to receive data acquired from other members who are primary custodians and redistribute it to the municipality. This obligates us to handle local data.

1.0 Introduction

1.1 Mission

It is the mission of GIS services at the Tug Hill Commission (Commission) to provide ongoing support for the commission programs of planning, community development, technical assistance and natural resources through production mapping and analysis in Tug Hill communities. Typically, GIS services are provided through program staff and circuit riders working with a community on a specific project. In addition, Commission GIS staff seeks to investigate other beneficial uses for the technology and share those discoveries with staff and Tug Hill communities as time permits.

1.2 Vision

GIS hardware, software and data sets will provide capacity-enhancing tools for communities to use in decision-making and project development. Data sets will be readily available in hard copy and on-line and will be comprehensive in nature, thus providing an up-to-date inventory and analysis tool.

1.3 History

The Commission developed its GIS in the late 1980s in a joint venture with the now defunct St. Lawrence Eastern Ontario Commission (SLEOC). The GIS was housed in the SLEOC office and consisted of copies of ESRI's DOS based PCARC/INFO, two digitizing tables, a pen plotter and various computers. Tug Hill and SLEOC each employed a full time GIS technician. Each agency also had program staff that used GIS part time. At that time, very few digital datasets were available; therefore, data creation was a large part of the GIS technicians' duties.

Around 1994, the Commission invested in an ESRI ArcView license allowing more program staff to work in GIS. Around this time, the Commission also switched its computer network from a UNIX system to a Microsoft Windows based Local Area Network type system. In 1995, SLEOC was abolished by the State and all of its GIS assets were given to Tug Hill. All system hardware and software components were moved into the Tug Hill office. SLEOC's datasets were archived by the Commission.

In 1998, the Commission upgraded its plotter to an inkjet model which dramatically improved the quality of its mapping services, allowing for the printing of solid fill graphics and raster data. More use of the Windows based ArcView application was also taking place during this time, aided by the Spatial Analyst extension that allowed topographical analysis. This period also saw the creation of the New York State GIS Data Sharing Cooperative and the availability of many new datasets. This brought about a large shift away from data creation at the Commission. During this period, the staff included a full time technician and two program staff that used GIS part time.

The Commission's early entry in GIS technology along with upgrades to software and the surplus of hardware (available due to the demise of SLEOC) allowed the Commission to share its GIS wealth with other government and not for profit agencies in the Watertown area. Through the Tug Hill Commission GIS Cooperative, a framework was put in place where other agencies could utilize Commission GIS equipment and services - especially technical assistance. Through this arrangement, the

Commission played a large role in the development of the Jefferson County Planning Department's GIS capability. While the nature of the Cooperative has evolved due to the more widespread use and availability of GIS, the Commission still plays a continuing role in providing technical assistance to local agencies.

In 2000, the Commission began providing GIS services to local communities in the form of the GIS Starter Kit program. Participating communities received compact discs with copies of free ESRI ArcExplorer software along with GIS data from a wide variety of sources in a user-friendly format. Providing this data established the Commission as the 'intermediary data custodian' as defined within the framework of the NYS Data Sharing Cooperative. This allowed local governments to designate the Commission as their intermediary custodian, which in turn allowed the Commission to package and redistribute data from primary custodians. This was necessary due to the differing formats and projections of the source data.

Around 2001, ESRI effectively combined its ARC/INFO and ArcView software into a new release called ARCGIS. The Commission opted to purchase the ARCEditor version of this software and discontinued use of ArcView and PC ARC/INFO. All GIS data was reformatted and reorganized into a database format. The digitizing equipment was sent to surplus and replaced with GPS units, which allowed the creation of data directly from the ground. The Commission then initiated a program where local governments in the region could utilize the Commission's GPS equipment to collect their own infrastructure data.

In 2005, the Commission invested in ARCIMS web GIS server software, funded in part through former New York Senator Jim Wright. A password protected internet map service was created that allows local government officials to view a variety of geographic data for their communities. This web based GIS continues the service to local governments that the Starter Kit program began.

Very recent developments include the creation of the Tug Hill GIS User group, which includes participants from the four Tug Hill region counties, as well as the provision of technical assistance to a developing GIS curriculum in the Carthage School District. Also of note is the growing number of GIS savvy program staff. Currently, four staff uses GIS regularly, including the full time GIS Specialist. Two additional staff are occasional users.

2.0 Program Philosophy

The Commission's GIS operates under three general program themes. First, the Commission provides outreach and education opportunities specifically for GIS users in the region. These are designed to give the user opportunities to become independent users of GIS requiring little or no guidance from professionals. Second, when work requests are received from staff or regional GIS users, the Commission strives to maintain a fair and efficient means of serving mapping and analysis needs. Third, the Commission provides technical assistance to users within and outside the organization. Each is discussed in the following paragraphs.

2.1 Outreach/Education

Tug Hill GIS Cooperative

In 1998, the Commission created the Tug Hill GIS Cooperative. The purpose of the cooperative is to make the THC GIS available to governmental agencies, non-profit corporations and other noncommercial entities in northern New York. Towns and villages of the Tug Hill Commission region are considered members of the cooperative in regard to any GIS work done with the Commission. Participating groups are asked to agree to the following standards:

a. A cooperative member requesting database development, analysis or hardcopy production services for projects that are directly related to Commission program priorities may receive such services from Commission staff at no charge.

b. A cooperative member requesting database development, analysis or hardcopy production services for projects that are indirectly tied to Commission program priorities may receive such services from Commission staff provided that *a*) it is expected that the services will involve little staff time, or *b*) the Commission is compensated through in-kind services or payment for direct staff time.

c. A cooperative member may undertake GIS tasks through its staff using Commission hardware, software and data, provided its staff acquire and maintain an acceptable knowledge of operating procedures.

d. Cooperative members may receive hardware and software training from Commission staff in return for in-kind services.

e. The Commission may serve as a repository of digital data for cooperative members. However, a cooperative member who produces data through the THC GIS shall be considered the "primary custodian" of the data under the guidelines of the *NYS GIS Cooperative Data Sharing Agreement*. Similarly, a cooperative member who creates hardcopy products through the THC GIS shall be considered the owner of such products.

Members include: the Adirondack North Country Association, Jefferson County Job Development Corporation, Jefferson County Planning Department, Jefferson County Soil and Water Conservation District, Lewis County Chamber of Commerce, Lewis County Planning Department, Oswego County Planning Department, Seaway Trail, Tug Hill Landowners Association, Tug Hill Tomorrow Land Trust, Thousand Islands

International Tourism Council, Thousand Islands Land Trust, The Nature Conservancy, and Winona Forest Recreation Association. See Appendix A for a copy of the Tug Hill GIS Cooperative agreement.

The Cooperative has seen less action in recent years, due to the more widespread availability of GIS among agencies in the area. The Cooperative is still a very valuable concept, however, and should be reexamined in order to adjust it to the needs of today's North Country agencies and groups.

A community or organization that borrows the THC GPS unit should be encouraged to join the Tug Hill GIS Cooperative.

Tug Hill GIS User Group

The Tug Hill GIS User Group was setup as a forum for GIS users and professionals to network, while providing a platform to learn how GIS is being used across the region, what GIS projects are being developed, and also a way to share technical advice and user tips. It was started in July 2006 and the meetings are usually held every three months.

A prime focus of the User Group is to showcase current GIS applications along certain topics/themes. To date, the group has covered topics in the educational, agricultural, and public health sectors, along with a meeting devoted to the ESRI release of ArcGIS 9.2.

With an average attendance of 20 people, the User Group has been very successful. The meetings have been very informative and so far have succeeded in meeting goals of the User Group. The Commission foresees the User Group continuing to play a vital role in networking, educating, and outreach. In the future it may become a way for addressing GIS issues that face the Region as a whole.

The Tug Hill GIS User's Group is an excellent tool for providing technical assistance on specific, applied topics. The THC should continue to coordinate the Tug Hill GIS User's Group. It should continue to meet on a quarterly basis and provide an open forum for exchange of ideas and the opportunity for local officials and local GIS users to come together and hear presentations about how geospatial technology and data are being applied in the field. State GIS Advisory Government

The State Agency Advisory Group to the New York State GIS Coordinating Body was established to address GIS interests specific to state government in New York. As an advisory group, its primary responsibilities are to raise issues and provide feedback about the impact of relevant GIS matters from a state agency perspective. The group also serves to provide a forum for information exchange regarding current statewide GIS programs, initiatives, and activities with which the agencies are involved.

The Tug Hill Commission has been an active participant of this group and uses it as an opportunity to network with other state agencies, learn new GIS techniques, and share technical advice and ideas. Also, on occasion we are asked to demonstrate some of our GIS/GPS techniques that we use on various projects. It is in the best interest of the Commission to continue its participation in the State Agency Advisory Group.

Web-based GIS

In 2005, the Commission began offering a web-based version of its GIS Starter Kit to Tug Hill communities. Communities are required to sign an Intermediary Custodian agreement, naming the Commission as the entity that distributes statewide GIS data to the community and provides any data the community might have to member of the NYS GIS Clearinghouse (see Appendix B for a copy of the Intermediary Custodian letter). The community then receives a username and password that allows it to access the web-based mapping application at thram.org. Currently, 48% of the communities in the Tug Hill region are engaged in the program. Of those engaged, 83% have completed the necessary paperwork to join the program.

The web-based GIS platform has many advantages over the GIS Starter Kit. Data is easily updated on the Commission's server and immediately available to communities. With the older, CD-based program, updates were done on an annual basis and were mailed on a CD. Also, unlike in the past, data is not clipped to the participating town, allowing the user to understand where their town or village fits into the larger area. It is available on any computer with Internet access, rather than being limited to whatever machine the community has installed the Starter Kit on. One disadvantage, however, is that the application runs slower with a dialup connection.

The Commission plans to continue offering the web-based GIS platform. Upgrades to the interface to make it more user-friendly, and the addition of other mapping applications, will be considered over the next five years.

2.2 Work Balance

Requests for Commission GIS services originate from two sources: Commission projects undertaken by staff for communities in the Tug Hill region and projects undertaken by the communities themselves. Generally demand from both sources is manageable and does not put a strain on what the Commission can provide in a timely fashion with a quality product. However, when demand is such that mapping/GPS requests must be prioritized, requests that support Commission projects should be considered first priority.

The GIS Specialist and other staff that regularly provide GIS mapping services generally prioritize their own workload. When competing demands on staff time and resources become too great, however, staff should consult with their supervisors and/or the Executive Director to help guide workload decisions.

2.3 Technical Assistance

The Commission GIS provides support to its communities in the spirit of its overall mission of enabling local governments to shape the futures of their communities. In terms of technical assistance, the Commission has two primary missions: 1) to provide mapping and analysis where needed on projects initiated through staff or circuit riders; and 2) to enable communities to seek out, implement and sustain their own geospatial solutions whenever feasible or deemed necessary by the community.

The Commission GIS will continue to meet the mapping and analysis needs of the communities through projects undertaken by staff and circuit riders. These will be prioritized accordingly by staff.

While the Commission will continue to provide mapping and analysis work on community driven projects, communities may find themselves in the position of wanting or needing to more fully utilize GIS tools locally so that mapping, analysis, data collection or data maintenance can occur at the local level. The Commission will work with its circuit riders and staff to find the best and most efficient ways of informing local officials about the types and options of geospatial technologies that exist and how they can be applied in their local communities.

In these cases, it is critical that the community considers all aspects of implementing geospatial technology and, most importantly, considers and plans for the ongoing needs of maintaining the system. Therefore, the Commission will strive to provide the community with reputable sources of information about hardware, software and ongoing training, maintenance costs and staffing needs. That may involve passing information along through staff or circuit riders or through direct correspondence with the communities via phone, email or meetings.

Presently, the Tug Hill Communities are in various stages of implementing geospatial technology. While some communities have not yet faced the need for their own local GIS or GPS, some may be considering an implementation, while others are ready for a full-blown installation project. The Commission should be in the position to provide every community, at whatever stage they are in, with information that will best enable them to choose a viable, self-sustaining solution. When a community needs more detailed assistance, the THC staff should assess its ability to provide that type of assistance in terms of hours needed and staff time available.

3.0 The Four Components of GIS

Geographic Information Systems are generally made up of four components: software, hardware, staff, and data. Following are sections on all components, what we currently have and what we anticipate needing in the future.

3.1 Software

We are currently using the following pieces of software:

SOFTWARE INVENTORY

BRAND	SOFTWARE	LICENSES	DESCRIPTION	UTILIZED
ESRI				
	ArcEditor	2	Primary GIS Software	Fully Utilized
	Spatial Analyst	2	Analysis	Utilized
	3D Analyst	1	3D Simulations	Under Utilized
	ArcPad Application Builder	1	Creating GPS Forms	Fully Utilized
	ArcPad	2	GPS Data Recording Software	Fully Utilized
	ArcIMS	1	Web-based GIS Viewer	Fully Utilized
	ArcSDE	1	Database for Data Storage	Fully Utilized
	ArcView 3.2	*2*	*Old Primary GIS Software*	*N/A*
	PC ArcInfo	*1*	*Old Primary GIS Editing Software*	*N/A*
Manifold				
	Manifold Professional Edition 7.X	1	GIS Software (Similar to ESRI)	N/A
@Last Software				
	SketchUp 4.0	1	Help Create 3D Simulations	Under Utilized
Trimble				
	GPS Analyst 1.20	1	Correcting GPS Data	Utilized
	GPSCorrect	1	GPS Software for Data Correction	Utilized
Magellan (THALES)				
	Mobile Mapper Office	N/A	Correcting & Viewing GPS Data	Utilized
Microsoft				
	SQL Server 2000	1	Relational Database (ArcSDE)	Fully Utilized
	IIS 6.0	N/A	Web Server Software	Fully Utilized
New Atlanta				
	ServletExec 5.0	1	Web Server Software	Fully Utilized

** italic - older software that is not used*

Currently our GIS has adequate software support. The main need will be keeping annual maintenance agreements for all the software, which costs $9000/year. Maintenance fees are necessary to ensure upgrades for the GIS software as they become available and for ESRI technical support. We may need to consider purchasing another ArcView floating license if the increased number of staff using GIS creates too many conflicts for the existing licenses. The addition of an ArcView license would cost $1500 and add $500 to our annual maintenance fee.

There have been recent compatibility issues between GIS database software and Microsoft Office software not being the same versions. We recommend that all the computers be upgraded to Office 2007. As ESRI continues to upgrade their software, we will have to keep track of this for possibly future Microsoft Office upgrades.

ESRI versus Manifold

The Tug Hill Commission has been searching out new technologies and more affordable software/hardware options over the years. One such product that has landed on the radar in the GIS community is Manifold GIS. It is a very affordable option to other mainstream GIS software. On average its initial cost is about 10% or less of what other GIS software cost. Manifold GIS currently has no maintenance cost.

The Commission has purchased a license of Manifold GIS to explore and compare it to other GIS products based on functionality and technical support. If the findings come back positive for Manifold GIS, then the Commission may want to look at slowly making the transition from their current GIS software to Manifold. This could save a lot of money in initial cost and maintenance.

3.2 Hardware

We are currently using the following pieces of hardware:

HARDWARE INVENTORY

TYPE	BRAND	EQUIPMENT	DESCRIPTION	UTILIZED
Servers				
	Dell			
		PowerEdge 1850	Server for ArcIMS	Fully Utilized
		PowerEdge 2850	Server for ArcSDE (Data Storage)	Fully Utilized
		PowerVault 114 T	Backup System	Fully Utilized
Desktops				
	Dell			
		Optiplex GX 280 (Mickey)	GIS Specialist Computer	Fully Utilized
		Optiplex GX 270 (GIS Machine)	General GIS Users Computer	Fully Utilized
	Compaq			
		Evo W4000 (Intern)	GIS Intern's Computer	Utilized
GPS Units				
	Trimble			
		GeoXT	Mapping Grade GPS	Utilized
	Magellan (THALES)			
		Mobile Mapper CE	Mapping Grade GPS	Utilized
Plotters/Printers/Scanners				
	HP			
		DesignJet 800PS	42" Plotter	Fully Utilized
		Color LaserJet 5500n	Print Letter/Legal Sized Documents	Fully Utilized
		ScanJet 4470c	Scanner	Utilized

The main hardware need in the future will probably be more memory for our centralized data server or another data server. A new server would cost about $2000 - $5000. Datasets are increasingly becoming larger with more raster data available and more detailed datasets being produced. Currently we do not have a memory issue, but one could arise in the near future.

We should evaluate the GIS team's desktop computers to make sure they are adequate to running ArcGIS. They may need to be upgraded to have more processing speed and random access memory.

GPS Unit

An effective Geographic Information System requires accurate and precise GIS data. The GPS program has been initiated to allow communities to collect their GIS data with GPS technology. We currently have access to large amounts of data through several GIS Clearinghouses, but data collection is still needed in the region to build a solid geospatial database. Two examples of datasets that are not readily available are infrastructure and recreational trails. Our municipalities or other organizations are able to use GPS for data collection to obtain these datasets. This data is also beneficial to the Commission, as it will help the Commission support its work in these communities.

The Commission currently has an informal GPS request system in place. It should be modified and made into a formal system for staff, local government officials, and other users to comply with. A database should be created like the GIS request database to store GPS requests in. The Commission also has a GPS loan policy for borrowers to review and sign. The Commission will also continue to set up workshops or training sessions for GPS users to use staff time efficiently.

See the Appendix C for the following documents: "GPS Request", "GPS Equipment Sheet", and "GPS Loan Policies" and a system diagram.

3.3 Staff

The Commission currently has one full-time GIS Specialist and three to four program staff that use GIS on a regular basis. The Commission also generally hires a GIS intern in the summer, as funds permit and projects necessitate.

Training needs & opportunities

Proper training is important for all staff using GIS. Traditionally this has come from hands on training sessions led by consultants or faculty at local universities and from the attendance of annual GIS conferences by staff. It is recommended that at least one member of the GIS team attend the annual NYS GIS Conference, the Northeast ARC Users (NEARC) Conference (when nearby), and the NYS GIS Summit. Hands on training should be sought as need arises and funding allows. Areas of concern include cartographic design, 3D GIS applications, data management, programming, and metadata issues.

Role of program staff in using GIS

Program staff use of GIS has several benefits to the Commission's overall work. Besides the obvious effect of moderating the workload of the GIS specialist, direct involvement with mapping and GIS analysis helps program staff gain greater knowledge of the communities and areas in which they work. These users also eliminate the "middle man" effect where program staff serves as a go between, delivering map edit requests and map edits between customers in communities and the GIS specialist. Program staff should be encouraged to push the envelope as far as possible to find new types of geospatial analysis to solve problems for communities.

Program staff should follow procedures as far as organizing and documenting their GIS use and the products they create. Cartographic standards and map archiving procedures

(both developed and approved by the GIS team) need to be followed so work is standardized and efforts are not duplicated. Also necessary is that any data created and/or edited by program staff is submitted to the GIS specialist before it is added to the Commission GIS datasets.

Several program staff have access to networked ArcEditor software on their desktops. This is a great convenience to these users and should be continued. At present, there seem to be few conflicts with users trying to access this shared software. If this becomes a problem in the future, a schedule could be developed where certain users would have access on certain days or certain times of day. Another option is to add an ArcView license to our current floating license as stated in the Software section above. Program staff who are not regular GIS users should be encouraged to become familiar with GIS "viewer" software such as ArcExplorer and the internet mapping applications developed by the Commission.

Allocating the GIS Specialist's Time

The Commission currently has a GIS request form in place. There are two ways to make a GIS request, one is by filling out a database form electronically (preferred method) and the other is filling out a hardcopy of that form. See Appendix D for the GIS request form.

The form should be updated and redistributed to staff, since the number of GIS users has increased and not everyone regularly submits request forms. The reinforcement is needed because more and more requests are starting to come in as verbal requests or email requests. Neither of these are part of the GIS request system. This makes it hard to track and maintain request records.

There has been an interest in tracking which program areas are requesting maps. There currently is nothing designated in the request form for entry of this information other then staff requesting.

Another issue the Commission faces involves requests for archived maps, as these can be time consuming when print size is large or multiple copies are needed. This can prevent the GIS Specialist from working on other GIS related projects. These archived maps are PDF versions of the original map and are currently stored in a centralized location (external hard drive), which all staff can access.

To help reinforce the GIS request system, guidelines should be provided on what needs to be a request and what staff can access already without a request. To help aid with the reproduction of archived maps, there should be more emphasis on staff using the centralized map archive location to reprint maps. If staff does not know how to print to the plotter for large sized maps, they should seek help from the GIS Specialist or inquire about having a training session setup for multiple staff members. Also, the Commission should look to have the system keep track of not only maps produced by the GIS Specialist, but by all staff, and have all maps included in the map archive.

Currently the GIS Specialist duties and time are spent on map production, technical support, training, system maintenance, GPS program, system design, database administrator duties, programming, analysis, coordinating, and managing GIS

components. The amount of time needed to keep up with all of these duties is reaching its maximum capacity. Additionally, with more staff using GIS software, there is more demand on the GIS Specialist for technical support, software upgrades of all systems, addition of new datasets, more procedures to keep data and maps centralized, training of staff, and more coordinating duties. To keep up with all of these duties, another part-time or full-time staff person may be needed to support GIS and database needs. The GIS Intern position every summer does help, but the crunch for grant maps are usually in the fall and spring. This is when map production takes away from other duties that need to be performed.

Role of Interns

The Commission has a long history of hiring college students during the summer for GIS internships. GIS interns generally work on specific projects where there is special revenue related to completing certain tasks. They also assist the GIS Specialist is doing daily basic mapping tasks, which frees the Specialist's time to do projects or tasks that require a greater time commitment than is generally available during the course of normal work. The Commission will continue to look for opportunities to employ GIS interns when needed and when funds are available.

3.4 Data

Inventory/Updating Schedule

In May 2007, the Commission completed a data inventory of its centralized GIS server (SDE). There is no current inventory for datasets on personal desktop computers among staff.

Procedures should be used to guide how the data inventory documentation is kept current in an efficient and timely manner. When a new dataset is added, it should be reflected in the inventory documentation. It should be the goal of the Commission to make these things as automated as possible. A database to track changes is a possible solution.

There is no formal schedule for updating our current datasets. Tax parcel data is normally done every two years and parcel centroid data is updated every year. Other datasets are updated only as needed.

Some datasets are very static and may not need updating, while others are dynamic which should require a routine updating schedule. The GIS team should categorize all datasets as dynamic or static and set up a schedule for updating the datasets on the centralized GIS server.

Seeking out new datasets

The costs of creating and maintaining GIS data can represent up to 80-90% of the overall operating cost of the GIS for an organization if they create most of their own data. It is, therefore, critical that the Commission continue to seek out and obtain, through entities such as the NYS Data Sharing Cooperative, existing datasets that are critical to the work of the organization. When appropriate, local communities should be advised of such entities and be encouraged to seek out datasets for themselves either through the THC, CUGIR, the NYS Data Sharing Cooperative, and other governmental

organizations. If applicable or warranted, an email list of interested GIS users should be created and used to communicate updates in datasets or announcements of new datasets from the various free sources as they become available.

Storage and access

The Commission is moving toward central data storage on an SDE server. Currently, a majority of the data is stored there. Permissions are set to each datasets stored on the SDE server to insure data security and integrity. The GIS Specialist should be the only authorized person to add or delete data from the SDE server.

The Commission currently has informal procedures set for adding new data to the SDE. The GIS Specialist should document how new data is to be added to or deleted from the SDE server and what staff database privileges should be available.

Consultant data delivery

Over the past few years, Commission projects have involved more work with outside consultants who need access to data on the NYS GIS Clearinghouse. The Commission has developed a copyright license agreement in cooperation with the NYS GIS Clearinghouse that consultants must sign before the Commission provides data to them (see Appendix E for the Copyright License Agreement). All staff should ensure that the agreement is signed before data is shared with consultants.

In some cases the amount of data needed by the consultant is difficult for Commission staff to process in a timely manner. The Commission is considering developing a password-protected web-based application that would allow consultants to download needed data directly from thram.org. This would save staff time and speed up data delivery.

Primary versus Secondary

In accordance with the guidelines set forth by the NYS GIS Cooperative, primary custodians are those that create and/or maintain GIS datasets. A secondary custodian is a user of data created or maintained by the primary custodian that must obtain permission from the primary owner to use the dataset. Whenever possible, the Commission will act as a secondary custodian, as it is not in the position creating or maintaining, and use datasets with permission from the primary custodian.

The Commission also serves as an "intermediary custodian" to many Tug Hill municipalities. This designation was created by the NYS Office of Cyber Security & Critical Infrastructure Coordination to facilitate the Commission GIS Starter Kit program by allowing the Commission to reformat and distribute data from primary custodians (such as NYSDOT and NYSDEC) to secondary custodians. The process requires an interested community to write a letter asking the Commission to be its intermediary custodian. The Commission then sends a letter along with a copy of the community's letter to the Cyber Security office.

The agreement states that the Commission will act as the primary custodian on behalf of the municipality to collect and distribute data owned by the municipality to other data sharing cooperative members; and that the Commission will act as the secondary custodian on behalf of the municipality to receive data acquired from other members

who are primary custodians and redistribute it to the municipality. As of the spring of 2008, the NYS Office of Cyber Security & Critical Infrastructure Coordination has determined that the "intermediary custodian" designation will no longer be required; however, the Commission may continue to use this designation where a community may not have the technical capability to download and work with the data from the Clearinghouse on its own.

Appendix A: Tug Hill GIS Cooperative Agreement

GIS COOPERATIVE AGREEMENT BETWEEN NYS TUG HILL COMMISSION
AND _____

1. Definitions.

Cooperative: the group of governmental agencies, non-profit corporations or other noncommercial entities who have executed the Tug Hill Commission GIS Cooperative agreement
Cooperative member: an entity that executes the Tug Hill Commission GIS Cooperative agreement
Tug Hill Commission GIS (Geographic Information System): a digital spatial information system consisting of hardware, software, data and personnel maintained by the Tug Hill Commission

2. Purpose. To make the Tug Hill Commission GIS available to governmental agencies, non-profit corporations and other noncommercial entities in northern New York.

3. Standards. We agree that:

a. a cooperative member requesting database development, analysis or hardcopy production services for projects that are directly related to Commission program priorities may receive such services from Commission staff at no charge, as Commission work schedule permits;

b. a cooperative member requesting database development, analysis or hardcopy production services for projects that are indirectly tied to Commission program priorities may receive such services from Commission staff, as Commission work schedule permits, provided that a) it is expected that the services will involve little staff time, or b) the Commission is compensated through in-kind services or payment for direct staff time;

c. a cooperative member may undertake GIS tasks through its staff using Commission hardware, software and data, provided its staff acquire and maintain a knowledge of operating procedures acceptable to the Commission;

d. cooperative members may receive hardware and software training from Commission staff in return for in-kind services, as Commission work schedule permits;

e. the Commission may serve as a repository of digital data for cooperative members. However, a cooperative member who produces data through the THC GIS shall be considered the owner of the data. Similarly, a cooperative member who creates hardcopy products through the THC GIS shall be considered the owner of such products;

f. towns and villages of the Tug Hill Commission region will be considered members of the cooperative in regard to any GIS work done with the Commission.

_____ _____
for Cooperative Member Title

_____
Date

_____ _____
Executive Director, Tug Hill Commission Date

Appendix B: Intermediary Custodian Letter

From Town to Commission

June 5, 2004

John Bartow
NYS Tug Hill Commission
317 Washington St.
Watertown, New York 13601

Subject: Intermediary Custodian

Dear Mr. Bartow:

As a fellow member of the NYSGIS Data Sharing Cooperative, we, the Town of _____, request that you act as Intermediary Custodian on our behalf to the NYSGIS Data Sharing Cooperative. Given the Town's business relationship with the Tug Hill Commission, this agreement should prove advantageous to both parties, while supporting the use of GIS within the Town of _____.

We realize that as Intermediary Custodian, the Commission will act as the Primary Custodian on behalf of the Town of _____ to collect and distribute data owned by the Town to other members. In addition, the Commission will act as the Secondary Custodian on behalf of the Town to receive data required from other members who are Primary Custodians and redistribute it to the Town of _____.

We will notify you, in writing, immediately should we need to terminate this agreement. Thank you for your assistance.

Sincerely,

_____, Supervisor
Town of _____
Fed ID # _____

On the _____ day of _____, before me personally came _____, to me known, and known to me to be the person who executed the above instrument, who, being duly sworn by me, did for himself depose and say that he is the Supervisor of the Town of _____, with its principal place of business located at _____, NY County of _____, and that he executed the foregoing instrument in the name of the Town of _____ and that he executed the same as the act and deed for the uses and purposes mentioned therein.

From Commission to NYS GIS Cooperative

January 24, 2006

William Johnson

NYS Office of Cyber Security
& Critical Infrastructure Coordination
30 South Pearl St., 11th Floor
Albany, NY 12207-3425

Subject: Intermediary Custodian

Dear Mr. Johnson:

The Town/Village of _____, member of the NYSGIS Data Sharing Cooperative, has requested that we, the NYS Tug Hill Commission, act as their Intermediary Custodian. A copy of their original request is attached.

We agree to act as the Intermediary Custodian and, as such, we agree to the following:

1) to act as the Primary Custodian on behalf of the above listed Member to collect and distribute Data owned by such Member to other Members; and
2) to act as the Secondary Custodian on behalf of the above listed Member to receive Data acquired from other Members who are Primary Custodians and redistribute it to the Member designating the NYS Tug Hill Commission as their Intermediary Custodian.

We will notify you in writing immediately should this arrangement between the NYS Tug Hill Commission and the Town/Village of _____ be terminated. Thank you for your assistance.

Sincerely,

John K. Bartow, Jr.
Executive Director

Appendix C: GPS Request, GPS Equipment Sheet, GPS Loan Policies, System Diagram

GPS Request
NYS Tug Hill Commission

Date:	12/1/2009

Contact Information:

Name:	
Organization:	
Address:	
City:	
State:	NY
Zip Code:	
Phone:	
Email:	
Person Using GPS: (If different from contact.)	

Project Information:

GPS Unit:	GPS001
GPS Project Name:	
Tug Hill Representative for Project:	**None**
Project Priority:	**High**
Requested Time Frame:	
Beginning Date:	
Ending Date:	

Brief Description of Project:

GPS Administrator Use

Request #:	
Date Request Approved:	
Date Project Completed:	
Condition of GPS	

Comments:

Equipment Sheet
NYS Tug Hill Commission

GPS001:

Trimble GeoXT (1)
Backpack (If Available) (1)
External Magnetic Antenna (1)
Stylus (1)
Docking Station (1)
Power Cord (1)
USB Cord (1)
ArcPad Software (1)
GPSCorrect Software (1)

GPS002:

Magellan (THALES) Mobile Mapper CE (1)
Backpack (If Available) (1)
External Precision Antenna (1)
Stylus (1)
Docking Station (1)
Power Cord (1)
USB Cord (1)
ArcPad Software (1)

GPS Loan Policies

NYS Tug Hill Commission

Loan Policy:

- All users must complete a training session (Usually 2 -4 hours) for the equipment being used.
- The primary contact must agree to and sign a copy of this loan agreement form.
- GPS units must be returned at their scheduled time. If an extension is needed, the request needs to be made 2 days prior to the designated return date.

I agree to:

- Assume full responsibility for this equipment during the time(s) that it is checked out to me.
- Use this equipment in a safe and responsible manner.
- Make sure that any other users of the equipment get the training needed and accept responsibility over their usage of the equipment.
- Reimburse the Tug Hill Commission for any damage or loss of the equipment or its accessories that occurs while it is checked out to me or my staff, which is not normal wear and tear.
- Not leave the equipment unattended and not allow anyone else to use the equipment that has not been trained to do so.

To reserve equipment (to view equipment, see the "Equipment Sheet"), you need to fill out the "GPS Request" form, which can be obtained from

Mickey Dietrich

(315) 785-2380

mickey@tughill.org

My signature below acknowledges that I have read and agreed to the policies as outlined in the orientation and on the policy handout. It also indicates that I understand that this agreement, which will be kept on file at the Tug Hill Commission, is binding and enforceable during the entire period in which I have equipment privileges from the Tug Hill Commission.

Print Clearly:

NAME: LAST_____ **FIRST**_____

ORGANIZATION:_____**PHONE:**_____

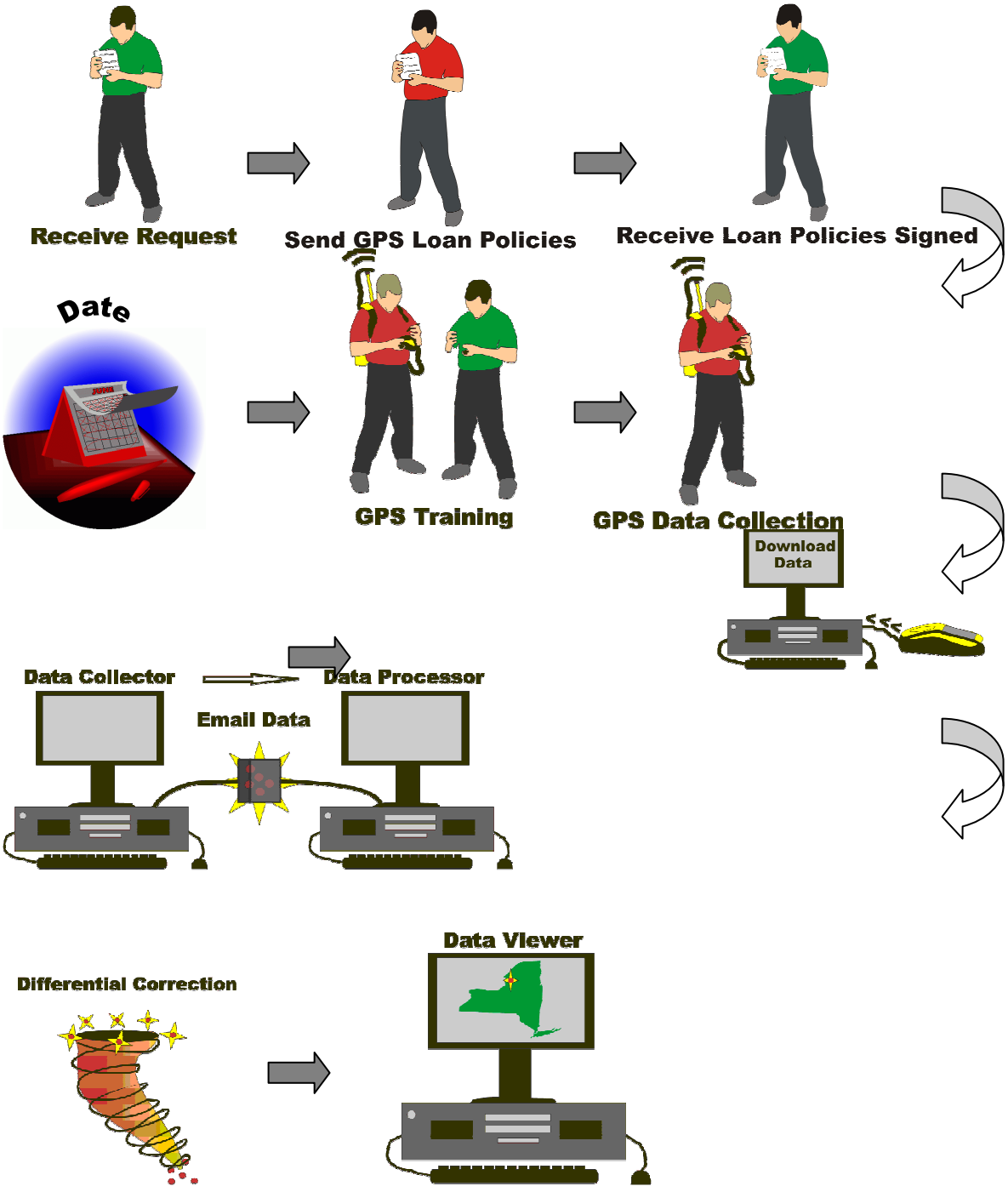
EMAIL ADDRESS:_____

TODAY'S DATE (MM/DD/YY):_____/_____/_____

SIGNATURE:_____

GPS System Diagram

Current program's system:



Detailed System Overview

Receive Request – A municipality/organization will send in a request to get trained in the use of the Commission's GPS unit. Working with the requesting municipality, a customized form will be created for the collection of the information they want. This form is then downloaded onto the GPS unit.

Send GPS Loan Policies – A municipality/organization will receive a loan policies document to be signed, once the Commission has received a request to loan out one of our GPS units.

Receive Loan Policies Signed – A municipality/organization will send back a signed copy of the loan policies.

Date – The Commission's GPS Program Coordinator sets up a date when training will take place and for how long the requesting municipality will have use of the unit.

GPS Training – On the date chosen, a Tug Hill Commission GIS staff person will go to the requesting municipality/organization and train their selected data collector.

GPS Data Collection – For the time slot given to the requesting municipality/organization, the selected user will go about collecting their data.

Download Data – Once the data is collected, the municipality/organization can either download their data at one of their sites or they can make arrangements to bring the unit to the Commission's office to have it downloaded there.

Email Data – If the downloading takes place at a requesting municipality/organization site, the downloaded files will need to be emailed or sent on CD to the GPS Program Coordinator for data corrections. However, if the data is downloaded at the Commission's office, there will be no need for sending the data.

Differential Correction – This is the process of correcting the data taken in the field to produce a more accurate dataset. Sometimes a data point can be 30 feet off from where it should be, but after the data correction is done, it can have accuracy within 5-10 feet. The corrections are done using the GPS Analyst extension.

Data Viewer – Once the data is corrected, it will be placed into a GIS viewer for the municipality/organization to work with.

Appendix D: GIS Request Form

GIS/GRAPHICS WORK REQUEST

Request #:	
Technician:	
Completion Date:	

Name of Project: **(use name appearing on project list if applicable)**	

Project Number (if applicable):	

Requested by:		**Date:**	

Priority:	*high*	**Deadline:**	

Project Geographic Area:	

Work to be Done:	

Comments:	

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6. The files may be distributed to only those involved in the [local entity] project(s) within the Licensee's firm and to Licensee's subcontractors provided the [local entity] copyright notice,

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10. Licensee's subcontractors may use the files in their work for Licensee but may not use, copy, retain, or distribute the files for any other purpose, and
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Name: _____

Title: _____

Signature: _____

Date: _____

For *[LOCAL ENTITY]*

Name: _____

Title: _____

Signature: _____

Date: _____