Niagara County, New York

GIS Needs Assessment and Implementation Plan

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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 2

I.A. PURPOSE OF THE STUDY 2
I.B. TEAM INVOLVEMENT 2
I.C. PROJECT TASKS AND ACTIVITIES 4
I.D. GUIDING PRINCIPLES FOR SUCCESSFUL GIS IMPLEMENTATION 4
I.E. NIAGARA COUNTY GIS IMPLEMENTATION RECOMMENDATIONS 7
I.E.i. Implementation Recommendations 8
I.E.ii. Application Prioritization 9
I.E.iii. Implementation Strategy 10
I.F. IMPLEMENTATION COSTS 23

II. GIS SYSTEM DESIGN REVIEW 26

II.A. GIS OVERVIEW 26
II.A.i. Benefits of a Municipal GIS 27
II.A.ii. Components of a GIS 27
II.A.iii. GIS Functions 28
II.B. DESIGNING NIAGARA COUNTY'S GIS 29
II.B.i. Kickoff Meetings and Educational Seminars 29
II.B.ii. Departmental Interviews 30
II.B.iii. Recommendation Procedures 31

III. GIS IMPLEMENTATION RECOMMENDATIONS 33

III.A. RECOMMENDED SYSTEM COMPONENTS 33
III.A.i. GIS Selection Criteria 33
III.A.ii. Personnel 34
III.A.iii. Hardware 34
III.A.iv. Operating Systems 35
III.A.v. Networks 35
III.A.vi. Software 36
III.A.vii. Procedures and Application Development 39
III.A.viii. Data 40

IV. PLANNING TOOLS 43

V. BACKGROUND / SUPPORTING INFORMATION 47

V.A. REGIONAL GIS COOPERATIVE 47
V.B. AVAILABLE FUNDING SOURCES 48
V.C. SYSTEM MAINTENANCE, MANAGEMENT, AND OPERATION 51
V.B.i. Data Management QA/QC (Quality Assurance / Quality Control) 51
V.B.ii. Data Availability and Collection 52
V.B.iii. Tracking Errors & Managing Change 53
V.B.iv. GIS Records Management & Data Retention 56
V.B.v. Data Resolution, Scale & Accuracy 57
V.B.vi. Metadata 58
V.B.vii. New York State GIS Data Sharing Cooperative 61

VI. CONCLUSIONS 64

APPENDIX A: GIS APPLICATION DESCRIPTIONS
APPENDIX B: GIS APPLICATIONS – BY PRIORITY
APPENDIX C: GIS APPLICATIONS – BY FREQUENCY
APPENDIX D: GIS USE AND COST SAVINGS BY DEPT, BY APPLICATION
APPENDIX E: GIS APPLICATION FREQUENCY AND SAVINGS BY DEPARTMENT, BY TYPE

APPENDIX F: GIS DATA LAYERS – MASTER INVENTORY AND CONVERSION COSTS
APPENDIX G: GIS DATA & LAYERS BY PRIORITY SCORE
APPENDIX H: GIS IMPLMENTATION COSTS BY DEPARTMENT BY YEAR
APPENDIX I: EXECUTIVE SUMMARY
APPENDIX J: INTERVIEW SUMMARIES
APPENDIX K: POTENTIAL INTERNET SOURCES FOR GIS DATA
APPENDIX L: NYS GIS TASK FORCE METADATA CAPTURE REQUIREMENTS

I. EXECUTIVE SUMMARY

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The following report summarizes Niagara County's future GIS system review and database design, including the County's specifications for custom application development. Findings are presented based on a series of interviews and GIS strategy meetings held with personnel from 28 County departments or divisions, the County Soil & Water Conservation District as well as informal discussions with the Towns of Lockport and Somerset and the City of Niagara Falls. Summaries and recommendations for the continued development, implementation, and improvement of Niagara County's GIS efforts are presented.

I.A. PURPOSE OF THE STUDY

The purpose of this study is to review the current spatial data flow structure within Niagara County and to make recommendations for the expanded implementation of GIS. Managing the County's existing facilities and infrastructure as well as planning for future growth places a burden on County personnel with a limited budget to keep maps and records up-to-date and available for use. The justification for conceptual implementation of GIS is based, in part, on the amount of time County personnel spend responding to questions involving geographic information (data tied to a location). Based on theses findings, we have provided recommendations for Niagara's future success in implementing a countywide Enterprise GIS.

I.B. TEAM INVOLVEMENT

William Budde played a lead role in coordinating the GIS Needs Assessment and Implementation Plan project. The County's GIS Committee, made up of representatives from County departments, also played significant roles. Discussions and communications regarding the Needs Assessment and Implementation Plan took place with the following key personnel:

Department	Name
Aging, Office for the	Nancy Smegelsky
Audit	Sharon Sacco
Board of Elections	Nancy Sharpe, Michael Norris
Central Data Processing	Larry Helwig
Code Enforcement	Jim Volkosh, Pat Travers
County Clerk	Did not participate
Employment and Training	David See, Douglas Linderman, Judith Tederous
Fire Coordinator / Emergency Services	Jim Volkosh
Health, Public	Paulette Kline
Health, Environmental	James Devald, Paul Dickey, Ron Gwozdek
Health, Mental	Did not participate
Historian	Did not participate

Department	Name
Human Resources	Bruce Fenwick
Industrial Development Agency	John Simon
Management and Budget	Sharon Sacco
Planning, Development & Tourism	Ed Sullivan, Mark Passuite, Jeff Degnan
Probation	N. James DeCamillo
Public Works – Building and Grounds, Engineering, Highway	Kevin O'Brien, Bruce McNutt, Joel Wendt, Rob DeVoe, Carl Allen
Real Property Tax Service	Bill Budde, Jackie Reynolds, Helen Robinson, Sue Simon
Refuse Disposal District	Richard Pope
Risk/Insurance	Bruce Fenwick
Sewer District	Frank Nerone
Sheriff	James Wesolowski
Social Services	Anthony Restaino, Sharon Sloma, Burt Marshall
Soil & Water Conservation District	Mark Seider
Veterans Services	Donald Thompson
Water District	Ron Johnston, Dave Branch, John Coleman
Weights & Measures, Sealer of	Robert Kinne

These participants are excited about the prospect of implementing an Enterprise GIS for Niagara County. The future success of the County's GIS will be due, in a large part, to the efforts and enthusiasm conveyed by these individuals. We have incorporated their ideas and suggestions into our recommendations.

I.C. PROJECT TASKS AND ACTIVITIES

We reached our conclusions and developed our recommendations through the following tasks and activities with County staff:

- GIS educational seminars (three seminars given to staff) along with many one-on-one demos.
- GIS strategy meetings with key personnel.
- Review and analysis of existing paper and digital datasets.
- Review of current hardware and network communications.
- One-on-one or group interviews with **29** departments, divisions or agencies to capture individual and department roles and responsibilities as well as GIS applications and required datasets.
- Compilation and distribution of interview summaries to interview participants.
- Follow-up phone calls with staff to define the priority, frequency of use and potential savings for defined applications
- Compilation of results and findings from the Needs Assessment.
- Development of Executive Summary and Implementation Plans for future use by County staff.
- Delivery of final report

I.D. GUIDING PRINCIPLES FOR SUCCESSFUL GIS IMPLEMENTATION

A GIS is composed of five key components – **Hardware**, **Software**, **Data**, **Applications**, and **Personnel**. Each is a critical component for deploying a successful GIS. Our implementation strategy addresses factors for each of the five components. The following outline offers a brief overview of our recommended strategy for GIS implementation. Most of the statements below may seem like basic truisms, but when used as practical guidelines, they create a solid basis for Enterprise GIS deployment:

<u>Hardware:</u>

- Establish and maintain a stable network environment to allow departments to communicate and share resources with adequate bandwidth to accommodate large datasets and images.
- Deploy powerful and stable servers to ensure fast data access and reliable backups.
- Provide adequate printing and plotting capabilities in a central or distributed manner.
- Leverage the investment in existing hardware by upgrading whenever possible rather than buying new.
- If new hardware is purchased, "recycle" older PC's for use in other departments. Equipment that is underpowered for GIS may be excellent for word processing.
- Purchase or upgrade equipment with the best products or components.
- Reassess buying off the State contract. Shop around for best prices even within the State contract vendors. State contract does not always mean the lowest cost.
- Standardize on brands whenever possible to reduce support and training costs.

Software:

- Purchase industry standard GIS software.
- Use the appropriate tools for the user's needs. Don't overbuy. If the user needs access to the GIS on a daily basis, provide robust desktop tools. If the user needs to access the GIS on a casual basis (monthly or annually), provide inexpensive "browser" tools like ArcIMS (Internet Map Server)
- Standardize office applications (word processing, databases, spreadsheets, e-mail) to reduce support and training costs.
- Upgrade software only if the new capabilities warrant the added expense.
- Acquire more sophisticated GIS software (ArcGIS 8.x or ArcSDE) in the future only if data maintenance issues warrant the expense and learning curve.

Data:

- Don't acquire data simply because it is available. Every piece of data needs to be stored, organized, managed, delivered over a network, updated, distributed, and archived. All these activities take time and effort. Choose data wisely with this in mind.
- Develop or acquire datasets by priority – critical first, functional next, useful last.
- Resolve all the street name and address range issues with the street centerline and parcel data. Address data is key to all departments within the County.
- Data maintenance is a critical issue. It is not glamorous or exciting, but it is crucial to the short-term and long-term success of the GIS. Data needs to be maintained and updated to retain its value.
- Share data with neighboring counties to increase awareness of planning or development activities that may affect each party.
- Take advantage of the NY State Data Sharing Agreement, but only acquire data you need. Carefully assess what function or advantage each data layer or item will provide.
- Develop your own data sharing agreements between City, Village, Town and County departments to share the cost for data capture and maintenance. Any database or map layer that is beneficial to multiple departments should be shared and arrangements for cost sharing agreements made. Cost should be shared now even if the department is not scheduled to use the data for 3 years.
- Create a data clearinghouse (FTP site) to distribute data to local municipalities.
- Understand the analytical purpose for data layers or attributes. If a data layer is only to be used for visual reference, try to use the NYS Digital Orthophoto Quadrangle (DOQ) images instead of digitizing. For example several departments expressed interest in seeing building outlines or footprints on their maps. Tracing each building in the County would be a very costly endeavor; however displaying the buildings from the DOQ images would provide the same results for free.
- Determine how the data will be used – visual display, query for attributes or for analysis. For example, streams could be used as a visual backdrop from a CAD file without any attributes. With attributes like name, class, order, the data could be selected for display. Additional data like slope and flow direction would be required if the streams were to be used for hazardous spill simulations.
- Rather than replicating legacy databases, the databases need to be redesigned using sound database concepts and practices. Most homegrown systems are well-intentioned efforts, but should be overhauled to meet user requirements.
- Rely on outside data conversion companies to create and update complex data layers (*i.e.* underground utilities, etc.)

- Develop "workflow" data capture procedures. A long-term, cost effective means of building GIS attribute databases involves creating procedures and data entry forms for work crews to capture and validate map feature attributes as part of their daily work routine. Rather than spending a large effort up front to create a dataset, the workflow approach builds a quality database over time.
- Develop and maintain metadata information (data about data) for each of the data layers you acquire.

Applications:

- Develop applications prioritized first by cost, then by criticality, then by frequency of use. By focusing first on developing low cost applications, using existing data, and implementation through GIS training and minimal development efforts, the County can quickly test and confirm the viability of GIS within new departments before developing more costly datasets and applications.
- Focus first on applications that share common functionality to minimize development costs and promote cost sharing between departments (*i.e.*, a parcel based query and display tool could be used by almost all departments).
- Start out first with a small number of departments that are eager to begin, and then slowly introduce the GIS to other departments over time.
- Deploy Internet Map Server (IMS) applications in departments that require casual query and display functionality.
- Deploy high-end desktop applications in departments that require daily, analytical GIS functions.
- Train your own staff internally or rely on outside consultants for developing custom applications and databases.

Personnel:

- Provide adequate PC training for all new users. Saving money by limiting end-user training will backfire with higher technical support costs. End-users resolving their own problems will lessen the impact of costly interruptions on Larry Helwig's staff.
- Provide adequate GIS training for both end-users and technical support staff. The more frequently a user will use the GIS, the more intense their training should be.
- Develop arrangements with Niagara County Community College to offer classes in CAD and GIS or to provide access to their training facilities for outside instructors.
- Purchase blocks of distance learning time for web based computer training through organizations like Career Builders or Ikon.
- If you don't have the skills in-house, rely on outside consultants as needed for help setting up networks, servers, databases, developing applications, and providing training and data conversion services.
- Rather than investing in hardware, software and training for specialized GIS functions that would only be run once a year, create a GIS Service Bureau to develop and run annual applications (i.e. election redistricting) and create a GIS Administrator position to oversee it.
- Identify individual end-users as GIS "Champions" within their departments. These people should be selected for their technical ability and level of interest in GIS. Their role would be to provide the first line of technical support and hands-on training to users. Allocate a certain portion of their time for GIS support issues.

I.E. NIAGARA COUNTY GIS IMPLEMENTATION RECOMMENDATIONS

Based on the results of the Needs Assessment interviews, GIS and hardware and staffing discussions with key personnel, and the output from the planning matrices, we recommend Niagara County move slowly in deploying an Enterprise GIS. The easiest way to accomplish this objective is to proceed with a phased GIS Implementation Plan over a four-year period that minimizes risk, minimizes costs and delivers GIS data and services to the appropriate departments.

Rather than plunging headlong into a full-blown GIS implementation, we recommend that Niagara County follow this approach:

1. Develop a regional GIS cooperative with Erie County. Both parties would benefit from sharing costs for servers, communication lines, software, application development, data conversion, and staff training (see Section V.A. for details).
2. Test the viability and the potential for growth of GIS within Niagara County by providing general access to GIS for one year through an ArcIMS site hosted by Erie County.
3. Provide data, training and desktop GIS software and applications to a handful of departments (Planning, Sheriff, Fire & Emergency Services, Public Works, Environmental Health, and Water District)
4. If interest in GIS is confirmed through the one-year ArcIMS test site and the test departments, create a GIS Administrator position to manage and support GIS growth in the county.
5. Roll out additional GIS applications and datasets to other departments that have expressed interest through the use of the ArcIMS site.
6. If continued demand for GIS is strong in the future, create a GIS Service Bureau to train, support and manage GIS use in all interested departments.

Our recommendations for Niagara County to move forward with an Enterprise GIS implementation are based on the following factors and considerations:

1. Demand for the practical application of GIS is very high within Niagara County.
2. GIS functionality has proven itself useful in a myriad of NY State counties and municipalities (Erie, Cayuga, Monroe, Tioga, Madison, Suffolk, Westchester, and Nassau Counties, **Towns of Lockport, Wheatfield, Somerset**, Amherst, Hamburg, Grand Island, Victor, Farmington, Canandaigua, East Bloomfield, Villages of Bloomfield and Newark, **City of Niagara Falls**, Buffalo, Rochester, and others).
3. Developing a regional GIS cooperative between Niagara and Erie County is a viable option that needs to be pursued.
4. Because of the strong need and use for geographic information for public safety and emergency response services, funding for Homeland Security could play a significant role in building the necessary infrastructure and data for GIS in Niagara County.
5. The Pictometry contract with Niagara County will provide a valuable resource for data collection and visual verification for Economic Development, RPTS, Highway, Engineering, Sheriff and Emergency Response based on the oblique photos. However, some departments, like Planning, have a stronger need for vertical photos (orthophotos) to make comparisons to historical aerial photos. The Pictometry orthophotos may meet their needs. **NOTE: Pictometry is not a replacement for GIS. The ortho images can act as a layer in the GIS, and the oblique photos will be useful, but there is no intelligence behind the Pictometry images. You still need a GIS to obtain information behind the photos.**

6. GIS can bring real productivity gains and timesaving to municipal workflow. The total anticipated savings from using GIS in the County of is approximately 34.5 person years annually. These savings could be realized in productivity gains due to faster access to information and maps.
7. The NY State Data Sharing Agreement is in place and is very beneficial to Niagara County by making GIS datasets available, free of charge, from participating agencies around the state.
8. Because of similarity in department functions and mapping needs, development costs for applications and datasets can be shared across many departments and the local municipalities.
9. Low cost, easy to use software and custom applications makes GIS available to end-users.

Weighing these factors, we recommend Niagara County continue to move forward slowly with a carefully thought out, four-year GIS Implementation Plan. By moving forward in yearly phases, the County can benefit from hardware and software cost reductions, advances in technology, and changes in priorities. It also allows time for departments to structure their budgets and justify additional costs based on the success of the initial GIS implementation.

Because of the enormous potential for growth in GIS usage over the years, it is imperative that the County prepare for and provide adequate records management infrastructure and staffing to handle this demand.

To address the dynamic nature of the implementation priority process, we have developed a database tool for the County personnel to use in the future to assess, prioritize, and estimate costs for application development and data creation. This Access tool allows the County to add new applications or datasets to the mix and adjust the four-year plan accordingly.

I.E.i. Implementation Recommendations

The following sections provide our recommendations for Niagara County's GIS implementation strategy. We've identified, evaluated and prioritized 84 applications by the following factors including:

- Prioritization (mission critical, useful, nice to have/pie-in-the-sky)
- Frequency of use (daily, weekly, biweekly, monthly and annual)
- Anticipated savings (time saved looking for maps and data)
- Number of departments served (one application could be used by X departments)
- Ease of implementation (availability of data - just add software and training)
- Costs (data conversion, hardware, software, training, application development)

Values were assigned to each application based on each of these contributing factors. Generally, those applications with the highest scores should be considered for early application development and those with lower scores for later deployment.

All totaled, there were 156 requests for GIS applications across 24 (out of 29) departments interested in using GIS. A large number of the 84 unique applications were requested across many departments. 27 of the 84 applications could be developed once and shared across many departments. Shared applications were assigned higher priority scores.

A number of potentially critical applications were not targeted for automation because of the infrequency of use. As stated before, it is not cost effective to purchase hardware, software and provide training to a department that needs to perform GIS functions on an annual or bimonthly basis. Rather, a GIS Service Bureau should be created 2-3 years in the future to fulfill infrequent GIS requests for these users. Departments with frequent (weekly or monthly), but simple requests could benefit from an Intranet Map Server (IMS) implementation. Hardware, software, training and support costs would be negligible and the user would get the needed results.

Some very useful applications were ranked lower because of the "black map syndrome." The user describing the application may have listed every possible layer to be included on the map. This may sound impressive, but it actually delays deployment of the useful GIS functions by making the application dependent on non-critical layers. Our approach to stratifying applications asks not only what functions are to be performed and what data layers and items they need, but also ranks the critical nature of the data the user needs.

For example, the Sheriff department may list building footprints or outlines on their wish list of data layers to include in an application description without realizing the cost to acquire such data. The same application would work very well without building outlines using the available parcel and street centerline data. The buildings would obviously add to the functionality of the application, but skipping building outlines and using the digital orthophoto base or images from Pictometry could achieve the same or better results at a lower cost.

One word of caution and explanation as the County considers deploying Pictometry and GIS. The two products are complimentary – not exclusionary. This is not an either or choice. Pictometry by itself only provides a visual reference to objects of interest. The images are "dumb". Clicking with a mouse will not return information about the building or property in question. For that capability, you need a GIS to tie database records to the map features.

Staff training is key to maximizing the County's investment in the tax parcel conversion effort. Providing access to GIS data and the ability to manipulate and analyze the data will enhance the use and value of the existing datasets.

With these factors in mind, Niagara County should pursue a four-year-phased GIS implementation schedule. By the end of the fourth year, all departments interested in using GIS will be utilizing their defined applications. As each year passes, technology changes and staff skills will increase. Those already using the GIS will think of better ways to utilize the tool, and application descriptions will subsequently change. This is to be expected, as most experts refer to GIS implementation as an evolutionary process. As individuals become more familiar with the power and capability of GIS, they will find new and innovative ways to use GIS to create derivative data layers and develop analytical tools. As these new ideas are generated, they will need to be prioritized and integrated into the Implementation Plan.

I.E.ii. Application Prioritization

The bottom line is this – choosing which of the 84 applications and 222 data layers and databases, should be developed first is a daunting task. To provide some structure and defendable guidelines to the process, we have developed a series of reports from the Access prioritization tool (see *Appendices A-I*). The tool scores each application based on the following factors for prioritizing development:

perceived priority, estimated frequency of use, anticipated savings, and associated costs for development.

Estimated frequency of use of an application is a measure of how often a particular application will be used. Potential GIS users in Niagara County can be divided into three groups: ***daily***, ***weekly,*** and ***monthly or annual*** users. Our goal is to address the estimated frequency of use for the GIS by individual departments. Applications with estimated frequencies of use by staff members of over 200 times per year are considered to be ***daily*** applications. Applications with estimated frequency of use of 50 to 200 times a year are considered ***weekly*** applications and ***monthly or annual*** applications if the estimated frequency of use is less than 50 times per year.

Anticipated savings gives us an idea of the amount of time using the GIS will save from an employee's daily routine. This is not a full-blown cost benefit analysis, but it raises awareness about the cost of doing business in a paper or poorly integrated digital environment. If using the GIS can save 5 minutes from a person's routine and they access the system 4 times a day, that translates to a savings POTENTIAL of 80 person hours a year (240 working days/year *4 times/day * 5 minutes /use). Those savings can be realized in reduced labor costs or increased capacity to provide additional productive services.

The applications can also be broken into three categories of **priority:** ***mission-critical, functional,*** and ***useful.*** Applications that would augment highly necessary functions and are crucial for implementation would be considered ***mission critical***. ***Functional*** applications are those that would be beneficial and would reduce the redundancy of tasks, but that are not as high a priority for development as mission-critical applications. ***Useful*** applications are those that would be "nice to have," but have a much lower priority than previously described functions.

Finally, application prioritization considers the **associated costs** of application development, including hardware, software, data, personnel, training, and programming costs. Each application is assigned a dollar figure based on the total costs for development and implementation.

I.E.iii. Implementation Strategy

In the implementation strategy presented below, we make the distinction between foreground and background activities.

Foreground activities involve visibly noticeable actions like installing software, providing training, delivering datasets and producing hard copy maps. Foreground activities are important because they reassure people that the GIS implementation is real and has shown proven results.

Background activities include organizing existing data, building new databases, converting datasets, upgrading networks, testing applications, developing skill sets and procedures for data maintenance and distribution. Of the two, background activities are probably more important. The current year's background activities lay the groundwork for the next year's foreground activities. Background activities are vital to ensuring the GIS moves forward and remains stable for years to come. Hardware and software have 3-5 year life cycles. Data has a 100-year life cycle. Protect your investment wisely with persistent background activities.

Projecting the first two years of a GIS implementation plan is a relatively safe venture. You normally have too many GIS development activities to fit into Year 1, so the extras slide into Year 2. Year 3

and beyond become more ambiguous and for this reason are not well populated with specifics. However, the overview concepts are still valid. By following the guidelines we have established, the details can be added to the Access Needs Assessment tool by the County staff in the future.

A tabular Executive Summary is included in Appendix I. The following sections provide a narrative explanation for the year-by-year recommendations. Not every item listed in the tabular summary is discussed in the narrative section. The narrative provides an overview of each year's planned activities; the tabular summary provides the actual details.

Year 1 Overview:

Foreground Activities

- Develop a regional GIS agreement with Erie County for an ArcIMS (Intranet Map Service) application to be incorporated into the County's web page.
- Focus on a small number of departments (Planning, Sheriff, Fire & Emergency Services, Public Works, Environmental Health, and Water District) for desktop GIS implementation
- Focus on developing and deploying "daily" and "weekly" applications using available data with minimal data conversion.
- Focus on applications that can be implemented through GIS training and minimal development efforts.
- Provide hardware, software and training where needed.

Background Activities

- Apply for SARA, EPA, or Homeland Security grants for GIS development funds.
- Focus on data organization and management (vitally important to begin correctly) by developing an FTP site to allow local municipalities to download the most recent datasets.
- Convert mission critical datasets that will be used in later years.
- Define the internal GIS technical support roles.

Year 1 Logic:

During the first year of implementation, the goal should be to address those applications deemed critical for development and have a ***daily*** estimated frequency of use. The County should also focus on working towards those applications that will require little to no extra cost and effort to produce. One of the elements crucial in the development of customized applications is the availability of the necessary components. The County already has several datasets available that are ready for inclusion in customized application development (Pictometry ortho photos, digital parcels, wetlands, brownfields, etc.). Baring some minor purchases, each target department is equipped with the necessary hardware. Only software and training are required for expanded implementation of the GIS into new departments. Several of the requested applications are simple query and displays and would require little or no programming for development.

For the majority of the casual users in the County, deploy an ArcIMS Internet Map Server through a regional GIS cooperative agreement through Erie County. Erie has already invested in hardware, software, communications infrastructure and staffing to support an ArcIMS site. They have also established procedures and agreements to host other agencies GIS data on the

web (City of Buffalo and the Town of Tonawanda). Given that the regional agreement has not been finalized, the cost for purchasing and configuring an NT server and the ArcIMS software is included in the year one cost estimates. The majority of these costs would be avoided if the regional agreement is finalized.

Another key element to consider in implementation scheduling is the eagerness of the different departments to embrace GIS. Implementation should be focused in these departments anxious for the technology and eager to learn, explore, and to be informed. In doing so, the continued success of GIS implementation is assured. It will also allow easier adaptation by other departments less enthusiastic toward the change. Target departments that are aware of the technology's advantages and capabilities and have already begun to use GIS to solve daily workflow requests (vicariously through the Planning Department).

To make this work, several background activities must be undertaken – most notably the organization and management of the GIS layers and database tables. It is critical to have a thoughtful disk management plan in place to organize and distribute data to end-users in other departments as well as to local municipal users. Equally important is the continued management of a reliable computer network. Unless these plans and procedures are in place, data access and distribution would be limited to the copies on end-user PCs.

Thought should also be given to identifying and testing "workflow" data capture methods and shared databases. Good examples include the data capture tools for the Water District and the scanned image registration tool for Planning and Public Works.

Other background activities should focus on developing lower frequency ("weekly - monthly") applications so that second year deployment is easier. In addition, it is important to begin collecting or converting datasets for mission critical applications like E-911 street addresses.

Year 1 Recommendations:

Hardware:

1) Avoid purchase of NT server to host ArcIMS Intranet site by entering into a regional GIS initiative with Erie County.
2) Install Fiber Optic line between Erie and Niagara County for data sharing (State funding?).
3) Establish an FTP site for data dissemination (sized to manage copies of all datasets and Pictometry "thumbnails").
4) Purchase NT server to host Pictometry imagery.
5) Host Pictometry server with Sheriff dispatch office – bandwidth is available through T1 lines to other departments.
6) Purchase a photo quality, large format color plotter to support demand for Pictometry imagery.
7) Purchase color scanners and printers for key departments
8) Buy a high resolution projector for computer training classes and GIS demonstrations.
9) Purchase 5 new PCs for Environmental Health, Public Works and the Water District users.
10) Upgrade 15 PCs across other departments to provide adequate compute power for desktop GIS use and database management.

Software:

1) Acquire ArcIMS (or use Erie County's server) to support web based GIS access.

2) Upgrade all MapInfo users to ArcView (Fire & Sheriff).
3) Purchase 15 copies of ArcView for 7 departments (Public Works counts for 3 of the 7 departments/divisions).
4) Acquire GIS archive software like ViewPoint from Eagle Mapping for RPTS to create datasets to share on the FTP site.
5) Acquire and distribute latest version of Internet Explorer for IMS end users.

Training:

1) Provide additional GIS educational seminars for County and Municipal governments to inform them of data and application availability, access requirements (i.e. Internet access, machine specs, etc.), license agreements, etc.
2) Conduct half day IMS training for casual end users (at BOCES or NCCC).
3) Provide standard 2-day ArcView training for desktop users (at BOCES or NCCC).
4) Conduct half day HANDS ON training for Pictometry with Niagara County data (at BOCES or NCCC).
5) Provide additional general PC training and refresher classes to staff (possibly sign up for blocks of web-based computer training time through distance learning trainers like Career Builders, Fred Pryor, etc.).

Applications:

1) Deploy an ArcIMS based general query & display tool to be shared by 13 departments and the general public.
2) Deploy Pictometry in 5 departments.
3) Acquire a GIS based 911-call display tool for the Sheriff and Fire & Emergency Response and integrate several state and local databases.
4) Develop Job-Matching program as well as on-line Maps and Directions for Employment and Training to promote the Welfare to Workfare initiatives.
5) Create image archive and retrieval system to provide shared access to scanned survey maps (Engineering, Highway, Planning, Building and Grounds, and Water District).
6) Integrate Real Property databases with GIS parcels to minimize data entry duplication and provide links to scanned survey maps.
7) Develop FTP data distribution site to upload / download data between towns, engineering firms, state agencies, fire companies, etc.
8) Develop a desktop and web based site selection tool for economic development.
9) Create an Environmental Awareness, ArcIMS based web-site for public access through the Planning department (hosted by Data Processing or Erie County).
10) Deploy a Human & Environmental Communicable Disease and a Water Quality Monitoring tool for Environmental Health.
11) Develop a CAD to GIS conversion and error checking process in RPTS and Public Works.
12) Create Bridge Inspection, Pavement and Sign Inventory tools for Highway.
13) Develop data entry panels for Water District staff to populate attributes for water mains, valves and pumps.

Data:

1) Acquire or refine geocodable street centerline layer (vendor data, or DOT/DMV efforts).
2) Project all tax parcel data to match NAD83 coordinate system (may have to go back to vendor for conversion specifics).
3) Project all local copies of NYS GIS Clearinghouse data to match local coordinates (floodplains, hydrology, brownfields, watersheds, railroads, geology, soils, municipal boundaries, wetlands, Census blocks, DEC spill locations, etc.)

4) Geocode or digitize the location of landmarks, schools, churches, fire stations, airports, hospitals, nursing homes, pharmacies, shelters, etc.
5) Convert paper maps of all districts (ag, water, sewer, fire, school, lighting, legislative, etc.).
6) Convert all existing MapInfo data layers and databases to ArcView shapefile or ArcInfo coverage formats from Sheriff.
7) Develop or modify bridge inspection database to tie into the GIS as well as digitize or derive the locations of all bridges.
8) Convert or access Economic Development data (including job openings) to provide hook between maps and database using geocoding to build primary tie.
9) Create economic development zone polygons for use in site selection tools.
10) Integrate RPS version 4 and Informix databases with ArcView and ArcIMS.
11) Data organization review and standardization for archive and distribution on the FTP site through ViewPoint software.
12) Capture and store 9-1-1 call locations as ArcView shapefiles.
13) Convert paper floorplans to CAD/GIS or access CAD files directly for Building and Grounds.
14) Capture scanned as-builts for Building & Grounds, Engineering, Highway and Water District.
15) Capture the location and attributes of all water facilities from vendor data and data entry panels.

Year 2 Overview:

Foreground Activities

- Expand GIS testing and deployment of daily mission critical applications (*e.g.*, Basemap Query Tool) to other departments that were not developed in year 1.
- Provide additional hardware, software and training.
- Deploy "weekly - monthly" applications (developed in year one) that can be used by many departments (*e.g.*, parcel-based query and display tool).
- Deploy Intranet Map Clients in "daily - weekly" user departments.

Background Activities

- Establish GIS administration and support roles through training/hiring.
- Enhance data organization and management (critical for long-term maintenance).
- Continue to convert mission critical datasets that will be used in later years.
- Develop "weekly - monthly" applications that can be used by other groups / departments in the third year.
- Design workflow data capture procedures for key departments.

More robust or higher end "weekly - monthly" desktop GIS applications (ArcView based analyses) should be developed and deployed during the second year.

The second year of implementation should expand casual access to GIS data and capabilities through the deployment of IMS clients in "weekly - monthly" departments. As more and more users come online, there will be increased pressure for more specialized, mission critical datasets. These datasets need to be weighed carefully for cost and benefit.

Year 2 Recommendations:

Hardware:

1) Network AVL system (automatic vehicle locator) with GIS for Sheriff.
2) Acquire large format plotter for Planning.
3) Purchase sub-meter GPS unit for detailed field capture and survey verification for Engineering.
4) Purchase hand-held Windows CE devices to support ArcPad and field data capture for Code Enforcement.
5) Upgrade 25 PCs and purchase 18 new PCs to keep up with compute power demand across 11 departments.
6) Acquire gigabit switches and network cards for GIS users with high bandwidth needs.
7) Acquire digital cameras for departments that need to capture and record visual information within the GIS.
8) Purchase 4 additional color inkjet printers.

Software:

1) Acquire (or use the Erie County copy) of ArcSDE for more robust data management. (ArcSDE can interface with DB2 on the AS400 to provide a bridge between New World and the GIS).
2) Obtain a copy of ArcIMS Route to enable web-based maps and directions and routing of vehicles.
3) Purchase 4 copies of Network Analyst to help define service areas and efficient routes for Social Service caseworkers.
4) Acquire Microsoft Access or SQL Server for database development efforts in RPTS and Weights and Measures.
5) Acquire ArcPad – portable GIS for hand-held Windows CE devices.
6) Purchase 26 additional copies of ArcView for desktop power users in 12 departments.

Training:

1) Offer relational database design and development classes in support of GIS activities.
2) Conduct additional half day ArcIMS training for casual end users.
3) Provide additional half day HANDS ON training for Pictometry
4) Provide ArcPad training.
5) Provide basic and advance courses in GPS utilization.
6) Offer advanced AutoCAD training classes.
7) Provide standard 2-day ArcView training for desktop users.
8) Provide GIS administration training for data management concepts.
9) Negotiate access to BOCES or NCCC computer training facilities for visiting instructors.
10) Work with BOCES and NCCC to define specific classes (AutoCAD, GIS, etc.) for County staff.
11) Provide additional general PC training and refresher classes to staff.

Applications:

1) Deploy additional general basemap query tools to new departments.
2) Provide Pictometry on desktops where needed.
3) Create a hand held data capture tool for Code Enforcement.
4) Integrate SCADA with GIS for the Water District.
5) Integrate state and local DSS databases to maximize utility of the data and simplify the production of annual reports.

6) Provide an image registration tool for Public Works for scanned as-built drawings.
7) Provide pre-plan, fire response and hazardous material collection and mapping tool for Fire & Emergency Services.
8) Implement crime analysis and sex offender notification tools for the Sheriff's Department.
9) Develop a business display tool and a title search tool for IDA to provide a map interface between RPTS data and the County Clerk's office.
10) Create a resident notification tool public FOIL response tool and for Environmental Health.
11) Build a project georeference tool for Environmental Health and Planning to tie documents to project polygons displayed on the GIS.
12) Integrate databases and deploy the Job Search tool, Service Provider Lookup, Case Worker / Client Matching routines for Social Services.
13) Develop employment / unemployment map display tools based on integrated databases for Employment and Training.
14) Provide network cabling display and network integration tools for Data Processing.
15) Convert site selection tool to a web-based application for business locator tools for IDA and Economic Development.
16) Develop an ArcIMS based power and Energy Awareness website and build a Shoreline Erosion Monitoring tool for Planning.
17) Integrate databases and implement a GIS link to an Electronic Home Monitoring tool for Probation.
18) Develop an Outcome Assessment display tool and deploy the Human & Environmental Communicable Disease Monitoring tool for Public Health.
19) Integrate the GPS field measurements directly into the GIS to enhance the quality of the basemap data.
20) Integrate the historic RTPS Informix database contents with the Parcel outlines to filter the assessment information to the current year's assessment while providing the latest version of the parcel outlines.
21) Develop an automatic process to update the parcel data on the FTP site on a regular basis.
22) Create data entry tools for Refuse Disposal and the Sewer District to capture and populate attributes for map features.
23) Develop a Water Sample Capture and Analysis display tool for the Sewer District and Soil & Water Conservation.
24) Develop an agriculture assessment tool to compute the value of farmland based on soil type, slope, area, drainage, crop use, etc.
25) Provide measuring tools for Buildings and Grounds to assist in cost estimates for square footage as well as work order system for facilities management.

Data:

1) Refine image rectification of existing Pictometry orthophotos.
2) Capture infrastructure data (sewer lines, phone, electric, gas, etc.) on an as-needed basis.
3) Develop project area map extent polygons to link scanned images with GIS basemap.
4) Merge all existing zoning maps into a single, uniform landuse and zoning map.
5) Geocode hospitals, clinics and service providers for Emergency Response and DSS.
6) Capture AVL locations for later display in GIS.
7) Scan building floorplans and as-built drawings for Data Processing, Fire & Emergency Services pre-plans and Building and Grounds applications.
8) Standardize client databases for all departments within DSS and create a centralized name and address database for common sharing and integration.
9) Geocode schools, daycares, liquor stores, bars, and adult entertainment locations for use in crime analysis and probation planning.

10) Acquire bus stops and routes from NFTA in GIS format.
11) Enhance the hazardous material database with standard easy to use data entry tools.
12) Capture the location of standpipes, elevator and sprinkler systems using hand held tools for code enforcement and Fire & Emergency Response.
13) Develop or convert paper and Excel records into a Sign Inventory database.
14) Create or acquire resident phone numbers for Reverse 911 and resident notification tool.
15) Convert known windmill sites, solar panel farms, hydroelectric plants, natural gas wells, etc. for the energy awareness web site.
16) Geocode client home addresses for caseworker route matching applications.
17) Integrate the meter reading database with the GIS.
18) Digitize the boundaries of subdivisions.
19) Create a hook between the GIS and the New World database on the AS400.
20) Create a hook between the Water District SCADA system and the GIS.

Year 3 Overview:

Foreground Activities

- If demand for GIS services is sufficiently high, create and fill GIS Analyst/Administrator position and create a GIS Service Bureau.
- Deploy "monthly / annual" applications (developed in year two) to be run by GIS Service Bureau.
- Convert additional datasets to enhance "daily - weekly" applications.
- Deploy public access kiosk or front counter applications for RPTS parcel data access.
- Deploy workflow data capture in key departments.

Background Activities

- Provide reliable user support.
- Provide additional hardware, software and training.
- Conduct an internal second phase needs assessment to review and evaluate development priorities.
- Test integrating the capture of GIS attribute data into the daily workflow in key departments.
- Develop critical "monthly / annual" applications to be run by GIS Service Bureau.
- Enhance "daily" applications to meet user needs.

Once GIS has been introduced to several departments, support and maintenance will become a larger issue. Trained staff will need to be in place to deal with the additional computer users, network traffic, and associated errors. Increased effort will be required to maintain and update existing datasets (*e.g.*, parcels, assessor records, permit databases, etc.). A GIS Service Bureau should be established to answer questions, update databases, install software and perform annual or monthly GIS procedures for casual users.

As users begin to think "spatially," more and more requests will come for enhancements to the existing applications as well as requests for new applications and datasets. These requests will have to be analyzed and prioritized using the planning tools provided to aid Niagara County in making appropriate decisions. A second internal needs assessment should be conducted to reestablish priorities and identify data and application needs. Based on the new set of needs, the existing applications and databases should be enhanced to meet the user requirements.

Year 3 Recommendations:

Hardware:

1) Purchase a large format plotter for the Sheriff's department for communicating crime analysis results.
2) Upgrade 16 PCs in 5 departments and purchase 6 new PCs in 3 departments.
3) Acquire additional gigabit switches and network cards for GIS users with high bandwidth needs.
4) Purchase color inkjet printers, scanners and digital cameras where needed.

Software:

1) Acquire ArcGIS 8.x NT for parcel creation and long-term data management in RPTS, Planning and Water District.
2) Acquire ArcLogistics Route to resolve routing and scheduling issues.
3) Pay maintenance fees for ArcIMS and ArcSDE
4) Purchase Network Analyst for Probation to resolve caseworker and parolee matching.
5) Buy 13 copies of ArcView for power users in 4 departments.

Training:

1) Provide specific AutoCAD and/or ArcGIS 8.x training for Real Property Tax, Water District and Planning staff.
2) Offer GIS Administration training for potential GIS Service Bureau staff.
3) Provide ArcLogistics Route training.
4) Offer standard 2-day ArcView training classes.
5) Make available additional training in the use of the ArcIMS web interface.
6) Provide additional half day HANDS ON training for Pictometry
7) Provide additional general PC training and refresher classes to staff.

Applications:

1) Install additional general basemap query tools as needed.
2) Create an image integration tool to tie scanned pages from the plot book to the GIS as well as a Red Line markup tool to make changes to the scanned images for RPTS.
3) Deploy the ArcIMS Route tool for Maps & Directions for Human Resources.
4) Integrate the Sewer District SCADA system with the GIS and provide a hook between scanned images and the GIS map features.
5) Develop an Arson Assessment tool for Fire and Emergency Response.
6) Provide access to Pictometry to departments that need it.
7) Create a Site Selection Prep tool to pull information together from the County GIS basemap to pass on to the State Site Selector web page.
8) Develop tools to create digital and hardcopy recreation and historic preservation maps for the Planning department.
9) Develop a caseworker / parolee match tool to assign the parolees based on caseload and geography.
10) Provide asset management, work order, inspection schedule tools for Buildings and Grounds.
11) Integrate AVL into the Highway department vehicles and GIS display tools.
12) Provide CAD/GIS integration tools for Highway and Engineering.
13) Develop a UFPO tool for engineering to assess underground utilities.
14) Develop an accident tracking tool for the Sheriff and a worker's compensation display tool for Risk & Insurance.

15) Develop a backyard address generator for the Sheriff's department to computer the address of the parcel behind each property.
16) Develop an automated printing routine to generate beat maps for officers coming on duty to assess the complaints and crimes committed within a set time frame.
17) Deploy ArcLogistics Route to establish efficient routes for Environmental Health restaurant inspections and for Public Health home health care.
18) Implement a routing analysis package to streamline the assignment of caseworkers to open cases for Social Services.
19) Develop a tool for DSS to provide monthly reports to the Legislature.
20) Modify the resident notification tool for use in Soil & Water to find names and addresses of residents along stretches of streams, for Public Health to warn residents of West Nile Virus or Rabies outbreaks, and for Refuse Disposal for public hearings about site selections.
21) Develop ditch survey tool for SWCD and a ditch maintenance tool for Highway Department based on Pictometry view tool.

Data:

1) Develop a work order, and materials tracking database for Buildings and Grounds.
2) Convert additional districts like agricultural, lighting, drainage, etc. as the need arises.
3) Scan significant pages from the RPTS plot book and tie them to GIS parcel outlines.
4) Convert building permits from paper to digital formats
5) Acquire business information databases from commercial sources or local chambers of commerce.
6) Convert recreational sites like parks, picnic areas, boat ramps, bird viewing areas, path & trails, fishing sites, camp sites, and recreational equipment to populate recreational hardcopy maps.
7) Acquire the latest USGS DEMs from the NYS clearinghouse
8) Convert erosion zones by comparing old and current air photos along streams and lakeshores.
9) Acquire the XYZ locations of commercial gas wells and private water wells.
10) Map the location of all active and inactive landfills in the county
11) Create pavement management database.
12) Populate attributes for storm and sanitary sewer mains and facilities.
13) Collect survey station points and elevation benchmarks.

Year 4 Overview:

<u>Foreground Activities</u>

- Deploy workflow data capture in all departments.
- Enhance "weekly - monthly" applications to meet user needs.

<u>Background Activities</u>

- Upgrade hardware as needed.
- Continue with employee training program.
- Evaluate and respond to new industry developments and trends.

By the fourth year, support and maintenance will become routine. Most network issues and hardware issues will be resolved and most users will have been trained. Data maintenance should also be routine or fairly automated. The established GIS Service Bureau should continue to answer

questions, update databases, install software, and expand to perform annual or monthly GIS procedures for casual users.

For the fourth and subsequent years of implementation, Niagara County should continue to deploy "workflow" data capture in all departments. By the fourth year all datasets should be developed and running in maintenance mode. New attributes or data layers should be added if they warrant the additional expense and effort.

By this time, all departments should have access to the GIS via the Internet Map Server. With GIS running in the background, users should experience optimal performance for casual and daily applications.

Niagara County will need to stay current with changes in technology and to make adjustments accordingly. As hardware technology improves and prices drop, PC's and servers should be replaced or upgraded as budgets allow.

Year 4 Recommendations:

Hardware:

1) Acquire hardware upgrades to keep PCs current
2) Purchase color printers, cameras and scanners as needed.

Software:

1) Acquire upgrades to ESRI software as needed.
2) Purchase additional copies of ArcIMS Route, ArcLogistics Route, or Network Analyst to aid in the assessment of exiting routes, service areas or to compute efficient routes.

Training:

1) Provide additional general PC training and refresher classes to staff.
2) Continue to offer GIS training as new staff are introduced to the program.
3) Provide programming classes for power users to develop their own solutions.
4) Provide ArcLogistics Route training as more departments embrace vehicle routing.
5) Offer additional ArcGIS 8.x training classes.

Applications:

1) Install additional general basemap query tool as needed.
2) Develop or purchase Election Redistricting software for Board of Elections.
3) Use Routing to evaluate the efficiency of bus routes and van services for Social Services, to schedule home visits for Probation, and Public Health, inspections for Code Enforcement and Weights and Measures, Meter Reader routes for the Water District, and Economic Development business visits.
4) Integrate databases and implement map analysis tools to help Fire & Emergency Services respond to chemical spills, explosions, downed power lines, gas leaks or severe weather conditions.
5) Develop a leak database for the Water District.
6) Create a census tracking tool to update the 10 year census with local counts of population shifts.
7) Use GIS to track retirees for Risk and Insurance.

8) Develop facilities management tool for the water treatment plants to track maintenance history of equipment.
9) Deploy the countertop kiosk in RPTS.
10) Develop a parks planning tool for Refuse Disposal.
11) Provide a map interface for Veterans service planning.
12) Create and erosion monitoring tool and vegetative assessment tool for SWCD.
13) Deploy the Site Selection Prep tool for IDA
14) Create a HEAP/STAR tool to evaluate the distribution of low-income seniors.
15) Develop a Countertop Kiosk Query tool to allow the public to access GIS basemap layers and print hardcopy maps.
16) Provide Pictometry to Building and Grounds

Data:

1) Purchase zip+4 boundaries from commercial vendors.
2) Track the location of leaks to develop a leak database.
3) Compile archeological sites for historic preservation and public education. Access to the outlines of archeological sites should be limited to planning department employees and the borders of the archeological sites should be kept vague to avoid creating a "treasure map" for salvagers.
4) Develop ditch maintenance database tied to locations in the GIS.
5) Attempt to convert easements to scanned images or as a graphic layer in the GIS.
6) Create a hook between the voter registration database and the GIS.
7) Convert existing election district boundaries to ArcView as well as geocode the registered voter addresses.
8) Acquire latest version of the USGS DEMs to compute surfaces and contours.
9) Develop the balance of the database files based on need and availability. A large number of conversion projects for year four, can target databases involve geocoding address and converting existing database tables to be GIS friendly.

I.F. IMPLEMENTATION COSTS

When evaluating the costs of a GIS we must take into account the offsetting costs of the current manual system. Redundant efforts and misplaced information are often the biggest problems associated with a manual system (*i.e.*, updates and edits being maintained by several departments). Keeping paper maps up-to-date and distributed to all departments is an almost impossible task. Once a map is printed, it is out of date. Problems also occur with maps existing at different scales. It is extremely difficult to try to compare two or three paper maps, all at varying scales. The costs associated with these activities and procedures can be minimized or eliminated by implementing GIS.

The savings in productivity rise as the use of GIS expands. Based on the projected estimates of GIS use across the 24 participating departments, and applying the interviewees anticipated savings, the GIS would yield an annual cost savings of 34.5 person years in productivity by year 4. When you expand the use of GIS for multiple departments, the savings will increase.

27 applications of the 84 identified applications can be shared across departments. The development costs for the shared applications could be discounted in the application plan to reflect lower costs for subsequent installation and deployment if the departments worked together cooperatively. Some applications could be used as is by all departments and therefore represent the biggest savings. Other applications contain the same core functionality but would require additional work to deploy in different departments (*i.e.*: routing applications for nurses, inspection schedules, caseworkers and clients, etc.).

The table below reflects the approximate projected costs for developing **ALL** applications, **ALL** datasets, purchasing **ALL** equipment and addressing **ALL** staff training issues over a four-year period.

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Total**
Hardware	$54,000	$108,700	$91,700	$99,300	**$353,700**
Software	$21,000	$41,880	$35,495	$62,000	**$160,375**
Training	$34,100	$36,100	$17,750	$14,350	**$102,300**
Applications	$56,900	$67,800	$43,500	$39,200	**$207,400**
Data	$188,000	$320,100	$249,500	$250,750	**$1,008,350**
Miscellaneous	$6,000	$0	$0	$0	**$6,000**
Subtotal	$360,000	$574,580	$437,945	$465,600	**$1,838,125**
Less: Total Potential Savings	$834,761	$1,469,900	$1,659,093	$1,725,093	**$5,697,008**
Bottom Line Costs (Savings)	$(474,761)	$(895,320)	$(1,221,148)	$(1,259,493)	**$(3,850,722)**
Person years (@ $50,000/yr.)	16.7	29.4	33.2	34.5	**113.8**

It should be noted that the GIS would pay for itself with a positive return after the first year based upon the information provided during the interview process. Although these numbers appear to be surprisingly large, on closer inspection, they are well within reason.

For example, Niagara County employs about 1,400 people. If each person in the County saved 7 minutes a day for a year, that would be equivalent to $840,000. Obviously some people will never directly use the GIS, but will benefit from the availability of data and faster networks. Others could use the GIS on a daily basis to perform their jobs and could save 4-5 hours per week.

A parallel analogy would be to imagine the productivity loss if we scrapped word processors and went back to typewriters. The impact would be enormous. Likewise, five years from now, we may wonder how we ever did our jobs without GIS.

Will the County see a reduction in staff to realize these gains? Probably not. However, there could be savings due to staff attrition. The real savings will be in staff productivity. Annual salaries are static costs. The same annual salary is paid whether the activities performed are efficient or inefficient. Using GIS to increase productivity and reduce time spent searching for and verifying maps and data can free staff capacity to engage in more productive activities or to perform additional work. The end result is the County will most likely save money. As an analogy, the County will acquire 1½ year's worth of results for 1 year's worth of effort.

Hardware costs were projected based on the assumption Niagara County could develop a working GIS, serving 24 departments utilizing their existing hardware. Aside from normal replacement and upgrade costs, additional costs for hardware are almost non-existent because of the proactive nature of the Data Processing Department and the aggressive support for technology within the County.

It must be stated again that these costs are estimates based on the development of very specific applications and datasets identified in the Needs Assessment and Implementation Plan project. The priority rankings assigned to each application and dataset was given within each department. At this point there has not been a cross-department prioritization and filter applied to choose the final implementation strategy. This report and the accompanying planning tools can help Niagara County best determine the costs and benefits realized for each application and dataset.

Significant savings in data conversion costs can be realized by the Pictometry project. Data layers like pavement edges, building footprints, vegetation, can be skipped because the orthophotos and oblique air photos will display the desired results without vector conversion.

In the following sections, we provide background information, recommendations, and approximate costs associated with acquiring the appropriate personnel, hardware, operating systems, networks, software, procedures and application development, and data for implementing GIS in Niagara County. Based on the perceived needs, budgetary constraints, and available grant money, the County can decide how to implement a GIS. Additional equipment and data can be purchased over a period of time in a phase-like implementation. For additional information, please refer to the *NYSA Local Government GIS Development Guides, vol. III*, p. 15.

In conclusion, Niagara County is well positioned to move forward with implementing a successful Enterprise GIS. The success of that implementation will depend on the commitment of the County to realize the utility of their investment so far and to take advantage of the other benefits GIS can provide to municipal government.

II. GIS SYSTEM DESIGN REVIEW

II. GIS SYSTEM DESIGN REVIEW

In order for a Geographic Information System to be successful, its design should conceptualize and integrate the system's function, intended use, and applicability to the intended departments and offices. The following sections provide background information about GIS system design, summarize the GIS Needs Assessment efforts, and review the County's current system specifications.

II.A. GIS OVERVIEW

Geographic Information Systems are computer software packages that combine maps (*e.g.*, tax parcels, zoning, streams, wetlands, road networks, utilities, infrastructure, etc.) with databases (*e.g.*, real property, traffic flow, emergency services, building permits, tax rolls, etc.) to provide timely information for key decision-making at the municipal level. A GIS "attempts to capture, store, manipulate, analyze and display spatially referenced and associated tabular attribute data, for solving complex research, planning, and management problems" (*NYSA, Local Government GIS Development Guides, vol. I*, p. 3).

GIS is a powerful and often misunderstood technology. Implementing a GIS is more than just purchasing hardware, software and data; it requires education, planning, communication and a great deal of hard work. Developing a GIS is a process of investigating and understanding the mapping and database needs and responsibilities across all departments within an organization.

Successful GIS efforts begin by asking questions like the following:

- How are maps and databases currently used within the organization?
- How much time and effort is devoted to map related activities?
- Who is responsible for keeping the digital maps and databases current and error free?
- What GIS functions (*e.g.*, routing, address matching, query and display, spatial analysis) are required?
- How will GIS blend into the everyday workflow of different departments?
- How should staffing needs, such as training, hiring, job function consolidation or expansion, be addressed?
- What are the system requirements and how do they fit within the existing hardware or computing framework?
- How will GIS data updates and maintenance fit within the records management policies of the organization?

II.A.i. Benefits of a Municipal GIS

There are many benefits a municipality will see when implementing a GIS. The basic goals and benefits of a municipal GIS include:

- Building a shared GIS database available to all departments.
- Providing better access to information for decision-making.
- Enhancing communication and cooperation between departments.
- Increasing efficiency in current municipal operations.
- Providing analytical mapping capabilities not currently available.
- Automating and standardizing records management for map data.

II.A.ii. Components of a GIS

There is often a false impression that a GIS is only a mapping software package. A successful GIS System Design involves the combination of five key components of GIS, each important in the definition and design of an integrated GIS system. The five key components of a GIS include: **1) hardware**, **2) software**, **3) data**, **4) people**, and **5) procedures**. The outline below provides a checklist for discussion of designing and maintaining the GIS system. Each item will be discussed further in the body of the report. Some topics are included for completeness, but do not reflect direct suggestions for Niagara County.

1) Hardware
   - NT/2000 servers (data / print / and CPU services)
   - Networks (cabling, network cards, switches, hubs, routers etc.)
   - Desktop PC's, laptops and hand held computers
   - Data capture (digitizers, scanners, digital cameras)
   - Plotters / printers (small and large scale, black and white and color output)
   - Backup systems (daily, weekly, and monthly backups)

2) Software
   - Desktop GIS (ArcView)
   - Casual End User (ArcExplorer, IMS Clients)
   - Data Maintenance (ArcGIS 8.x NT, AutoCAD)
   - Data Distribution (ArcSDE, ArcIMS (Internet Map Server))
   - Custom Applications (Visual Basic, AML, Avenue, Map Objects, Java Script, Java)

3) Data
   - Acquisition (collection, purchase, scanning, digitizing, surveying, key entry)
   - Storage (on-line (disk / network access), near-line (CD jukeboxes), off-line (tape or CD storage))
   - Distribution (network access, CD-ROM, Intranet / Internet)
   - Maintenance (contractors, in-house)

4) People
   - Training (assessing and defining skill levels)
   - Outsourcing required GIS skills
   - Creating Civil Service titles (defining new job titles for GIS related activities)
   - Hiring for GIS Positions (GIS Technician, Analyst, Programmer, Database Specialist)

5) Procedures
   - QA/QC (verifying the data is correct)
   - Data Collection (blending GIS data collection into everyday tasks)
   - Data Maintenance (keeping data current with updates and corrections)
   - Network Administration (user accounts, security and permissions)
   - Map Queries and Reports (generate hardcopy maps, reports and analyses)
   - Backup Procedures (daily, weekly, and monthly backups)

II.A.iii. GIS Functions

A geographic information system can be used in numerous ways, defined by the following five, basic categories:

1) Simple Display
2) Query and Display
3) Map Analysis
4) Spatial Modeling
5) Data Administration

1) Simple Display - One function a municipal GIS can provide is to produce computer generated or automated maps. This function could be used to replicate official County, street, tax parcel, water/sewer, zoning and district maps. For online use, this type of function would display data using different colors or symbols to reflect a specific attribute of the data (i.e. shade parcels by landuse or assessed value)

2) Query and Display - Instead of reproducing a standard map, a query and display function allows the user to search for and highlight specific features or characteristics. Some typical queries might include:
   - Find all parcels zoned commercial with frontage less than 100'.
   - Show all parcels with assessed values greater than $X.
   - Highlight all properties owned by Niagara County.

3) Map Analysis - By overlaying one layer onto another, new information or relationships may be derived. For example:
   - Intersect a FEMA floodway map with the parcel map and determine the total number of parcels affected. Compute statistics on the assessed value and landuse classification of the affected parcels.
   - Overlay pavement and infrastructure layers to determine the total length of water, sewer, gas, and cabling that is inside or outside the pavement.

- Find the intersection of all utility lines with road or stream crossings to document potential breakage points.

4) Spatial Modeling - This function combines features of Map Analysis and Query and Display with the ability of GIS to understand nearness or proximity and how map features connect. These "what if" requests are generally more complex and demanding in terms of data and computer power. Some examples of spatial modeling include:
   - Given the current growth rates, determine the optimal site for a new fire hall.
   - Model a rainfall event and determine the impact of flooding along major streams.
   - Find the optimal route for school buses to service a growing school age population.
   - For each building in the County that can function as a shelter (school, church, fire hall), what is the total capacity of each building and how many residents are within a five minute drive time of each facility. In the event of an emergency, what is the nearest shelter for each resident?

5) Data Administration - In addition to end user query and analysis tools, GIS can be used as a data management tool to keep maps and database records current. These functions and capabilities would only be granted to department personnel with appropriate permissions and responsibilities. Some example functions include:
   - Data entry panels
   - Data quality checks (QC/QA)
   - Metadata management
   - Perform land parcel splits or joins.
   - Update the owner name and information when a property changes hands.
   - Update the municipal zoning maps when resolutions are approved for zoning variances.
   - Change the infrastructure features and attributes when road reconstruction causes facilities to be relocated.

II.B. DESIGNING NIAGARA COUNTY'S GIS

Several steps were employed in planning Niagara County's implementation strategy. The following sections describe each of the key steps the GIS Resource Group took to develop the recommendations for the County.

II.B.i. Kickoff Meetings and Educational Seminars

The first step in our Implementation Plan was to hold several kickoff meetings with the County staff to define the scope of the interview process. We reviewed potential applications and identified participating County staff members. Strategies for GIS development for the County were discussed and details concerning the implementation project were outlined. The meetings were important for

everyone involved to be aware of what the County would like to focus on for the GIS and what they could expect for a developed implementation strategy.

We presented a series GIS overview and demonstrations to the County staff to demonstrate available GIS capabilities. We demonstrated the ability to enter an address or parcel id to select and zoom to the parcel in question and to find all parcels within 200 feet of the parcel in question. Most people present made favorable comments regarding the future potential.

A GIS Needs Assessment is a critical first step in the planning and implementation of a complex municipal GIS. As an important component to successful system design and implementation, a GIS Needs Assessment should:

- Educate personnel and potential users about GIS technology,
- Determine existing database and mapping resources in place,
- Assess the amount of time personnel spend dealing with map related data, and
- Identify benefits a GIS would provide to a municipality (timesavings and capabilities).

II.B.ii. Departmental Interviews

Representatives from each department were asked to describe their roles and responsibilities, workflow processes, and the types of data they used or maintained. Departmental interview summaries were compiled along with specific applications that were requested. Interview summaries were e-mailed back to the individuals to review the applications requested previously. Specifically, personnel were asked to make any additions / deletions / changes to the applications, to rate the priority of data features for each application and estimate the frequency of usage and potential time savings associated with each application. A follow-up telephone interview was conducted to gather this information. Based on the responses given in these face-to-face and follow-up interviews from key departmental personnel, we are confident that our recommendations for Niagara County will benefit each department in terms of improving overall workflow and day-to-day operations.

Of the 29 departments / divisions or agencies interviewed, only 5 declined to identify GIS applications for their departments. As we indicated during the educational seminars, no is a legitimate answer.

Based on the results from each department, a total of 84 applications in 24 departments were identified and defined. The detailed results of these interviews and suggested applications and data layers are found in Appendix J.

Departmental representatives reviewed the data components previously defined as necessary for an application's development and implementation. Matrices were developed that allow comparison of individual applications and their associated necessary data components. Arranging the applications and data layers by estimated frequency of use identifies those applications and data layers which will be accessed more frequently, and thereby given higher priority for development (and an equitable means for cost savings). This also provides an equitable means to allocate data conversion costs. Even though a department may not be scheduled to use GIS until year 4, the costs for conversion can be allocated to them in earlier years.

Departmental representatives also rated on a scale of one to three the criticality of each necessary data layer for each application (1= critical, must have; 2 = useful, but not necessary; 3 = helpful, "nice to have"). Specifically, each of the 84 identified applications were described in terms of what data layers and data features would be needed for the applications to run. Rating the importance of the data that goes into each application helps in the overall implementation strategy of application development. One of the important considerations in determining application development and database design strategies is the priority given to an application and to the data associated with its development.

Figuring into data considerations is the costs associated with acquiring the necessary and desired datasets. Features about each data layer were evaluated for availability and ease and cost of implementation.

The following summarize the findings based on those interviews:

- 84 applications in 24 departments were requested for a total 156 application requests.
- 27 of the 84 applications can be shared across multiple departments.
- 57 of the 84 applications are specific to individual departments.
- 222 individual data layers, image sets or databases were identified.
- Based on the estimated savings for each GIS use, Niagara County could expect to save 34.5 person years by the end of year 4 with the implementation of a GIS.

II.B.iii. Recommendation Procedures

Based on the review of the GIS Needs Assessment, discussions and meetings with key participating personnel, our consultants compiled all data and information pertaining to data layers and applications into an Access database with customized tables, queries and report matrices (see PLANNING TOOL in the next section). Each of these data entry tools and reports focuses on different information that, when taken as a whole, will serve as a tool for future implementation development and prioritization. We've based our recommendations for application prioritization on the estimated frequency of use, departmental prioritization, number of departments using the application, ease of implementation, and associated costs.

Several prioritization matrices and reports were created that allow visual comparison of the estimated frequency of use, associated costs to implement, and perceived priority of each of the applications. The matrices will serve as useful tools for assisting County officials evaluate and determine application development over time. In the future, as needs and budgets change, our proposed implementation strategy may need to be altered by the County. The Planning Tool will provide a standard means for interpreting the priority for application deployment. By assigning values for cost, benefit and frequency to each new application or dataset, the matrices will verify the deployment decisions.

III. GIS IMPLEMENTATION RECOMMENDATIONS

III. GIS IMPLEMENTATION RECOMMENDATIONS

Niagara County is well on its way to implementation of a fully functional Enterprise GIS. Niagara County personnel indicate the County is ready and anxious to embrace the technology, and is armed with many of the building blocks necessary for successful GIS implementation. Most of the County departments have adequate computing facilities and are fully operational in terms of hardware, and require a modest investment in software capabilities. Several data layers have already been developed (parcels and water facilities) and adopted into the system, and some mechanisms are in place for the management and upkeep of these growing datasets. However, more attention needs to be paid to long-term data management – especially address and assessment information.

The remainder of this report will detail our conclusions and recommendations for implementation of a GIS for Niagara County. Included in the following sections is additional information related to GIS selection criteria for necessary hardware, software, personnel, and data. We feel it is important for Niagara County to be aware of this information and use it as a resource for continued development and refinement of their GIS.

III.A. RECOMMENDED SYSTEM COMPONENTS

A municipal GIS is comprised of several components, each important in the overall functionality of the system. The following sections describe our recommendations to Niagara County in each of these areas, including geographic information system selection, hardware, software, data, personnel, application development, operating systems, and networking.

III.A.i. GIS Selection Criteria

The following criteria are suggested for the selection of a commercial GIS:

1) The GIS should have all the *functional capability* to meet the display, query, map analysis, spatial modeling, and data administration needs determined in the interview process.

2) The *response time* for the most sensitive applications should be determined and be acceptable to the user. The response times shown in the application descriptions can be used as an initial estimate of the most demanding applications.

3) The GIS should have a "macro" or *high level language* for the development of applications. The user should be able to initiate applications through user-specific menus that minimize the need to know either the operating system or, in some cases, the GIS command language.

4) The GIS should be able to *directly query external databases*.

5) The GIS must have normal *database development and maintenance tools* (*e.g.*, automated data dictionaries, update controls, validity checks, etc.). Also desirable is for the database

maintenance component to contain a mechanism to record the date of database changes/updates.

III.A.ii. Personnel

Several options are available for staffing a GIS. Training will be important for existing employees who will be working with the GIS. For employees working directly with the GIS on a daily basis and maintaining the databases, an estimate of $800 per year per employee for training costs is about average. This includes class instruction on computer techniques, GIS methodology and procedures, and other specific topics (*e.g.*, networking, database maintenance, software training, etc.). Those trained will be employees utilizing the GIS to assist in their current job tasks.

By the second or third year of GIS implementation, (depending on the number of users, databases and departments), Niagara County should consider creating a GIS Service Bureau. One or more part-time or full-time GIS technical support persons may be needed to maintain the GIS system, update the data, assist users with questions, and develop simple applications. It is important to have knowledgeable and experienced individuals to maintain this resource. The job could be filled by training existing staff or by hiring additional personnel experienced in GIS. The GIS Service Bureau could be a standalone department or could be housed in an existing department like Planning or RPTS.

III.A.iii. Hardware

On most counts, Niagara County departments and offices are adequately equipped with recent computer technology. Computer hardware has been decreasing in price over the last few years; top-of-the-line systems can be purchased for average desktop applications at very low costs. For high end desktop users, we recommend purchasing computers with Pentium IV processors, hard drives with 10 gigabytes of disk space, 800–900 MHz CPU (clock speed), at least 128 megabytes (256 or more preferably) of RAM, high resolution color monitors, internal tape drives (if the machine is not connected to a network server), network cards, 56KB or cable modems (if standalone), and CD-ROM drives. This will permit the software to run easily and allow for a great deal of database storage. A computer with this configuration should cost between $1,000-$1,500 per machine.

Larger, more powerful machines should be purchased to act as network data servers. These machines should have 800 MHz-2.0 GHz CPU, at least 512 megabytes of RAM, internal tape drives for network backups, and the Windows NT/2000 operating system. These machines would cost between $3,000-$5,000. We recommend using an NT/2000 server to host all shared databases with a high-speed network to link all municipal departments. Databases containing confidential or sensitive material would still be housed in the departments responsible for the data.

A Windows NT/2000 server should be purchased to host the ArcIMS Intranet site to begin to get GIS technology out to as many departments as possible. A server for this purpose will cost approximately $15,000. The cost of this machine could be avoided if the County enters into a Regional GIS Cooperative arrangement with Erie County.

Since GIS is such a visual means of communication, it is important for Niagara County to acquire a high quality, large format, color plotter for hardcopy map generation. A top of the line, network ready HP plotter would cost somewhere around $10,000.

The County should also invest in a high quality digital projector for in-house training and GIS demonstrations. A quality device can be obtained for under $4,000.

Small format (8.5" x 14") color scanners would be a useful option if the County departments desire to capture black and white documents or color photos. The cost of such a device should be under $300.

III.A.iv. Operating Systems

We recommend that the County continue to purchase and utilize Windows 95/98 or NT/2000 as its operating system. We suggest holding off on Windows XP until it has stabilized for at least 1 year. The Windows 2000 operating systems for desktop users provide better memory allocation, which, in our experience, allows the GIS software to run more efficiently. Casual users accessing the GIS through an ArcIMS site can run successfully with Windows 95/98/NT/2000 as long as they have the latest version of Internet Explorer on their PCs.

III.A.v. Networks

The goal of a network is to provide data, printers, Internet access, system backups and software distribution to all users from a central location. The critical factor in network selection, is not so much the brand name or type of network but stability and bandwidth. The speed of the network is important for the GIS. Geographic datasets tend to be large and applications using them can be CPU and memory intensive. The more efficient your network is, the better your GIS will function. It is important that the network drives are permanently mapped, so as not to cause difficulties for departments sharing data. In the near future (1-2 years out), the County should consider an upgrade to a Gigabit Ethernet Network to enhance data access speeds. The exiting Ethernet cabling would not need to be replaced, only the rack mounted switches. These units cost approximately $1,500 for a 16-port switch. To further enhance network performance, fiber optic lines should be used to connect all local servers within the same cluster to reduce data collisions between the servers.

Network bandwidth is THE limiting factor that will control the recommendations for data storage and dissemination. Centralized servers with master copies of all datasets are ideal for managing data and applications, however, if the network bandwidth can't keep up with the network traffic demands, alternative solutions need to be explored. Those options include:

1) Fiber lines between remote sites.
2) Decentralized servers with read-only copies of data.
3) Sneaker net CDs for remote sites without network access.

The dataset that will push this issue the most is the Pictometry project. The total disk space requirements for the full set of images will be close to 70 GB of data. Compression software could be employed to lessen the network traffic, however the client machine will need to be "beefier" to uncompress the image on the client side.

Since the Pictometry image data will only be updated with a full replacement every two years and a partial replacement on an annual basis, decentralized servers could be used to minimize the network demand. Even if individual images need to be transferred from the central server to decentralized servers on a regular basis to improve their geo-registration accuracy, it shouldn't impact the network too extensively.

Because the decentralized servers contain read-only data, they would not require backups of the data or extensive redundancy of power supplies and disk drives. The Sheriff's department's use of Pictometry is mission critical and therefore would require a very stable, fault tolerant server. In fact, the Sheriff's server may be used as THE prime data store with all other servers making copies from this primary source.

The County can also develop an efficient, high tech "sneaker net" by acquiring CD-Write drives. The units cost around $200 and the CDs cost around $1-2.00 each. Instead of delivering data to remote departments over slow phone lines, the data can be written onto CD-ROMs and distributed to remote departments. Depending on how frequently the databases are updated, new CDs for some layers may have to be re-mastered once a month and for some layers once a year. More dynamic data can be downloaded via phone lines at night.

III.A.vi. Software

Desktop, PC-based GIS software is relatively inexpensive ($1,200 - $3,000 per license). Software for Enterprise-wide solutions that run on UNIX or NT/2000 platforms are significantly more expensive ($6,000 - $10,000, NY State contract price). In addition, a new technology has emerged to allow organizations to share data across multiple departments and buildings. Software manufacturers have developed Internet versions of PC based GIS software for use by multiple users at one time. This requires no additional hardware requirements for the end user's PC, but may require additional memory and CPU power for the server. The cost for Internet software is more expensive than the regular PC version, between $7,500 (per CPU), but would be cost effective if the County is planning on purchasing many desktop software licenses or wants to provide access to the general public.

The software listed below is presented as a glossary of terms, not as a set of recommendations. We recommend Niagara County shift to use ArcView for day-to-day high demand end user access, but also deploy an ArcIMS (Internet Map Server). Again this recommendation could be altered if Niagara County can engage in a Regional GIS initiative with Erie County.

Glossary of GIS Software Terms

- ArcExplorer

  An inexpensive desktop mapping solution to consider is a package called ArcExplorer. ArcExplorer is a stripped down or *Lite* version of ArcView and provides basic mapping and query capabilities. Its main advantage is cost – it is free. Although somewhat limited in what it can do, ArcExplorer is a very cost-effective means of delivering mapping to multiple departments. Data delivery becomes a limiting factor. Map layers and databases would need to be provided via network, CD-ROM, or local copies of the data. The Towns of Tonawanda and Amherst are

using this tool for casual user access. The limiting factor is network access between remote buildings.

- ArcReader

  ArcReader is an evolutionary advancement over ArcExplorer based on the concept of the Adobe Acrobat Reader. Like ArcExplorer, ArcReader is free and provides users with the ability to pan and zoom, query and display map and tabular data. A companion product called ArcPublisher allows a GIS administrator to assemble a package of GIS data and publish the information in an ArcReader format. The data can be distributed on a CD, a network or over the Internet. End users view the map data using ArcReader. In the future, instead of developing hardcopy recreation, fishing or bike trail maps, Niagara County could publish the resultant maps on CD or on-line.

- ArcGIS® 8.x

  For future, long-term data maintenance, the County should look into a copy of ArcGIS 8.x for NT. Although there are 2-3 GIS software packages on the market, we recommend the software products developed by Environmental Systems Research Institute, Inc. (ESRI). As the #1 GIS software manufacturer in the world, ESRI offers a variety of options ranging from simple desktop mapping software to Enterprise-wide GIS client/server and data management systems. This software would provide all the data maintenance, distribution, and analysis capabilities for the County. In most organizations the best solution is a collection of software packages based on the main functions of each department. In general, a combination of ArcView and ArcGIS 8.x is recommended as the best solution for an organization-wide geographic information system. The majority of GIS installations in the Western New York area use ESRI products.

  ArcGIS 8.x offers a complete solution for the automation, management, display, and high-quality output of geographic and associated multimedia data. ArcGIS 8.x uses state-of-the-art data entry technology including scanning, digitizing, global positioning systems (GPS), and data conversion, and comes with a macro language (AML) and Visual Basic COM objects to allow complete automation of all procedures. There are a number of commercially viable Land Records Management tools that are based on ArcGIS 8.x. These tools would be useful for Niagara County to edit and manage parcels and utility features. As the County becomes less dependent on consultants, implementing an ArcGIS 8.x system will provide all the GIS database maintenance and editing tools needed to manage the GIS in-house.

- ArcSDE®

  ArcSDE is ESRI's client/server technology for storing and managing spatial data in a relational database management system (RDBMS). This technology enables and encourages Enterprise-wide sharing and distribution of information. ArcSDE is designed to provide very fast access to large, multi-user databases. All of ESRI's software, ArcExplorer, ArcReader, ArcView, MapObjects, ArcIMS, ArcCAD, and ArcGIS 8.x can read and write data to ArcSDE. CAD users can even store their native CAD drawings in ArcSDE and allow all GIS users to access the CAD

drawings as GIS layers. This option, like ArcGIS 8.x NT, is only to be considered in the future (2-3 years out).

- ArcView® GIS

  ArcView GIS is a powerful desktop GIS analysis and map presentation software package. ArcView is easy to learn and use and is fully customizable using its Avenue™ programming language. ArcView provides high-end address matching and geocoding, powerful editing tools, and exceptional analysis capabilities. ArcView GIS also provides excellent data integration of images, CAD drawings, ArcInfo coverages, database tables, and map data. ArcView's extensible architecture works as a series of "plug-in" modules that can be mixed and matched to extend the functional capabilities of ArcView GIS. Optional extensions are available for network routing (Network Analyst) and performing complex spatial analysis of geographic data (Spatial Analyst). The majority of GIS functions required by Niagara County staff can be handled by ArcView GIS.

- MapObjects™

  MapObjects is a development package that provides the tools needed to create specialized solutions for desktop mapping and GIS needs. You can add mapping components to enhance existing applications, build lightweight data viewing applications, or create specialized mapping and GIS programs that fulfill specific tasks and requirements. MapObjects works with any development environment that supports OLE (Visual Basic, C++, Delphi, etc.) and Windows 95/98, Windows NT 4 or higher or Windows 2000. This development software is easy to use (for programmers) and provides quick response to database queries.

- ArcIMS (Internet/Intranet Map Server)

  To provide departmental access to the GIS data, the County should consider a technology called the Internet Map Server (IMS). The Internet map server provides a way to publish maps on the Internet or Intranet (internal network). Many large organizations and municipalities are using the map servers as a fast and efficient solution to provide geographic data to their staff, "clients," and the public. The map servers perform simple spatial analysis and queries and would work well for many departments' requirements. In addition, the map servers could be used in an Intranet setting to provide general internal query functions between departments.

  Niagara County could adopt this technology to provide query access to their data through a simple web browser. This technology offers read only access for simple queries, map display and printing, and geocoding (address matching). The display viewed by the user is completely customizable and saves thousands of dollars by eliminating the need to have ArcView on every desktop.

  The *advantages* to this approach include:

  - Easy to use software running within a standard Windows Web Browser (Netscape or Internet Explorer).
  - Provides access and data distribution to all departments and citizens.

- Secure, selective access (read only access to layers and databases you make available).

The *negatives* for this solution are:

- An additional NT/2000 server would need to be purchased to act as the map and web server (or this function could be hosted by a third party like Erie County).
- The "deployment" fee for this software is costly ($7,500). However, if you plan to deploy ArcView on more than five desktops across the County, it is cost-effective.
- Additional staff time would be required to maintain the web server and respond to potential technical calls from users.

- Avenue

  Avenue is the programming language that comes with ArcView. As the customization and development environment for ArcView, Avenue is used to customize how ArcView looks, to modify existing tools, create new tools, to integrate ArcView with other applications, and to develop and distribute custom applications on top of ArcView.

- Visual Basic

  Visual Basic is Microsoft's most popular development tool for Windows applications. Visual Basic is most often used to build applications that present users with menu choices in a graphic user interface (GUI). Most Windows popular windows software packages offer Visual Basic components to allow customization of and integration with other Windows software.

- AML

  AML or Arc Macro Language is a very powerful set of tools to allow ArcGIS 8.x users to create menu interfaces or perform repetitive data management or analytical processes. AML is a procedural language that contains the necessary string manipulation, math functions, looping structures and conditional tests of modern programming languages.

III.A.vii. Procedures and Application Development

The costs associated with developing procedures are often difficult to determine because of the varying complexity involved with the creation of applications. Many of the applications we identified are query and display functions that can generally be written for approximately $700-$1,000 per application. The cost for more complex applications, such as spatial analysis procedures, will depend on how difficult they are and how much time they will require to develop. Of the 84 applications suggested by various departments, approximately 21 are considered to be complex. Standard industry rates for GIS programmers range between $75 and $125 per hour. Based on an average of twenty hours of programming for a complex application, Niagara County can expect to pay approximately $1,500 - $2,200 for each tool. If the development work is done as "work for hire",

then Niagara County owns the software and can install the applications on as many machines as they would like, thus reducing the costs for shared applications or modules.

III.A.viii. Data

Data is always the most expensive aspect of developing a GIS. The costs associated with data capture vary depending on the capture method, the scale of the source documents, and the number and complexity of the map features. For a more detailed discussion of data conversion options and costs please refer to NYSA *Local Government GIS Development Guides, vol. II*, pp. 40-58.

Niagara County currently has several digital GIS datasets, which are suitable for many mapping and inventorying procedures. A rich source for additional datasets is the New York State GIS Data Sharing Cooperative (more detailed discussion on the Cooperative can be found in the BACKGROUND/SUPPORTING INFORMATION section found later in this report).

We researched and created a detailed list of potential GIS data sources for Niagara County (see APPENDIX K: POTENTIAL INTERNET SOURCES FOR GIS DATA). Many of these organizations offer data and information on the Internet, and their addresses have been provided. We are not attesting to the detail, completeness, or accuracy of each dataset. These qualities should be researched before any data is acquired or used.

The following is a summary of available data and suggestions for the acquisition of additional demographic, spatial, and other types of GIS data for Niagara County.

1) Physical/Environmental Data

   Niagara County currently has a rich set of physical geographic data layers for basemap type applications such as reference mapping, basic inventorying, resource management and planning activities. Suggested additional physical data to collect and maintain might include more detailed and complete (annotated) coverages of hydrology (*e.g.*, ponds and streams, etc.), enhanced topography (*e.g.*, survey control points or benchmarks), environmentally sensitive areas, and septic tank locations. The costs of these datasets range from free to several thousand dollars.

2) Utilities Data

   Detailed utility data layers are currently not available to Niagara County. Niagara County may be able to secure public utility data such as electrical power lines and gas mains from scanned planimetric maps. Telephone and cable networks may be useful in future applications, but may be difficult to acquire from local utility companies. A cooperative between Niagara County and the utility companies that service it would be beneficial, as the same datasets would serve both parties. Since 9/11 data security has become a major concern. If utility data is made available, it would have to be guarded carefully and not made available for public access.

3) Infrastructure Data

   Infrastructure information pertaining to water, sewer, and streets is critical in many GIS applications. The Water and Public Works departments have CAD files

containing the locations of hydrants, manholes, storm / sanitary sewer lines, and water mains. None of these layers are attributed, and require additional data items to maximize their utility. Additional infrastructure features recommended for data capture and collection efforts include catch basins, culverts, pavement conditions, bridges and ditches.

4) Municipal/Cultural Data

Municipal and cultural features of the local landscape are important characteristics that are often needed in planning and inventorying purposes. Administrative boundaries including school, election, agriculture, fire, highway, sanitary sewer, storm sewer, and water districts are vital layers of data at the local level. Other cultural features to acquire include landmarks such as schools, churches, and hospitals and may even include coverages of media extents for cellular, radio and television. Some of these cultural features are available from the Census TIGER data, available free from the US Census Bureau. Many data publishers, like GDT, enhance census data for easier use. This data usually costs around $1,500 for the entire US, but can be purchased in smaller subsets (state, county or town) for $100-$500.

5) Department Specific Layers

Existing paper maps that are not included in either the parcel or planimetric layers would have to be scanned, digitized, or geocoded to load them into the GIS. Example layers include special district maps, traffic count maps, historic site maps, recreational facility maps, cross road culvert maps, hazardous material locations, septic system layouts, etc. The cost of converting these layers will depend on the number of map features, complexity and associated attributes. The price should range from $3,000-$15,000 per layer.

IV. PLANNING TOOLS

IV. PLANNING TOOLS

Enclosed with this report is a set of tools to help plan and manage the GIS implementation. The tools include:

Appendix A: GIS Application Descriptions
Appendix B: GIS Applications - by Priority
Appendix C: GIS Applications - by Frequency of Use
Appendix D: GIS Use and Cost Savings by Dept, by Application
Appendix E: GIS Application Frequency of Use and Savings by Department, by Type
Appendix F: GIS Data Layers Master Inventory and Conversion Costs
Appendix G: GIS Data & Layers by Priority Score
Appendix H: GIS Implementation Costs by Department by Year
Appendix I: Executive Summary

IV.A. GIS APPLICATION DESCRIPTIONS (APPENDIX A)

An application is a program written to reduce repetitive tasks expressed as a button or a selection from a menu. Appendix A provides a descriptive list of the 84 GIS applications for use with the countywide GIS. Descriptions are organized by application ID, numbered sequentially by department. The type of application, priority, display-scale, frequency of use, anticipated savings and required response times are also listed.

IV.B. GIS APPLICATIONS - BY PRIORITY (APPENDIX B)

All applications have been prioritized as high, medium and low priority. This sort-order displays the applications by user defined priority within each department.

IV.C. GIS APPLICATIONS - BY FREQUENCY OF USE (APPENDIX C)

Application frequency can be lumped into three categories – Daily, Weekly and Monthly/Annual. This matrix sorts a subset of the information provided in Appendix A by estimated frequency of use per application. Often times, this is the easiest way for a municipality to begin prioritizing application development. Usually, the applications estimated to have the greatest usage by the personnel, use common data layers required by most other applications (*e.g.*, parcels and streets). If the data needed for the highest priority applications is developed early on, very often, other applications can be completed easily in the future. Conversely, the data collection and application development using datasets with expected low frequencies of usage could be put on hold until time and money become available.

The applications have not been prioritized or filtered by management as to their usefulness, practicality, or cost to implement. The County should prioritize the applications and data prior to full implementation.

IV.D. GIS USE AND COST SAVINGS BY DEPT, BY APPLICATION (APPENDIX D)

This matrix lists the 24 departments requiring application development by each type (*e.g.*, display, query & display, map analysis, data administration, and spatial model). The application priority, a numeric rank order, expected number of users, frequency of use, and an estimated time savings for each application is displayed. This matrix presents a summary of expected GIS use for each department. A number of departments anticipate little or no savings from deploying GIS. As we indicated in the educational seminars, "NO" is a legitimate answer.

IV.E. GIS APPLICATION FREQUENCY AND SAVINGS BY DEPT BY TYPE (APPENDIX E)

Appendix E lists the 24 departments requiring application development. The estimated number of times each department will use the requested applications is listed by application type (*e.g.*, display, query & display, map analysis, data administration, and spatial model). Based on the proposed frequency of use and the anticipated savings for each time a user accesses the GIS, the County can expect to save 34.5 person years of productive time using the GIS

Note that the development costs for some departments exceeds the anticipated savings and should either be skipped, postponed or assigned to the GIS Service Bureau.

IV.F. GIS DATA LAYERS - MASTER INVENTORY AND CONVERSION COSTS (APPENDIX F)

A total of 222 data layers were requested to feed the 84 customized applications described in the previous sections. Appendix F1 provides a listing of all necessary data layers and a description of each in terms of the data type and status, date, and source. This matrix is nicknamed the "haves and needs" matrix. Columns noted with **H** indicate the County has some volume or version of the data (the comment fields should help determine extent and completeness). Those columns marked with **N** indicate the format the data needs to be in to be used by the applications. Appendix F2 includes a comment field with additional information pertaining to the acquisition, editing, etc. of the data.

Those layers that the County has (complete or incomplete) are noted in the Access table for easy reference. The data exists in a variety of formats: ArcInfo coverages, or ArcView shapefiles, database files, or scanned paper documents. This inventory also lists the source of the data and an estimated cost for conversion. Rows with a zero cost indicate the existence of a completed dataset.

The type of data capture is recorded for each data layer and includes methods such as data for purchase (*i.e.*, vendor), digitizing, scanning, conversion, and database construction. Additional information related to the data acquisition is provided in each layer's description.

The costs for converting all layers and databases noted in the application descriptions could run as high as $1,008,350. However, if the data was prioritized and filtered, the costs could be closer to $750,000.

IV.G. GIS DATA & LAYERS BY PRIORITY SCORE (APPENDIX G)

Applications with a large number of "required datasets" lead to a condition we refer to as the "black map syndrome" where the user lists an excessively large number of data layers required to be viewed or analyzed by an application. The result is that if all the layers were turned on at once, the map would be black with information and totally unreadable. To limit the effect of the "black map syndrome", we asked users who were most familiar with their data needs to denote the priority of each data layer –

1 = must have (required) with a weighted value of 3
2 = like to have (functional) with a weighted value of 2
3 = nice to have (optional) with a weighted value of 1

By summing the raw counts for each data layer (optional, functional and required) we can compute the total number of times a layer has been requested.

To make the distinction greater between the required and the optional datasets, we've computed an overall priority score by assigning a weighted value to each data layer for each application and summing the results.

Required = weighted value of 3
Functional = weighted value of 2
Optional = weighted value of 1

The overall average priority of each data layer is generally higher for those datasets being used by more applications. Decisions about development of datasets needed for only one or two applications may be made based on the average priority given to the data layers by the requesting department(s) (e.g., environmentally sensitive site, needed for only one application, but rated as critical for an application might be considered for earlier acquisition than building outlines, needed by multiple applications but rated lower for criticality).

IV.H. GIS IMPLEMENTATION COSTS BY DEPARTMENT BY YEAR (APPENDIX H)

This matrix summarizes the costs for implementation by department by year for hardware, software, training (H1), application development (H2) and data development costs shared across departments (H3) as a percentage of costs based on the number of times a department would access a dataset.

Using these matrices, department managers can see exactly how much they are spending on an annual basis for each component of the GIS and how costs are being shared or allocated to their department based on expressed needs.

IV.I. EXECUTIVE SUMMARY (APPENDIX I)

The final matrix presents executive summaries for the sequence and costs for GIS implementation for each department on a year-by-year basis for hardware, software, training, application development and data acquisition or conversion.

V. BACKGROUND/SUPPORTING INFORMATION

V. BACKGROUND / SUPPORTING INFORMATION

The following sections provide additional background information pertaining to sources of financing, system maintenance, management, and operational issues, as well as metadata standards and capture methods.

V.A. REGIONAL GIS COOPERATIVE

The heart of regionalism is the idea that savings can be achieved by eliminating redundant services across all levels of government within a defined geographic area.

Because GIS is a relatively new service offering within municipal government and is not currently embraced across all municipal agencies and departments, it is often overlooked as a cost savings effort. It should, however, be viewed as an effort in **cost avoidance**.

If you look at the parallels and differences between implementing GIS at the City, Village, Town and County levels you can find many opportunities for savings. A worse case scenario for decentralized GIS would have each department or individual responsible for acquiring and maintaining their own copies of GIS datasets (in unique coordinate systems), selecting their own brand and version of GIS software, developing their own (or contracting for the development of their own) GIS applications, each department managing their own servers, networks, plotters and backup efforts. The duplication of effort and waste should be obvious. However, step away from the individual and department view and we have the same level of duplication and waste when we look at Cities, Villages and Towns developing GIS support structures within their communities, while Counties develop the same GIS infrastructure. One of the reasons for conducting a Needs Assessment study and developing an Implementation Plan is to avoid these kinds of misguided efforts by looking for ways to share costs, avoid duplication of efforts, and ensure standardization of datasets.

GIS, as a regional endeavor, can take on many forms.

Hardware:

At the lowest level, most users cannot share desktop computers, or local network cables, but could take advantage of shared servers, high-speed fiber optic or T1 lines, data backups, etc. Purchasing computers through a cooperative may offer savings. Support issues would also be lessened if standards were adopted for hardware purchases where staff from all departments would have a common level of experience supporting a given brand or series of model numbers.

Software:

Like hardware, legal copies of commercial GIS software must be purchased for each user's desktop computer. However, GIS applications that are developed as work-for-hire, can be shared freely by the funding organization with any other organization. Economies of scale are possible when common applications are identified and developed to work with multiple departments, communities or county governments. By each group recognizing the commonality in application needs, the same tools can be used across all departments and municipalities, thereby saving money.

An even more significant cost savings can be achieved by deploying web based GIS solutions. By hosting common datasets and applications (general query and display) on a central bank of servers and accessed over the intranet or Internet, the participating organizations can eliminate the need to develop and support their own Enterprise GIS. They may still wish to acquire and deploy desktop GIS within specific departments, but for the most part, casual users will have direct access to a reliable source of GIS information and analysis capability.

Staff Training:

If GIS tech support resources are established to support multiple organizations, departments, communities, etc., training dollars can be pooled and common problems addressed for all users. If the same applications where common to all departments and municipalities, knowledge could be shared and costs avoided. The same is true for end-user training. Money can be saved by buying blocks of time for hands-on or for web-based self-paced training classes for basic computer operations or specific GIS classes through organizations like Ikon, ESRI, local community colleges, or Universities.

Data:

Data is the key to successful GIS deployment. Without access to accurate, timely, relevant data, the GIS deployment would be a waste of time and effort. Hardware and software have a life expectancy of 3-5 years. Data on the other hand has a 100-year life cycle. It is important to recognize data as an asset that requires long-term maintenance. By sharing data formats, database structures and management procedures, data support costs can be significantly reduced. As such costs for data conversion, management and distribution should be shared across all participating departments to keep costs down.

Even though municipal boundaries divide the world up into discrete areas for governance, taxation and local regulations, environmental, economic, and social factors do not honor these boundaries. The decisions and actions of one municipality directly affect all neighboring communities within the region. To avoid conflicting decisions in landuse, zoning and economic development, it is important to share maps and data with neighboring communities.

V.B. AVAILABLE FUNDING SOURCES

Several funding sources are available to Niagara County for the continued development of their GIS. As outlined in discussion of the proposed NYS Data Sharing Cooperative initiative, GIS datasets would be available, at minimal costs, to other members of the Cooperative. As a governmental unit, Niagara County would be eligible to join the Cooperative, free of charge, and participate in data exchange with other members. This would be a potentially good source for the County to acquire GIS datasets they don't have or as a means of updating GIS datasets already in use and keeping them current. Also, the County would be able to charge fair market value for commercial users of any or all of their data. Other potential sources for funding require more of a problem-solving approach where money is requested to help address a particular segment of a community or landscape, all of which might cover GIS costs. If a proposal targets particular problems, datasets, or applications, applying for specialized grants would be a way of financing the GIS and, at the same time, showcasing it's worth to the County and the state. The following offers a brief overview of some of the funding possibilities available to Niagara County GIS user community.

1) Homeland Security Funds…

ESRI offered a series of grants for municipalities actively involved in GIS or for governments just getting started in GIS. The link below provides an overview of the grant process.

http://www.esri.com/industries/localgov/grants/grant_crisis.html

The deadlines for these grants have expired, but Congress just recently passed funding allocations for Homeland Security measures. At this time, we could not find any definite grant applications related to this funding.

FGDC (Federal Geographic Data Committee) promotes the development of metadata standards as a means of efficient data sharing and use. The links below provide some background to the grant programs.

http://www.fgdc.gov/publications/homeland.html
http://www.fgdc.gov/funding/cap2002.html

2) Local Government Advisory Group (proposed)

The Local Government Advisory Group is proposing grants for helping counties spearhead GIS within their communities. The Group is proposing award grants in the amount of $100,000, with 15% local matching funds.

3) Community Development Block Grants

The Department of Housing and Urban Development (HUD) is the federal agency responsible for national policy and programs that address America's housing needs, improve and develop the Nation's communities, and enforce fair housing laws. The department is now focusing its resources on providing housing and economic development opportunities where they are most needed and can be best utilized through local planning. Community Development Block Grants (CDBG) are awarded to help communities with economic development, job opportunities and housing rehabilitation. Grants can be awarded under the State CDBG Program which provides states with annual direct grants which they in turn award to smaller communities for use in revitalizing neighborhoods, expanding affordable housing and economic opportunities, and/or improving community facilities and services.

Communities eligible for State CDBG funds are municipalities with fewer than 50,000 residents and non-urban counties (generally those with populations of 200,000 or fewer). Communities can devote these funds to a wide range of activities that best serve their own particular development priorities, provided that they 1) benefit low- and moderate-income families, 2) prevent or eliminate slums or blight, or 3) meet other urgent community development needs. Some example eligible activities include building public facilities and improvements (*e.g.*, streets, sidewalks, sewers, water systems, parks and community centers, and fire stations), assisting for-profit businesses for special economic development activities (*e.g.*, assembling land to attract new industry), and enforcing local building codes to reverse housing deterioration and other signs of blight.

States receive CDBG funds as an annual block grant and then develop a method to distribute funds to eligible local governments. To ensure that funds are used appropriately and distributed in amounts large enough to have an impact, most states hold annual funding competitions for non-entitlement communities (non-metropolitan and non-urban counties). As with the Environmental Bond Act, funding would have to be targeted for specific problems, of which GIS could be used to solve. However, these programs target more housing, economic development issues that may be of more interest to and use for Niagara County.

4) Federal Grants and Special Appropriations

Numerous requests for proposals for federal funding opportunities become available on a daily basis and can be monitored through a service such as "Fedix" from U.S. Opportunity Alert (USOA). For a minimal charge (currently $9.90 per month), subscribers automatically receive comprehensive research and education funding opportunities from a wide range of foundations and corporations. The Fedix Opportunity Alert service can be customized to target grants based on keywords and/or particular federal departments and agencies, such as public planning and Department of Housing and Urban Development.

Many of these granting opportunities would allow Niagara County to team up with other investigators from other affiliations such as a university, private consulting firm, or non-for-profit organization, whereby each group contributes according to their specialty to get the project done. For example, many requests for proposals relate to the health industry, particularly the geographic components of disease incidence, rural access to health services, and managing individual health care provision via route allocation. Proposals such as these may require the inclusion of an epidemiologist and/or health care researcher to the grant proposal. Other proposals are geared more towards educational outreach activities where technology is proposed to help involve the public and/or particular groups in decision-making. Proposals such as these targeted for the dissemination of information to the general public would allow the County to purchase new equipment such as a laptop, projector, etc.

5) New York State Environmental Bond Act

As the first Environmental Bond Act of New York, the Clean Water/Clean Air Bond Act of 1996 supports funding for programs that address environmental problems threatening New York's air, water, and natural lands. Five types of projects may qualify for funding under the Bond Act and include: the Safe Drinking Water Program, the Clean Water Program, the Solid Waste Initiative, the Urban Environmental Restoration Program (*i.e.*, "brownfields"), and the Air Quality Program (*i.e.*, "Green Growth Projects"). Governor Pataki has proposed spending millions on Bond Act projects including applications for water quality management plans, local parks, historic preservation, Heritage Area Grants, and agricultural and farmland protection programs.

Eligible applicants for Bond Act funding include: counties, cities, towns, villages, school districts, district corporations, improvement districts, public authorities, public benefit corporations, Native American nations or tribes, Soil and Water

Conservation districts, Agricultural and Farmland Protection boards, public and private drinking water suppliers, plus certain nonprofit corporations and state agencies. This is a potentially good source for funding, but funding requests would have to be targeted to a specific problem that GIS could be used to solve. Such problems could include the development of a municipal recycling project, protecting farmland and addressing agricultural non-point sources of pollution, and cleaning up abandoned sites (brownfields) for reuse (other types of projects under one of the five program areas are also eligible.

6) New York State Archives and Records Administration

Each year, the New York State Archives (NYSA) offers competitive grants for records management projects including GIS implementation projects (up to $100,000). Though Niagara County has already utilized this funding source for GIS Needs Assessment and Implementation Planning, additional funding may be available in the form of technology improvement grants.

7) Other Miscellaneous Funding Sources

Other sources of GIS funding and development in New York State, as outlined by the New York State GIS Clearinghouse include local government capital bonds, reassessment projects and tax map conversion, partnerships with utilities, and new technology initiatives and investments. Rural Development Programs and programs involving state and federal water quality monitoring and improvement, E-911 development, and public infrastructure evaluation and mapping are also possible avenues for funding of a local GIS.

V.C. SYSTEM MAINTENANCE, MANAGEMENT, AND OPERATION

The management and maintenance of the GIS and its database will likely require as much attention as was needed to initially build it. Most GIS databases are very dynamic, changing almost daily, and users will continually think of additional applications that they would like to have developed. Formal procedures for all maintenance and updating activities need to be created and followed by the GIS system staff and by all users to ensure continued successful operation of the GIS. The following sections address these maintenance and management issues in more detail as they relate to the operation of Niagara County's GIS.

V.B.i. Data Management QA/QC (Quality Assurance / Quality Control)

Developing data management procedures for a GIS is one of the most important aspects of designing a GIS. It's also the least glamorous. However, since data has a 100-year life cycle, it is imperative that maintenance procedures are developed and implemented to protect your investment.

Data management is a critical component for any Enterprise GIS. A countywide system that supports multiple departments should manage their system using ArcGIS 8.x (comparable NY counties include Erie and Monroe; towns and villages include Amherst, Penfield and Fairfield). The ArcGIS 8.x software is complex and costly, but offers many tools and utilities for managing, updating

and distributing large datasets. One factor that makes ArcGIS 8.x appealing to smaller County governments is that it has been ported to the NT/2000 platform. Though less mature than UNIX, NT/2000 has a lower learning curve, maintenance, and support costs.

The GIS Resource Group has developed a series of QC/QA ArcInfo programs written in the Arc Macro Language (AML) which could be made available to Niagara County if ArcInfo NT/2000 was used as the data maintenance GIS software. However, at this point in time without ArcInfo NT, the QC steps outlined for ArcView will have to suffice to manage and track changes and data quality. In addition, more involved data management issues and QC activities may be acquired as an outside service rather than being performed in-house. The service provider should have adequate resources and experience to deliver quality data.

V.B.ii. Data Availability and Collection

One of the most important considerations when designing a comprehensive GIS database is that a balance between the user requirements and needs is maintained with the reality of the current datasets at hand. A crucial step that is often overlooked when creating a GIS is to look at the utility of the data sources being used for conversion. User needs may require X pieces of information be gathered and tracked for each feature in the database. However, if the needed information is only available for 10% of the features, one needs to rethink how that data will be derived, who will collect it, and what its value is to the municipality.

For datasets outside the scope of the initial data conversion effort, the best option for data collection is to integrate it into the staff's daily routine. This may take longer to collect all the data, but it does not disrupt workflow and costs less. Determine what field crew or staff would be able to capture the data without it being a burden on their job and decide which people know the most about the data you are attempting to capture. We refer to this as the "First Reliable Occurrence of Information" and it is an extremely accurate and cost effective method for capturing data.

V.B.iii. Tracking Errors & Managing Change

> Errors range from subtle to obvious…subtle when you can't find them and obvious when you can…
>
> *Wise Sage*

Developing long-term database maintenance procedures is extremely important to ensure the integrity of the system. The GIS is only as good as the data in it. You can purchase the best dataset available, but if regular updates are not made, the outdated digital map has the same value as outdated paper maps. Editing the database can become a tedious task. However, it is important for data integrity that edits are done accurately and consistently. All changes should be tracked in a way that will allow you to determine when the records were updated, by whom, and what level of confidence the data was rated. When necessary, a history log can be displayed for each record and all changes to the data will be noted. Archiving data is a good way to keep out-of-date information from cluttering the system, while allowing easy recall should there be something wrong with the updates or new data.

The old adage ***Garbage In – Garbage Out*** is true for all computer systems. GIS is no exception. However, GIS is unique in that it provides tools and capabilities to evaluate and visualize errors in tabular data that would otherwise be missed. The following section presents an overview of GIS data errors and how to use ArcView to review, highlight, and fix errors.

1) <u>Attribute Errors</u>
   - <u>Attributes Out of Range</u>

     These errors are easiest to identify and fix in ArcView. This class of error can be identified in ArcView using the table or view documents. By systematically creating thematic maps, sorting the columns, or creating summary tables on each data item in the theme tables, the user should be able to identify which data is out of range. The basic philosophy is that by sorting the tables, errors generally float to the top or sink to the bottom.

     Another way to identify the correct range of values is to summarize each field and inspect the summary table. The resulting table contains a list of all unique values and a count of each occurrence. Values of zero are not acceptable and any value with a very low count should be scrutinized to see if it is an acceptable value.

     To identify which parcels are missing the property class value, the legend editor could be used to assign a bold color to the parcels with a zero value. Another option would be to create a subset of the data by using the query builder to filter the data to show only the offending parcels.

   - <u>Incorrect Data Classification</u>

     This type of error is very similar to the "attributes out of range" except it involves data being stored in the wrong format type. Tabular data can be expressed as numbers (real and integer), dates and character or text fields. In

reality all data can be stored as text fields, but you can't perform range searches on text as well as you can on numeric data.

- Missing Records

  These errors only show up when joining multiple tables. The errors are not obvious unless many records fail to join. For the more subtle errors, the tables should be joined and sorts and summaries on the joined sections of the tables should be performed. If fewer records match than the original table contains, problems with the key field or target database are present. Joining tables in both directions can also identify missing records.

- Wrong Values

  These attribute errors are most difficult to spot and represent values within the acceptable range of values, but were entered incorrectly. Errors can be spotted visually or analytically using theme-on-theme selection or spatial joins. For example a property class code in the 400 range for business is within acceptable limits, but it may be wrong because of the surrounding polygons. By overlying a zoning map with a landuse map, all properties that have a landuse code different from the zoning classification could be identified.

  By applying associated rules of logic, one can test if features that connect share common attributes. For example pipe and valve sizes should be common where two pipes connect at a valve. By performing a spatial join between the valves (point theme) and pipes (line theme), the pipe can temporarily inherit the attributes of the valves and can be compared. The standard deviation classification option in the legend editor can then be used to highlight extraneous values for examination.

2) Coordinate Errors

- Digitizing Errors

  This class of error is very prevalent. These errors are a result of mechanical limitations of the hardware (digitizing board) and/or user skill and accuracy. These errors can be identified visually in ArcView, analytically in ArcGIS 8.x, and fixed in ArcGIS 8.x, ArcCAD, or ArcView (as shapefiles). The basic form these errors take include:

  - closure – polygons do not close properly
  - connectivity – arcs that should connect don't (*i.e.*, pipe and street networks)
  - coincidence – duplicate lines or points that represent the same feature
  - completeness – missing data (new subdivisions)

  There are a series of commands in ArcGIS 8.x that can be used to identify and fix errors (*e.g.*, LABELERRORS, SELECT DANGLE, NEAR, EXTEND, SNAP, CLEAN, INTERSECT).

- Source Document Errors

  With these errors, the data may have been digitized very precisely, but the source map was in error. This class of error is very difficult to distinguish from digitizing errors unless you have the source document and a check plot from the vendor. Like digitizing errors, source document errors are hard to spot unless the error is significant enough to cause an overlap in the data. A good example might be a body of water that intersects a road or buildings. These errors can be found using the GIS by finding all features of one class that *should not intersect* with features of another class. Roads should not intersect with buildings or even parcels. Roads should fall completely within the right of way.

- Edge Matching Errors

  These errors show up along the edges of adjacent maps of different scales. To create a seamless GIS dataset, all data at map edges must be aligned and connected. The attributes for common graphic features must also be checked and set to be common. Most edge match problems occur because the two maps being joined are of different scales. The draftsman has never been able to check the consistency of the paper maps because they could not be overlaid. Once entered into the GIS, the data can be displayed at any convenient scale and the edge match errors will become apparent.

- Projection Systems / Datums / Transformations

  This class of errors is very common when acquiring data from a variety of sources. The manifestation of these errors ranges from subtle to obvious. Subtle when the differences between your datasets are slight and obvious when two datasets are in completely different coordinate systems (State Plane feet and Lat-Long). In most cases these problems are found visually. However, if the data has adequate metadata and projection information, the files can be compared electronically for differences. For example, the floodplain (FEMA) data did not line up correctly with survey data.

  The majority of the old paper maps in New York State have been surveyed and plotted using a horizontal datum called NAD27 (North American Datum - 27). This reference datum was established in 1927 for all mapping in North America. With the advent of satellites and GPS technology, it was discovered that the NAD27 datum was not as accurate as it could be. A new standard datum for surveying was established in 1983 – NAD83. Digital data converted by vendors or available from the State are tied to one of these datums. A good example for Niagara County is a comparison of several data layers from the State DOT and DEC.

V.B.iv. GIS Records Management & Data Retention

There are four key issues to be addressed with regards to GIS records management and retention:

1) What to keep?
2) How long to keep it?
3) How to keep it?
4) How often to keep it?

According to the *NYSA Guidelines for the Legal Acceptance of Public Records in an Emerging Electronic Environment**,

> "Records should be retained, regardless of their storage media, for the amount of time required by the agency for legal, audit, administrative, historical, or other purposes."
>
> "The agency Records Management Officer (RMO), program managers, records custodians, information technology staff and legal counsel all must be involved with managing records to ensure their legal acceptance and authenticity."
>
> *(*To assist local RMOs with the task of defining GIS policies, the NYS Archives and Records Administration is currently developing a series of guidelines to regulate and define records management and retention policies for GIS in local government. See the Local Government Records Technical Information Series No. 39 for assistance.)*

A record in a GIS is difficult to define since it can include: the data tables, the graphic elements, air photos, scanned images, hardcopy maps and reports produced from the GIS, data dictionaries and metadata. Even more important than the data to track and retain are the steps used to manipulate the data or the GIS functions (*e.g.*, projection, transform, edits, overlay, intersection, conflation, etc.) used to arrive at the current state of the data (see discussion on feature based metadata later in this section).

The computer industry is in a constant state of flux with new advances in hardware, software and storage media. Unfortunately, because GIS is a computer-based product, it is hostage to the ever-changing world of computers. As the GIS software is upgraded, older data must be retrieved and written again to the storage media in the newer formats, or older versions of the operating system and GIS software must be retained to ensure readability. Neither alternative sounds attractive because as hardware changes, it may be difficult to run older versions of the newer operating systems.

The Federal Government has spent the last fourteen years trying to define a Spatial Data Transfer Standard (SDTS) to allow exchange between GIS software packages. All of the industry standard GIS packages can read and write the current federal format. Until a final exchange format is developed and accepted, the GIS data should be archived in both the SDTS format and in the native GIS readable format on high quality tapes or CD-ROMs. The creation of each archive file needs to be documented with the time, date, file format, and contents to allow for easy retrieval. This step is handled by most automated backup software packages. By querying the backup log, the user can locate files by name or date and restore the data from tape.

Paper maps and reports are easily integrated into the standard retention procedures. Managing the digital data in the GIS can be viewed as a normal backup and recovery process in the IT department. However, because some data layers in the GIS tend to be dynamic with changes occurring daily, multiple versions of the GIS must be stored according to the accepted retention schedules.

A reliable backup system is necessary for any database. Should anything happen to your hardware (*e.g.*, the file server disk drive crashes), you will be able to restore your backup data to another machine and be operational again with minimal impact on the database. The question of how often to create a permanent archive of the GIS will depend on the change activity of the database. Following a standard backup procedure of daily, weekly, and monthly backups should cover all bases. The daily incremental backup record all files which changed that day. The weekly and monthly backups are full backups and record all software and data on the system. These tapes should be retained in compliance with Niagara County's standard operating procedures. If your staff only makes edits once a week, a weekly backup should be enough. However, if changes are constantly being made, a daily backup is important. If you have a large dataset that would be time consuming to backup every day, consider backing up only part of the database daily and then do a full backup once per week. While this may seem like an obvious suggestion, simple maintenance procedures sometimes get set aside or forgotten until a problem occurs.

Major annual or semi-annual updates to the database should be accompanied by a full archive of the data before and after the update. The purpose of archiving the database immediately after the update is to provide a clean version for restoration in the event of a failure.

Some commercially available GIS packages contain simple utilities that make saving an archive record very easy (*e.g.*, ViewPoint from Eagle Mapping). The software will extract and save all data within a project window, clipped out from the official database and stored in a standard zip format.

V.B.v. Data Resolution, Scale & Accuracy

Any discussion about data conversion should start with the topic of accuracy. Often it is believed that if we settle for anything less than 100% accuracy, the GIS will be useless. Although we are not advocating loading garbage data into the GIS, we are suggesting that in reality one is often faced with a mix of data quality to load. Each source document carries a different scale, resolution, quality and level of accuracy. Some information is so questionable that it should not be loaded. But what if this is the only data we have? These are the original documents - what do we do? Start over from scratch?

There are two types of accuracy to be considered - relative and absolute. *Absolute accuracy* implies that the coordinates of all features are known exactly with respect to real world coordinates (GPS). *Relative accuracy* implies that each feature within a window of observation is drawn exactly to scale, (relative to each other), but the real world coordinates are unknown, not accurate, or unimportant. Most CAD drawings have relative accuracy, but lack absolute accuracy. Although a worthy goal, achieving 100% absolute accuracy is often cost prohibitive. When faced with a variety of data sources with a mix of scales, vintage, accuracy, coordinate systems, and data reliability, decisions need to be made up front regarding what data is worth capturing and including in your GIS. A practical solution to this dilemma is to capture all the data and keep track of the quality and accuracy of the data.

For example, if the Engineering Department required 3mm accuracy for new survey data, but the existing data was collected with a lower degree of accuracy, the existing database would need to be rebuilt to the desired accuracy at great expense. It must be recognized up front that to achieve this level of resolution, all new data must be collected. This implies physically re-surveying every feature to be included in the GIS with GPS or total station to an accuracy of +/- 3 cm. There are more economically feasible long-term solutions to achieve these accuracy goals, such as maintaining the feature-based pedigree. Through time, as the data is revised using accurate survey methods (total station or GPS) the locational pedigree value is increased and the error bar size is reduced. This approach may take years to achieve the goal of 3mm accuracy, but is more cost effective as part of the day-to-day workflow of the organization than as a data conversion step.

V.B.vi. Metadata

Metadata is a hot topic in GIS data management. Metadata (data about data) is very important to track at the data evaluation, database design, and data capture phases of a conversion project. A data dictionary is critical to store the source document scale, resolution, method of capture, and attribute ranges of the data. As the project moves through the data capture to the data maintenance phase, the focus shifts from datasets to feature accuracy. Understanding how to integrate data of different scales and accuracy by creating and tracking a feature level metadata is vitally important for the overall success of building a complete and accurate GIS.

The most important functions of metadata are to:

- Provide a basic description of a dataset.
- Provide information for data transfer to facilitate data sharing.
- Provide information for entries into a clearinghouse to catalog available data.

As a vitally important element in establishing the source and lineage of GIS data, metadata is equally important for conveying data quality when sharing information with others. Metadata collection usually takes place at the onset of a GIS data conversion process. All maps, photos, and related documents are reviewed for source, scale, accuracy, map projection coordinate system, the minimum, maximum extent of the data, etc. All pertinent data is dutifully recorded in a metadata file. But what happens to the metadata once edits and updates begin to take place? What is the best way to record and convey changes? Changing the date of the last update in the metadata file is not very meaningful if only 10% of the map was updated. Even stating that 10% of the map features were updated is less than satisfactory because the changes were related to specific features. To adequately manage GIS data and communicate the status of change and the quality assurance to potential users, we need to blend the macro level metadata with feature-based metadata at the micro level.

One approach to establishing a micro level metadata is the creation of a two-digit pedigree field that is attached to each map feature. The pedigree is a two-digit code that reflects the user's level of confidence with both the locational accuracy and the quality of the feature attributes. The first digit of the pedigree field tracks the level of confidence in the position of the map feature and the second digit tracks confidence in the quality of the associated attributes. The values range from 'zero' (very poor) to 'five' (excellent). Depending on the scale and method of data capture, each feature is assigned a default pedigree value ('zero' for best visual fit, 'five' for GPS). Each feature is assigned a default pedigree as a function of global metadata (*e.g.*, source, scale, conversion method, etc.). As authorized edits take place, the users assign new or improved pedigree values based on the quality of the data being introduced into the dataset. The pedigree allows the data administrator and users to

thematically view the data with "error bars" or graduated symbols and to visually determine the level of confidence in the data, where edits have taken place, and over what period of time. The goal is to increase the value of each feature's pedigree through time, improving the quality of the overall dataset, and communicating changes on a feature basis. This approach has been very successful for tracking changes in the Erie County Water Authority GIS project.

The metadata structure and content recommended in the *NYSA Local Government GIS Development Guides* was prepared using the following criteria:

1) The metadata must first, and primarily, serve as a documentation and data management tool for the data administrator in an agency or department.
2) Secondly, the metadata must encompass and support the data manager and records management officer in a local agency in all aspects of data management including data definition, source documentation, management and updating, and data archiving and retention requirement.
3) Thirdly, the metadata information must be able to generate and supply database descriptions for spatial data clearinghouses such as the prototype New York State Spatial Data Clearinghouse developed under the GIS Demonstration Project conducted by the Center for Technology in Government, SUNY - Albany and any relevant federal spatial data clearinghouses.

Metadata capture is very important, yet extremely tedious. The federal metadata standard includes more than 370+ elements. This is the reason that the New York State GIS Task Force limited the number of data entry fields to 129 and organized the data into fourteen categories. These streamlined metadata items are shown in APPENDIX L: NYS GIS TASK FORCE METADATA CAPTURE REQUIREMENTS.

Because metadata entry can be tedious, it is important to use a tool that is functional and easy to use. Many metadata tools are available, free of charge, off the Internet for recording metadata. However, only a few will allow easier submission to the NYS GIS Clearinghouse Repository. The following descriptions provide evaluations of several commercial and shareware versions of Web and Windows based metadata entry tools. Metadata records can be submitted to the NYS GIS Metadata Repository in one of three ways:

1) *Using a web-based, brief metadata entry form*:
   - **Metadata Entry System Form (formerly called Metadata Lite**)
     The Metadata Entry System is tied to New York State's official GIS Metadata Repository and produces a brief record using the fields from the FDGC Content Standards. Once a record has been entered and submitted to the Metadata Repository, it is run through a program called "mp" (a compiler for formal metadata) and then indexed. This record can then be searched using the Clearinghouse's computer. Only one account will be assigned to each agency, but may be used by multiple staff members within the agency.

     The advantages are its compliancy with federal metadata standards and New York State GIS Clearinghouse's Metadata Repository and it is easy and quick to use.

2) *Using one of two stand-alone full-data entry programs* conforming to NYS GIS Clearinghouse:*
   - **National Biological Information Infrastructure (NBII) MetaMaker v. 2.10**

MetaMaker is a Microsoft Access based tool produced by the Environmental Management Technical Center (Biological Resources Division, U.S. Geographical Survey).

This software is very powerful that when given some time and experience working with it, can be a good tool for very complete metadata documentation. The overall complexity and detail may discourage casual users. However, with time taken to learn the software, a user can take advantage of all it has to offer and have a very good tool for metadata retention. Advantages include customizing templates and reports for more efficient entry and final documentation and a keyword search engine that allows finding particular items associated with a metadata set easier. Disadvantages are associated with its complexity in metadata recording, coupled with its slightly unintuitive front-end design.

- **Corpsmet95, Build 1.97.04.26**
  Corpsmet95 is a CSDGM metadata creation tool developed for the U.S. Army Corps of Engineers by Coastal Oceanographics, Inc.

  System uses a file management type structure based on the seven Federal Geographic Data Committee main categories to access, browse, and edit sections within the entire project (*i.e.*, "treeview" layout). This layout design serves as a reminder for what information should and is included in a FGDC compliant metadata report and allows the user to access quickly and easily certain, detailed sections within a report (*e.g.*, adding an additional keyword). However, this same interface may also be cumbersome when creating a new report and adding large amounts of information at once (*i.e.*, having to keep opening and closing each section's information boxes). Additionally, the interface design discourages users wanting to view larger sections of the metadata report while editing and adding information. Overall, the software may be useful for those not familiar with FGDC metadata standards and who are unsure as to what information is needed in a metadata report and how to report it. However, for more experienced metadata editor users, the system's user interface may seem repetitive and somewhat heavy-handed.

  *Each of these two systems require users to run two programs called "cns" and "mp" to make any necessary corrections to entries before submitting to the Clearinghouse Repository.

3) *Using a non-conforming metadata format*:
   - **FGDCMETA.aml, version 1.1**
     FGDCMETA.aml is the intelligent metadata tool for ArcGIS 8.x and its associated datasets and runs on ArcGIS 8.x for UNIX or NT. The principal contact for this software is Dan Nelson, Illinois State Geological Survey.
     The software extracts coordinate system information (if the data set has a .prj file), bounding box in latitude and longitude, and vector or raster object count directly from an ArcInfo dataset. A template document with metadata elements and formatting suitable for the program "mp" is produced, but passes off further responsibility for metadata entry to an editor (*e.g.*, "vi" or "xtme") better suited for filling in what can only be done manually. The tool can produce

either a fairly minimal template document (sections 1 and 7 of the CSDGM plus whatever was extracted for sections 3 and 4), or a more complete template that includes all the major sections (but not all the possible subsections). The partially populated metadata templates it produces are compatible with "mp", and if completed correctly, will be CSDGM compliant.

- **The Data Dictionary (Datadict)**
  Developed by the Natural Resource Information System at Montana State Library, Datadict is for recording metadata about ArcInfo data sets and runs with ArcGIS 8.x on UNIX or NT/2000 platforms.

  The Data Dictionary stores documentation in INFO files in the dataset workspace, automatically starting the documentation process for each of the items in the data set's attribute tables. A record for each metadata entry is stored in the INFO file *index*. The Datadict supports adding unlimited text to most of the free text fields in the FGDC standard Identification_Information and Data_Quality Information sections. It supports adding an unlimited number of sources, processing steps, and attributes to a dataset's metadata record, though the amount of text that can be stored in the fields of these sections is limited. The software automatically captures as much information as possible about the datasets, including the projection, bounding rectangle, feature counts, attribute definitions, and attribute minimum and maximum values. Datadict does not support Route, Section, Annotation, or Region attributes. It does not allow you to enter metadata for data sets that do not have their projections defined.

- **Metadata produced in any other format** (*e.g.*, a text or WordPerfect file) will be accepted for inclusion in the Metadata Repository's browseable directory only (a search of these records will not be possible due to the non-conformity of the format).

V.B.vii. New York State GIS Data Sharing Cooperative

The NYS GIS Data Sharing Cooperative consists of governmental entities and non-profit corporations whom have set up agreements for the purpose of improving access to GIS data through sharing. The Cooperative involves pending legislation to the FOIL (Freedom of Information Law), and to date has been sent out to all NY agencies to sign. The concept is new, with presumably no other states trying this. The federal model for data sharing releases GIS data to the public domain with no restrictions, and either free or at no more than the cost of duplication.

While this model emphasizes openness and sharing of data, a couple of negatives are associated with this approach. First, the model has no mechanism by which formal coordination of maintenance or custodial responsibilities can be given to a GIS dataset. Users have no assurance of receiving updates to a dataset made by other users. Situations arise where, like the Census Bureau's TIGER line data, many different users will independently make edits to the same dataset. Such duplication of effort is costly and wasteful. This brings us to the second downfall associated with the federal model and that is because of its openness, participation in the data sharing is actually restricted. Many commercial

data producers, utility companies, public/private partnerships, and governmental agencies usually do not want to release their data under these circumstances.

Conversely, New York's statewide data sharing initiative should encourage the sharing of created and maintained GIS datasets by public agencies throughout the state at the least cost possible. The proposed model includes the option to charge fees up to fair market value to commercial users of GIS data. Such fees are limited to the cost of duplication and with Internet serving as the primary mechanism for information exchange, costs will be minimal. Maintenance of data relies on empowered custodians acting as equals in a statewide cooperative network. Primary custodians, as creators of a dataset, are considered owners of the data and should be the ones maintaining the dataset. Secondary custodians are other members of the cooperative who can readily obtain the datasets and who can pass updates, corrections, and revisions back to the Primary Custodians only (only Primary Custodians can redistribute improved datasets elsewhere outside the Cooperative). This management style ensures those acquiring datasets from a Primary Custodian can be ensured that they are getting the best and most up-to-date information available. The initiative also allows bargaining leverage to negotiate with outsiders for value-added improvements to the data, thereby enabling members to obtain real value in exchange for their data.

In summary, the NYS GIS Data Sharing Cooperative proposes the following:

- Datasets will be available between Cooperative members at a cost not to exceed the marginal cost of dissemination (virtually free if you use the Internet).
- Updates and corrections to a dataset are reported back to Primary Custodians, ensuring the most recent, up-to-date version remains with the owner, the only source for that particular dataset.
- Members wishing to release data into the public domain are free to do so with their own datasets, not datasets owned by other members of the Cooperative.
- All members of the Cooperative will agree to comply over time with metadata standards and data exchange formats developed and endorsed by the GIS Coordinating Body (to be included in the NYS GIS Clearinghouse). Initially, data contributors are asked to fill out a one-page simple inventory of the datasets they currently have.
- Primary Custodians will have the right, at their option, to charge right-to-use fees not to exceed fair market value for commercial uses of their datasets.
- Membership in the Cooperative is open to governmental entities and not-for-profit corporations free of charge. No "up front" data contribution is required to join the Cooperative.
- Cooperative members are encouraged to use the Internet to make their GIS data available, thereby eliminating staff time to fill orders for GIS data and providing an easy and quick method for data exchange.
- Entire political subdivisions such as towns or counties should join the Cooperative on behalf of the many individual agencies under them.

VI. CONCLUSIONS

VI. CONCLUSIONS

The primary focus of this study was to judge the feasibility and conceptual design of the continued development and implementation of a countywide Enterprise GIS for Niagara County, New York. After careful review of the many agencies and departments that comprise Niagara County government, the GIS Resource Group highly recommends Niagara County move forward with implementation of GIS. The study has documented a set of viable applications for a Geographic Information System to be used by the majority of departments within the County.

One word of caution and explanation as the County considers deploying Pictometry and GIS. The two products are complimentary – not exclusionary. This is not an either or choice. Pictometry by itself only provides a visual reference to objects of interest. The images are "dumb". Clicking with a mouse will not return information about the building or property in question. For that capability, you need a GIS to tie database records to the map features.

We recommend the County pursue a four-year, phased Implementation Plan. The reason for the phased approach is to take advantage of advancements in hardware, software and data collection methods and to thoughtfully integrate GIS in the daily workflow of the County. Niagara County ORPTS team has successfully tested the viability of converting all Niagara County Mylar tax maps to AutoCAD Map and ArcView shapefiles. The County's hardware and network strategy is in great shape for future growth. The Planning Department possesses the strongest interest and potential for growing internal GIS skills to help support and train users in other departments. Long term we recommend the formation of a GIS Service Bureau.

Our advice includes:

- Identify departments that are eager to use GIS.
- Tackle easy, inexpensive applications early on to ensure success and acceptance.
- Convert, cleanup or acquire datasets that give you the most "bang for the buck" (*i.e.*, street centerlines, parcels, Pictometry, etc.).
- Train and develop staff to use and understand the GIS technology.
- Develop workflow data capture into the daily routine of County staff.

The most critical long-term hardware issue is providing an adequate network between remote buildings or devising a means of distributing the data to the remote sites. We recommend pursuing a central NT/2000 server with all GIS data resident in one place. The majority of users would benefit from accessing an original copy of the data off of a high-speed server. Having a stable network with sufficient bandwidth is important for supporting data transfer or for copying data resident on remote machines. Data access could be addressed by:

- Direct network access (ArcView or ArcExplorer)
- Indirect data access using the Internet / Intranet (ArcIMS)
- Read-only copies of data at remote sites (tapes, CD-ROMS)

Most of Niagara County staff and officials are excited and interested in GIS. They seem to have a good understanding of its capabilities and offered excellent ideas and suggestions on how the departments could utilize this tool to assist in decision making and planning. A GIS could greatly benefit the County by increasing efficiency and productivity. In addition, 84 applications have been identified, a database content list has been formulated, and the frequency of application use and

estimated timesaving has been clearly outlined. This study documents sufficient justification for continued effort toward developing a countywide Enterprise GIS.

APPENDIX A: GIS APPLICATION – DESCRIPTIONS

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
421	No Applications Requested	Audit	none	none	0	0.0	0.0	none	No applications were determined to be needed by this department.
510	Election District Verification	Board of Elections	Map Analysis	low	12	1.0	12.0	minutes	Application to verify that a voter's address falls within the correct election district or has been assigned the correct district value.
501	Election District Tool	Board of Elections	Map Analysis	low	2	56.0	112.0	minutes	Tool used for modifying election districts, and determining the number of registered voters assigned to each district. *Allow the Clerk to move boundary lines to alter / balance the number of voters per district. Would also be used to determine new polling locations based on voter distribution.*
220	Polling Location Map	Board of Elections	Query + Display	low	40	0.3	13.3	minutes	Internet based map application to display the location of polling locations based on a voter's address.
421	No Applications Requested	Clerk	none	none	0	0.0	0.0	none	No applications were determined to be needed by this department.
507	Inspection Schedule Tool	Code Enforcement	Spatial Model	low	48	1.5	72.0	hours	Application to schedule and route inspections. *Application to schedule and route code enforcement inspections. The tool would assess inspections locations and timing (annual or bi-annual) and would lump or cluster stops that could be inspected within a given time frame (1/2 day or full day). Inspection dates may be adjusted in order to conduct all inspections within a neighborhood on the same day. The purpose is to minimize the drive time for inspectors and to reduce redundant trips to the same areas in the county.*
408	Hand Held Data Entry Tool	Code Enforcement	Data Administration	medium	960	0.3	320.0	seconds	Application to allow users data entry in the field. *Application to allow users to enter code enforcement inspection information in the field. Basic information regarding the project would be entered into a desktop database. The inspector would download the records for his day's worth of inspections to a hand held computer and report the findings of the inspection process using check boxes (C=conforms, V=violations, NA=Not applicable) and pick lists for comments to minimize data entry in the field. The system can also record voice comment to minimize manual data entry with the unit in the field. Images from a digital camera can also be integrated to the database to document findings.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
200	General Query Tool	Code Enforcement	Query + Display	high	480	0.3	120.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Application to allow users to query and display code enforcement information. The type of project, status of the inspection, or any other criteria that is managed in the database, could be used to symbolize the active inspection projects. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen displays.*
128	Cabling Display Tool	Data Processing	Display	high	192	0.5	96.0	seconds	Application to display the location of network cables either inside buildings or buried underground. *The locations of cabling will be supported by scanned or digital photos of cable runs, hub closet, trench locations, etc., tied to parcels, ROWs, building floor plans (scanned images, CAD drawings or GIS layers).*
418	Computer Inventory Tool	Data Processing	none	none	0	0.0	0.0	none	Application to analyze a given computer and record owner name, department name, hardware configuration (CPU speed, memory, diskspace, network and video card speed, etc.), operating system and selected software packages. *The data resultant data records would need to import into the PeopleSoft asset management tool currently used by Niagara County.*
423	FTP Site	Data Processing	Data Administration	medium	240	1.0	240.0	hours	As a means of distributing GIS data to local municipalities in standard formats, an FTP site containing the latest version of GIS data layers for each community. *This would also allow end users to copy the data themselves rather than asking a GIS user for help.*
511	GIS Network Integration Tool	Data Processing	Spatial Model	high	192	0.5	96.0	minutes	Application to integrate network schematic with cable display tool. Each connecting line of the schematic between servers, routers and buildings could be related to a physical cable location on the GIS display. *The cable display tool will be integrated with the Novell/Visio network schematic. Each connecting line of the schematic between servers, routers and campus buildings could be related to a physical cable location on the GIS display.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
406	Database Integration	Employment and Training	Data Administration	high	1,200	1.0	1,200.0	hours	Application to create or tie together existing databases to share common data. *DOL office systems should be networked to create a single repository of job information. This would be beneficial to the Job counselors, employers looking to hire, and to individuals searching the system for possible job openings. This system should be web based and available to DOL, Social Services caseworkers, Employment and Training counselors. The system should be broken into an employer database (job openings), and a client database (job seekers). When employer information is entered into the system (one time), it is available to all users of the system. Client database would be available only to DOL, Social Services or Employment and Training counselors. Any counselor should be able to access the system and refer a client for a job interview.*
211	Job Search Tool	Employment and Training	Spatial Model	high	14,400	0.3	3,600.0	minutes	Application to provide an easy to use query and display interface to locate jobs, transportation, daycare facilities, etc. *This tool would integrate the Employer and Client Databases with a map interface and a radius search tool.*
212	Maps & Directions	Employment and Training	Query + Display	medium	14,400	0.1	1,200.0	seconds	Application to allow users to create maps and directions including specific buildings and/or rooms. *The general public or job counselors can create maps and directions for job seekers to locate interviews, training facilities and a means of transportation. RouteMap IMS is a probable solution for this application. The printout should include detail at the campus and floor plan level to assist individuals to find specific buildings or rooms.*
312	Employment/Unemployment Maps	Employment and Training	Map Analysis	high	60	0.2	10.0	minutes	Application to allow job counselors and planners to display current distribution of active versus inactive employers with addresses of unemployed individuals. *Application to allow job counselors and planners to display the current distribution of active versus inactive employers (with employee counts) as well as the addresses of unemployed individuals. Density maps can be calculated to target areas for job training, counseling, and to encourage economic development.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
612	Project Georeference Tool	Environmental Health	Data Administration	medium	240	0.8	180.0	minutes	Tool to create a polygon outline of a study area and to create a keyword record with the report name, date, author, study type, report location, etc. *This tool would allow for the capture and sharing of institutional knowledge. The data creation step would establish polygonal areas that define the rough outline of the study area. The name of the reviewer, the date of the report or study, the type of study, the results of the study and the name and location of the final report would be key entered. If the document is digital, a hotlink to the document would be created. If the document or report is hardcopy, a room number, file cabinet or shelf location would be provided.*
200	General Query Tool	Environmental Health	Query + Display	high	7,200	0.3	2,400.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Occurrences would be automatically geocoded to show clusters and they would be able to be symbolized by the type of disease, by age of the infected or any other criteria that is managed in the current database. Users should have options to pan, zoom, select features with a mouse or by query and to create hardcopy maps of the screen display.*
613	Public FOIL Response	Environmental Health	Query + Display	medium	250	1.0	250.0	minutes	Tool to find and report all known hazardous materials, spills, complaints and conditions within a given search radius. *The tool should generate a listing and a hard copy of the map of the area of interest with all pertinent layers displayed.*
506	Vehicle Routing	Environmental Health	Spatial Model	low	960	1.0	960.0	hours	Application to schedule optimal routes for vehicles. *Application to determine the best sequence and optimal route to visit inspection sites on a daily basis.*
420	Water Quality Sampling Capture Tool	Environmental Health	Data Administration	high	540	0.5	270.0	seconds	Application to allow users to place a water sampling location on a map and to assign a unique id to link to the sample analysis database. *The user should be allowed to filter or symbolize the data by type of sample (pool, beach, surface water, domestic drinking water, etc.), type of tests performed on the sample, as well as level of contamination.*
305	Resident Notification Application	Environmental Health	Map Analysis	medium	60	0.2	10.0	minutes	Finds residents within a set distance of a location of interest for communication purposes. *Application to allow incidents of West Nile disease or rabies to be located and then allow the user to specify a radius of residents to notify. Application then queries the existing parcel database and returns names and addresses of parcel within the specified radius and exports them to a database file. The resulting database can be used to send form letters to residents notifying them of incidents of West Nile disease or rabies.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
214	Human & Environmental Communicable Disease	Environmental Health	Query + Display	high	1,440	0.3	360.0	seconds	Application to allow users to display location of communicable disease cases such as HIV, Hepatitis, TB, or environmental disease outbreak such as rabies, Lyme disease, or West Nile virus. *Users should have options to pan, zoom, select features with a mouse or by a query and to create hardcopy maps of the screen display.*
214	Human & Environmental Communicable Disease	Environmental Health	Query + Display	high	1,440	0.3	360.0	seconds	Application to allow users to display location of communicable disease cases such as HIV, Hepatitis, TB, or environmental disease outbreak such as rabies, Lyme disease, or West Nile virus. *Users should have options to pan, zoom, select features with a mouse or by a query and to create hardcopy maps of the screen display.*
105	Pictometry Display Tool	Fire & Emergency Services	Display	high	5,840	0.3	1,946.7	seconds	Display ortho or oblique air photos of properties. *Application to allow end users to view oblique photos related to a particular area of interest. The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.*
313	911 Call Display Tool	Fire & Emergency Services	Map Analysis	high	13,140	0.2	2,190.0	seconds	Application to allow 911 dispatchers to display and zoom to the emergency call location. *Application to allow 911 dispatchers to display and zoom to the emergency call location. Basemap data including street names, house number, owner names should all display on the map at an appropriate zoom scale.*
314	Evacuation Planning / Response Tool	Fire & Emergency Services	Map Analysis	low	30	2.0	60.0	seconds	Application to compute, display and overlay a chemical plume/spill on the GIS basemap. *Application to compute, display and overlay a chemical plume or spill, on the GIS basemap (based on the characteristics of the chemical released, wind direction and speed). The system should display affected areas, emergency evacuation sites, decontamination sites and medial assistance sites. This tool could be used as a planning tool or in the event of a real emergency.*
406	Database Integration	Fire & Emergency Services	Data Administration	low	12	-1.0	-12.0	hours	Application to create or tie together existing databases to share common data. *Procedure to link the existing AS400 database records to the GIS basemap to display previous emergency events. The primary effort would involve matching the AS400 records to GIS parcels based on addresses, geocoded locations and populating the AS400 tables with a common key like SBL.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
407	Hazmat Data Collection Tool	Fire & Emergency Services	Data Administration	medium	143	4.0	572.0	seconds	Application to allow users to easily record the types and volumes of hazardous material stored at their locations. *Application to allow users to easily record the types and volumes of hazardous material stored at their business locations following the SARA Title III guidelines. The application should be simple enough to be run across the internet or small enough to fit on a floppy or CD which can be mailed to every business address. The reasoning is that if the tool is simple and helps businesses to keep track of their hazardous materials, they will more readily comply. The tool should provide links to EPA regulation tables and chemical look-ups to define the proper chemical handling and storage procedures. The tool should also direct the user to a County website with a map showing what fire district the business resides in and what fire house they should send their database results to.*
505	Automated Vehicle Locator	Fire & Emergency Services	Spatial Model	medium	35,040	0.1	2,920.0	seconds	Application to track vehicles in real time using GPS and radio transmissions *Application to allow emergency response vehicles, ambulances, fire trucks, vans, etc. to be tracked and located on a map in real-time using GPS and radio transmitters. Dispatchers will be able to see the status (moving, parked, engine on, engine off), location, and travel direction of any vehicle within the fleet. The system also creates an archive of travel patterns to document the location of all vehicles, which can be played back for any vehicle in question. For example, :Where was truck XYZ at 2:00 am on a given date?"*
200	General Query Tool	Fire & Emergency Services	Query + Display	high	2,880	0.3	960.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Allows users to query and display fire related data including parcels, building outlines, hydrants, mains and hazardous material locations. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen display.*
213	Arson Assessment Tool	Fire & Emergency Services	Map Analysis	medium	375	1.0	375.0	seconds	Application to allow users to display the location and timing of previous fires for arson investigation. *Application to allow users to display the location and timing of previous fires for arson investigation. All the user to filter data by date and time windows, by cause of fire, by extent of damage, fire behavior, names of perpetrators, suspects, witnesses, etc.*
421	No Applications Requested	Historian	none	none	0	0.0	0.0	none	No applications were determined to be needed by this department.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
212	Maps & Directions	Human Resources	Query + Display	medium	96	0.3	24.0	seconds	Application to allow users to create maps and directions including specific buildings and/or rooms. *This tool would allow visitors to the Niagara County web site to compute routes from a given address to any public building, training facility, or department office location.*
105	Pictometry Display Tool	Industrial Development	Display	medium	192	0.2	32.0	seconds	Display ortho or oblique air photos of properties.
200	General Query Tool	Industrial Development	Query + Display	medium	960	0.2	160.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *View data layers that relate to business activity and site promotion.*
616	Business Display Tool	Industrial Development	Query + Display	high	96	0.7	64.0	seconds	Application to display the location and types of businesses (based on SIC code) throughout the area of interest. *Ability to geocode business addresses and to color code the symbols based on SIC code, number of employees, revenue, years in business, etc.*
618	Title Search Tool	Industrial Development	Query + Display	high	96	1.0	96.0	seconds	Application to display title information related to selected properties. *Ability to display scanned images or title database information related to a given property within Niagara County.*
619	Site Selection Prep Tool	Industrial Development	Data Administration	medium	96	2.0	192.0	seconds	Application to search and filter properties within a given area of interest that are suitable for automatic submission to the State Site Finder tool. *The idea behind this tool is to automatically transfer information to the State Finder Site without key entering property information available from the County GIS site. This process would save data entry time and reduce errors. The IDA staff would visit the County's GIS to query and display potential sites to showcase on the NYS site finder. But rather than printing the information out and key entering the data again into the NYS site, the IDA employee could select one or more properties of interest and press a submit button. All of the key information regarding site location, acreage, owner name, distance to thruway, landuse class, assessed value, etc., would be transferred to the NYS finder site.*
421	No Applications Requested	Management and Budget	none	none	0	0.0	0.0	none	No applications were determined to be needed by this department.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
105	Pictometry Display Tool	Planning, Development,	Display	low	36	0.3	9.0	seconds	Display ortho or oblique air photos of properties. *The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.*
110	Scanned Image Integration	Planning, Development,	Display	high	1,200	0.3	400.0	seconds	Display scanned images tied to map features. *Images could be integrated by creating polygon outlines that define the extent of the drawings and storing the image name with each polygon. As the user clicks the polygon area, the image is displayed in the default Windows imaging tool.*
127	Shoreline Erosion Monitoring	Planning, Development,	Display	medium	24	3.0	72.0	minutes	Application to display the status of current and historic lake levels and the effects or risks of shoreline erosion. *Users will be allowed to turn layers on and off, zoom to the extent of an area of interest. Layers will be symbolized to indicate status and risk assessment. Basic functions like identify, pan, zoom and find will be included. Time-lapse animation can be achieved by displaying historic data from oldest to youngest. Rates of change can be measured between time stamped shorelines and lake levels. Zones of erosion and deposition could be denoted as the difference between current and historic shorelines. Hotlinks from map locations to digital or scanned photos would allow comparison of current and historic conditions.*
124	Environmental Awareness Site	Planning, Development,	Query + Display	high	240	0.5	120.0	minutes	Web based application to display the location and status of environmentally sensitive sites. *Users will be allowed to turn layers on and off, enter an address and zoom to the extent of the found property. Layers will be symbolized to indicate status and risk assessment. Basic functions like identify, pan, zoom and find will be included.*
200	General Query Tool	Planning, Development,	Query + Display	high	3,840	0.2	640.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *This tool would allow for basic GIS functionality like address matching, search, overlay, pan, zoom, identify and printing. Basemap layers, specific to Planning, would be added for increased functionality.*
217	Web Based Site Selection	Planning, Development,	Query + Display	high	720	1.0	720.0	minutes	Application to allow visitors to query and display potential sites for locating a business. *This ArcIMS site would promote the available manufacturing, industrial, commercial office and retail space within Niagara County. Property descriptions, photos, contact names would be available to the end user to filter and print from downloadable PDF files.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
218	Historic Preservation	Planning, Development,	Query + Display	low	72	1.0	72.0	minutes	Web based application to showcase historical locations. *Visitors would be able to search and find historic sites of interest, to view the location on a map and take part in a virtual tour of the site of interest. The user would be directed to neighboring historic sites with directions to the next site on a virtual walking tour of a historic preservation district.*
315	Registration of Scanned Images	Planning, Development,	Data Administration	high	96	-2.0	-192.0	hours	Application to take scanned images and georeference the image to the GIS basemap. *This tool would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.*
414	Land Ownership Maps	Planning, Development,	Data Administration	high	4	20.0	80.0	hours	Application to manage and automate the generation of annotated land ownership maps. *The process of plotting ownership maps on a town-wide basis has traditionally been a manual effort. Because of the time required to maintain and update the ownership information on the paper maps, this activity has been put on hold. Although annotation placement can be automated, text for the smallest parcel will have to be placed by hand, or plotted at a different scale.*
506	Vehicle Routing	Planning, Development,	Spatial Model	low	12	1.5	18.0	hours	Application to schedule optimal routes for vehicles. *The system would create optimal routes to maximize staff time and minimize travel costs, and to visually communicate the routes for a given day. This application would allow the environmental/fisheries/economic development teams to plan site visits or inspections based on schedules and proximity.*
612	Project Georeference Tool	Planning, Development,	Data Administration	medium	36	-2.0	-72.0	minutes	Tool to create a polygon outline of a study area and to create a keyword record with the report name, date, author, study type, report location, etc. *This tool would allow for the capture and sharing of institutional knowledge. The data creation step would establish polygonal areas that define the rough outline of the study area. The name of the reviewer, the date of the report or study, the type of study, the results of the study and the name and location of the final report would be key entered. If the document is digital, a hotlink to the document would be created. If the document or report is hardcopy, a room number, file cabinet or shelf location would be provided.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
620	Project Display Tool	Planning, Development,	Query + Display	medium	384	1.0	384.0	seconds	Application to allow end users to search for and display previous project reviews based on type of study, area of interest, name of study, reviewer's name, year and other keywords.
125	Recreation Map Generation	Planning, Development,	Display	low	36	2.0	72.0	minutes	Application to create digital and hardcopy maps or brochures of bike trails, campsites, fishing sites, etc.
126	Power & Energy Awareness Site	Planning, Development,	Display	medium	96	0.3	32.0	minutes	Web based application to display the location and status of traditional and alternative energy resources (hydro-electric, solar, wind, hydrogen fuel cells, natural gas, etc.). *Users will be allowed to select specific energy resources, turn layers on and off, select a site of interest (for example a windmill farm) and zoom to the extent of the selected property. Photos and video clips of the site would be provided to increase interest and awareness of alternative power sources. Information regarding re-licensing and deregulation would also be available. Basic functions like identify, pan, zoom, and find will be included. Layers will be symbolized to indicate status, cost, power generation, potential savings, etc.*
200	General Query Tool	Probation	Query + Display	medium	2,112	0.1	176.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers.
605	Electronic Home Monitoring Tool	Probation	Map Analysis	high	5,280	0.3	1,760.0	seconds	Application to allow users to display locations of home monitoring cases.
506	Vehicle Routing	Probation	Spatial Model	medium	240	1.5	360.0	hours	Application to schedule optimal routes for vehicles.
406	Database Integration	Probation	Data Administration	high	15,840	0.2	2,640.0	hours	Application to create or tie together existing databases to share common data.
221	Caseworker/client Matching Tool	Probation	Map Analysis	medium	240	0.5	120.0	seconds	Application to compare home addresses of caseworkers to address of clients with regularly scheduled visits.
202	Countertop Kiosk Query Tool	Public Citizens	Query + Display	medium	4,800	0.5	2,400.0	seconds	Provide access to many data layers for residents, real estate agents, appraisers, and developers to review.
105	Pictometry Display Tool	Public Citizens	Display	medium	4,800	0.3	1,600.0	seconds	Display ortho or oblique air photos of properties.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
608	Sex Offender Notification	Public Citizens	Query + Display	high	1,000	1.0	1,000.0	seconds	Tool to allow the public to view the locations of sex offenders relative to their home address.
222	ArcIMS Server	Public Citizens	Query + Display	high	24,000	0.1	2,000.0	seconds	This application provides intranet or Internet access to the GIS layers via web browsers. This tool will be well used by realtors, appraisers, attorneys, developers, and interested individuals. *Even though the DP department would not be a heavy user of this application, they would assume a support role for administering the site and the underlying data layer.*
214	Human & Environmental Communicable Disease	Public Health	Query + Display	high	960	1.0	960.0	seconds	Application to allow the users to display locations of any communicable disease cases such as HIV, Hepatitis, TB, or environmental disease outbreak such as rabies, Lyme disease, or West Nile virus. *Application would allow users to display health risks as a function of disease type, significance of risk, or to filter the data by time windows. Users would have options to pan, zoom, and select features with a mouse or by a query and to create hardcopy maps of the screen display.*
120	Outcome Assessment Tool	Public Health	Display	high	144	1.0	144.0	minutes	Application to display the location of and results of home or site inspections. *Application to display the location of and results of home inspections, public outreach programs, mosquito larvae testing, etc. For example, locations of lead point, radon, and fire inspections and test results could be posted on a map. A series of maps could be generated to show changes in the distribution and severity of health related problems relative to the concentration of public outreach programs. This could be used as an assessment tool and as a planning tool to redirect resources from month to month, year to year, etc. to maximize the benefits to the participant.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
305	Resident Notification Application	Public Health	Map Analysis	medium	30	16.0	480.0	minutes	Finds residents within a set distance of a location of interest for communication purposes. *Application to allow incidents of disease, industrial accidents or bio-terrorist attacks to be pinpointed and to notify residents within a specified radius of the risk. The application finds the starting point and queries the existing parcel database to return names and addresses of parcels within the specified radius and exports them to a database file. The resulting database can be used to send form letters to residents notifying them of non-emergency risks (i.e. incidents of West Nile virus, Lyme disease or rabies). For emergency situations, a technology called Reverse 911 could also play a role. Instead of just creating mailing labels, the system could call all phone numbers within a given radius and play a pre-recorded message.*
200	General Query Tool	Public Health	Query + Display	high	18,000	0.1	1,500.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Tool to allow users to query and display public health information. Occurrences would be automatically geocoded to show clusters and they would be able to symbolized by the type of disease, by age of the infected, or any other criteria that is managed in the current database. Users should have options to pan, zoom, select features with a mouse or by a query and to create hardcopy maps of the screen display.*
214	Human & Environmental Communicable Disease	Public Health	Query + Display	high	960	1.0	960.0	seconds	Application to allow the users to display locations of any communicable disease cases such as HIV, Hepatitis, TB, or environmental disease outbreak such as rabies, Lyme disease, or West Nile virus. *Application would allow users to display health risks as a function of disease type, significance of risk, or to filter the data by time windows. Users would have options to pan, zoom, and select features with a mouse or by a query and to create hardcopy maps of the screen display.*
506	Vehicle Routing	Public Health	Spatial Model	low	960	1.0	960.0	hours	Application to schedule optimal routes for vehicles. *Application that would define efficient routes for scheduled visits. This tool could be used for restaurant inspections, home care nurses, early intervention - literally any situation where multiple visits have to be made within a set schedule with a limited number of resources. Because of the general nature of this application, the address database is listed below an event database. The event could be a patient address, a scheduled stop for an inspector, (i.e. restaurant, pool, school, etc.)*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
216	Nurse/patient Matching Tool	Public Health	Query + Display	low	960	1.0	960.0	hours	Application to compare home addresses of nurses to address of patients with regular scheduled visits. *Application that would compare the home address of all nurses on staff against the addresses of patients with regularly scheduled visits. Based on the proximity, the nurses' specialty and the patients need of those services, the tool would find the closest patients to assign to a given nurse. Maps of effecting routes and schedules could be generated, but may be viewed more as "big brother" than as a help. Instead, simply helping the nurses reduce their travel time and comfortably increasing the number of visits made per day, will help improve efficiency and keep jobs.*
119	Facility Management Tool	Public Works - Building & Grounds	Query + Display	high	288	1.0	288.0	seconds	Application to display the layout of the plant floor plan including location of all equipment.
200	General Query Tool	Public Works - Building & Grounds	Query + Display	high	720	0.3	180.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers.
315	Registration of Scanned Images	Public Works - Building & Grounds	Data Administration	medium	96	-1.0	-96.0	hours	Application to take scanned images and georeference the image to the GIS basemap. *This application would take the scanned project record drawings and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-*
409	CAD Integration	Public Works - Building & Grounds	Data Administration	medium	72	0.5	36.0	seconds	This application would tie existing CAD drawings to map features.
409	CAD to GIS Conversion	Public Works - Building & Grounds	Data Administration	medium	72	0.5	36.0	seconds	This application would tie existing CAD drawings to map features.
507	Inspection Schedule Tool	Public Works - Building & Grounds	Spatial Model	medium	288	1.0	288.0	seconds	Application to schedule and route inspections.
614	Document Management Tool	Public Works - Building & Grounds	Query + Display	high	720	0.5	360.0	seconds	Tool to tie scanned images to record drawings, index cards or photos for projects.
105	Pictometry Display Tool	Public Works - Building & Grounds	Display	low	75	0.5	37.5	seconds	Display ortho or oblique air photos of properties.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
200	General Query Tool	Public Works - Engineering	Query + Display	high	720	0.3	180.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *ArcView or ArcIMS application to allow end users to query and display features in the GIS. The tool would allow for basic GIS functionality like address matching, search, overlay, pan, zoom, identify and printing. Basemap layers, specific to DPW, would be added for increased functionality.*
315	Registration of Scanned Images	Public Works - Engineering	Data Administration	medium	96	-1.0	-96.0	hours	Application to take scanned images and georeference the image to the GIS basemap. *This application would take the scanned project record drawings and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.*
105	Pictometry Display Tool	Public Works - Engineering	Display	low	75	0.5	37.5	seconds	Display ortho or oblique air photos of properties. *Used for road projects, bridges, etc. to tie images to the GIS. Images can be integrated by creating polygon outlines that define the extent of the contract and storing the image name with each polygon. As the user clicks the polygon area, the image is displayed in the default Windows imaging tool.*
413	Survey Data Integration	Public Works - Engineering	Data Administration	high	8	40.0	320.0	minutes	Application to allow easy integration of GPS field data into the GIS. *Application to allow the easy integration of GPS field data into the GIS. The process would involve conversion of the GPS data from Lat-Long to the County coordinate system (e.g. state plane feet, UTM meters, etc.) and appropriate datum (NAD 27 or NAD 83). If a data logger is involved, attributes for each map feature would also be extracted and associated with the GPS coordinates.*
121	UFPO Tool	Public Works - Engineering	Display	medium	12	4.0	48.0	minutes	Application to allow the end users to see the location of all known utilities before a crew is sent out to dig. *Application to allow the end user to see the location of all known utilities before a crew is sent out to dig. This routine would read the UFPO tickets and zoom to the location of the proposed dig to determine the presence or location of buried utilities.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
409	CAD to GIS Conversion	Public Works - Engineering	Data Administration	medium	288	1.0	288.0	minutes	This application would tie existing CAD drawings to map features. *Application to integrate CAD drawings and GIS. The integration can take place at several different levels. At very low levels the CAD drawings can be hot-linked to features in the GIS and AutoCAD can be automatically started to view and modify the CAD drawings. At a mid-range level, a world file can be created which allows the CAD drawing to be overlaid on the GIS basemap as a set of layers from the drawing. Or the integration can be achieved at a higher level where the CAD drawings are converted to GIS and attributes are permanently attached to the drawing entities within the GIS.*
409	CAD Integration	Public Works - Engineering	Data Administration	medium	288	1.0	288.0	minutes	This application would tie existing CAD drawings to map features. *Application to integrate CAD drawings and GIS. The integration can take place at several different levels. At very low levels the CAD drawings can be hot-linked to features in the GIS and AutoCAD can be automatically started to view and modify the CAD drawings. At a mid-range level, a world file can be created which allows the CAD drawing to be overlaid on the GIS basemap as a set of layers from the drawing. Or the integration can be achieved at a higher level where the CAD drawings are converted to GIS and attributes are permanently attached to the drawing entities within the GIS.*
614	Document Management Tool	Public Works - Engineering	Query + Display	high	960	0.3	320.0	seconds	Tool to tie scanned images to record drawings, index cards or photos for projects.
409	CAD Integration	Public Works - Highway	Data Administration	medium	192	1.0	192.0	seconds	This application would tie existing CAD drawings to map features.
615	Bridge Inspection Tool	Public Works - Highway	Data Administration	high	720	0.5	360.0	seconds	Application to capture, manage and display the condition of any bridge.
409	CAD to GIS Conversion	Public Works - Highway	Data Administration	medium	192	1.0	192.0	seconds	This application would tie existing CAD drawings to map features.
400	Pavement Management Tool	Public Works - Highway	Data Administration	high	8	32.0	256.0	seconds	Tool to capture the width, material, weight limits and condition of all road surfaces.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
404	Sign Management Tool	Public Works - Highway	Data Administration	high	480	0.5	240.0	seconds	Tool to allow the capture of road sign locations, condition, material and inspection records.
505	Automated Vehicle Locator	Public Works - Highway	Spatial Model	medium	480	1.5	720.0	seconds	Application to track vehicles in real time using GPS and radio transmissions
105	Pictometry Display Tool	Public Works - Highway	Display	low	75	0.5	37.5	seconds	Display ortho or oblique air photos of properties.
200	General Query Tool	Public Works - Highway	Query + Display	high	720	0.3	180.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers.
315	Registration of Scanned Images	Public Works - Highway	Data Administration	medium	96	-1.0	-96.0	hours	Application to take scanned images and georeference the image to the GIS basemap. *This application would take the scanned project record drawings and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-*
614	Document Management Tool	Public Works - Highway	Query + Display	medium	960	1.0	960.0	seconds	Tool to tie scanned images to record drawings, index cards or photos for projects.
604	Parcel Filter Tool	Real Property Tax Service	Query + Display	medium	24	3.0	72.0	minutes	Application to keep parcel outlines current and filter the assessor information to show the latest, final assessment and parcel linework. *This tool would filter assessor info and show last years assessment.*
110	Scanned Image Integration	Real Property Tax Service	Display	low	576	0.3	144.0	seconds	Display scanned images tied to map features. *RPTS would integrate scanned images from the plot book as well as EA-5217 forms tied to the parcel outlines.*
200	General Query Tool	Real Property Tax Service	Query + Display	high	5,760	0.3	1,440.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers.
202	Countertop Kiosk Query Tool	Real Property Tax Service	Query + Display	low	960	0.3	240.0	minutes	Provide access to many data layers for residents, real estate agents, appraisers, and developers to review. *This would allow end users to research parcel and related data from the front counter.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
409	CAD Integration	Real Property Tax Service	Data Administration	high	960	0.5	480.0	hours	This application converts CAD drawings to GIS layers and verifies arc and label errors. *Application to verify the quality of CAD data for readiness to convert to GIS (QC steps to confirm label errors, dangles and overshoots). Could be run on a scheduler or manually. Intermediate results include an error layer to notify CAD operators of errors in CAD data. The end result is a converted GIS coverage or shapefile from the CAD source.*
409	CAD to GIS Conversion	Real Property Tax Service	Data Administration	high	960	0.5	480.0	hours	This application converts CAD drawings to GIS layers and verifies arc and label errors. *Application to verify the quality of CAD data for readiness to convert to GIS (QC steps to confirm label errors, dangles and overshoots). Could be run on a scheduler or manually. Intermediate results include an error layer to notify CAD operators of errors in CAD data. The end result is a converted GIS coverage or shapefile from the CAD source.*
603	Red Line Application	Real Property Tax Service	Data Administration	low	192	0.8	144.0	minutes	Tool to allow end user to markup suggested changes to associate notes with scanned image or drawing files. *Tool to allow the RPTS user to make changes to scanned images or files.*
105	Pictometry Display Tool	Real Property Tax Service	Display	high	384	0.8	288.0	seconds	Display ortho or oblique air photos of properties.
423	FTP Site	Real Property Tax Service	Data Administration	medium	48	1.0	48.0	hours	As a means of distributing GIS data to local municipalities in standard formats, an FTP site containing the latest version of GIS data layers for each community. *RPTS staff could post latest versions of parcel outlines and filtered RPS data for each municipality on a monthly, quarterly or as needed basis.*
116	Data Entry/Retrieval Tool	Refuse Disposal District	Data Administration	high	96	1.0	96.0	seconds	Application to allow current and past information available for future efficiencies *Application to allow information about past and current jobs to be input to allow for more efficient future retrieval. Attribute information stored for current and future job sites would be accessed and placed into pre-formatted reports replacing the reports that are currently generated. The application should also allow the user to create hard copy maps of the screen display.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
508	Parks Planning Tool	Refuse Disposal District	Spatial Model	medium	48	6.0	288.0	hours	Application to compile existing basemap data and use simple drawing tools to generate proposed plans for new parks and recreation sites. *Application to compile existing basemap data and to use simple drawing tools to generate proposed plans for new parks & recreation sites.*
305	Resident Notification Application	Refuse Disposal District	Map Analysis	medium	48	16.0	768.0	minutes	Finds residents within a set distance of a location of interest for communication purposes. *Application to retrieve address information of property owners for notification of new waste management or recycling facility. Application queries the existing parcel database and returns names and addresses of parcel along a specified area and exports them to a database file. The resulting database can be used to send form letters to residents.*
116	Data Entry/Retrieval Tool	Refuse Disposal District	Data Administration	high	96	1.0	96.0	seconds	Application to allow current and past information available for future efficiencies *Application to allow information about past and current jobs to be input to allow for more efficient future retrieval. Attribute information stored for current and future job sites would be accessed and placed into pre-formatted reports replacing the reports that are currently generated. The application should also allow the user to create hard copy maps of the screen display.*
200	General Query Tool	Refuse Disposal District	Query + Display	high	96	1.0	96.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Application to assist in on-site environmental assessment, determining soil classification, as well as retrieving information on nearby wells or septic systems. Users should have the option to pan, zoom, select features, and to create hard copy maps of the screen display.*
600	Accident Tracking Tool	Risk/Insurance	Display	medium	24	1.0	24.0	minutes	This application would track the location and type of accidents. This application should also report road conditions and weather status and other factors that may have caused the accident. *All County streets and property would be tracked. Road conditions and weather status among other features should be reported that may have caused an accident.*
601	Workers Compensation Tracking	Risk/Insurance	Query + Display	medium	8	0.5	4.0	minutes	This application would track workers compensation cases throughout an organization. It can also track department of origin and areas having the most claims, if applicable.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
602	Retiree Tracking	Risk/Insurance	Data Administration	low	4	1.0	4.0	minutes	This application would track a former employee from their location as employees to where they live currently. *This would track where County employees would retire to whether inside the County or out.*
411	Image Archive/Retrieval Tool	Sewer District	Data Administration	medium	96	-2.0	-192.0	seconds	Application to allow the storage and retrieval of record drawings and as-builts. *Tool to allow the storage and retrieval of record drawings and as-built drawings of sewer lines and facilities across the country. Convert all the existing paper maps and drawings to scanned images and referenced them to the GIS parcel basemap.*
116	Data Entry/Retrieval Tool	Sewer District	Data Administration	high	48	2.0	96.0	seconds	Application to collect and display current and past information. *A sample database and reporting tool to expedite the generation of standard State and Federal reports, an Access database should be developed with the sole purpose of reducing the manual data entry and reformatting that goes into the creation of each monthly report. By capturing the data electronically at the earliest possible point in the sampling and analysis step, time can be saved and errors reduced.*
116	Data Entry/Retrieval Tool	Sewer District	Data Administration	high	48	2.0	96.0	seconds	Application to collect and display current and past information. *A sample database and reporting tool to expedite the generation of standard State and Federal reports, an Access database should be developed with the sole purpose of reducing the manual data entry and reformatting that goes into the creation of each monthly report. By capturing the data electronically at the earliest possible point in the sampling and analysis step, time can be saved and errors reduced.*
119	Facility Management Tool	Sewer District	Query + Display	low	192	1.5	288.0	seconds	Application to display the layout of the plant floor plan including location of all equipment. *Application to display the layout of the plant floor plan including the location of all equipment, filters, pumps, valves and mains. Digital photos of each piece of equipment could be related to the floorplans as well as scanned versions of the maintenance manuals for each piece of equipment. The maintenance history and future scheduled preventative maintenance for the equipment could also be collected and displayed. Valve status and sequencing for procedures like back flushing or filters could be illustrated graphically for new hires.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
215	Water Sample Analysis	Sewer District	Query + Display	high	7,200	0.1	600.0	minutes	Application to query and display sample data by date, chemical agent or reading, volume, etc. *Application to allow end user to query and display sample data by date, chemical agent or reading, volume, compliance with State and Federal regulations. The user could ask to see the results of all water sample tests by date window, or to see only lab results that exceed a given threshold for any chemical agent that is analyzed in a map form.*
509	Integration of SCADA with GIS	Sewer District	Spatial Model	medium	5,760	0.0	192.0	minutes	Application to provide links between the GIS and SCADA water system. *Display tool to show the real time SCADA results for the 3,000 sampling points.*
609	Beat Maps	Sheriff	Query + Display	high	3,840	0.3	1,280.0	minutes	Create and generate hard copy maps to show all complaints and crime activity during the last X hours within a given police service area (beat). *Display all crimes by standard symbology to show type of crime and time of day.*
105	Pictometry Display Tool	Sheriff	Display	high	87,600	0.1	7,300.0	seconds	Display ortho or oblique air photos of properties.
610	Complaint Logger Tool	Sheriff	Data Administration	high	26,280	0.3	6,570.0	minutes	Database application to track current and historic complaints, their status and outcome. *Repeat calls can be symbolized by size of symbol. Complaints can be filtered by time windows and by complaint type.*
608	Sex Offender Notification	Sheriff	Query + Display	medium	144	1.0	144.0	seconds	Tool to allow the public to view the locations of sex offenders relative to their home address. *This ArcIMS based tool would allow end users to visit the county website, enter an address and determine if there were any known sex offenders within a defined radius. Basic functions like pan, zoom, identify and print would also be available.*
606	Crime Analysis	Sheriff	Map Analysis	medium	720	3.0	2,160.0	minutes	Application to display current and historic crime locations as a analysis tool for crime prevention and pattern recognition. *Allow the user to query, filter and display crimes by time window, type of crime. Develop walking and drive distance rings around crime locations and find all parolee locations within reasonable distance. Perform cluster analysis to find similar crimes within a spatial distance, etc. Display locations of parolees, bars, liquor stores, adult entertainment, churches, schools, community centers, etc.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
600	Accident Tracking Tool	Sheriff	Display	medium	480	1.0	480.0	minutes	This application would track the location and type of accidents. This application should also report road conditions and weather status and other factors that may have caused the accident. *The analyst can filter and color code the data by a time window, type of accident, severity, cause, weather conditions, visibility, response time, etc.*
505	Automated Vehicle Locator	Sheriff	Spatial Model	high	52,560	0.1	4,380.0	seconds	Application to track vehicles in real time using GPS and radio transmissions *Application to display the location and status of all emergency response vehicles. GPS locations of the vehicles will be transmitted to the dispatch computer via radio signal and displayed in real time. By using symbols and color halos, the dispatcher can determine the type of vehicle (squad car, undercover, ambulance, fire truck, etc.) and its status (stationary, inactive, active, etc.)*
406	Database Integration	Sheriff	Data Administration	high	175,200	0.1	14,600.0	seconds	Application to create or tie together existing databases to share common data.
313	911 Call Display Tool	Sheriff	Map Analysis	high	52,560	0.0	876.0	seconds	Application to allow 911 dispatchers to display and zoom to the emergency call location. *Symbolize the call location by type of call (crime, domestic, fire, accident, hostage, etc.). Integrate GIS with the New World Systems Aegis 911 package.*
611	Backyard Address Generator	Sheriff	Spatial Model	medium	12	24.0	287.7	hours	Application to generate a backyard parcel address for each parcel in the database to assist dispatchers to direct backup police squad cars to a house number corresponding to the house in the backyard. *The backup unit could be sent the street behind the call address to cutoff an escape route. The routine would use the same logic to compute the ROW address points. In this case, all inside points would be selected that had different street names (name and type - Ave, Rd, Ct, etc.)*
417	Census Tracking Tool	Social Services	Data Administration	low	70	-1.0	-70.0	minutes	As population trends change of time, this tool would assist with tracking the changes in age, ethnicity, income, educational attainment, etc. *As population trends change over time, it would assist Social Services to track the changes in age, ethnicity, income, education attainment, etc. within the County on an on-going basis.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
416	HEAP/STAR Tool	Social Services	Data Administration	low	70	8.0	560.0	minutes	Based on the number of applicants for this program, department workers would work with local community centers or churches to gather HEAP applications.
317	Bus Route/Van Service Analysis	Social Services	Map Analysis	medium	40	2.0	80.0	hours	Access to routing and scheduling on the desktop for ease of preparing transportation by either department van or public transportation.
316	Resolve Address Issue	Social Services	Data Administration	high	16,800	-0.1	-1,400.0	hours	This process would involve the analysis of existing address information and the cleanup and standardization of addresses. *This application/service is key to all other applications since the location of the service recipient must be accurately depicted on the map for reliable analysis to be performed. In the case of rural routes and PO boxes, they would be researched and manually placed or tied to the street intersection or parcel outline.*
221	Caseworker/client Matching Tool	Social Services	Map Analysis	high	2,100	0.5	1,050.0	hours	Application to compare home addresses of caseworkers to address of clients with regularly scheduled visits. *Application that would compare the home address of all caseworkers on staff against the addresses of clients with regularly scheduled visits. Based on the proximity, the caseworkers' specialty and the clients need of those services, the tool would find the closest clients to assign to a given caseworker. Maps of effecting routes and schedules could be generated, but may be viewed more as "big brother" than as a help. Instead, simply helping the caseworkers reduce their travel time and comfortably increasing the number of visits made per day, will help improve efficiency and keep jobs.*
219	Service Provider Lookup	Social Services	Query + Display	high	10,080	0.1	840.0	hours	A tool to enable caseworkers and counselors to match people in need with service providers based on location and ease of access (bus routes, etc.) *Services to include are shelters, soup kitchens, daycare, drug programs, job training, counseling, churches, adoption centers, public defenders, thrift stores, etc. The tool would provide an easy search tool to match the person in need with the closest services available.*
415	Reports to Legislature	Social Services	Data Administration	medium	48	1.5	72.0	hours	Map and summary table showing the number the number of cases and results of programs. *A map showing the distribution and volume of services extruded out from the map (3D view), may provide an easy to read visual tool to present to the County Legislature.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
211	Job Search Tool	Social Services	Spatial Model	high	6,720	0.3	1,680.0	minutes	Application to provide an easy to use query and display interface to locate jobs, transportation, daycare facilities, etc. *The routes would also determine the closest bus routes or driving directions from the seeker's location to the employer. Additionally, schools and day care centers would be displayed to give the job seeker assistance to locate these amenities.*
406	Database Integration	Social Services	Data Administration	high	16,800	0.5	8,400.0	hours	Application to create or tie together existing databases to share common data. *This tool would integrate State and local databases with GIS parcel or geocoded addresses. Ability to access up-to-date information is key to analyzing services and benefits to the service recipients within the given budget. Options include direct integration at the code level, sharing databases and extracts on a regular basis.*
200	General Query Tool	Social Services	Query + Display	medium	6,720	0.1	560.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *The user could display cases by type, by level of risk, be caseworker name, by cost or service, by outcome measures, etc.*
420	Water Quality Sampling Capture Tool	Soil, Water Conservation District	Data Administration	medium	24	6.0	144.0	seconds	Application to allow users to place a water sampling location on a map and to assign a unique id to link to the sample analysis database.
422	Projection Wizard Tool	Soil, Water Conservation District	Data Administration	high	12	1.0	12.0	minutes	Tool to help end users resolve projection problems.
419	Erosion Monitoring Tool	Soil, Water Conservation District	Spatial Model	low	2	20.0	40.0	hours	Application to compare historic aerial photos, trace current and previous stream banks and determine the area in square footage or acreage of erosion.
321	Ag Assessment Tool	Soil, Water Conservation District	Spatial Model	high	100	1.0	100.0	minutes	Application to assign a dollar value to a parcel based on the quality of the soil data for farming. The tool should overlay, clip and assign proportional percentages of soil type to the parcel polygon and compute a property value.
320	Vegetative Assessment	Soil, Water Conservation District	Map Analysis	low	1	5.0	5.0	hours	Image analysis tool to determine the type and percentages of vegetation based on pixel signatures.
319	Ditch Survey Tool	Soil, Water Conservation District	Map Analysis	low	8	10.0	80.0	minutes	Application to assess a proposed ditching project and to record proper elevations for grading ditches.

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
215	Water Sample Analysis	Soil, Water Conservation District	Query + Display	medium	36	8.0	288.0	minutes	Application to query and display sample data by date, chemical agent or reading, volume, etc.
200	General Query Tool	Soil, Water Conservation District	Query + Display	high	300	0.5	150.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers.
105	Pictometry Display Tool	Soil, Water Conservation District	Display	high	150	0.3	37.5	seconds	Display ortho or oblique air photos of properties.
423	FTP Site	Soil, Water Conservation District	Data Administration	high	36	1.0	36.0	hours	As a means of distributing GIS data to local municipalities in standard formats, an FTP site containing the latest version of GIS data layers for each community.
117	Veterans Services Planning	Veterans Services	Display	low	8	1.0	8.0	minutes	Application to determine location of existing veterans. *Application to determine location of existing veterans that may be eligible for benefits. Users should have the options to pan, zoom, select features and to create hard copy maps of the screen display.*
116	Data Entry/Retrieval Tool	Water District	Data Administration	high	480	-1.0	-480.0	seconds	Application to allow current and past information available for future efficiencies *Water facilities tool to allow end users to digitize the location of water facilities (mains, valves, tees, meters, tanks, pump stations, etc.). The user can record the age, size, material, condition and maintenance history for each water facility feature.*
410	Leak Database	Water District	Data Administration	low	144	0.5	72.0	minutes	Application to record the location and type of leaks as well as maintenance and repair history. *The leak database is an application to record the location and type of leaks as well as the maintenance and repair history for affected pipes. The user could filter and display leaks by type, by age, by frequency to help identify problem areas. This information would be very useful to include in the hydraulic model to calibrate water use and pressure drops to indicate possible water leak locations. It would also be useful in long term capital improvement planning. Leak locations would be reported by address, parcel ID, or by a graphic click on the map to associate the leak to the correct main.*
509	Integration of SCADA with GIS	Water District	Spatial Model	high	4,320	0.3	1,080.0	minutes	Application to provide links between the GIS and SCADA water system. *Provides links between the GIS and current SCADA data associated with specific water facilities (meter pits, tanks, pump stations). Allow the display of pressures, tank levels, flow rates, and pump performance on the GIS basemap.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
506	Vehicle Routing	Water District	Spatial Model	low	48	1.5	72.0	hours	Application to schedule optimal routes for vehicles. *This application would determine the best sequence to visit the meters on a monthly basis. Because the meter readers don't have a set schedule of routes to visit the meter pits, it may be worthwhile to periodically assess the efficiency of the current routes and determine if a defined sequence would be helpful in reducing travel costs.*
409	CAD to GIS Conversion	Water District	Data Administration	high	96	0.5	48.0	minutes	This application would tie existing CAD drawings to map features. *This tool would tie existing CAD drawings to map features by storing the drawing name with the water facility. As the user clicks the map features, AutoCAD starts and displays the drawing of choice. Another approach would integrate the CAD drawings by adding the drawings to the GIS layer list and creating world files to register the CAD drawings to the GIS basemap. The CAD drawing would be displayed as the user zooms into the area of interest.*
409	CAD Integration	Water District	Data Administration	high	96	0.5	48.0	minutes	This application would tie existing CAD drawings to map features. *This tool would tie existing CAD drawings to map features by storing the drawing name with the water facility. As the user clicks the map features, AutoCAD starts and displays the drawing of choice. Another approach would integrate the CAD drawings by adding the drawings to the GIS layer list and creating world files to register the CAD drawings to the GIS basemap. The CAD drawing would be displayed as the user zooms into the area of interest.*
406	Database Integration	Water District	Data Administration	low	144	0.3	36.0	hours	Application to create or tie together existing databases to share common data. *Integration of meter reading access database and GIS. This application integrates the contents of the Meter Reading database and the GIS to allow users to click on a given meter and see the current and historic readings at that site.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
315	Registration of Scanned Images	Water District	Data Administration	high	240	-3.0	-720.0	hours	Application to take scanned images and georeference the image to the GIS basemap. *This process would take the scanned contracts and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap and would be a starting point for heads-up digitizing of the water feature locations. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.*
118	Zoom Tool	Water District	Display	high	2,160	0.0	9.0	seconds	Simple zoom tool to allow user to zoom to specific project area or saved extent. *Application to zoom to saved extents that would allow a zoom to a specific municipality, project area or saved extent. The user can select the name of a town, village or city from a pulldown menu and zoom directly to the extent of that area of interest. Likewise, users can save a current map extent and return by reselecting the saved extent from an explorer-like dialog.*
116	Data Entry/Retrieval Tool	Water District	Data Administration	high	480	-1.0	-480.0	seconds	Application to allow current and past information available for future efficiencies *Water facilities tool to allow end users to digitize the location of water facilities (mains, valves, tees, meters, tanks, pump stations, etc.). The user can record the age, size, material, condition and maintenance history for each water facility feature.*
200	General Query Tool	Water District	Query + Display	high	2,160	0.3	540.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Tool to allow the display of the water system by size, material, age, pressure, water use, etc. This interface would resemble ArcView, ArcExplorer or ArcReader. It would provide basic GIS functions to identify features, query underlying tables to find specific records, turn layers on and off, zoom and pan, and display layers by colors or symbols to show size, age, condition, material, etc.*
200	General Query Tool	Weights & Measures	Query + Display	medium	144	0.3	48.0	seconds	Provide access to data layers for general queries on parcels, environmental data, and infrastructure layers. *Users may query and display data by municipality (or zip code), by inspection pass or failed, or by date to see what inspections are coming due or can be scheduled for random visits. Users should have the option to pan, zoom, select features and to create hard copy maps of the screen display.*

APPENDIX A: for: Niagara County
GIS APPLICATION DESCRIPTIONS

AppID	Application Name	Requesting Department	Application Type	Application Priority	Freq /Yr	Hours Saved / Use	Hours Saved /Yr	Response Time	Application Description Department Specific Notes
406	Database Integration	Weights & Measures	Data Administration	high	24	1.5	36.0	hours	Application to create or tie together existing databases to share common data. *Application to store and manage business data by SIC code to help identify new businesses that would require inspections.*
506	Vehicle Routing	Weights & Measures	Spatial Model	low	96	2.0	192.0	hours	Application to schedule optimal routes for vehicles. *Application would create further efficiency in the scheduling of inspections by location and device/store type.*
607	Internet Access	Weights & Measures	Query + Display	high	96	0.5	48.0	seconds	To have the ability to research and detect new inspection sites and verify local data and information without traveling to other locations.

APPENDIX B: GIS APPLICATIONS – BY PRIORITY

APPENDIX B: *for: Niagara County*
GIS APPLICATIONS BY PRIORITY
Sorted by Frequency of Use

Application Name	*Requesting Department*	*# Times used / yr*
Priority: high		
Database Integration	Sheriff	175,200
Pictometry Display Tool	Sheriff	87,600
911 Call Display Tool	Sheriff	52,560
Automated Vehicle Locator	Sheriff	52,560
Complaint Logger Tool	Sheriff	26,280
ArcIMS Server	Public Citizens	24,000
General Query Tool	Public Health	18,000
Database Integration	Social Services	16,800
Resolve Address Issue	Social Services	16,800
Database Integration	Probation	15,840
Job Search Tool	Employment and Training	14,400
911 Call Display Tool	Fire & Emergency Services	13,140
Service Provider Lookup	Social Services	10,080
General Query Tool	Environmental Health	7,200
Water Sample Analysis	Sewer District	7,200
Job Search Tool	Social Services	6,720
Pictometry Display Tool	Fire & Emergency Services	5,840
General Query Tool	Real Property Tax Service	5,760
Electronic Home Monitoring Tool	Probation	5,280
Integration of SCADA with GIS	Water District	4,320
Beat Maps	Sheriff	3,840
General Query Tool	Planning, Development, Tourism	3,840
General Query Tool	Fire & Emergency Services	2,880
General Query Tool	Water District	2,160
Zoom Tool	Water District	2,160
Caseworker/client Matching Tool	Social Services	2,100
Human & Environmental Communicable Disease Monitoring Tool	Environmental Health	1,440
Database Integration	Employment and Training	1,200
Scanned Image Integration	Planning, Development, Tourism	1,200
Sex Offender Notification	Public Citizens	1,000
CAD Integration	Real Property Tax Service	960
CAD to GIS Conversion	Real Property Tax Service	960
Document Management Tool	Public Works - Engineering	960
Human & Environmental Communicable Disease Monitoring Tool	Public Health	960
Bridge Inspection Tool	Public Works - Highway	720
Document Management Tool	Public Works - Building & Grounds	720
General Query Tool	Public Works - Highway	720
General Query Tool	Public Works - Building & Grounds	720
General Query Tool	Public Works - Engineering	720

Application Name	*Requesting Department*	*# Times used / yr*
Web Based Site Selection	Planning, Development, Tourism	720
Water Quality Sampling Capture Tool	Environmental Health	540
Data Entry/Retrieval Tool	Water District	480
General Query Tool	Code Enforcement	480
Sign Management Tool	Public Works - Highway	480
Pictometry Display Tool	Real Property Tax Service	384
General Query Tool	Soil, Water Conservation District	300
Facility Management Tool	Public Works - Building & Grounds	288
Environmental Awareness Site	Planning, Development, Tourism	240
Registration of Scanned Images	Water District	240
Cabling Display Tool	Data Processing	192
GIS Network Integration Tool	Data Processing	192
Pictometry Display Tool	Soil, Water Conservation District	150
Outcome Assessment Tool	Public Health	144
Ag Assessment Tool	Soil, Water Conservation District	100
Business Display Tool	Industrial Development	96
CAD Integration	Water District	96
CAD to GIS Conversion	Water District	96
Data Entry/Retrieval Tool	Refuse Disposal District	96
General Query Tool	Refuse Disposal District	96
Internet Access	Weights & Measures	96
Registration of Scanned Images	Planning, Development, Tourism	96
Title Search Tool	Industrial Development	96
Employment/Unemployment Maps	Employment and Training	60
Data Entry/Retrieval Tool	Sewer District	48
FTP Site	Soil, Water Conservation District	36
Database Integration	Weights & Measures	24
Projection Wizard Tool	Soil, Water Conservation District	12
Pavement Management Tool	Public Works - Highway	8
Survey Data Integration	Public Works - Engineering	8
Land Ownership Maps	Planning, Development, Tourism	4

Priority: medium

Automated Vehicle Locator	Fire & Emergency Services	35,040
Maps & Directions	Employment and Training	14,400
General Query Tool	Social Services	6,720
Integration of SCADA with GIS	Sewer District	5,760
Countertop Kiosk Query Tool	Public Citizens	4,800
Pictometry Display Tool	Public Citizens	4,800
General Query Tool	Probation	2,112
Document Management Tool	Public Works - Highway	960
General Query Tool	Industrial Development	960
Hand Held Data Entry Tool	Code Enforcement	960
Crime Analysis	Sheriff	720
Accident Tracking Tool	Sheriff	480
Automated Vehicle Locator	Public Works - Highway	480

Application Name	*Requesting Department*	*# Times used / yr*
Project Display Tool	Planning, Development, Tourism	384
Arson Assessment Tool	Fire & Emergency Services	375
CAD Integration	Public Works - Engineering	288
CAD to GIS Conversion	Public Works - Engineering	288
Inspection Schedule Tool	Public Works - Building & Grounds	288
Public FOIL Response	Environmental Health	250
Caseworker/client Matching Tool	Probation	240
FTP Site	Data Processing	240
Project Georeference Tool	Environmental Health	240
Vehicle Routing	Probation	240
CAD Integration	Public Works - Highway	192
CAD to GIS Conversion	Public Works - Highway	192
Pictometry Display Tool	Industrial Development	192
General Query Tool	Weights & Measures	144
Sex Offender Notification	Sheriff	144
Hazmat Data Collection Tool	Fire & Emergency Services	143
Image Archive/Retrieval Tool	Sewer District	96
Maps & Directions	Human Resources	96
Power & Energy Awareness Site	Planning, Development, Tourism	96
Registration of Scanned Images	Public Works - Engineering	96
Registration of Scanned Images	Public Works - Building & Grounds	96
Registration of Scanned Images	Public Works - Highway	96
Site Selection Prep Tool	Industrial Development	96
CAD Integration	Public Works - Building & Grounds	72
CAD to GIS Conversion	Public Works - Building & Grounds	72
Resident Notification Application	Environmental Health	60
FTP Site	Real Property Tax Service	48
Parks Planning Tool	Refuse Disposal District	48
Reports to Legislature	Social Services	48
Resident Notification Application	Refuse Disposal District	48
Bus Route/Van Service Analysis	Social Services	40
Project Georeference Tool	Planning, Development, Tourism	36
Water Sample Analysis	Soil, Water Conservation District	36
Resident Notification Application	Public Health	30
Accident Tracking Tool	Risk/Insurance	24
Parcel Filter Tool	Real Property Tax Service	24
Shoreline Erosion Monitoring	Planning, Development, Tourism	24
Water Quality Sampling Capture Tool	Soil, Water Conservation District	24
UFPO Tool	Public Works - Engineering	12
Backyard Address Generator	Sheriff	12
Workers Compensation Tracking	Risk/Insurance	8

Priority: low

Countertop Kiosk Query Tool	Real Property Tax Service	960
Nurse/patient Matching Tool	Public Health	960
Vehicle Routing	Public Health	960

Application Name	*Requesting Department*	*# Times used / yr*
Vehicle Routing	Environmental Health	960
Scanned Image Integration	Real Property Tax Service	576
Facility Management Tool	Sewer District	192
Red Line Application	Real Property Tax Service	192
Database Integration	Water District	144
Leak Database	Water District	144
Vehicle Routing	Weights & Measures	96
Pictometry Display Tool	Public Works - Highway	75
Pictometry Display Tool	Public Works - Building & Grounds	75
Pictometry Display Tool	Public Works - Engineering	75
Historic Preservation	Planning, Development, Tourism	72
Census Tracking Tool	Social Services	70
HEAP/STAR Tool	Social Services	70
Inspection Schedule Tool	Code Enforcement	48
Vehicle Routing	Water District	48
Polling Location Map	Board of Elections	40
Pictometry Display Tool	Planning, Development, Tourism	36
Recreation Map Generation	Planning, Development, Tourism	36
Evacuation Planning / Response Tool	Fire & Emergency Services	30
Database Integration	Fire & Emergency Services	12
Election District Verification	Board of Elections	12
Vehicle Routing	Planning, Development, Tourism	12
Ditch Survey Tool	Soil, Water Conservation District	8
Veterans Services Planning	Veterans Services	8
Retiree Tracking	Risk/Insurance	4
Election District Tool	Board of Elections	2
Erosion Monitoring Tool	Soil, Water Conservation District	2
Vegetative Assessment	Soil, Water Conservation District	1

Priority: none

Computer Inventory Tool	Data Processing	0
No Applications Requested	Management and Budget	0
No Applications Requested	Audit	0
No Applications Requested	Clerk	0
No Applications Requested	Historian	0

APPENDIX C: GIS APPLICATIONS – BY FREQUENCY

APPENDIX C: for: Niagara County

GIS APPLICATIONS BY FREQUENCY

Sorted by Frequency of Use

Application Name	Requesting Department	Application Type	Application Priority	# Times used / yr
Use: Daily				
Database Integration	Sheriff	Data Administration	high	175,200
Pictometry Display Tool	Sheriff	Display	high	87,600
911 Call Display Tool	Sheriff	Map Analysis	high	52,560
Automated Vehicle Locator	Sheriff	Spatial Model	high	52,560
Automated Vehicle Locator	Fire & Emergency Services	Spatial Model	medium	35,040
Complaint Logger Tool	Sheriff	Data Administration	high	26,280
ArcIMS Server	Public Citizens	Query + Display	high	24,000
General Query Tool	Public Health	Query + Display	high	18,000
Resolve Address Issue	Social Services	Data Administration	high	16,800
Database Integration	Social Services	Data Administration	high	16,800
Database Integration	Probation	Data Administration	high	15,840
Job Search Tool	Employment and Training	Spatial Model	high	14,400
Maps & Directions	Employment and Training	Query + Display	medium	14,400
911 Call Display Tool	Fire & Emergency Services	Map Analysis	high	13,140
Service Provider Lookup	Social Services	Query + Display	high	10,080
General Query Tool	Environmental Health	Query + Display	high	7,200
Water Sample Analysis	Sewer District	Query + Display	high	7,200
General Query Tool	Social Services	Query + Display	medium	6,720
Job Search Tool	Social Services	Spatial Model	high	6,720
Pictometry Display Tool	Fire & Emergency Services	Display	high	5,840
General Query Tool	Real Property Tax Service	Query + Display	high	5,760
Integration of SCADA with GIS	Sewer District	Spatial Model	medium	5,760
Electronic Home Monitoring Tool	Probation	Map Analysis	high	5,280
Pictometry Display Tool	Public Citizens	Display	medium	4,800
Countertop Kiosk Query Tool	Public Citizens	Query + Display	medium	4,800
Integration of SCADA with GIS	Water District	Spatial Model	high	4,320
General Query Tool	Planning, Development, Tourism	Query + Display	high	3,840
Beat Maps	Sheriff	Query + Display	high	3,840
General Query Tool	Fire & Emergency Services	Query + Display	high	2,880
Zoom Tool	Water District	Display	high	2,160
General Query Tool	Water District	Query + Display	high	2,160
General Query Tool	Probation	Query + Display	medium	2,112
Caseworker/client Matching Tool	Social Services	Map Analysis	high	2,100
Human & Environmental Communicable Disease Monitoring Tool	Environmental Health	Query + Display	high	1,440
Human & Environmental Communicable Disease Monitoring Tool	Environmental Health	Query + Display	high	1,440
Scanned Image Integration	Planning, Development, Tourism	Display	high	1,200
Database Integration	Employment and Training	Data Administration	high	1,200
Sex Offender Notification	Public Citizens	Query + Display	high	1,000
General Query Tool	Industrial Development	Query + Display	medium	960
Countertop Kiosk Query Tool	Real Property Tax Service	Query + Display	low	960
Human & Environmental Communicable Disease Monitoring Tool	Public Health	Query + Display	high	960
Human & Environmental Communicable Disease Monitoring Tool	Public Health	Query + Display	high	960
Nurse/patient Matching Tool	Public Health	Query + Display	low	960

Application Name	Requesting Department	Application Type	Application Priority	# Times used / yr
Hand Held Data Entry Tool	Code Enforcement	Data Administration	medium	960
CAD to GIS Conversion	Real Property Tax Service	Data Administration	high	960
CAD Integration	Real Property Tax Service	Data Administration	high	960
Vehicle Routing	Public Health	Spatial Model	low	960
Vehicle Routing	Environmental Health	Spatial Model	low	960
Document Management Tool	Public Works - Engineering	Query + Display	high	960
Document Management Tool	Public Works - Highway	Query + Display	medium	960
General Query Tool	Public Works - Highway	Query + Display	high	720
General Query Tool	Public Works - Engineering	Query + Display	high	720
General Query Tool	Public Works - Building & Grounds	Query + Display	high	720
Web Based Site Selection	Planning, Development, Tourism	Query + Display	high	720
Crime Analysis	Sheriff	Map Analysis	medium	720
Document Management Tool	Public Works - Building & Grounds	Query + Display	high	720
Bridge Inspection Tool	Public Works - Highway	Data Administration	high	720
Scanned Image Integration	Real Property Tax Service	Display	low	576
Water Quality Sampling Capture Tool	Environmental Health	Data Administration	high	540
Data Entry/Retrieval Tool	Water District	Data Administration	high	480
Data Entry/Retrieval Tool	Water District	Data Administration	high	480
General Query Tool	Code Enforcement	Query + Display	high	480
Sign Management Tool	Public Works - Highway	Data Administration	high	480
Automated Vehicle Locator	Public Works - Highway	Spatial Model	medium	480
Accident Tracking Tool	Sheriff	Display	medium	480
Pictometry Display Tool	Real Property Tax Service	Display	high	384
Project Display Tool	Planning, Development, Tourism	Query + Display	medium	384
Arson Assessment Tool	Fire & Emergency Services	Map Analysis	medium	375
General Query Tool	Soil, Water Conservation District	Query + Display	high	300
Facility Management Tool	Public Works - Building & Grounds	Query + Display	high	288
CAD to GIS Conversion	Public Works - Engineering	Data Administration	medium	288
CAD Integration	Public Works - Engineering	Data Administration	medium	288
Inspection Schedule Tool	Public Works - Building & Grounds	Spatial Model	medium	288
Public FOIL Response	Environmental Health	Query + Display	medium	250
Environmental Awareness Site	Planning, Development, Tourism	Query + Display	high	240
Caseworker/client Matching Tool	Probation	Map Analysis	medium	240
Registration of Scanned Images	Water District	Data Administration	high	240
FTP Site	Data Processing	Data Administration	medium	240
Vehicle Routing	Probation	Spatial Model	medium	240
Project Georeference Tool	Environmental Health	Data Administration	medium	240

Use: Weekly

Pictometry Display Tool	Industrial Development	Display	medium	192
Facility Management Tool	Sewer District	Query + Display	low	192
Cabling Display Tool	Data Processing	Display	high	192
CAD Integration	Public Works - Highway	Data Administration	medium	192
CAD to GIS Conversion	Public Works - Highway	Data Administration	medium	192
GIS Network Integration Tool	Data Processing	Spatial Model	high	192
Red Line Application	Real Property Tax Service	Data Administration	low	192
Pictometry Display Tool	Soil, Water Conservation District	Display	high	150
Outcome Assessment Tool	Public Health	Display	high	144
General Query Tool	Weights & Measures	Query + Display	medium	144
Database Integration	Water District	Data Administration	low	144
Leak Database	Water District	Data Administration	low	144

Application Name	Requesting Department	Application Type	Application Priority	# Times used / yr
Sex Offender Notification	Sheriff	Query + Display	medium	144
Hazmat Data Collection Tool	Fire & Emergency Services	Data Administration	medium	143
Ag Assessment Tool	Soil, Water Conservation District	Spatial Model	high	100
Data Entry/Retrieval Tool	Refuse Disposal District	Data Administration	high	96
Data Entry/Retrieval Tool	Refuse Disposal District	Data Administration	high	96
Power & Energy Awareness Site	Planning, Development, Tourism	Display	medium	96
General Query Tool	Refuse Disposal District	Query + Display	high	96
Maps & Directions	Human Resources	Query + Display	medium	96
Registration of Scanned Images	Public Works - Engineering	Data Administration	medium	96
Registration of Scanned Images	Public Works - Building & Grounds	Data Administration	medium	96
Registration of Scanned Images	Public Works - Highway	Data Administration	medium	96
Registration of Scanned Images	Planning, Development, Tourism	Data Administration	high	96
CAD to GIS Conversion	Water District	Data Administration	high	96
CAD Integration	Water District	Data Administration	high	96
Image Archive/Retrieval Tool	Sewer District	Data Administration	medium	96
Vehicle Routing	Weights & Measures	Spatial Model	low	96
Internet Access	Weights & Measures	Query + Display	high	96
Business Display Tool	Industrial Development	Query + Display	high	96
Title Search Tool	Industrial Development	Query + Display	high	96
Site Selection Prep Tool	Industrial Development	Data Administration	medium	96
Pictometry Display Tool	Public Works - Building & Grounds	Display	low	75
Pictometry Display Tool	Public Works - Engineering	Display	low	75
Pictometry Display Tool	Public Works - Highway	Display	low	75
Historic Preservation	Planning, Development, Tourism	Query + Display	low	72
CAD Integration	Public Works - Building & Grounds	Data Administration	medium	72
CAD to GIS Conversion	Public Works - Building & Grounds	Data Administration	medium	72
HEAP/STAR Tool	Social Services	Data Administration	low	70
Census Tracking Tool	Social Services	Data Administration	low	70
Resident Notification Application	Environmental Health	Map Analysis	medium	60
Employment/Unemployment Maps	Employment and Training	Map Analysis	high	60
Data Entry/Retrieval Tool	Sewer District	Data Administration	high	48
Data Entry/Retrieval Tool	Sewer District	Data Administration	high	48
Resident Notification Application	Refuse Disposal District	Map Analysis	medium	48
Reports to Legislature	Social Services	Data Administration	medium	48
FTP Site	Real Property Tax Service	Data Administration	medium	48
Vehicle Routing	Water District	Spatial Model	low	48
Inspection Schedule Tool	Code Enforcement	Spatial Model	low	48
Parks Planning Tool	Refuse Disposal District	Spatial Model	medium	48
Polling Location Map	Board of Elections	Query + Display	low	40
Bus Route/Van Service Analysis	Social Services	Map Analysis	medium	40
Pictometry Display Tool	Planning, Development, Tourism	Display	low	36
Recreation Map Generation	Planning, Development, Tourism	Display	low	36
Water Sample Analysis	Soil, Water Conservation District	Query + Display	medium	36
FTP Site	Soil, Water Conservation District	Data Administration	high	36
Project Georeference Tool	Planning, Development, Tourism	Data Administration	medium	36
Resident Notification Application	Public Health	Map Analysis	medium	30
Evacuation Planning / Response Tool	Fire & Emergency Services	Map Analysis	low	30
Shoreline Erosion Monitoring	Planning, Development, Tourism	Display	medium	24
Database Integration	Weights & Measures	Data Administration	high	24
Water Quality Sampling Capture Tool	Soil, Water Conservation District	Data Administration	medium	24
Accident Tracking Tool	Risk/Insurance	Display	medium	24

Application Name	Requesting Department	Application Type	Application Priority	# Times used / yr
Parcel Filter Tool	Real Property Tax Service	Query + Display	medium	24

Use: Monthly / Annual

UFPO Tool	Public Works - Engineering	Display	medium	12
Database Integration	Fire & Emergency Services	Data Administration	low	12
Projection Wizard Tool	Soil, Water Conservation District	Data Administration	high	12
Vehicle Routing	Planning, Development, Tourism	Spatial Model	low	12
Election District Verification	Board of Elections	Map Analysis	low	12
Backyard Address Generator	Sheriff	Spatial Model	medium	12
Veterans Services Planning	Veterans Services	Display	low	8
Ditch Survey Tool	Soil, Water Conservation District	Map Analysis	low	8
Pavement Management Tool	Public Works - Highway	Data Administration	high	8
Survey Data Integration	Public Works - Engineering	Data Administration	high	8
Workers Compensation Tracking	Risk/Insurance	Query + Display	medium	8
Land Ownership Maps	Planning, Development, Tourism	Data Administration	high	4
Retiree Tracking	Risk/Insurance	Data Administration	low	4
Erosion Monitoring Tool	Soil, Water Conservation District	Spatial Model	low	2
Election District Tool	Board of Elections	Map Analysis	low	2
Vegetative Assessment	Soil, Water Conservation District	Map Analysis	low	1
Computer Inventory Tool	Data Processing	none	none	0
No Applications Requested	Management and Budget	none	none	0
No Applications Requested	Clerk	none	none	0
No Applications Requested	Audit	none	none	0
No Applications Requested	Historian	none	none	0

APPENDIX D: GIS USE AND COST SAVINGS BY DEPARTMENT, BY APPLICATION

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Audit

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
No Applications Requested	none	none	0	0	0 x per day	0.00	$0

Department SAVINGS per year: 0 hrs $0

Dept: Board of Elections

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Election District Tool	Map Analysis	low	1	2	1 x per year	56.00	$1,904
Election District Verification	Map Analysis	low	2	2	6 x per year	1.00	$204
Polling Location Map	Query + Display	low	3	2	20 x per year	0.33	$227

Department SAVINGS per year: 137 hrs $2,335

Dept: Clerk

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
No Applications Requested	none	none	0	0	0 x per day	0.00	$0

Department SAVINGS per year: 0 hrs $0

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Code Enforcement

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
General Query Tool	Query + Display	high	1	1	2 x per day	0.25	$2,160
Hand Held Data Entry Tool	Data Administration	medium	2	1	4 x per day	0.33	$5,760
Inspection Schedule Tool	Spatial Model	low	3	1	1 x per week	1.50	$1,440

Department SAVINGS per year: 512 hrs $9,360

Dept: Data Processing

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Cabling Display Tool	Display	high	1	4	1 x per week	0.50	$1,920
Computer Inventory Tool	none	none	0	0	0 x per day	0.00	$0
FTP Site	Data Administration	medium	2	20	1 x per month	1.00	$4,080
GIS Network Integration Tool	Spatial Model	high	1	4	1 x per week	0.50	$1,920

Department SAVINGS per year: 432 hrs $7,920

Dept: Employment and Training

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Database Integration	Data Administration	high	3	5	1 x per day	1.00	$20,400
Employment/Unemployment Maps	Map Analysis	high	2	5	1 x per month	0.17	$200
Job Search Tool	Spatial Model	high	1	10	6 x per day	0.25	$54,000
Maps & Directions	Query + Display	medium	4	10	6 x per day	0.08	$18,000

Department SAVINGS per year: 6,010 hrs $92,600

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Environmental Health

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
General Query Tool	Query + Display	high	1	30	1 x per day	0.33	$55,200
Human & Environmental Communicable Disease Monitoring Tool	Query + Display	high	2	10	3 x per week	0.25	$9,360
Project Georeference Tool	Data Administration	medium	5	10	2 x per month	0.75	$4,320
Public FOIL Response	Query + Display	medium	7	5	50 x per year	1.00	$6,250
Resident Notification Application	Map Analysis	medium	3	5	1 x per month	0.17	$300
Vehicle Routing	Spatial Model	low	4	20	1 x per week	1.00	$19,200
Water Quality Sampling Capture Tool	Data Administration	high	3	15	3 x per month	0.50	$6,750

Department SAVINGS per year: 4,430 hrs $101,380

Dept: Fire & Emergency Services

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
911 Call Display Tool	Map Analysis	high	1	12	3 x per everyday	0.17	$37,230
Arson Assessment Tool	Map Analysis	medium	5	5	75 x per year	1.00	$6,750
Automated Vehicle Locator	Spatial Model	medium	6	4	24 x per everyday	0.08	$49,640
Database Integration	Data Administration	low	8	1	1 x per month	-1.00	($216)
Evacuation Planning / Response Tool	Map Analysis	low	7	30	1 x per year	2.00	$1,080
General Query Tool	Query + Display	high	2	30	2 x per week	0.33	$15,360
Hazmat Data Collection Tool	Data Administration	medium	4	143	1 x per year	4.00	$9,152
Pictometry Display Tool	Display	high	3	4	4 x per everyday	0.33	$33,093

Department SAVINGS per year: 9,012 hrs $152,089

Dept: Historian

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
No Applications Requested	none	none	0	0	0 x per day	0.00	$0

Department SAVINGS per year: 0 hrs $0

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Human Resources

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Maps & Directions	Query + Display	medium	1	2	1 x per week	0.25	$384

Department SAVINGS per year: 24 hrs $384

Dept: Industrial Development

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Business Display Tool	Query + Display	high	2	2	1 x per week	0.67	$1,280
General Query Tool	Query + Display	medium	3	2	2 x per day	0.17	$2,880
Pictometry Display Tool	Display	medium	5	2	2 x per week	0.17	$576
Site Selection Prep Tool	Data Administration	medium	4	2	1 x per week	2.00	$3,072
Title Search Tool	Query + Display	high	1	2	1 x per week	1.00	$1,920

Department SAVINGS per year: 544 hrs $9,728

Dept: Management and Budget

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
No Applications Requested	none	none	0	0	0 x per day	0.00	$0

Department SAVINGS per year: 0 hrs $0

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Planning, Development, Tourism

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Environmental Awareness Site	Query + Display	high	5	5	1 x per week	0.50	$1,800
General Query Tool	Query + Display	high	1	8	2 x per day	0.17	$10,240
Historic Preservation	Query + Display	low	9	3	2 x per month	1.00	$1,152
Land Ownership Maps	Data Administration	high	6	1	1 x per quarter	20.00	$1,360
Pictometry Display Tool	Display	low	12	3	1 x per month	0.25	$162
Power & Energy Awareness Site	Display	medium	7	2	1 x per week	0.33	$576
Project Display Tool	Query + Display	medium	7	8	1 x per week	1.00	$6,528
Project Georeference Tool	Data Administration	medium	7	3	1 x per month	-2.00	($1,080)
Recreation Map Generation	Display	low	10	3	1 x per month	2.00	$1,152
Registration of Scanned Images	Data Administration	high	3	2	1 x per week	-2.00	($2,304)
Scanned Image Integration	Display	high	4	5	1 x per day	0.33	$7,200
Shoreline Erosion Monitoring	Display	medium	8	2	1 x per month	3.00	$1,296
Vehicle Routing	Spatial Model	low	11	1	1 x per month	1.50	$270
Web Based Site Selection	Query + Display	high	2	5	3 x per week	1.00	$12,240

Department SAVINGS per year: 2,355 hrs $40,592

Dept: Probation

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Caseworker/client Matching Tool	Map Analysis	medium	4	1	1 x per day	0.50	$3,000
Database Integration	Data Administration	high	1	22	3 x per day	0.17	$39,600
Electronic Home Monitoring Tool	Map Analysis	high	2	22	1 x per day	0.33	$26,400
General Query Tool	Query + Display	medium	3	22	2 x per week	0.08	$2,640
Vehicle Routing	Spatial Model	medium	4	1	1 x per day	1.50	$5,400

Department SAVINGS per year: 5,056 hrs $77,040

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Public Citizens

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
ArcIMS Server	Query + Display	high	1	100	1 x per day	0.08	$30,000
Countertop Kiosk Query Tool	Query + Display	medium	4	20	1 x per day	0.50	$36,000
Pictometry Display Tool	Display	medium	3	50	2 x per week	0.33	$32,000
Sex Offender Notification	Query + Display	high	2	1000	1 x per year	1.00	$15,000

Department SAVINGS per year: 7,000 hrs $113,000

Dept: Public Health

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
General Query Tool	Query + Display	high	3	75	1 x per day	0.08	$22,500
Human & Environmental Communicable Disease Monitoring Tool	Query + Display	high	2	4	1 x per day	1.00	$19,200
Nurse/patient Matching Tool	Query + Display	low	5	4	1 x per day	1.00	$19,200
Outcome Assessment Tool	Display	high	1	6	2 x per month	1.00	$2,880
Resident Notification Application	Map Analysis	medium	4	10	3 x per year	16.00	$8,160
Vehicle Routing	Spatial Model	low	6	4	1 x per day	1.00	$19,200

Department SAVINGS per year: 5,004 hrs $91,140

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Public Works - Building & Grounds

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
CAD Integration	Data Administration	medium	4	3	2 x per month	0.50	$612
Document Management Tool	Query + Display	high	1	3	1 x per day	0.50	$5,400
Facility Management Tool	Query + Display	high	2	2	3 x per week	1.00	$4,896
General Query Tool	Query + Display	high	2	3	1 x per day	0.25	$2,700
Inspection Schedule Tool	Spatial Model	medium	3	2	3 x per week	1.00	$4,896
Pictometry Display Tool	Display	low	5	3	25 x per year	0.50	$638
Registration of Scanned Images	Data Administration	medium	3	2	1 x per week	-1.00	($1,440)

Department SAVINGS per year: 1,094 hrs $17,702

Dept: Public Works - Engineering

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
CAD Integration	Data Administration	medium	4	3	2 x per week	1.00	$5,184
Document Management Tool	Query + Display	high	1	2	10 x per week	0.33	$5,760
General Query Tool	Query + Display	high	2	3	1 x per day	0.25	$3,600
Pictometry Display Tool	Display	low	5	3	25 x per year	0.50	$750
Registration of Scanned Images	Data Administration	medium	3	2	1 x per week	-1.00	($1,632)
Survey Data Integration	Data Administration	high	2	1	8 x per year	40.00	$7,040
UFPO Tool	Display	medium	3	1	1 x per month	4.00	$960

Department SAVINGS per year: 1,098 hrs $21,662

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Public Works - Highway

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Automated Vehicle Locator	Spatial Model	medium	4	2	1 x per day	1.50	$15,840
Bridge Inspection Tool	Data Administration	high	3	3	1 x per day	0.50	$7,200
CAD Integration	Data Administration	medium	6	2	2 x per week	1.00	$3,456
Document Management Tool	Query + Display	medium	5	2	10 x per week	1.00	$19,200
General Query Tool	Query + Display	high	2	3	1 x per day	0.25	$3,600
Pavement Management Tool	Data Administration	high	1	4	2 x per year	32.00	$6,400
Pictometry Display Tool	Display	low	8	3	25 x per year	0.50	$750
Registration of Scanned Images	Data Administration	medium	3	2	1 x per week	-1.00	($1,632)
Sign Management Tool	Data Administration	high	2	1	2 x per day	0.50	$4,800

Department SAVINGS per year: 2,850 hrs $59,614

Dept: Real Property Tax Service

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
CAD to GIS Conversion	Data Administration	high	1	4	1 x per day	0.50	$8,160
Countertop Kiosk Query Tool	Query + Display	low	9	4	1 x per day	0.25	$4,080
FTP Site	Data Administration	medium	6	4	1 x per month	1.00	$816
General Query Tool	Query + Display	high	3	6	4 x per day	0.25	$24,480
Parcel Filter Tool	Query + Display	medium	5	2	1 x per month	3.00	$1,224
Pictometry Display Tool	Display	high	4	4	2 x per week	0.75	$4,896
Red Line Application	Data Administration	low	8	4	1 x per week	0.75	$2,448
Scanned Image Integration	Display	low	7	6	2 x per week	0.25	$2,448

Department SAVINGS per year: 2,856 hrs $48,552

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Refuse Disposal District

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Data Entry/Retrieval Tool	Data Administration	high	1	2	1 x per week	1.00	$1,728
General Query Tool	Query + Display	high	1	2	1 x per week	1.00	$1,728
Parks Planning Tool	Spatial Model	medium	3	1	1 x per week	6.00	$5,184
Resident Notification Application	Map Analysis	medium	2	1	1 x per week	16.00	$13,824

Department SAVINGS per year: 1,248 hrs $22,464

Dept: Risk/Insurance

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Accident Tracking Tool	Display	medium	1	1	2 x per month	1.00	$384
Retiree Tracking	Data Administration	low	3	1	1 x per quarter	1.00	$64
Workers Compensation Tracking	Query + Display	medium	2	1	2 x per quarter	0.50	$64

Department SAVINGS per year: 32 hrs $512

Dept: Sewer District

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Data Entry/Retrieval Tool	Data Administration	high	1	4	1 x per month	2.00	$2,400
Facility Management Tool	Query + Display	low	5	4	1 x per week	1.50	$5,760
Image Archive/Retrieval Tool	Data Administration	medium	4	2	1 x per week	-2.00	($3,072)
Integration of SCADA with GIS	Spatial Model	medium	3	1	24 x per day	0.03	$3,840
Water Sample Analysis	Query + Display	high	2	1	30 x per day	0.08	$9,600

Department SAVINGS per year: 984 hrs $18,528

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Sheriff

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
911 Call Display Tool	Map Analysis	high	2	3	48 x per everyday	0.02	$13,140
Accident Tracking Tool	Display	medium	7	5	2 x per week	1.00	$7,200
Automated Vehicle Locator	Spatial Model	high	3	3	48 x per everyday	0.08	$65,700
Backyard Address Generator	Spatial Model	medium	8	3	0.33 x per month	24.00	$3,453
Beat Maps	Query + Display	high	4	16	1 x per day	0.33	$19,200
Complaint Logger Tool	Data Administration	high	4	3	24 x per everyday	0.25	$98,550
Crime Analysis	Map Analysis	medium	6	3	1 x per day	3.00	$32,400
Database Integration	Data Administration	high	1	20	24 x per everyday	0.08	$219,000
Pictometry Display Tool	Display	high	3	20	12 x per everyday	0.08	$109,500
Sex Offender Notification	Query + Display	medium	5	3	1 x per week	1.00	$2,160

Department SAVINGS per year: 38,078 hrs $570,303

Dept: Social Services

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Bus Route/Van Service Analysis	Map Analysis	medium	6	10	1 x per quarter	2.00	$2,000
Caseworker/client Matching Tool	Map Analysis	high	5	70	30 x per year	0.50	$21,000
Census Tracking Tool	Data Administration	low	10	70	1 x per year	-1.00	($1,750)
Database Integration	Data Administration	high	1	70	1 x per day	0.50	$168,000
General Query Tool	Query + Display	medium	5	70	2 x per week	0.08	$11,200
HEAP/STAR Tool	Data Administration	low	9	70	1 x per year	8.00	$11,200
Job Search Tool	Spatial Model	high	4	70	2 x per week	0.25	$33,600
Reports to Legislature	Data Administration	medium	8	4	1 x per month	1.50	$1,800
Resolve Address Issue	Data Administration	high	2	70	1 x per day	-0.08	($28,000)
Service Provider Lookup	Query + Display	high	3	70	3 x per week	0.08	$16,800

Department SAVINGS per year: 11,772 hrs $235,850

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Soil, Water Conservation District

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Ag Assessment Tool	Spatial Model	high	5	2	50 x per year	1.00	$1,500
Ditch Survey Tool	Map Analysis	low	8	2	1 x per quarter	10.00	$1,200
Erosion Monitoring Tool	Spatial Model	low	9	2	1 x per year	20.00	$600
FTP Site	Data Administration	high	1	3	1 x per month	1.00	$540
General Query Tool	Query + Display	high	3	3	100 x per year	0.50	$2,250
Pictometry Display Tool	Display	high	4	3	50 x per year	0.25	$563
Projection Wizard Tool	Data Administration	high	2	2	6 x per year	1.00	$180
Vegetative Assessment	Map Analysis	low	10	1	1 x per year	5.00	$75
Water Quality Sampling Capture Tool	Data Administration	medium	6	3	8 x per year	6.00	$2,160
Water Sample Analysis	Query + Display	medium	7	3	12 x per year	8.00	$4,320

Department SAVINGS per year: 893 hrs $13,388

Dept: Veterans Services

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Veterans Services Planning	Display	low	1	2	1 x per quarter	1.00	$144

Department SAVINGS per year: 8 hrs $144

APPENDIX D: for Niagara County

DEPARTMENT COST SAVINGS - BY GIS APPLICATION

Dept: Water District

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
CAD Integration	Data Administration	high	4	1	2 x per week	0.50	$816
Data Entry/Retrieval Tool	Data Administration	high	2	2	1 x per day	-1.00	($8,160)
Database Integration	Data Administration	low	7	3	1 x per week	0.25	$540
General Query Tool	Query + Display	high	3	3	3 x per day	0.25	$9,180
Integration of SCADA with GIS	Spatial Model	high	5	3	6 x per day	0.25	$16,200
Leak Database	Data Administration	low	8	3	1 x per week	0.50	$1,080
Registration of Scanned Images	Data Administration	high	1	1	1 x per day	-3.00	($10,800)
Vehicle Routing	Spatial Model	low	9	1	1 x per week	1.50	$1,080
Zoom Tool	Display	high	6	3	3 x per day	0.00	$135

Department SAVINGS per year: 657 hrs $10,071

Dept: Weights & Measures

Application Name	Application Type	Priority	App. Rank by Dept.	# of Users	Frequency of Use	Hrs Saved/Use	Dollars Saved/Yr
Database Integration	Data Administration	high	1	1	2 x per month	1.50	$720
General Query Tool	Query + Display	medium	2	3	1 x per week	0.33	$720
Internet Access	Query + Display	high	3	2	1 x per week	0.50	$960
Vehicle Routing	Spatial Model	low	4	1	2 x per week	2.00	$3,264

Department SAVINGS per year: 324 hrs $5,664

Niagara County

TOTAL SAVINGS

102,408 hrs $1,722,021

APPENDIX E: GIS APPLICATION FREQUENCY AND SAVINGS BY DEPARTMENT, BY TYPE

APPENDIX E: *for: Niagara County*

GIS APPLICATION FREQUENCYOF USE and SAVINGS BY DEPARTMENT BY TYPE

Department	*Count of Applications by Type for Each Dept.*					*Total Development Cost Estimate (based on App. Type)*	*Productivity Savings based on Time Savings*	*Projected Annual Savings (Development Costs - Time Savings)*
	Display	*Query & Display*	*Map Analysis*	*Data Admin*	*Spatial Model*			
App. type development cost:	*$500*	*$1,000*	*$1,200*	*$1,600*	*2,000*	*Count x AppType Cost*	*(See Appendix D)*	
Audit						$0	$0	$0
Board of Elections		1	2			$3,400	$2,335	($1,065)
Clerk						$0	$0	$0
Code Enforcement		1		1	1	$4,600	$9,360	$4,760
Data Processing	1			1	1	$4,100	$7,920	$3,820
Employment and Training		1	1	1	1	$5,800	$92,600	$86,800
Environmental Health		4	1	2	1	$10,400	$101,380	$90,980
Fire & Emergency Services	1	1	3	2	1	$10,300	$152,089	$141,789
Historian						$0	$0	$0
Human Resources		1				$1,000	$384	($616)
Industrial Development	1	3		1		$5,100	$9,728	$4,628
Management and Budget						$0	$0	$0
Planning, Development, Tourism	5	5		3	1	$14,300	$40,592	$26,292
Probation		1	2	1	1	$7,000	$77,040	$70,040
Public Citizens	1	3				$3,500	$113,000	$109,500
Public Health	1	4	1		1	$7,700	$91,140	$83,440
Public Works - Building & Grounds	1	3		3	1	$10,300	$17,702	$7,402
Public Works - Engineering	2	2		4		$9,400	$21,662	$12,262
Public Works - Highway	1	2		6	1	$14,100	$59,614	$45,514

Department	Count of Applications by Type for Each Dept.					Total Development Cost Estimate (based on App. Type)	Productivity Savings based on Time Savings	Projected Annual Savings (Development Costs - Time Savings)
	Display	Query & Display	Map Analysis	Data Admin	Spatial Model			
App. type development cost:	$500	$1,000	$1,200	$1,600	2,000	Count x AppType Cost	(See Appendix D)	
Real Property Tax Service	2	3		4		$10,400	$48,552	$38,152
Refuse Disposal District		1	1	2	1	$7,400	$22,464	$15,064
Risk/Insurance	1	1		1		$3,100	$512	($2,588)
Sewer District		2		3	1	$8,800	$18,528	$9,728
Sheriff	2	2	2	2	2	$12,600	$570,303	$557,703
Social Services		2	2	5	1	$14,400	$235,850	$221,450
Soil, Water Conservation District	1	2	2	3	2	$13,700	$13,388	($313)
Veterans Services	1					$500	$144	($356)
Water District	1	1		7	2	$16,700	$10,071	($6,629)
Weights & Measures		2		1	1	$5,600	$5,664	$64
TOTAL Savings:	**22**	**48**	**17**	**53**	**20**	**$204,200**	**$1,722,021**	**$1,517,821**

Note: Costs for hardware, software and data are not included in this summary - only staff productivity estimates.
Zero, negative, or low savings indicate departments which should not immediately embrace GIS.

APPENDIX F: GIS DATA LAYERS – MASTER INVENTORY AND CONVERSION COSTS

APPENDIX F1: Organization: Niagara County

MASTER DATA LAYER INVENTORY and CONVERSION COSTS BY PRIORITY

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
911 Call Database	6										H			$4,000	$4,000				Emergency Response
Accident Database	9										H			$6,200	$6,200				Sheriff Department
Adult Entertainment Locations	9	H										N	H	$500		$500			Business Database CD or phone books
Aerial Photos (Oblique - Pictomet	38		H											$25,000	$25,000	$25,000			Pictometry
Ag Districts	36			H		N								$8,000			$8,000		RPTS and Soil & Water Conservation D
Airports	11			H		N					N		H	$500	$500				Planning
Aquifers	6			H		H							H	$1,500		$1,500			Consultant studies and Planning depart
Archaeological Sites	2	H		H		N				H	H	N	H	$1,200				$1,200	Consultant studies and Planning depart
Bars	9	H								H	N	N		$500			$500		Business Database CD or phone books
Basemap Data	3					H					H			$0					All departments
Bird Viewing Sites	4			H		N				H	N		H	$750			$750		Planning
Boat Ramps	4	H		H		N				H	N		H	$750			$750		Planning
Bridges	17			H		N	H	N	H		H		H	$5,000	$5,000				DOT / Highway
Brownfields	18					H					H		H	$250	$250				Consultant studies
Building & Room Database	11						H		H	H	N		H	$8,000		$8,000			Buildings and Grounds
Building Floorplans	12					N	H	N	H		N		H	$12,000		$12,000			Buildings and Grounds
Building Footprints	12					N		H						$12,000				$12,000	Aerial Photos
Building Permits	2					N				H	N	N	H	$6,000			$6,000		Code Enforcement
Bus Routes	22			H		N					N		H	$250		$250			NFTA
Bus Stops	13			H		N					N		H	$250		$250			NFTA
Business Database	18										N	N		$1,000	$1,000				Data Vendors

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Business License Database	3									H	N		H	$5,000		$5,000			County Clerk
Business Locations	19									H	N	N		$1,500		$1,500			Business Database CD or phone books
Cable Lines	15					N	N		N		N			$15,000			$15,000		Cable companies
CAD Drawings	18								N					$1,500		$1,500			All Departments
CAD World Files	12								H		N			$1,500		$1,500			registration process
Campsites	3			H		N							H	$500			$500		Planning
Case Management System	9										H	N		$9,000		$9,000			Social Services
Census Blocks/Tracts	35					N					N			$100	$100				Census Bureau
Chamber of Commerce Databas	4										N	N		$750			$750		Chamber of Commerce
Churches	12					N					N			$100		$100			RPTS
Client Database	12										H	N		$1,500		$1,500			Social Services
Clinic Locations	9									H	N	N		$500		$500			Business Database CD or phone books
Command Center	3	H										N	H	$500	$500				Emergency Response
Communicable Disease Databas	6									H	N	N	H	$8,000		$8,000			Public Health
Community Centers	13					H					N			$1,300		$1,300			RPTS
Complaint Database	9									H	N	N	H	$8,600		$8,600			All Departments
Computed Routes and Directions	5					H					H			$0			$0		Routing package
Contours	18		N		N	H								$2,500			$2,500		Computed from elevations
Contract Polygons	2					N	H	H						$3,500	$3,500				Water District
Counseling Agency Locations	4										H	N		$1,500		$1,500			Social Services
County Employee Database	3										N			$7,500			$7,500		Human Resource Department
County Owned Building Footprint	10					H					N			$8,500			$8,500		RPTS extract and heads up digitizing
County Owned Properties	24					H					N			$200		$200			RPTS extract
County Retiree Database	3										H	N	H	$1,800				$1,800	Human Resource Department

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
County RPTS Database	18					H					H		H	$13,500	$13,500				RPTS Informix database
Court House Locations	10			H		N					N		H	$200		$200			Business Database CD or phone books
Crime Database	12										H	N		$8,500	$8,500				Sheriff Department
Daycare Centers	14									H	H	N		$2,350		$2,350			Business Database CD or phone books
DEC Spill List	6					N								$100	$100				NYS DEC
Decontamination Sites	3					N						N	H	$250	$250				Emergency Response
Detailed Campus Maps	3			H		N		N						$500		$500			Employment and Training
Detention Facility Locations	7			H		N					N		H	$300	$300				force geocode
Digital Elevation Models (DEMs)	8				N									$5,500			$5,500		NYS GIS Clearinghouse
Digital Ortho Photos (DOQs)	113		N											$6,500	$6,500				NYS GIS Clearinghouse
Digital Photos	13		N											$1,200		$1,200			Digital camera
Ditches	3		H			N	H				N		H	$3,750				$3,750	Soil & Water Conservation District
DOL Job Database	12										H	N		$7,500		$7,500			NYS DOL
DSS Case Database	21										H	N		$500			$500		Social Services
Easements	4	H				N					N		H	$20,000				$20,000	County Clerk
Economic Development Databas	8										H	N		$7,500		$7,500			IDA
Election Districts	12			H		N								$7,500				$7,500	Board of Elections
Electrical Utility Lines	13			N		N	N		N		N			$25,000				$25,000	NYSEG / NIMO
Elevation Monumentation	3			H		N					N		H	$6,750			$6,750		Engineering Department
Elevator Locations	6					N		H		H	N		H	$2,500			$2,500		Code Enforcement
Employer Database	6										N	N		$9,500			$9,500		Employment and Training
Employment & Training Databas	9										H	N	H	$1,250			$1,250		Employment and Training
Environmentally Sensitive Sites	5	H		H		N					N		H	$750	$750				NYS DEC
EPA Database	3										H			$1,000	$1,000				EPA

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
EPA Site Locations	17					N					H			$100	$100				EPA
Equipment Maintenance Databas	6										N		H	$1,250			$1,250		Buildings and Grounds
Erosion Zones	12			H		N		N			N		H	$2,600			$2,600		image analysis
Evacuation Shelters	3	H				N						N	H	$800	$800				RPTS
Fire Districts	28			H		N					N			$800	$800				Fire Coordinator
Fire Halls	17			H		N					N			$400	$400				Fire Coordinator
Fire History Database	3										N			$4,500		$4,500			Fire Coordinator
Fishing Sites	4	H		H		N					N		H	$750			$750		Planning
Floodplains	32			N		H	H	H			H			$2,500	$2,500				FEMA
Gas Lines	12			N		N	N				N			$20,000				$20,000	NYSEG / National Fuel
Gas Wells	3			H		N					N		H	$5,500			$5,500		Planning
Geocoded Addresses	71	H									N	N	H	$4,500	$4,500				All Departments
Geocoded Client Home Address	12					N					H	N		$1,200		$1,200			Social Services / Employment & Trainin
Geocoded Inspection Locations	15	H									N	N		$1,200			$1,200		Code Enforcement
Geocoded Job Opening Address	9	H								H	N	N		$1,200			$1,200		Employment and Training
Geocoded Lab Samples	9									H	N	N		$1,200		$1,200			Public Health
Geocoded Occurrence Locations	12									H	N	N		$1,200		$1,200			Public Health
Geology (bedrock)	7			N		N								$200			$200		NYS GIS Clearinghouse
Geology (surface)	10			N		N								$200			$200		NYS GIS Clearinghouse
Georeferenced Scanned Contrac	3			H				N						$8,500	$8,500				Water District
Georeferenced Scanned Images	3			H				N						$2,500		$2,500	$2,500		All Departments
Georeferenced Scanned Images	16							N			N			$0	$0				All Departments
GPS Survey Data	3										N		N	$5,000			$5,000		field data collection
Ground Control Points	3										N			$1,000		$1,000	$1,000	$1,000	Engineering / local surveyors

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Hazardous Material Inventory	**14**	H									N			$2,500	$2,500	$2,500			Fire Coordinator
Hazardous Materials Sites	**23**	H								H	N	N	H	$400	$400				NYS DEC
Historic Parcel Database	**4**									H	N		H	$5,000		$5,000			RPTS
Historical Sites	**7**	H	N	H		N				H		N	H	$500				$500	Municipal Historians
Hospitals	**20**	H									N	N	H	$150	$150				Public Health
Hotlinks to Features	**6**		N			N		N			N			$2,500		$2,500			All Departments
House Numbers	**6**					H					H			$1,200	$1,200				RPTS
Hydrants	**14**			H		N	H	H	H					$4,000	$4,000	$4,000			Water District
Hydrology	**82**	H				H					N			$3,750		$3,750			derive from USGS DOQs
IDA Projects	**20**			H		N					N	N	H	$750		$750			IDA
Inclusion/Exclusion Zones	**3**			H		N						N	H	$3,500				$3,500	Probation
Inspection Database	**21**									H	N			$3,500		$3,500			Code Enforcement
Inspection Database (Handheld)	**3**										N			$2,500			$2,500		Code Enforcement
Interactive VRML Photos	**2**		N										H	$3,000				$3,000	Digital camera
Job Opening Database	**5**										N		N	$2,500		$2,500			Employment and Training
Keyword Database	**12**							H		H	N		H	$3,000	$3,000	$3,000	$3,000	$3,000	All Departments
Lab Analysis Database	**9**									H	N		H	$3,000	$3,000	$3,000	$3,000	$3,000	Public Health
Landfills	**32**			H		N	H		H	H	N		H	$8,500			$8,500		Solid Waste
Landuse	**34**					H					N			$500	$500				RPTS
Leak Locations	**3**						H			H	N	N	H	$9,000		$9,000	$9,000		Water District
Legislative Districts	**8**			H		N					N			$2,200		$2,200			Board of Election
Lighting Districts	**10**			H		N			N		N			$800			$800		RPTS
Liquor Stores	**10**	H								H	N	N		$500			$500		Business Database CD or phone books
Maintenance History Database	**3**									H	N		H	$4,500			$4,500		Buildings and Grounds

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Meter Pit Locations	**6**					N		H		H	N		H	$6,500		$6,500			Water District
Meter Reading Database	**8**										H			$6,500		$6,500			Water District
Meter Reading District Outlines	**10**			H		N		H			N		H	$2,500		$2,500			Water District
Municipal Boundaries	**130**					N			H		N			$200	$200				RPTS
Network Schematic	**3**		H			N		H			N		H	$6,500		$6,500			IT Department
New World AS400 Database	**6**										H		H	$13,000		$13,000			Fire Coordinator
Nurses Addresses	**3**									H	N	N		$500		$500			Public Health
Nursing Homes	**5**									H	N	N		$500	$500				Business Database CD or phone books
Occurrence Database	**3**										H			$3,000		$3,000			Public Health
Parcel Outlines	**295**	H				N			H		H			$1,000	$1,000	$1,000	$1,000	$1,000	RPTS
Parks	**14**			H		N							H	$5,000			$5,000		Planning
Paths & Trails	**12**			H		N					H			$1,500	$1,500				Planning
Patient Addresses	**3**									H	N	N	H	$3,750	$3,750	$3,750	$3,750	$3,750	Public Health
Pavement	**22**	H				N				H	N		H	$4,500		$4,500	$4,500	$4,500	Highway Department
Pharmacy Locations	**3**									H	N	N		$750	$750				Business Database CD or phone books
Phone CDs	**2**										N			$500	$500	$500	$500	$500	Data Vendors
Phone Wires	**14**			N		N	N				N			$12,000				$12,000	local phone company
Picnic Sites	**5**			H		N		H			N		H	$1,000			$1,000		Planning
Plume Outline	**3**					N					N			$2,500	$2,500				CAMEO system
Police Districts	**19**	H				N					N		H	$1,500	$1,500				Sheriff Department
Police Stations	**10**	H									N	N	H	$500	$500				Sheriff Department
Polling Places	**5**	H									N	N	H	$500				$500	Board of Elections
Pre-plan Printouts	**9**	H	N				H	N			N		H	$1,500	$1,500	$1,500	$1,500	$1,500	Fire Coordinator
Preventative Maintenance Datab	**3**	H	N			N	H	N	H		N		H	$9,000		$9,000			Buildings and Grounds

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Probation Database	15									H	N		H	$6,000			$6,000		Probation
Project Database	6	H	N					N			N		H	$2,000		$2,000	$2,000	$2,000	All Departments
Project Outline Polygons	35	H				N					N			$1,500		$1,500	$1,500	$1,500	All Departments
Projection Metadata	4					H					N		H	$2,500	$2,500				NYS GIS Clearinghouse
Pump Stations	3	H				N	H	N	H		N		H	$1,200		$1,200			Sewer District
Railroads	27		N	H		N	H				N			$15,000		$15,000			Planning
Recreational Equipment (swing s	3			H		N	H	N			N		H	$500		$500	$500	$500	Planning
Red Line Layers	6					H		N		H			H	$1,200	$1,200				RPTS
Resident Phone Numbers	3										N			$500	$500	$500	$500	$500	Phone CDs
Sample Data Locations	9									H	N	N	H	$1,200		$1,200	$1,200	$1,200	Environmental Health
Sample Data Results	6					H					N			$750		$750	$750	$750	Environmental Health
Saved Extent Files	3					H					N		H	$800	$800				All Departments
SCADA Sites	12			H		N		H			N		H	$800			$800		Water District
Scanned As-Built Drawings	39	H	N	H		N	H	N						$1,750		$1,750			Public Works
Scanned Brochures	3		H					N						$750			$750		Planning
Scanned EA-5217 Forms	9													$500		$500	$500	$500	RPTS
Scanned Floor Plans	22	H						N					H	$9,000	$9,000	$9,000	$9,000	$9,000	Buildings and Grounds / Fire Coordinat
Scanned Index Cards	9	H	N				H	N				N		$1,500			$1,500		All Departments
Scanned Maintenance Manuals	3	H	N					N					H	$4,000		$4,000	$4,000	$4,000	Buildings and Grounds
Scanned or Digital Photos	26	H	N			H		N			N			$1,000	$1,000	$1,000	$1,000	$1,000	All Departments
Scanned Plot Book Pages	8	H	N				H	N				N		$1,500		$1,500			RPTS
School Districts	17			H		N					N			$800		$800			Planning
Schools	29	H				N						N		$200	$200				Planning
Septic Tank Locations	9	H				N	H	N			N	N		$7,500				$7,500	Code Enforcement

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Service Provider Locations	**6**									H	H	N	H	$1,200		$1,200			DSS
Service Recipients (geocoded ad	**3**									H	H	N	H	$2,750		$2,750	$2,750	$2,750	DSS
Sewer Districts	**14**			H		N					N			$800	$800				Sewer District
Sewer Facilities	**23**			H		N	H				N			$3,500		$3,500	$3,500	$3,500	Sewer District
Sewer Mains	**25**		N	H		H	H				N			$3,000		$3,000	$3,000	$3,000	Sewer District
Sex Offender Database	**6**									H	H	N	H	$6,500	$6,500				Sheriff Department
Shoreline Current Data	**3**		N	N		N		N			N		H	$4,000			$4,000	$4,000	Planning
Shoreline Structures	**3**		N	N		N		N			N		H	$2,000			$2,000	$2,000	Planning
Shorelines Historic Data	**3**		N	N		N		N			N		H	$3,000			$3,000	$3,000	Planning
SIC Code Information	**6**										N	N	H	$500	$500	$500	$500	$500	Business Database CD
Sign Inventory Database	**3**	H				N				H	N		H	$9,000		$9,000	$9,000	$9,000	Highway Department
Sign Locations	**3**	H		H		N				H	N		H	$9,500		$9,500			Highway Department
Significant Users	**9**					N					N		H	$2,200		$2,200			Sewer District
Snowmobile Trails	**4**			H		N					N		H	$1,200				$1,200	Planning
Soils	**32**			N		N					N			$500			$500		USDA Soil Conservation
Solar Power Grids	**3**			H		N					N		H	$1,500			$1,500		Planning
SPEDES Permits	**6**					N					N		H	$200	$200				NYS DEC
Spill Locations	**3**					N					N		H	$200	$200				NYS DEC
Sprinkler Systems	**3**	H				N	N	N	N		N		H	$6,000	$6,000	$6,000	$6,000	$6,000	Fire Coordinator
State Crime Database	**3**										H	N	H	$9,500	$9,500				State Police
State DSS Database	**6**										N		H	$3,500	$3,500				State DSS
Steep Slope Regions	**8**			H	N	N					N		H	$1,300			$1,300		Planning
Storm Drainage Receivers	**3**	H		H		N			H		N		H	$6,000				$6,000	Sewer District
Street Centerlines	**329**			H		N					N			$500	$500				Data Vendors / DOT-DMV

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Street Names	17					N	H		H		N		H	$3,800	$3,800	$3,800	$3,800	$3,800	Street Centerlines
Subdivisions	8	H		H		N								$6,650	$6,650	$6,650	$6,650	$6,650	Planning
Survey Station Points	3	H				N			H	N	N			$4,000			$4,000	$4,000	Engineering Department
Training Center Locations	5										N	N	H	$800		$800	$800	$800	Employment and Training
Trip Database	6										N		H	$3,500				$3,500	DSS / NFTA
Underground Storage Tanks	6					N					N		H	$200	$200				NYS DEC
Unemployment Database	5										N		H	$6,250		$6,250			Employment and Training
Variance Permit Files	2	H	N								N	N		$1,000			$1,000		Code Enforcement
Vegetation	17		H			N					N			$800				$800	DOQs or Aerial Photos
Vehicle Coordinates (GPS points	9					N					N			$5,500			$5,500		AVL system
Vehicle Database	18									H	N			$3,500				$3,500	Motor Pool
VFW Posts	3	H									N	N	H	$500				$500	Veterans Services
Video Clips	3		N											$2,500				$2,500	Digital Video Camera
Voice Recordings	1										N		H	$2,500				$2,500	Digital recorder
Voter Registration Database	3	H									N	N		$6,800				$6,800	Board of Elections
Water Districts	16			H		N					N			$750	$750				Water District
Water Facilities & Valves	28					N	H	N	H		N		H	$500	$500				Water District
Water Mains	43					N	H	N	H		N		H	$500	$500				Water District
Water Quality Database	9										H	N	H	$3,500		$3,500			Environmental Health
Water Sample Points	18	H				N					N		H	$750		$750			Environmental Health
Water Tanks & Towers	5			H		N					N		H	$500	$500				Water District
Watersheds	17					H								$100	$100				NYS DEC / GIS Clearinghouse
Well Locations	8	N				N					N			$7,000			$7,000		Private driller's records
Wetlands	41					H								$100	$100				NYS DEC / GIS Clearinghouse

Data Layer	Priority Score	Document - paper	Document - digital image	Map - paper	Map - ArcInfo coverage	Map - ArcView shapefile	Schematic - paper	Schematic - scanned image	Schematic - CAD drawings	Database - table or spreadsheet	Database - paper	Database - geocoded shapefile	Institutional Knowledge	Estimated Conversion Costs	Year 1 Recommended Conversion Costs	Year 2 Recommended Conversion Costs	Year 3 Recommended Conversion Costs	Year 4 Recommended Conversion Costs	Source of layer data
Wind Contour Maps	**3**					N					N			$4,500				$4,500	NOAA climate data
Windmill sites	**3**			H		N					N		H	$500			$500		Planning
Wooded lots	**2**	H				N		N						$3,000				$3,000	Aerial Photos
Work Order Database	**8**									H	N			$6,000			$6,000		Public Works
Zip+4 Outlines	**5**					N								$1,000				$1,000	Data Vendors
Zoning Areas	**19**			H		N					N			$8,500	$8,500				Planning
													Grand Total	*$999,350*	*$188,000*	*$319,600*	*$249,500*	*$242,250*	

APPENDIX F2: Organization: Niagara County

MASTER DATA LAYER INVENTORY - COMMENTS

Data Layer	Priority Score	Comments
Street Centerlines	329	Short term solution is to acquire ArcView StreetMaps. DOT and DMV are converting each counties street centerlines within the next 1-2 years. Purchase G
Parcel Outlines	295	procedure to convert and QC GIS parcel CAD drawings to reflect changes in land ownership - cost is minimal due to current work procedures.
Municipal Boundaries	130	One time conversion from CAD to GIS
Digital Ortho Photos (DOQs)	113	Georegister images from UTM to local coordinate system
Hydrology	82	add stream names and attributes
Geocoded Addresses	71	Geocode to match local streets or parcels
Water Mains	43	Acquire existing ArcView shapefiles from Wendel. Provide data entry panel for staff to populate main attribute data records. Use scanned images as visual b
Wetlands	41	Project from UTM to local coordinate system
Scanned As-Built Drawings	39	setup procedure to scan as-built drawings and tie to area of interest polygons
Aerial Photos (Oblique - Pictometry)	38	Acquire digital oblique photo library from Pictometry
Ag Districts	36	Convert existing paper maps of ag districts to shape files
Census Blocks/Tracts	35	Download from website and project to match local coordinate system
Project Outline Polygons	35	Initial setup of database and procedures to create polygon outlines which denote locations of department specific studies. End users populate a keyword dat
Landuse	34	ArcView display function based on Assessor property class value and predefined menus
Floodplains	32	adjust to match accurate basemap
Landfills	32	Convert paper maps or drawings of current and historic landfill outlines
Soils	32	project to match local coordinate system
Schools	29	RPTS extract / phone book geocoding
Fire Districts	28	digitize outlines from paper maps
Water Facilities & Valves	28	Acquire existing ArcView shapefiles from Wendel. Provide data entry panel for staff to populate main attribute data records. Use scanned images as visual b
Railroads	27	trace from digital orthos and detemine the ownership information
Scanned or Digital Photos	26	procedure to connect scanned images to map features
Sewer Mains	25	digitizing locations and populating database records
County Owned Properties	24	Extract all county owned parcels and create new shape file
Hazardous Materials Sites	23	project to match local datum
Sewer Facilities	23	setup procedure for digitizing locations and populating database records
Bus Routes	22	Projection of existing ArcView shapefiles to match local coordinate system
Pavement	22	setup procedure to capture pavement condition and tie it into an Access database
Scanned Floor Plans	22	scan floor plans to be used in building maintenance and fire planning
DSS Case Database	21	Provide ODBC access to DSS case schedule database

Data Layer	Priority Score	Comments
Inspection Database	21	create database tables to replicate paper system
Hospitals	20	geocode or digitize locations
IDA Projects	20	convert IDA project addresses to geocoded shapefile or extract parcels from RPTS
Business Locations	19	Geocode business locations for economic development, weights and measures, hazmat response plans, etc.
Police Districts	19	convert paper maps to ArcView shapefile
Zoning Areas	19	Conversion of paper maps or CAD drawings to ArcView shapefile
Brownfields	18	Final cleanup and integration of Brownfield locations and attributes. May need to be transformed to match common coodinate system.
Business Database	18	Acquire digital database of business locations and attributes like SIC code, number of employees, annual revenue, etc. Create geocoded shapefile from busi
CAD Drawings	18	Acquire CAD drawings in recent formats. Setup procedure for read-only integration
Contours	18	Compute contours from raw elevation data in DEMs, control points, mass points and break lines
County RPTS Database	18	Port RPTS UNIX database from Informix to Access
Vehicle Database	18	Convert paper or digital vehicle database records to use within routing package
Water Sample Points	18	Create table of water sample point locations and IDs
Bridges	17	Convert existing DOT bridge location maps to ArcView shapefiles. Assign bridge IDs to allow links to DOT database records. Scan exisiting bridge drawing
EPA Site Locations	17	project to match local datum and / or geocode to streets or parcels
Fire Halls	17	digitize locations off paper maps
School Districts	17	RPTS CAD layer
Street Names	17	setup autolabel annotations from street centerlines
Vegetation	17	derived from Image Analysis
Watersheds	17	Project from UTM to local coordinate system
Georeferenced Scanned Images (Wo	16	resultant file from image georeference process
Water Districts	16	Convert district outlines from paper maps to ArcView shapefile format. Minimal attributes include district name and ID number.
Cable Lines	15	Conversion of paper maps or CAD drawings to ArcView shapefiles with attribute records describing cable size, ownership, capacity, year installed, etc.
Geocoded Inspection Locations	15	setup procedure for geocoding inspection location addresses
Probation Database	15	Conversion of existing probation records to allow geocoding of parolee home and work addresses to assist in crime analysis
Daycare Centers	14	Geocoded addresses
Hazardous Material Inventory	14	conversion of existing paper or digital records to Access database
Hydrants	14	convert paper maps to ArcView shapefiles
Parks	14	convert paper maps to ArcView shapefile
Phone Wires	14	currently unavailable - suggest that phone companies provide data as public service
Sewer Districts	14	trace from scanned tax maps
Bus Stops	13	Projection of existing ArcView shapefiles to match local coordinate system
Community Centers	13	Extract Community Center SBL and address data from RPTS Parcel shapefile database
Digital Photos	13	setup hotlink procedure to tie photos to map features

Data Layer	Priority Score	Comments
Electrical Utility Lines	13	Convert paper maps where available - try to get utility firms to provide locations as public service
Building Floorplans	12	Conversion and integration of existing paper floorplans tied to room database by building. Floor and room number IDs.
Building Footprints	12	Heads up digitizing of building outlines. This effort is not strongly recommended unless a specifc spatial application requires analysis of proximity of building
CAD World Files	12	Develop procedure for registering CAD drawings to real world coordinates. World files are a by product of the registration process.
Churches	12	Extract parcel outlines from RPTS database for Church locations
Client Database	12	Convert existing database records to common format accessable through ODBC to allow GIS display of client information at geocoded address locations.
Crime Database	12	Provide ODBC driver acccess to existing crime database to allow GIS display through geocoded addresses.
DOL Job Database	12	Provide ODBC access to DOL job database for geocode address display
Election Districts	12	Convert paper maps to ArcView shapefile using redistricting tool
Erosion Zones	12	heads up digitizing by comparing current and historic photos
Gas Lines	12	Convert paper maps where available - try to get utility firms to provide locations as public service
Geocoded Client Home Addresses	12	Setup procedure to geocode addresses to match local streets or parcels
Geocoded Occurrence Locations	12	setup procedure to geocode health risk occurrence locations
Keyword Database	12	setup database procedure to create a reference between scanned images or paper documents and reports and map features (project polygon outlines, servic
Paths & Trails	12	Conversion of existing paper paths and trail maps to ArcView shapefiles. Minimal attributes of path name and use restrictions would be added.
SCADA Sites	12	convert SCADA site locations to ArcView point shapefile with site ID
Airports	11	Conversion of airport locations from existing paper maps
Building & Room Database	11	Conversion and integration of existing paper and digital database records tied to digital versions of all floorplans.
County Owned Building Footprint Loc	10	Extract all county owned parcels and then perform heads up digitizing on ortho photos to create building outlines
Court House Locations	10	Geocode or digitize locations
Geology (surface)	10	project to match local datum
Lighting Districts	10	extract layer from CAD parcels
Liquor Stores	10	Geocode the addresses of all liquor store locations to aid in crime analysis efforts. Force geocode if addresses are not reliable
Meter Reading District Outlines	10	convert paper maps of district outlines to ArcView shapefiles
Police Stations	10	convert addresses and parcel extracts to define ArcView shapefile
Accident Database	9	ODBC connection to existing database to display accident locations and attributes
Adult Entertainment Locations	9	Geocode the addresses of all adult entertainment locations to aid in crime analysis efforts. Force geocode if addresses are not relaible
Bars	9	Geocode the addresses of all bar locations to aid in crime analysis efforts. Force geocode if addresses are not reliable
Case Management System	9	Conversion of existing database to allow automatic ODBC connection from GIS to case worker records to geocoded client address locations.
Clinic Locations	9	Convert paper or digital business records to create geocoded address locations of clinics
Complaint Database	9	Create digital data entry forms and reports around current paper system. Create geocoded shapefile from address info.
Employment & Training Database	9	Provide ODBC connection to GIS
Geocoded Job Opening Addresses	9	setup procedure for geocoding employer location addresses
Geocoded Lab Samples	9	setup procedure to geocode lab sample locations

Data Layer	Priority Score	Comments
Lab Analysis Database	9	Lab result database from water, lead, radon, asbestos tests
Pre-plan Printouts	9	procedure to automate fire pre-plan output
Sample Data Locations	9	water sample collection locations
Scanned EA-5217 Forms	9	setup process for RPTS staff to scan forms
Scanned Index Cards	9	scan cards and tie to service locations
Septic Tank Locations	9	convert paper records to digital files and images
Significant Users	9	build database to record and manage significant industrial users for pre-treatment testing
Vehicle Coordinates (GPS points)	9	Capture vehicle GPS locations and store as shapefile for replay and analysis
Water Quality Database	9	Convert existing paper or digital water quality history records to a standard format to link to the GIS by sample IDs
Digital Elevation Models (DEMs)	8	Project GRIDS from UTM to local coordinate system
Economic Development Database	8	Convert existing paper or digital records for sites
Legislative Districts	8	convert existing paper maps to ArcView shapefiles
Meter Reading Database	8	develop ODBC connection between meter locations and meter reading database
Scanned Plot Book Pages	8	convert paper plot book pages to scanned images tied to parcel IDs
Steep Slope Regions	8	areas derived from contours and DEMs
Subdivisions	8	trace outlines to denote new subdivisions
Well Locations	8	Convert paper records to digital database format and populate with locations, owner info, depth, perforations, flow rates, etc.
Work Order Database	8	Convert paper or digital work order files to integrate with GIS routing routines
Detention Facility Locations	7	Geocode or digitize jail locations
Geology (bedrock)	7	project to match local datum
Historical Sites	7	convert paper records to digital files and images
911 Call Database	6	An automatic ODBC interface needs to be written to allow historic 911 call locations and attributes to be displayed in the GIS.
Aquifers	6	Convert existing paper maps to update the current aquifer data layer from consultant reports and the NYS GIS Clearinghouse
Communicable Disease Database	6	Consolidate and convert paper and digitial health records regarding communiciable diseases to an Access database with data entry forms and report generati
DEC Spill List	6	Project from UTM to local coordinate system
Elevator Locations	6	Digitize the locations of all elevators in IDA and County buildings for Emergency Response pre-plans
Employer Database	6	Provide Welfare to Workfare tools to allow job councelors to arrange job seekers with job openings.
Equipment Maintenance Database	6	Provide ODBC access to display records associated with buildings and room numbers
Hotlinks to Features	6	setup procedures to hook images to map features
House Numbers	6	house number annotations on parcels
Meter Pit Locations	6	Heads up digitiziing of meter locations from schematics or adjustment of Wendel hydraulic model
New World AS400 Database	6	provide program interface to allow arson database stored in New World AS400 to be displayed in GIS
Project Database	6	create Access database to hold keyword index for project references
Red Line Layers	6	setup procedure to perform edits on the scanned plot book pages

Data Layer	Priority Score	Comments
Sample Data Results	6	setup procedure to access lab results from GIS
Service Provider Locations	6	geocode addresses - force geocode if needed
Sex Offender Database	6	provide dbf extract or ODBC connection to database
SIC Code Information	6	extract SIC info from CD to match known business addresses
SPEDES Permits	6	project from UTM to match local coordinate system
State DSS Database	6	provide dbf extract or ODBC connection to state database
Trip Database	6	extract from trip history database of Medicaid van service trips
Underground Storage Tanks	6	project to match local datum
Computed Routes and Directions	5	Computed routes and directions are a by-product of the routing process. Street centerlines and stops are required to create routes,
Environmentally Sensitive Sites	5	project to match local datum and / or geocode to streets or parcels
Job Opening Database	5	setup procedure to capture job opening information into Access database
Nursing Homes	5	create ArcView geocode shapefile from CD addresses or from phone book
Picnic Sites	5	convert paper maps to ArcView shapefile
Polling Places	5	Geocoding polling locations. Force geocode if addresses are problematic
Training Center Locations	5	geocode addresses - force geocode if needed
Unemployment Database	5	create database with address specific unemployment information of individuals trying to get off Welfare
Water Tanks & Towers	5	Create or acquire ArcView shapefile of tank locations. Populate database records with size, age, condition, flow rates, etc.
Zip+4 Outlines	5	Acquire zip+4 outlines for geocoding verification
Bird Viewing Sites	4	Create point or polygon shapefile denoting the locations of bird sittings by species
Boat Ramps	4	Create point shape file of boat ramp locations from existing recreation maps
Chamber of Commerce Database	4	Convert existing paper or digital business locations from Chamber of Commerce offices
Counseling Agency Locations	4	Geocode addresses from database
Easements	4	Huge data conversion problem because of poor source records
Fishing Sites	4	digitize known fishing locations from existing maps and brochures
Historic Parcel Database	4	scan all plot book pages with complicated details
Projection Metadata	4	create and manage metadata records for GIS data layers projection information and attribute tables
Snowmobile Trails	4	trace paper maps to create ArcView shapefiles
Basemap Data	3	General basemap layer to be made available for download
Business License Database	3	Convert exisiting paper records and procedures to capture buisness information when a license application is filed and approved.
Campsites	3	Create point shapefile of campsite locations from existing recreation maps
Command Center	3	Geocoded location used to denote command center locations in specific emergencies. These points maybe created in advance (schools, churches, county b
County Employee Database	3	Access employee database through ODBC driver to plot addresses on the GIS
County Retiree Database	3	Access employee database through ODBC driver to plot addresses of retirees on the GIS
Decontamination Sites	3	Geocoded sites chosen in advance prior to emergency events (parks, schools, hospitals, etc.)

Data Layer	Priority Score	Comments
Detailed Campus Maps	3	Scan campus maps for job training and attach as hotlink to campus location
Ditches	3	Provide initial setup for capture of ditch elevation data
Elevation Monumentation	3	Convert paper maps and survey notes to XYZ values
EPA Database	3	Provide ODBC access to display records associated with sites
Evacuation Shelters	3	extract from parcel data
Fire History Database	3	Provide ODBC access to display records associated with sites
Gas Wells	3	Digitize or geocode known gas wells as ArcView shapefiles and populate owner, depth and production stats
Georeferenced Scanned Contracts	3	Contracts refer to the bundles of as-built drawings of the water system. The drawings include a strip map, aerial photo and a profile. The contracts need to b
Georeferenced Scanned Images	3	Georeference scanned images to align with map features in ortho photos
GPS Survey Data	3	field data capture of GPS survey points
Ground Control Points	3	capture of existing ground control XYZ data
Inclusion/Exclusion Zones	3	Create zones defining parollee's range of movement based on parolee home addresses
Inspection Database (Handheld)	3	port database tables to hand held
Leak Locations	3	historic locations of leaks tied to customer address or Pipe ID - convert existing paper history records to Access database
Maintenance History Database	3	create database to store and manage maintenance history inforamtion regarding equipment (e.g. HVAC systems, roofing, parking lots, etc.)
Network Schematic	3	convert paper or digital schematic of computer network to an ArcView shapefile
Nurses Addresses	3	convert home addresses to geocode shapefile
Occurrence Database	3	create database to record monitored behavior and incidents of public health risks
Patient Addresses	3	database extract of patient addresses for geocoding
Pharmacy Locations	3	create database to record pharmacy location, phone number, hours of operation, etc. for emergency response
Plume Outline	3	Process to share plume outline computed from CAMEO software for analysis in ArcView
Preventative Maintenance Database	3	create database to store and manage predictive information regarding equipment (e.g. HVAC systems, roofing, parking lots, etc.)
Pump Stations	3	setup procedure to digitize pump station locations from maps or extract from CAD files
Recreational Equipment (swing sets,	3	trace location and type of equipment from digtial orthos
Resident Phone Numbers	3	extract addresses and phone numbers
Saved Extent Files	3	setup procedure to create map extents to match saved extents (i.e. towns, cities, districts, etc.)
Scanned Brochures	3	capture scanned color brochures to link with map features
Scanned Maintenance Manuals	3	scan pages from operation manuals and store as PDF, XML or HTML formats
Service Recipients (geocoded addres	3	geocode addresses - force geocode if needed
Shoreline Current Data	3	trace features from current digital orthos
Shoreline Structures	3	trace features from current digital orthos
Shorelines Historic Data	3	trace features from historic digital orthos or scanned aerials
Sign Inventory Database	3	create database of sign inventory information including sign type, material, age, maintenance history and location
Sign Locations	3	develop work flow process to convert paper records to digital files and images

Data Layer	Priority Score	Comments
Solar Power Grids	3	Digitize known solar power grid sites as ArcView shapefiles and populate owner, capacity and cost savings
Spill Locations	3	project from UTM to match local coordinate system
Sprinkler Systems	3	capture the presence or absence of sprinkler systems within structures
State Crime Database	3	provide dbf extract or ODBC connection to state database
Storm Drainage Receivers	3	trace locations from aerial photos
Survey Station Points	3	setup procedure to convert XYZ data from survey equipment or notes
VFW Posts	3	Convert paper lists or directories of VFW Post addresses
Video Clips	3	Develop procedure to record digital video clips and tie them to map features
Voter Registration Database	3	convert to DBF format and geocode addresses
Wind Contour Maps	3	Generate contours from historic NOAA climate data
Windmill sites	3	Digitize known windmill sites as ArcView shapefiles and populate owner, capacity and cost savings
Archaeological Sites	2	Convert existing paper maps and documents to create polygons or point locations of archaeological sites.
Building Permits	2	Conversion of existing paper forms to digital database. Geocoding the permit addresses to display the location and status of active and historic permits.
Contract Polygons	2	Create polygon outlines that approximate the contract drawing areas of interest
Interactive VRML Photos	2	Capture a series of panoramic photos of scenes inside or outside significant buildings
Phone CDs	2	extract business addresses from CD
Variance Permit Files	2	scanning historic records to create archive of variance folders
Wooded lots	2	Image analysis to identify wooded lots from vegetative cover
Voice Recordings	1	Setup procedure to allow users to record voice comments and associate them with a location in the field.

APPENDIX G: GIS DATA & LAYERS BY PRIORITY SCORE

APPENDIX G
DATA LAYER PRIORITY LIST

Niagara County

Layer Use Score	Data Layer	Total Apps requiring this layer	=	Optional	+	Functional	+	Req'd
329	Street Centerlines	119	=	2	+	24	+	93
295	Parcel Outlines	113	=	2	+	40	+	71
130	Municipal Boundaries	60	=	8	+	34	+	18
113	Digital Ortho Photos (DOQs)	45	=	2	+	18	+	25
82	Hydrology	30	=	1	+	6	+	23
71	Geocoded Addresses	24	=		+	1	+	23
43	Water Mains	19	=	4	+	6	+	9
41	Wetlands	17	=	2	+	6	+	9
39	Scanned As-Built Drawings	13	=		+		+	13
38	Aerial Photos (Oblique - Pictometry)	17	=	5	+	3	+	9
36	Ag Districts	15	=	1	+	7	+	7
35	Census Blocks/Tracts	13	=	1	+	2	+	10
35	Project Outline Polygons	12	=		+	1	+	11
34	Landuse	12	=		+	2	+	10
32	Floodplains	15	=	4	+	5	+	6
32	Landfills	12	=	1	+	2	+	9
32	Soils	12	=		+	4	+	8
29	Schools	13	=	2	+	6	+	5
28	Fire Districts	12	=	2	+	4	+	6
28	Water Facilities & Valves	13	=	4	+	3	+	6
27	Railroads	11	=	1	+	4	+	6
26	Scanned or Digital Photos	9	=		+	1	+	8
25	Sewer Mains	11	=	3	+	2	+	6
24	County Owned Properties	9	=		+	3	+	6
23	Hazardous Materials Sites	9	=		+	4	+	5
23	Sewer Facilities	10	=	3	+	1	+	6
22	Bus Routes	9	=		+	5	+	4
22	Pavement	9	=	2	+	1	+	6
22	Scanned Floor Plans	8	=		+	2	+	6
21	DSS Case Database	7	=		+		+	7
21	Inspection Database	7	=		+		+	7
20	Hospitals	7	=		+	1	+	6
20	IDA Projects	7	=		+	1	+	6
19	Business Locations	7	=	1	+		+	6
19	Police Districts	8	=		+	5	+	3
19	Zoning Areas	7	=		+	2	+	5
18	Brownfields	7	=	1	+	1	+	5
18	Business Database	6	=		+		+	6
18	CAD Drawings	6	=		+		+	6
18	Contours	7	=		+	3	+	4
18	County RPTS Database	6	=		+		+	6
18	Vehicle Database	6	=		+		+	6
18	Water Sample Points	6	=		+		+	6
17	Bridges	7	=	1	+	2	+	4
17	EPA Site Locations	7	=	1	+	2	+	4
17	Fire Halls	7	=	1	+	2	+	4
17	School Districts	8	=	1	+	5	+	2
17	Street Names	6	=		+	1	+	5
17	Vegetation	8	=	1	+	5	+	2
17	Watersheds	8	=	3	+	1	+	4

Layer Use Score	Data Layer	Total Apps requiring this layer	=	Optional	+	Functional	+	Req'd
16	Georeferenced Scanned Images (World Files)	6	=	1	+		+	5
16	Water Districts	8	=	2	+	4	+	2
15	Cable Lines	6	=	1	+	1	+	4
15	Geocoded Inspection Locations	5	=		+		+	5
15	Probation Database	5	=		+		+	5
14	Daycare Centers	6	=	1	+	2	+	3
14	Hazardous Material Inventory	5	=		+	1	+	4
14	Hydrants	5	=		+	1	+	4
14	Parks	5	=		+	1	+	4
14	Phone Wires	6	=	1	+	2	+	3
14	Sewer Districts	7	=	2	+	3	+	2
13	Bus Stops	5	=		+	2	+	3
13	Community Centers	6	=	1	+	3	+	2
13	Digital Photos	5	=		+	2	+	3
13	Electrical Utility Lines	6	=	1	+	3	+	2
12	Building Floorplans	4	=		+		+	4
12	Building Footprints	6	=	1	+	4	+	1
12	CAD World Files	4	=		+		+	4
12	Churches	6	=	1	+	4	+	1
12	Client Database	4	=		+		+	4
12	Crime Database	4	=		+		+	4
12	DOL Job Database	4	=		+		+	4
12	Election Districts	4	=		+		+	4
12	Erosion Zones	5	=	1	+	1	+	3
12	Gas Lines	5	=		+	3	+	2
12	Geocoded Client Home Addresses	4	=		+		+	4
12	Geocoded Occurrence Locations	4	=		+		+	4
12	Keyword Database	4	=		+		+	4
12	Paths & Trails	5	=	1	+	1	+	3
12	SCADA Sites	4	=		+		+	4
11	Airports	5	=		+	4	+	1
11	Building & Room Database	4	=		+	1	+	3
10	County Owned Building Footprint Locations	5	=	1	+	3	+	1
10	Court House Locations	4	=		+	2	+	2
10	Geology (surface)	5	=	1	+	3	+	1
10	Lighting Districts	5	=	1	+	3	+	1
10	Liquor Stores	4	=		+	2	+	2
10	Meter Reading District Outlines	4	=		+	2	+	2
10	Police Stations	4	=		+	2	+	2
9	Accident Database	3	=		+		+	3
9	Adult Entertainment Locations	4	=		+	3	+	1
9	Bars	4	=		+	3	+	1
9	Case Management System	3	=		+		+	3
9	Clinic Locations	3	=		+		+	3
9	Complaint Database	3	=		+		+	3
9	Employment & Training Database	3	=		+		+	3
9	Geocoded Job Opening Addresses	3	=		+		+	3
9	Geocoded Lab Samples	3	=		+		+	3
9	Lab Analysis Database	3	=		+		+	3
9	Pre-plan Printouts	3	=		+		+	3
9	Sample Data Locations	3	=		+		+	3
9	Scanned EA-5217 Forms	3	=		+		+	3
9	Scanned Index Cards	3	=		+		+	3
9	Septic Tank Locations	5	=	2	+	2	+	1

Layer Use Score	Data Layer	Total Apps requiring this layer	=	Optional	+	Functional	+	Req'd
9	Significant Users	3	=		+		+	3
9	Vehicle Coordinates (GPS points)	3	=		+		+	3
9	Water Quality Database	3	=		+		+	3
8	Digital Elevation Models (DEMs)	5	=	2	+	3	+	
8	Economic Development Database	3	=		+	1	+	2
8	Legislative Districts	4	=	1	+	2	+	1
8	Meter Reading Database	3	=		+	1	+	2
8	Scanned Plot Book Pages	3	=		+	1	+	2
8	Steep Slope Regions	3	=		+	1	+	2
8	Subdivisions	4	=	1	+	2	+	1
8	Well Locations	4	=	2	+		+	2
8	Work Order Database	3	=		+	1	+	2
7	Detention Facility Locations	3	=		+	2	+	1
7	Geology (bedrock)	4	=	1	+	3	+	
7	Historical Sites	3	=		+	2	+	1
6	911 Call Database	2	=		+		+	2
6	Aquifers	2	=		+		+	2
6	Communicable Disease Database	2	=		+		+	2
6	DEC Spill List	2	=		+		+	2
6	Elevator Locations	2	=		+		+	2
6	Employer Database	2	=		+		+	2
6	Equipment Maintenance Database	2	=		+		+	2
6	Hotlinks to Features	3	=		+	3	+	
6	House Numbers	3	=	1	+	1	+	1
6	Meter Pit Locations	2	=		+		+	2
6	New World AS400 Database	2	=		+		+	2
6	Project Database	2	=		+		+	2
6	Red Line Layers	2	=		+		+	2
6	Sample Data Results	2	=		+		+	2
6	Service Provider Locations	2	=		+		+	2
6	Sex Offender Database	2	=		+		+	2
6	SIC Code Information	2	=		+		+	2
6	SPEDES Permits	2	=		+		+	2
6	State DSS Database	2	=		+		+	2
6	Trip Database	2	=		+		+	2
6	Underground Storage Tanks	2	=		+		+	2
5	Computed Routes and Directions	2	=		+	1	+	1
5	Environmentally Sensitive Sites	2	=		+	1	+	1
5	Job Opening Database	2	=		+	1	+	1
5	Nursing Homes	2	=		+	1	+	1
5	Picnic Sites	2	=		+	1	+	1
5	Polling Places	2	=		+	1	+	1
5	Training Center Locations	2	=		+	1	+	1
5	Unemployment Database	2	=		+	1	+	1
5	Water Tanks & Towers	2	=		+	1	+	1
5	Zip+4 Outlines	3	=	1	+	2	+	
4	Bird Viewing Sites	2	=	1	+		+	1
4	Boat Ramps	2	=	1	+		+	1
4	Chamber of Commerce Database	2	=	1	+		+	1
4	Counseling Agency Locations	3	=	2	+	1	+	
4	Easements	3	=	2	+	1	+	
4	Fishing Sites	2	=	1	+		+	1
4	Historic Parcel Database	2	=	1	+		+	1
4	Projection Metadata	2	=	1	+		+	1

Layer Use Score	Data Layer	Total Apps requiring this layer	=	Optional	+	Functional	+	Req'd
4	Snowmobile Trails	2	=	1	+		+	1
3	Basemap Data	1	=		+		+	1
3	Business License Database	1	=		+		+	1
3	Campsites	1	=		+		+	1
3	Command Center	1	=		+		+	1
3	County Employee Database	1	=		+		+	1
3	County Retiree Database	1	=		+		+	1
3	Decontamination Sites	1	=		+		+	1
3	Detailed Campus Maps	1	=		+		+	1
3	Ditches	1	=		+		+	1
3	Elevation Monumentation	1	=		+		+	1
3	EPA Database	1	=		+		+	1
3	Evacuation Shelters	1	=		+		+	1
3	Fire History Database	1	=		+		+	1
3	Gas Wells	1	=		+		+	1
3	Georeferenced Scanned Contracts	1	=		+		+	1
3	Georeferenced Scanned Images	1	=		+		+	1
3	GPS Survey Data	1	=		+		+	1
3	Ground Control Points	1	=		+		+	1
3	Inclusion/Exclusion Zones	1	=		+		+	1
3	Inspection Database (Handheld)	1	=		+		+	1
3	Leak Locations	1	=		+		+	1
3	Maintenance History Database	1	=		+		+	1
3	Network Schematic	1	=		+		+	1
3	Nurses Addresses	1	=		+		+	1
3	Occurrence Database	1	=		+		+	1
3	Patient Addresses	1	=		+		+	1
3	Pharmacy Locations	2	=	1	+	1	+	
3	Plume Outline	1	=		+		+	1
3	Preventative Maintenance Database	1	=		+		+	1
3	Pump Stations	1	=		+		+	1
3	Recreational Equipment (swing sets, benches, pic	1	=		+		+	1
3	Resident Phone Numbers	1	=		+		+	1
3	Saved Extent Files	1	=		+		+	1
3	Scanned Brochures	1	=		+		+	1
3	Scanned Maintenance Manuals	1	=		+		+	1
3	Service Recipients (geocoded addresses)	1	=		+		+	1
3	Shoreline Current Data	1	=		+		+	1
3	Shoreline Structures	1	=		+		+	1
3	Shorelines Historic Data	1	=		+		+	1
3	Sign Inventory Database	1	=		+		+	1
3	Sign Locations	1	=		+		+	1
3	Solar Power Grids	1	=		+		+	1
3	Spill Locations	1	=		+		+	1
3	Sprinkler Systems	1	=		+		+	1
3	State Crime Database	1	=		+		+	1
3	Storm Drainage Receivers	1	=		+		+	1
3	Survey Station Points	1	=		+		+	1
3	VFW Posts	1	=		+		+	1
3	Video Clips	2	=	1	+	1	+	
3	Voter Registration Database	1	=		+		+	1
3	Wind Contour Maps	1	=		+		+	1
3	Windmill sites	1	=		+		+	1
2	Archaeological Sites	2	=	2	+		+	

Layer Use Score	Data Layer	Total Apps requiring this layer	=	Optional	+	Functional	+	Req'd
2	Building Permits	1	=		+	1	+	
2	Contract Polygons	1	=		+	1	+	
2	Interactive VRML Photos	1	=		+	1	+	
2	Phone CDs	1	=		+	1	+	
2	Variance Permit Files	1	=		+	1	+	
2	Wooded lots	1	=		+	1	+	
1	Voice Recordings	1	=	1	+		+	

APPENDIX H: GIS IMPLEMENTATION COSTS BY DEPARTMENT BY YEAR

APPENDIX H1:
FOUR YEAR IMPLEMENTATION PLAN COSTS BY DEPARTMENT

Niagara County

Computer Requirements

Department: **Board of Elections**

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Color Ink Jet Printer	$500				1				$500	$500
New PC	$2,000				1				$2,000	$2,000
					subtotal:				*$2,500*	*$2,500*
Software										
ArcView 3.x	$900				1				$900	$900
					subtotal:				*$900*	*$900*
Training										
ArcView Course	$600				2				$1,200	$1,200
					subtotal:				*$1,200*	*$1,200*
					Total for Department =				**$4,600**	**$4,600**

Computer Requirements

Department: **Code Enforcement**

	Total Item Cost	*# units / yr*				*Cost / yr*				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
Hand Held PC	$600		1				$600			$600
Network Cabling (installed / ft)	$100									$0
New PC	$2,000				1				$2,000	$2,000
Digital Camera	$300			1				$300		$300
Color Ink Jet Printer	$500				1				$500	$500
					subtotal:		*$600*	*$300*	*$2,500*	*$3,400*
Software										
ArcGIS Annual Maintenance	$3,000									$0
ArcIMS Route	$2,000									$0
ArcLogistics Route	$5,000				1				$5,000	$5,000
ArcPad	$500		1				$500			$500
					subtotal:		*$500*		*$5,000*	*$5,500*
Training										
Intro to GIS	$250		1				$250			$250
PC Basics	$250		1				$250			$250
ArcPad Class (0.5 day class)	$150		1				$150			$150
ArcLogistics Route class	$400				1				$400	$400
					subtotal:		*$650*		*$400*	*$1,050*
					Total for Department =		**$1,750**	**$300**	**$7,900**	**$9,950**

Computer Requirements

Department: **Data Processing**

	Total Item Cost	*# units / yr*				*Cost / yr*				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
NT Server	$12,000	1				$12,000				$12,000
Network Card (Gigabit)	$200		80	160	240		$16,000	$32,000	$48,000	$96,000
LCD Projector	$3,000	1				$3,000				$3,000
Network Switch (Gigabit)	$2,000		5	10	15		$10,000	$20,000	$30,000	$60,000
					subtotal:	*$15,000*	*$26,000*	*$52,000*	*$78,000*	*$171,000*
Miscellaneous										
Map server set-up	$3,000	1				$3,000				$3,000
					subtotal:	*$3,000*				*$3,000*
Software										
ArcSDE	$8,000		1				$8,000			$8,000
ArcIMS	$7,500	1				$7,500				$7,500
ArcSDE Annual Maintenance	$1,500			1	1			$1,500	$1,500	$3,000
ArcIMS Annual Maintenance	$1,000		1	1	1		$1,000	$1,000	$1,000	$3,000
					subtotal:	*$7,500*	*$9,000*	*$2,500*	*$2,500*	*$21,500*
Training										
Intro to GIS	$250	3				$750				$750
GIS Administration	$1,000		3				$3,000			$3,000
					subtotal:	*$750*	*$3,000*			*$3,750*
					Total for Department =	**$26,250**	**$38,000**	**$54,500**	**$80,500**	**$199,250**

Computer Requirements

Department: Employment and Training

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Upgrade to current PC	$1,000		2	3			$2,000	$3,000		$5,000
Color Ink Jet Printer	$500		1				$500			$500
					subtotal:		*$2,500*	*$3,000*		*$5,500*
Software										
ArcView 3.x	$900		3	7			$2,700	$6,300		$9,000
					subtotal:		*$2,700*	*$6,300*		*$9,000*
Training										
ArcView Course	$600		3	7			$1,800	$4,200		$6,000
					subtotal:		*$1,800*	*$4,200*		*$6,000*
					Total for Department =		**$7,000**	**$13,500**		**$20,500**

Department: Environmental Health

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Color Ink Jet Printer	$500		1		1		$500		$500	$1,000
New PC	$2,000	3	2	3	2	$6,000	$4,000	$6,000	$4,000	$20,000
Upgrade to current PC	$1,000	3	3	3	3	$3,000	$3,000	$3,000	$3,000	$12,000
					subtotal:	*$9,000*	*$7,500*	*$9,000*	*$7,500*	*$33,000*
Software										
ArcLogistics Route	$5,000			1				$5,000		$5,000
ArcView 3.x	$900	3	2	3	2	$2,700	$1,800	$2,700	$1,800	$9,000
					subtotal:	*$2,700*	*$1,800*	*$7,700*	*$1,800*	*$14,000*
Training										
ArcView Course	$600	5	5			$3,000	$3,000			$6,000
ArcIMS End User (3 hours)	$50	30	4	4	4	$1,500	$200	$200	$200	$2,100
ArcLogistics Route class	$400			2				$800		$800
					subtotal:	*$4,500*	*$3,200*	*$1,000*	*$200*	*$8,900*
					Total for Department =	**$16,200**	**$12,500**	**$17,700**	**$9,500**	**$55,900**

Computer Requirements

Department: Fire & Emergency Services

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
New PC	$2,000		2				$4,000			$4,000
Color Ink Jet Printer	$500			1				$500		$500
					subtotal:		*$4,000*	*$500*		*$4,500*
Software										
ArcView 3.x	$900		2	2	2		$1,800	$1,800	$1,800	$5,400
					subtotal:		*$1,800*	*$1,800*	*$1,800*	*$5,400*
Training										
ArcView Course	$600		2	2	2		$1,200	$1,200	$1,200	$3,600
ArcIMS End User (3 hours)	$50	10	5	5	5	$500	$250	$250	$250	$1,250
Pictometry training (3 hours)	$50	4				$200				$200
					subtotal:	*$700*	*$1,450*	*$1,450*	*$1,450*	*$5,050*
					Total for Department =	**$700**	**$7,250**	**$3,750**	**$3,250**	**$14,950**

Department: Human Resources

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Software										
ArcIMS Route	$2,000		1				$2,000			$2,000
					subtotal:		*$2,000*			*$2,000*
Training										
ArcIMS End User (3 hours)	$50	4				$200				$200
ArcIMS Route class	$400		4				$1,600			$1,600
					subtotal:	*$200*	*$1,600*			*$1,800*
					Total for Department =	**$200**	**$3,600**			**$3,800**

Computer Requirements

Department: **Industrial Development**

	Total Item Cost	*# units / yr*				*Cost / yr*				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
Upgrade to current PC	$1,000		2				$2,000			$2,000
Color Ink Jet Printer	$500	1				$500				$500
					subtotal:	*$500*	*$2,000*			*$2,500*
Software										
ArcView 3.x	$900		2				$1,800			$1,800
					subtotal:		*$1,800*			*$1,800*
Training										
Pictometry training (3 hours)	$50			2				$100		$100
ArcView Course	$600		2				$1,200			$1,200
ArcIMS End User (3 hours)	$50	2				$100				$100
					subtotal:	*$100*	*$1,200*	*$100*		*$1,400*
					Total for Department =	**$600**	**$5,000**	**$100**		**$5,700**

Computer Requirements

Department: **Planning, Development, Tourism**

	Total Item Cost	*# units / yr*				*Cost / yr*				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
Color Desktop Scanner	$300	1				$300				$300
Color Ink Jet Printer	$500	1				$500				$500
Large Format Plotter	$10,000		1				$10,000			$10,000
New PC	$2,000		2	2	1		$4,000	$4,000	$2,000	$10,000
Upgrade to current PC	$1,000	2	2			$2,000	$2,000			$4,000
					subtotal:	*$2,800*	*$16,000*	*$4,000*	*$2,000*	*$24,800*
Miscellaneous										
Map server set-up	$3,000	1				$3,000				$3,000
					subtotal:	*$3,000*				*$3,000*
Software										
ArcLogistics Route	$5,000				1				$5,000	$5,000
ArcView 3.x	$900	2	2			$1,800	$1,800			$3,600
ArcGIS 8.x	$7,500			1				$7,500		$7,500
					subtotal:	*$1,800*	*$1,800*	*$7,500*	*$5,000*	*$16,100*
Training										
GIS Administration	$1,000			1				$1,000		$1,000
Pictometry training (3 hours)	$50			3				$150		$150
ArcView Course	$600	4	4			$2,400	$2,400			$4,800
ArcGIS	$1,600			1				$1,600		$1,600
ArcLogistics Route class	$400				2				$800	$800
ArcIMS End User (3 hours)	$50	12	2			$600	$100			$700
					subtotal:	*$3,000*	*$2,500*	*$2,750*	*$800*	*$9,050*
					Total for Department =	**$10,600**	**$20,300**	**$14,250**	**$7,800**	**$52,950**

Computer Requirements

Department: Probation

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
New PC	$2,000				1				$2,000	$2,000
Upgrade to current PC	$1,000		4	4			$4,000	$4,000		$8,000
					subtotal:		*$4,000*	*$4,000*	*$2,000*	*$10,000*
Software										
Network Analyst	$1,295			1				$1,295		$1,295
ArcLogistics Route	$5,000				1				$5,000	$5,000
					subtotal:			*$1,295*	*$5,000*	*$6,295*
Training										
ArcIMS End User (3 hours)	$50		12	10			$600	$500		$1,100
ArcLogistics Route class	$400				2				$800	$800
					subtotal:		*$600*	*$500*	*$800*	*$1,900*
					Total for Department =		**$4,600**	**$5,795**	**$7,800**	**$18,195**

Department: Public Citizens

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Training										
Pictometry training (3 hours)	$50	50				$2,500				$2,500
					subtotal:	*$2,500*				*$2,500*
					Total for Department =	**$2,500**				**$2,500**

Computer Requirements

Department: Public Health

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
New PC	$2,000		4		1		$8,000		$2,000	$10,000
Upgrade to current PC	$1,000									$0
					subtotal:		*$8,000*		*$2,000*	*$10,000*
Software										
ArcLogistics Route	$5,000				1				$5,000	$5,000
ArcView 3.x	$900		4				$3,600			$3,600
					subtotal:		*$3,600*		*$5,000*	*$8,600*
Training										
ArcView Course	$600		4				$2,400			$2,400
ArcLogistics Route class	$400				2				$800	$800
ArcIMS End User (3 hours)	$50	35	30	5	5	$1,750	$1,500	$250	$250	$3,750
					subtotal:	*$1,750*	*$3,900*	*$250*	*$1,050*	*$6,950*
					Total for Department =	**$1,750**	**$15,500**	**$250**	**$8,050**	**$25,550**

Department: Public Works - Building & Grounds

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Color Desktop Scanner	$300	1				$300				$300
Upgrade to current PC	$1,000	2				$2,000				$2,000
Digital Camera	$300	1				$300				$300
Color Ink Jet Printer	$500		1				$500			$500
					subtotal:	*$2,600*	*$500*			*$3,100*
Software										
ArcView 3.x	$900	2				$1,800				$1,800
					subtotal:	*$1,800*				*$1,800*
Training										
Pictometry training (3 hours)	$50				3				$150	$150
ArcIMS End User (3 hours)	$50	3				$150				$150
ArcView Course	$600	2	1			$1,200	$600			$1,800
					subtotal:	*$1,350*	*$600*		*$150*	*$2,100*
					Total for Department =	**$5,750**	**$1,100**		**$150**	**$7,000**

Computer Requirements

Department: Public Works - Engineering

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Upgrade to current PC	$1,000	1	1			$1,000	$1,000			$2,000
GPS Survey Unit	$8,000		1				$8,000			$8,000
Color Ink Jet Printer	$500	1				$500				$500
Color Desktop Scanner	$300	1				$300				$300
New PC	$2,000	1	2			$2,000	$4,000			$6,000
					subtotal:	*$3,800*	*$13,000*			*$16,800*
Software										
ArcView 3.x	$900	2				$1,800				$1,800
					subtotal:	*$1,800*				*$1,800*
Training										
ArcView Course	$600	2				$1,200				$1,200
GPS training	$1,000			2				$2,000		$2,000
Pictometry training (3 hours)	$50		3				$150			$150
ArcIMS End User (3 hours)	$50	2				$100				$100
					subtotal:	*$1,300*	*$150*	*$2,000*		*$3,450*
					Total for Department =	**$6,900**	**$13,150**	**$2,000**		**$22,050**

Department: Public Works - Highway

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Color Desktop Scanner	$300	1				$300				$300
Digital Camera	$300		1				$300			$300
Upgrade to current PC	$1,000	2				$2,000				$2,000
					subtotal:	*$2,300*	*$300*			*$2,600*
Software										
ArcView 3.x	$900	2	1			$1,800	$900			$2,700
					subtotal:	*$1,800*	*$900*			*$2,700*
Training										
ArcView Course	$600	2				$1,200				$1,200
ArcIMS End User (3 hours)	$50	4				$200				$200
Pictometry training (3 hours)	$50		3				$150			$150
					subtotal:	*$1,400*	*$150*			*$1,550*
					Total for Department =	**$5,500**	**$1,350**			**$6,850**

Computer Requirements

Department: **Real Property Tax Service**

	Total Item Cost	*# units / yr*				*Cost / yr*				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
New PC	$2,000				1				$2,000	$2,000
Color Desktop Scanner	$300			1				$300		$300
Color Ink Jet Printer	$500				1				$500	$500
					subtotal:			*$300*	*$2,500*	*$2,800*
Software										
Microsoft Access	$300		4				$1,200			$1,200
ArcView 3.x	$900	1	2			$900	$1,800			$2,700
ArcGIS 8.x	$7,500				4				$30,000	$30,000
					subtotal:	*$900*	*$3,000*		*$30,000*	*$33,900*
Training										
Access Basics	$200		3				$600			$600
ArcView Course	$600		2				$1,200			$1,200
ArcIMS End User (3 hours)	$50	6				$300				$300
ArcGIS	$1,600				4				$6,400	$6,400
Access Database Design	$300		1				$300			$300
Pictometry training (3 hours)	$50	6				$300				$300
					subtotal:	*$600*	*$2,100*		*$6,400*	*$9,100*
					Total for Department =	**$1,500**	**$5,100**	**$300**	**$38,900**	**$45,800**

Computer Requirements

Department: Refuse Disposal District

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Upgrade to current PC	$1,000		1	1			$1,000	$1,000		$2,000
Color Desktop Scanner	$300			1				$300		$300
Digital Camera	$300				1				$300	$300
					subtotal:		*$1,000*	*$1,300*	*$300*	*$2,600*
Software										
ArcView 3.x	$900		1				$900			$900
					subtotal:		*$900*			*$900*
Training										
ArcIMS End User (3 hours)	$50	2				$100				$100
ArcView Course	$600		2				$1,200			$1,200
					subtotal:	*$100*	*$1,200*			*$1,300*
					Total for Department =	**$100**	**$3,100**	**$1,300**	**$300**	**$4,800**

Department: Risk/Insurance

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Software										
ArcView 3.x	$900			1				$900		$900
					subtotal:			*$900*		*$900*
Training										
ArcView Course	$600			2				$1,200		$1,200
					subtotal:			*$1,200*		*$1,200*
					Total for Department =			**$2,100**		**$2,100**

Computer Requirements

Department: Sewer District

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
New PC	$2,000		1				$2,000			$2,000
					subtotal:		*$2,000*			*$2,000*
Software										
ArcView 3.x	$900		1				$900			$900
					subtotal:		*$900*			*$900*
Training										
ArcView Course	$600		2	2			$1,200	$1,200		$2,400
ArcIMS End User (3 hours)	$50	4				$200				$200
					subtotal:	*$200*	*$1,200*	*$1,200*		*$2,600*
					Total for Department =	**$200**	**$4,100**	**$1,200**		**$5,500**

Department: Sheriff

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Large Format Plotter	$10,000			1				$10,000		$10,000
					subtotal:			*$10,000*		*$10,000*
Software										
ArcView 3.x	$900		2				$1,800			$1,800
					subtotal:		*$1,800*			*$1,800*
Training										
Pictometry training (3 hours)	$50	20				$1,000				$1,000
Intro to GIS	$250	12				$3,000				$3,000
ArcView Course	$600		4				$2,400			$2,400
ArcIMS End User (3 hours)	$50	10				$500				$500
					subtotal:	*$4,500*	*$2,400*			*$6,900*
					Total for Department =	**$4,500**	**$4,200**	**$10,000**		**$18,700**

Computer Requirements

Department: Social Services

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Hardware										
Color Desktop Scanner	$300			1				$300		$300
New PC	$2,000		5				$10,000			$10,000
Upgrade to current PC	$1,000	5	10	5		$5,000	$10,000	$5,000		$20,000
Color Ink Jet Printer	$500	2	2			$1,000	$1,000			$2,000
					subtotal:	*$6,000*	*$21,000*	*$5,300*		*$32,300*
Software										
Network Analyst	$1,295		4				$5,180			$5,180
ArcView 3.x	$900		4				$3,600			$3,600
					subtotal:		*$8,780*			*$8,780*
Training										
ArcIMS End User (3 hours)	$50	70	5	5	5	$3,500	$250	$250	$250	$4,250
Network Analyst class	$400		4				$1,600			$1,600
PC Basics	$250	20	5	5	5	$5,000	$1,250	$1,250	$1,250	$8,750
ArcView Course	$600		4				$2,400			$2,400
					subtotal:	*$8,500*	*$5,500*	*$1,500*	*$1,500*	*$17,000*
					Total for Department =	**$14,500**	**$35,280**	**$6,800**	**$1,500**	**$58,080**

Department: Soil, Water Conservation District

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4	Total Cost
Training										
ArcIMS End User (3 hours)	$50	4				$200				$200
ArcView Course	$600		2				$1,200			$1,200
Pictometry training (3 hours)	$50	3				$150				$150
					subtotal:	*$350*	*$1,200*			*$1,550*
					Total for Department =	**$350**	**$1,200**			**$1,550**

Computer Requirements

Department: Water District

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Hardware										
Large Format Plotter	$10,000	1				$10,000				$10,000
Digital Camera	$300		1				$300			$300
New PC	$2,000	1		1		$2,000		$2,000		$4,000
					subtotal:	*$12,000*	*$300*	*$2,000*		*$14,300*
Software										
ArcView 3.x	$900	3				$2,700				$2,700
ArcGIS Annual Maintenance	$3,000				1				$3,000	$3,000
ArcGIS 8.x	$7,500			1				$7,500		$7,500
					subtotal:	*$2,700*		*$7,500*	*$3,000*	*$13,200*
Training										
GIS Administration	$1,000		1				$1,000			$1,000
ArcView Course	$600	3				$1,800				$1,800
ArcIMS End User (3 hours)	$50	6				$300				$300
ArcGIS	$1,600			1				$1,600		$1,600
					subtotal:	*$2,100*	*$1,000*	*$1,600*		*$4,700*
					Total for Department =	**$16,800**	**$1,300**	**$11,100**	**$3,000**	**$32,200**

Department: Weights & Measures

	Total Item Cost	# units / yr				Cost / yr				
		Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr1*	*Yr2*	*Yr3*	*Yr4*	*Total Cost*
Software										
ArcIMS Route	$2,000				1				$2,000	$2,000
Microsoft Access	$300		2				$600			$600
					subtotal:		*$600*		*$2,000*	*$2,600*
Training										
ArcIMS Route class	$400				1				$400	$400
Access Database Design	$300		1				$300			$300
Access Basics	$200		2				$400			$400
ArcIMS End User (3 hours)	$50	4				$200				$200
					subtotal:	*$200*	*$700*		*$400*	*$1,300*
					Total for Department =	**$200**	**$1,300**		**$2,400**	**$3,900**

Organization Total:	**$115,100**	**186,680**	**144,945**	**175,650**	**$622,375**

APPENDIX H2:
FOUR YEAR IMPLEMENTATION PLAN COSTS BY DEPARTMENT
Niagara County

Applications

Department: Audit

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
No Applications Requested	421	$0									$0
						Total Department Costs:					**$0**

Department: Board of Elections

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Polling Location Map	220	$1,000				1				$1,000	$1,000
Election District Tool	501	$1,400				1				$1,400	$1,400
Election District Verification	510	$1,400				1				$1,400	$1,400
						Total Department Costs:				**$3,800**	**$3,800**

Department: Clerk

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
No Applications Requested	421	$0									$0
						Total Department Costs:					**$0**

Department: Code Enforcement

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
General Query Tool	200	$1,000	1				$1,000				$1,000
Hand Held Data Entry Tool	408	$1,700		1				$1,700			$1,700
Inspection Schedule Tool	507	$2,200				1				$2,200	$2,200
						Total Department Costs:	**$1,000**	**$1,700**		**$2,200**	**$4,900**

Applications

Department: Data Processing

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Cabling Display Tool	128	$700		1				$700			$700
Computer Inventory Tool	418	$0									$0
FTP Site	423	$1,700			1				$1,700		$1,700
GIS Network Integration Tool	511	$2,200		1				$2,200			$2,200
						Total Department Costs:		**$2,900**	**$1,700**		**$4,600**

Department: Employment and Training

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Job Search Tool	211	$2,200	1				$2,200				$2,200
Maps & Directions	212	$1,000	1				$1,000				$1,000
Employment/Unemployment Maps	312	$1,400		1				$1,400			$1,400
Database Integration	406	$1,700		1				$1,700			$1,700
						Total Department Costs:	**$3,200**	**$3,100**			**$6,300**

Department: Environmental Health

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
General Query Tool	200	$1,000	1				$1,000				$1,000
Human & Environmental Communica	214	$1,000	1				$1,000				$1,000
Resident Notification Application	305	$1,400		1				$1,400			$1,400
Water Quality Sampling Capture Too	420	$1,700	1				$1,700				$1,700
Vehicle Routing	506	$2,200			1				$2,200		$2,200
Project Georeference Tool	612	$1,700		1				$1,700			$1,700
Public FOIL Response	613	$1,000		1				$1,000			$1,000
						Total Department Costs:	**$3,700**	**$4,100**	**$2,200**		**$10,000**

Applications

Department: Fire & Emergency Services

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700	1				$700				$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Arson Assessment Tool	213	$1,400			1				$1,400		$1,400
911 Call Display Tool	313	$1,400	1				$1,400				$1,400
Evacuation Planning / Response Too	314	$1,400				1				$1,400	$1,400
Database Integration	406	$1,700				1				$1,700	$1,700
Hazmat Data Collection Tool	407	$1,700		1				$1,700			$1,700
Automated Vehicle Locator	505	$2,200		1				$2,200			$2,200
						Total Department Costs:	**$3,100**	**$3,900**	**$1,400**	**$3,100**	**$11,500**

Department: Historian

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
No Applications Requested	421	$0									$0
						Total Department Costs:					**$0**

Department: Human Resources

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Maps & Directions	212	$1,000			1				$1,000		$1,000
						Total Department Costs:			**$1,000**		**$1,000**

Department: Industrial Development

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700			1				$700		$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Business Display Tool	616	$1,000		1				$1,000			$1,000
Title Search Tool	618	$1,000		1				$1,000			$1,000
Site Selection Prep Tool	619	$1,700			1	1			$1,700	$1,700	$3,400
						Total Department Costs:	**$1,000**	**$2,000**	**$2,400**	**$1,700**	**$7,100**

Applications

Department: Management and Budget

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
No Applications Requested	421	$0									$0
Total Department Costs:											**$0**

Department: Planning, Development, Tourism

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700			1				$700		$700
Scanned Image Integration	110	$700	1				$700				$700
Environmental Awareness Site	124	$1,000	1				$1,000				$1,000
Recreation Map Generation	125	$700			1				$700		$700
Power & Energy Awareness Site	126	$700		1				$700			$700
Shoreline Erosion Monitoring	127	$700		1				$700			$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Web Based Site Selection	217	$1,000	1				$1,000				$1,000
Historic Preservation	218	$1,000			1				$1,000		$1,000
Registration of Scanned Images	315	$1,700	1				$1,700				$1,700
Land Ownership Maps	414	$1,700	1				$1,700				$1,700
Vehicle Routing	506	$2,200				1				$2,200	$2,200
Project Georeference Tool	612	$1,700		1				$1,700			$1,700
Project Display Tool	620	$1,000		1				$1,000			$1,000
Total Department Costs:							**$7,100**	**$4,100**	**$2,400**	**$2,200**	**$15,800**

Department: Probation

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
General Query Tool	200	$1,000			1				$1,000		$1,000
Caseworker/client Matching Tool	221	$1,400			1				$1,400		$1,400
Database Integration	406	$1,700		1				$1,700			$1,700
Vehicle Routing	506	$2,200				1				$2,200	$2,200
Electronic Home Monitoring Tool	605	$1,400		1				$1,400			$1,400
Total Department Costs:								**$3,100**	**$2,400**	**$2,200**	**$7,700**

Applications

Department: Public Citizens

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700	1				$700				$700
Countertop Kiosk Query Tool	202	$1,000			1				$1,000		$1,000
ArcIMS Server	222	$1,000	1				$1,000				$1,000
Sex Offender Notification	608	$1,000		1				$1,000			$1,000
						Total Department Costs:	**$1,700**	**$1,000**	**$1,000**		**$3,700**

Department: Public Health

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Outcome Assessment Tool	120	$700		1				$700			$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Human & Environmental Communica	214	$1,000		1				$1,000			$1,000
Nurse/patient Matching Tool	216	$1,000			1				$1,000		$1,000
Resident Notification Application	305	$1,400			1				$1,400		$1,400
Vehicle Routing	506	$2,200				1				$2,200	$2,200
						Total Department Costs:	**$1,000**	**$1,700**	**$2,400**	**$2,200**	**$7,300**

Department: Public Works - Building & Grounds

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700				1				$700	$700
Facility Management Tool	119	$1,000		1				$1,000			$1,000
General Query Tool	200	$1,000	1				$1,000				$1,000
Registration of Scanned Images	315	$1,700		1				$1,700			$1,700
CAD Integration	409	$1,700	1				$1,700				$1,700
Inspection Schedule Tool	507	$2,200			1				$2,200		$2,200
Document Management Tool	614	$1,000		1				$1,000			$1,000
						Total Department Costs:	**$2,700**	**$3,700**	**$2,200**	**$700**	**$9,300**

Applications

Department: Public Works - Engineering

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700		1				$700			$700
UFPO Tool	121	$700			1				$700		$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Registration of Scanned Images	315	$1,700	1				$1,700				$1,700
CAD Integration	409	$1,700			1				$1,700		$1,700
Survey Data Integration	413	$1,700		1				$1,700			$1,700
Document Management Tool	614	$1,000	1				$1,000				$1,000
						Total Department Costs:	**$3,700**	**$2,400**	**$2,400**		**$8,500**

Department: Public Works - Highway

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700		1				$700			$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Registration of Scanned Images	315	$1,700		1				$1,700			$1,700
Pavement Management Tool	400	$1,700	1				$1,700				$1,700
Sign Management Tool	404	$1,700	1				$1,700				$1,700
CAD Integration	409	$1,700			1				$1,700		$1,700
Automated Vehicle Locator	505	$2,200			1				$2,200		$2,200
Document Management Tool	614	$1,000		1				$1,000			$1,000
Bridge Inspection Tool	615	$1,700	1				$1,700				$1,700
						Total Department Costs:	**$6,100**	**$3,400**	**$3,900**		**$13,400**

Applications

Department: Real Property Tax Service

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700	1				$700				$700
Scanned Image Integration	110	$700			1				$700		$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Countertop Kiosk Query Tool	202	$1,000				1				$1,000	$1,000
CAD to GIS Conversion	409	$1,700	1				$1,700				$1,700
FTP Site	423	$1,700		1				$1,700			$1,700
Red Line Application	603	$1,700			1				$1,700		$1,700
Parcel Filter Tool	604	$1,000		1				$1,000			$1,000
						Total Department Costs:	**$3,400**	**$2,700**	**$2,400**	**$1,000**	**$9,500**

Department: Refuse Disposal District

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Data Entry/Retrieval Tool	116	$1,700		1				$1,700			$1,700
General Query Tool	200	$1,000	1				$1,000				$1,000
Resident Notification Application	305	$1,400			1				$1,400		$1,400
Parks Planning Tool	508	$2,200				1				$2,200	$2,200
						Total Department Costs:	**$1,000**	**$1,700**	**$1,400**	**$2,200**	**$6,300**

Department: Risk/Insurance

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Accident Tracking Tool	600	$700			1				$700		$700
Workers Compensation Tracking	601	$1,000			1				$1,000		$1,000
Retiree Tracking	602	$1,700				1				$1,700	$1,700
						Total Department Costs:			**$1,700**	**$1,700**	**$3,400**

Applications

Department: Sewer District

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Data Entry/Retrieval Tool	116	$1,700		1				$1,700			$1,700
Facility Management Tool	119	$1,000				1				$1,000	$1,000
Water Sample Analysis	215	$1,000		1				$1,000			$1,000
Image Archive/Retrieval Tool	411	$1,700			1				$1,700		$1,700
Integration of SCADA with GIS	509	$2,200			1				$2,200		$2,200
		Total Department Costs:						**$2,700**	**$3,900**	**$1,000**	**$7,600**

Department: Sheriff

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700	1				$700				$700
911 Call Display Tool	313	$1,400	1				$1,400				$1,400
Database Integration	406	$1,700	1				$1,700				$1,700
Automated Vehicle Locator	505	$2,200	1				$2,200				$2,200
Accident Tracking Tool	600	$700			1				$700		$700
Crime Analysis	606	$1,400		1				$1,400			$1,400
Sex Offender Notification	608	$1,000		1				$1,000			$1,000
Beat Maps	609	$1,000			1				$1,000		$1,000
Complaint Logger Tool	610	$1,700		1				$1,700			$1,700
Backyard Address Generator	611	$2,200			1				$2,200		$2,200
		Total Department Costs:					**$6,000**	**$4,100**	**$3,900**		**$14,000**

Applications

Department: Social Services

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
General Query Tool	200	$1,000	1				$1,000				$1,000
Job Search Tool	211	$2,200		1				$2,200			$2,200
Service Provider Lookup	219	$1,000		1				$1,000			$1,000
Caseworker/client Matching Tool	221	$1,400		1				$1,400			$1,400
Resolve Address Issue	316	$1,700		1				$1,700			$1,700
Bus Route/Van Service Analysis	317	$1,400				1				$1,400	$1,400
Database Integration	406	$1,700		1				$1,700			$1,700
Reports to Legislature	415	$1,700			1				$1,700		$1,700
HEAP/STAR Tool	416	$1,700				1				$1,700	$1,700
Census Tracking Tool	417	$1,700				1				$1,700	$1,700
						Total Department Costs:	**$1,000**	**$8,000**	**$1,700**	**$4,800**	**$15,500**

Department: Soil, Water Conservation District

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Pictometry Display Tool	105	$700	1				$700				$700
General Query Tool	200	$1,000	1				$1,000				$1,000
Water Sample Analysis	215	$1,000		1				$1,000			$1,000
Ditch Survey Tool	319	$1,400			1				$1,400		$1,400
Vegetative Assessment	320	$1,400				1				$1,400	$1,400
Ag Assessment Tool	321	$2,200		1				$2,200			$2,200
Erosion Monitoring Tool	419	$2,200				1				$2,200	$2,200
Water Quality Sampling Capture Too	420	$1,700		1				$1,700			$1,700
Projection Wizard Tool	422	$1,700	1				$1,700				$1,700
FTP Site	423	$1,700	1				$1,700				$1,700
						Total Department Costs:	**$5,100**	**$4,900**	**$1,400**	**$3,600**	**$15,000**

Department: Veterans Services

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Veterans Services Planning	117	$700				1				$700	$700
						Total Department Costs:				**$700**	**$700**

Applications

Department: Water District

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
Data Entry/Retrieval Tool	116	$1,700	1	0	0	0	$1,700	$0	$0	$0	$1,700
Zoom Tool	118	$700	1	0	0	0	$700	$0	$0	$0	$700
General Query Tool	200	$1,000	1	0	0	0	$1,000	$0	$0	$0	$1,000
Registration of Scanned Images	315	$1,700	1	0	0	0	$1,700	$0	$0	$0	$1,700
Database Integration	406	$1,700	0	0	1	0	$0	$0	$1,700	$0	$1,700
CAD Integration	409	$1,700	0	1	0	0	$0	$1,700	$0	$0	$1,700
Leak Database	410	$1,700	0	0	0	1	$0	$0	$0	$1,700	$1,700
Vehicle Routing	506	$2,200	0	0	0	1	$0	$0	$0	$2,200	$2,200
Integration of SCADA with GIS	509	$2,200	0	1	0	0	$0	$2,200	$0	$0	$2,200
						Total Department Costs:	**$5,100**	**$3,900**	**$1,700**	**$3,900**	**$14,600**

Department: Weights & Measures

	ID	App. Dev. Costs	Development / yr Yr1	Yr2	Yr3	Yr4	Cost / yr Yr1	Yr2	Yr3	Yr4	Total Cost
General Query Tool	200	$1,000		1				$1,000			$1,000
Database Integration	406	$1,700		1				$1,700			$1,700
Vehicle Routing	506	$2,200				1				$2,200	$2,200
Internet Access	607	$1,000	1				$1,000				$1,000
						Total Department Costs:	**$1,000**	**$2,700**		**$2,200**	**$5,900**
						Total Organization Cost:	**$56,900**	**$67,800**	**$43,500**	**$39,200**	**$207,400**

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
911 Call Database	**$4,000.00**	Sheriff	2	100%	$4,000.00
		Layer Totals:	**2**	**100%**	**$4,000.00**
Accident Database	**$6,200.00**	Risk/Insurance	1	33%	$2,066.67
		Sheriff	2	67%	$4,133.33
		Layer Totals:	**3**	**100%**	**$6,200.00**
Adult Entertainment Locations	**$500.00**	Probation	1	25%	$125.00
		Sheriff	3	75%	$375.00
		Layer Totals:	**4**	**100%**	**$500.00**
Aerial Photos (Oblique - Pictometry)	**$25,000.00**	Data Processing	1	6%	$1,470.59
		Environmental Health	3	18%	$4,411.76
		Fire & Emergency Services	1	6%	$1,470.59
		Industrial Development	1	6%	$1,470.59
		Planning, Development, Tourism	2	12%	$2,941.18
		Public Citizens	1	6%	$1,470.59
		Public Works - Building & Grounds	1	6%	$1,470.59
		Public Works - Engineering	1	6%	$1,470.59
		Public Works - Highway	1	6%	$1,470.59
		Real Property Tax Service	1	6%	$1,470.59
		Risk/Insurance	1	6%	$1,470.59
		Soil, Water Conservation District	3	18%	$4,411.76
		Layer Totals:	**17**	**100%**	**$25,000.00**
Ag Districts	**$8,000.00**	Industrial Development	1	7%	$571.43
		Planning, Development, Tourism	1	7%	$571.43
		Public Citizens	1	7%	$571.43
		Real Property Tax Service	3	21%	$1,714.29
		Refuse Disposal District	1	7%	$571.43
		Soil, Water Conservation District	7	50%	$4,000.00
		Layer Totals:	**14**	**100%**	**$8,000.00**
Airports	**$500.00**	Industrial Development	3	60%	$300.00
		Planning, Development, Tourism	1	20%	$100.00
		Public Citizens	1	20%	$100.00
		Layer Totals:	**5**	**100%**	**$500.00**
Aquifers	**$1,500.00**	Planning, Development, Tourism	1	50%	$750.00
		Refuse Disposal District	1	50%	$750.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**2**	**100%**	**$1,500.00**
Archaeological Sites	**$1,200.00**	Public Citizens	1	50%	$600.00
		Soil, Water Conservation District	1	50%	$600.00
		Layer Totals:	**2**	**100%**	**$1,200.00**
Bars	**$500.00**	Probation	1	25%	$125.00
		Sheriff	3	75%	$375.00
		Layer Totals:	**4**	**100%**	**$500.00**
Basemap Data	**$0.00**	Soil, Water Conservation District	1	100%	$0.00
		Layer Totals:	**1**	**100%**	**$0.00**
Bird Viewing Sites	**$750.00**	Planning, Development, Tourism	1	50%	$375.00
		Public Citizens	1	50%	$375.00
		Layer Totals:	**2**	**100%**	**$750.00**
Boat Ramps	**$750.00**	Planning, Development, Tourism	1	50%	$375.00
		Public Citizens	1	50%	$375.00
		Layer Totals:	**2**	**100%**	**$750.00**
Bridges	**$5,000.00**	Public Citizens	1	14%	$714.29
		Public Works - Building & Grounds	1	14%	$714.29
		Public Works - Engineering	2	29%	$1,428.57
		Public Works - Highway	2	29%	$1,428.57
		Soil, Water Conservation District	1	14%	$714.29
		Layer Totals:	**7**	**100%**	**$5,000.00**
Brownfields	**$250.00**	Industrial Development	3	43%	$107.14
		Planning, Development, Tourism	3	43%	$107.14
		Public Citizens	1	14%	$35.71
		Layer Totals:	**7**	**100%**	**$250.00**
Building & Room Database	**$8,000.00**	Data Processing	1	25%	$2,000.00
		Human Resources	1	25%	$2,000.00
		Public Works - Building & Grounds	2	50%	$4,000.00
		Layer Totals:	**4**	**100%**	**$8,000.00**
Building Floorplans	**$12,000.00**	Data Processing	2	50%	$6,000.00
		Fire & Emergency Services	1	25%	$3,000.00
		Public Works - Building & Grounds	1	25%	$3,000.00
		Layer Totals:	**4**	**100%**	**$12,000.00**
Building Footprints	**$12,000.00**	Data Processing	2	33%	$4,000.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Building Footprints	**$12,000.00**	Planning, Development, Tourism	1	17%	$2,000.00
		Refuse Disposal District	2	33%	$4,000.00
		Weights & Measures	1	17%	$2,000.00
		Layer Totals:	**6**	**100%**	**$12,000.00**
Building Permits	**$6,000.00**	Weights & Measures	1	100%	$6,000.00
		Layer Totals:	**1**	**100%**	**$6,000.00**
Bus Routes	**$250.00**	Employment and Training	2	22%	$55.56
		Industrial Development	2	22%	$55.56
		Public Citizens	1	11%	$27.78
		Social Services	4	44%	$111.11
		Layer Totals:	**9**	**100%**	**$250.00**
Bus Stops	**$250.00**	Employment and Training	2	40%	$100.00
		Industrial Development	1	20%	$50.00
		Public Citizens	1	20%	$50.00
		Social Services	1	20%	$50.00
		Layer Totals:	**5**	**100%**	**$250.00**
Business Database	**$1,000.00**	Fire & Emergency Services	1	17%	$166.67
		Industrial Development	3	50%	$500.00
		Planning, Development, Tourism	2	33%	$333.33
		Layer Totals:	**6**	**100%**	**$1,000.00**
Business License Database	**$5,000.00**	Weights & Measures	1	100%	$5,000.00
		Layer Totals:	**1**	**100%**	**$5,000.00**
Business Locations	**$1,500.00**	Human Resources	1	14%	$214.29
		Industrial Development	3	43%	$642.86
		Planning, Development, Tourism	2	29%	$428.57
		Public Citizens	1	14%	$214.29
		Layer Totals:	**7**	**100%**	**$1,500.00**
Cable Lines	**$15,000.00**	Data Processing	2	33%	$5,000.00
		Public Works - Building & Grounds	1	17%	$2,500.00
		Public Works - Engineering	2	33%	$5,000.00
		Public Works - Highway	1	17%	$2,500.00
		Layer Totals:	**6**	**100%**	**$15,000.00**
CAD Drawings	**$1,500.00**	Public Works - Building & Grounds	2	33%	$500.00
		Public Works - Engineering	1	17%	$250.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
CAD Drawings	**$1,500.00**	Public Works - Highway	1	17%	$250.00
		Real Property Tax Service	1	17%	$250.00
		Water District	1	17%	$250.00
		Layer Totals:	**6**	**100%**	**$1,500.00**
CAD World Files	**$1,500.00**	Public Works - Building & Grounds	1	25%	$375.00
		Public Works - Engineering	1	25%	$375.00
		Public Works - Highway	1	25%	$375.00
		Real Property Tax Service	1	25%	$375.00
		Layer Totals:	**4**	**100%**	**$1,500.00**
Campsites	**$500.00**	Planning, Development, Tourism	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Case Management System	**$9,000.00**	Probation	3	100%	$9,000.00
		Layer Totals:	**3**	**100%**	**$9,000.00**
Census Blocks/Tracts	**$100.00**	Board of Elections	1	8%	$7.69
		Employment and Training	1	8%	$7.69
		Fire & Emergency Services	1	8%	$7.69
		Industrial Development	1	8%	$7.69
		Planning, Development, Tourism	1	8%	$7.69
		Public Citizens	1	8%	$7.69
		Public Health	3	23%	$23.08
		Social Services	3	23%	$23.08
		Veterans Services	1	8%	$7.69
		Layer Totals:	**13**	**100%**	**$100.00**
Chamber of Commerce Database	**$750.00**	Industrial Development	1	50%	$375.00
		Weights & Measures	1	50%	$375.00
		Layer Totals:	**2**	**100%**	**$750.00**
Churches	**$100.00**	Sheriff	4	67%	$66.67
		Social Services	2	33%	$33.33
		Layer Totals:	**6**	**100%**	**$100.00**
Client Database	**$1,500.00**	Employment and Training	1	25%	$375.00
		Probation	2	50%	$750.00
		Weights & Measures	1	25%	$375.00
		Layer Totals:	**4**	**100%**	**$1,500.00**
Clinic Locations	**$500.00**	Public Health	3	100%	$500.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**3**	**100%**	**$500.00**
Command Center	**$500.00**	Fire & Emergency Services	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Communicable Disease Database	**$8,000.00**	Environmental Health	1	50%	$4,000.00
		Public Health	1	50%	$4,000.00
		Layer Totals:	**2**	**100%**	**$8,000.00**
Community Centers	**$1,300.00**	Public Health	1	17%	$216.67
		Sheriff	3	50%	$650.00
		Social Services	2	33%	$433.33
		Layer Totals:	**6**	**100%**	**$1,300.00**
Complaint Database	**$8,600.00**	Environmental Health	2	67%	$5,733.33
		Sheriff	1	33%	$2,866.67
		Layer Totals:	**3**	**100%**	**$8,600.00**
Computed Routes and Directions	**$0.00**	Public Health	1	50%	$0.00
		Social Services	1	50%	$0.00
		Layer Totals:	**2**	**100%**	**$0.00**
Computer Inventory	**$0.00**	Data Processing	1	100%	$0.00
		Layer Totals:	**1**	**100%**	**$0.00**
Contours	**$2,500.00**	Planning, Development, Tourism	1	14%	$357.14
		Refuse Disposal District	2	29%	$714.29
		Soil, Water Conservation District	4	57%	$1,428.57
		Layer Totals:	**7**	**100%**	**$2,500.00**
Contract Polygons	**$3,500.00**	Water District	1	100%	$3,500.00
		Layer Totals:	**1**	**100%**	**$3,500.00**
Counseling Agency Locations	**$1,500.00**	Probation	3	100%	$1,500.00
		Layer Totals:	**3**	**100%**	**$1,500.00**
County Employee Database	**$7,500.00**	Risk/Insurance	1	100%	$7,500.00
		Layer Totals:	**1**	**100%**	**$7,500.00**
County Owned Building Footprint Locations	**$8,500.00**	Public Citizens	1	20%	$1,700.00
		Public Works - Building & Grounds	2	40%	$3,400.00
		Public Works - Engineering	1	20%	$1,700.00
		Public Works - Highway	1	20%	$1,700.00
		Layer Totals:	**5**	**100%**	**$8,500.00**

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
County Owned Properties	**$200.00**	Code Enforcement	2	22%	$44.44
		Public Works - Building & Grounds	3	33%	$66.67
		Public Works - Engineering	2	22%	$44.44
		Public Works - Highway	2	22%	$44.44
		Layer Totals:	**9**	**100%**	**$200.00**
County Retiree Database	**$1,800.00**	Risk/Insurance	1	100%	$1,800.00
		Layer Totals:	**1**	**100%**	**$1,800.00**
County RPTS Database	**$13,500.00**	Real Property Tax Service	6	100%	$13,500.00
		Layer Totals:	**6**	**100%**	**$13,500.00**
Court House Locations	**$200.00**	Probation	3	75%	$150.00
		Public Citizens	1	25%	$50.00
		Layer Totals:	**4**	**100%**	**$200.00**
Crime Database	**$8,500.00**	Sheriff	4	100%	$8,500.00
		Layer Totals:	**4**	**100%**	**$8,500.00**
Daycare Centers	**$2,350.00**	Employment and Training	1	17%	$391.67
		Sheriff	4	67%	$1,566.67
		Social Services	1	17%	$391.67
		Layer Totals:	**6**	**100%**	**$2,350.00**
DEC Spill List	**$100.00**	Environmental Health	2	100%	$100.00
		Layer Totals:	**2**	**100%**	**$100.00**
Decontamination Sites	**$250.00**	Fire & Emergency Services	1	100%	$250.00
		Layer Totals:	**1**	**100%**	**$250.00**
Detailed Campus Maps	**$500.00**	Employment and Training	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Detention Facility Locations	**$300.00**	Probation	3	100%	$300.00
		Layer Totals:	**3**	**100%**	**$300.00**
Digital Elevation Models (DEMs)	**$5,500.00**	Planning, Development, Tourism	5	100%	$5,500.00
		Layer Totals:	**5**	**100%**	**$5,500.00**
Digital Ortho Photos (DOQs)	**$6,500.00**	Data Processing	1	2%	$144.44
		Fire & Emergency Services	3	7%	$433.33
		Industrial Development	1	2%	$144.44
		Planning, Development, Tourism	8	18%	$1,155.56
		Public Citizens	1	2%	$144.44
		Public Works - Building & Grounds	3	7%	$433.33

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Digital Ortho Photos (DOQs)	**$6,500.00**	Public Works - Engineering	5	11%	$722.22
		Public Works - Highway	6	13%	$866.67
		Real Property Tax Service	2	4%	$288.89
		Refuse Disposal District	3	7%	$433.33
		Sheriff	3	7%	$433.33
		Soil, Water Conservation District	5	11%	$722.22
		Water District	4	9%	$577.78
		Layer Totals:	**45**	**100%**	**$6,500.00**
Digital Photos	**$1,200.00**	Code Enforcement	1	20%	$240.00
		Public Works - Building & Grounds	1	20%	$240.00
		Public Works - Highway	2	40%	$480.00
		Sewer District	1	20%	$240.00
		Layer Totals:	**5**	**100%**	**$1,200.00**
Ditches	**$3,750.00**	Soil, Water Conservation District	1	100%	$3,750.00
		Layer Totals:	**1**	**100%**	**$3,750.00**
DOL Job Database	**$7,500.00**	Employment and Training	3	75%	$5,625.00
		Social Services	1	25%	$1,875.00
		Layer Totals:	**4**	**100%**	**$7,500.00**
DSS Case Database	**$500.00**	Probation	1	14%	$71.43
		Social Services	6	86%	$428.57
		Layer Totals:	**7**	**100%**	**$500.00**
Easements	**$20,000.00**	Public Citizens	1	33%	$6,666.67
		Real Property Tax Service	2	67%	$13,333.33
		Layer Totals:	**3**	**100%**	**$20,000.00**
Economic Development Database	**$7,500.00**	Industrial Development	2	67%	$5,000.00
		Weights & Measures	1	33%	$2,500.00
		Layer Totals:	**3**	**100%**	**$7,500.00**
Election Districts	**$7,500.00**	Board of Elections	3	75%	$5,625.00
		Real Property Tax Service	1	25%	$1,875.00
		Layer Totals:	**4**	**100%**	**$7,500.00**
Electrical Utility Lines	**$25,000.00**	Industrial Development	1	17%	$4,166.67
		Public Works - Building & Grounds	1	17%	$4,166.67
		Public Works - Engineering	2	33%	$8,333.33
		Public Works - Highway	1	17%	$4,166.67

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Electrical Utility Lines	**$25,000.00**	Refuse Disposal District	1	17%	$4,166.67
		Layer Totals:	**6**	**100%**	**$25,000.00**
Elevation Monumentation	**$6,750.00**	Soil, Water Conservation District	1	100%	$6,750.00
		Layer Totals:	**1**	**100%**	**$6,750.00**
Elevator Locations	**$2,500.00**	Code Enforcement	1	50%	$1,250.00
		Fire & Emergency Services	1	50%	$1,250.00
		Layer Totals:	**2**	**100%**	**$2,500.00**
Employer Database	**$9,500.00**	Employment and Training	2	100%	$9,500.00
		Layer Totals:	**2**	**100%**	**$9,500.00**
Employment & Training Database	**$1,250.00**	Employment and Training	3	75%	$937.50
		Planning, Development, Tourism	1	25%	$312.50
		Layer Totals:	**4**	**100%**	**$1,250.00**
Environmentally Sensitive Sites	**$750.00**	Soil, Water Conservation District	2	100%	$750.00
		Layer Totals:	**2**	**100%**	**$750.00**
EPA Database	**$1,000.00**	Planning, Development, Tourism	1	100%	$1,000.00
		Layer Totals:	**1**	**100%**	**$1,000.00**
EPA Site Locations	**$100.00**	Industrial Development	1	14%	$14.29
		Planning, Development, Tourism	3	43%	$42.86
		Public Citizens	1	14%	$14.29
		Soil, Water Conservation District	2	29%	$28.57
		Layer Totals:	**7**	**100%**	**$100.00**
Equipment Maintenance Database	**$1,250.00**	Public Works - Building & Grounds	2	100%	$1,250.00
		Layer Totals:	**2**	**100%**	**$1,250.00**
Erosion Zones	**$2,600.00**	Planning, Development, Tourism	1	20%	$520.00
		Public Citizens	1	20%	$520.00
		Soil, Water Conservation District	3	60%	$1,560.00
		Layer Totals:	**5**	**100%**	**$2,600.00**
Evacuation Shelters	**$800.00**	Employment and Training	1	50%	$400.00
		Public Citizens	1	50%	$400.00
		Layer Totals:	**2**	**100%**	**$800.00**
Fire Districts	**$800.00**	Environmental Health	2	17%	$133.33
		Fire & Emergency Services	3	25%	$200.00
		Industrial Development	1	8%	$66.67

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Fire Districts	**$800.00**	Public Citizens	1	8%	$66.67
		Real Property Tax Service	3	25%	$200.00
		Sheriff	2	17%	$133.33
		Layer Totals:	**12**	**100%**	**$800.00**
Fire Halls	**$400.00**	Fire & Emergency Services	3	43%	$171.43
		Industrial Development	1	14%	$57.14
		Public Citizens	1	14%	$57.14
		Sheriff	2	29%	$114.29
		Layer Totals:	**7**	**100%**	**$400.00**
Fire History Database	**$4,500.00**	Fire & Emergency Services	1	100%	$4,500.00
		Layer Totals:	**1**	**100%**	**$4,500.00**
Fishing Sites	**$750.00**	Planning, Development, Tourism	1	50%	$375.00
		Public Citizens	1	50%	$375.00
		Layer Totals:	**2**	**100%**	**$750.00**
Floodplains	**$2,500.00**	Industrial Development	1	7%	$166.67
		Planning, Development, Tourism	4	27%	$666.67
		Public Citizens	1	7%	$166.67
		Real Property Tax Service	2	13%	$333.33
		Refuse Disposal District	3	20%	$500.00
		Soil, Water Conservation District	4	27%	$666.67
		Layer Totals:	**15**	**100%**	**$2,500.00**
Gas Lines	**$20,000.00**	Public Works - Building & Grounds	1	20%	$4,000.00
		Public Works - Engineering	2	40%	$8,000.00
		Public Works - Highway	1	20%	$4,000.00
		Refuse Disposal District	1	20%	$4,000.00
		Layer Totals:	**5**	**100%**	**$20,000.00**
Gas Wells	**$5,500.00**	Planning, Development, Tourism	1	100%	$5,500.00
		Layer Totals:	**1**	**100%**	**$5,500.00**
Geocoded Addresses	**$4,500.00**	Board of Elections	1	4%	$187.50
		Environmental Health	1	4%	$187.50
		Fire & Emergency Services	1	4%	$187.50
		Human Resources	1	4%	$187.50
		Probation	3	13%	$562.50
		Public Health	2	8%	$375.00
		Risk/Insurance	2	8%	$375.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Geocoded Addresses	**$4,500.00**	Sheriff	7	29%	$1,312.50
		Social Services	5	21%	$937.50
		Weights & Measures	1	4%	$187.50
		Layer Totals:	**24**	**100%**	**$4,500.00**
Geocoded Client Home Addresses	**$1,200.00**	Employment and Training	2	50%	$600.00
		Probation	1	25%	$300.00
		Social Services	1	25%	$300.00
		Layer Totals:	**4**	**100%**	**$1,200.00**
Geocoded Inspection Locations	**$1,200.00**	Code Enforcement	2	40%	$480.00
		Environmental Health	1	20%	$240.00
		Planning, Development, Tourism	1	20%	$240.00
		Weights & Measures	1	20%	$240.00
		Layer Totals:	**5**	**100%**	**$1,200.00**
Geocoded Job Opening Addresses	**$1,200.00**	Employment and Training	3	100%	$1,200.00
		Layer Totals:	**3**	**100%**	**$1,200.00**
Geocoded Lab Samples	**$1,200.00**	Public Health	3	100%	$1,200.00
		Layer Totals:	**3**	**100%**	**$1,200.00**
Geocoded Occurrence Locations	**$1,200.00**	Environmental Health	3	75%	$900.00
		Fire & Emergency Services	1	25%	$300.00
		Layer Totals:	**4**	**100%**	**$1,200.00**
Geology (bedrock)	**$200.00**	Planning, Development, Tourism	1	25%	$50.00
		Public Citizens	1	25%	$50.00
		Refuse Disposal District	1	25%	$50.00
		Soil, Water Conservation District	1	25%	$50.00
		Layer Totals:	**4**	**100%**	**$200.00**
Geology (surface)	**$200.00**	Planning, Development, Tourism	1	20%	$40.00
		Public Citizens	1	20%	$40.00
		Refuse Disposal District	1	20%	$40.00
		Soil, Water Conservation District	2	40%	$80.00
		Layer Totals:	**5**	**100%**	**$200.00**
Georeferenced Scanned Contracts	**$8,500.00**	Water District	1	100%	$8,500.00
		Layer Totals:	**1**	**100%**	**$8,500.00**

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Georeferenced Scanned Images	**$2,500.00**	Water District	1	100%	$2,500.00
		Layer Totals:	**1**	**100%**	**$2,500.00**
Georeferenced Scanned Images (World Files)	**$0.00**	Planning, Development, Tourism	1	17%	$0.00
		Public Works - Building & Grounds	1	17%	$0.00
		Public Works - Engineering	1	17%	$0.00
		Public Works - Highway	1	17%	$0.00
		Water District	2	33%	$0.00
		Layer Totals:	**6**	**100%**	**$0.00**
GPS Survey Data	**$5,000.00**	Public Works - Engineering	1	100%	$5,000.00
		Layer Totals:	**1**	**100%**	**$5,000.00**
Ground Control Points	**$1,000.00**	Public Works - Engineering	1	100%	$1,000.00
		Layer Totals:	**1**	**100%**	**$1,000.00**
Hazardous Material Inventory	**$2,500.00**	Fire & Emergency Services	4	80%	$2,000.00
		Public Citizens	1	20%	$500.00
		Layer Totals:	**5**	**100%**	**$2,500.00**
Hazardous Materials Sites	**$400.00**	Environmental Health	2	22%	$88.89
		Fire & Emergency Services	3	33%	$133.33
		Public Citizens	1	11%	$44.44
		Soil, Water Conservation District	3	33%	$133.33
		Layer Totals:	**9**	**100%**	**$400.00**
Historic Parcel Database	**$5,000.00**	Public Citizens	1	50%	$2,500.00
		Real Property Tax Service	1	50%	$2,500.00
		Layer Totals:	**2**	**100%**	**$5,000.00**
Historical Sites	**$500.00**	Planning, Development, Tourism	1	33%	$166.67
		Public Citizens	1	33%	$166.67
		Soil, Water Conservation District	1	33%	$166.67
		Layer Totals:	**3**	**100%**	**$500.00**
Hospitals	**$150.00**	Fire & Emergency Services	2	29%	$42.86
		Public Citizens	1	14%	$21.43
		Public Health	1	14%	$21.43
		Sheriff	2	29%	$42.86
		Veterans Services	1	14%	$21.43
		Layer Totals:	**7**	**100%**	**$150.00**
Hotlinks to Features	**$2,500.00**	Public Works - Building & Grounds	1	33%	$833.33

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Hotlinks to Features	**$2,500.00**	Public Works - Engineering	1	33%	$833.33
		Public Works - Highway	1	33%	$833.33
		Layer Totals:	**3**	**100%**	**$2,500.00**
House Numbers	**$1,200.00**	Public Citizens	1	33%	$400.00
		Water District	2	67%	$800.00
		Layer Totals:	**3**	**100%**	**$1,200.00**
Hydrants	**$4,000.00**	Fire & Emergency Services	4	80%	$3,200.00
		Sheriff	1	20%	$800.00
		Layer Totals:	**5**	**100%**	**$4,000.00**
Hydrology	**$3,750.00**	Environmental Health	4	13%	$500.00
		Fire & Emergency Services	1	3%	$125.00
		Industrial Development	4	13%	$500.00
		Planning, Development, Tourism	7	23%	$875.00
		Public Citizens	1	3%	$125.00
		Public Health	1	3%	$125.00
		Real Property Tax Service	3	10%	$375.00
		Refuse Disposal District	3	10%	$375.00
		Sewer District	1	3%	$125.00
		Soil, Water Conservation District	4	13%	$500.00
		Weights & Measures	1	3%	$125.00
		Layer Totals:	**30**	**100%**	**$3,750.00**
IDA Projects	**$750.00**	Code Enforcement	2	29%	$214.29
		Industrial Development	4	57%	$428.57
		Public Citizens	1	14%	$107.14
		Layer Totals:	**7**	**100%**	**$750.00**
Inclusion/Exclusion Zones	**$3,500.00**	Probation	1	100%	$3,500.00
		Layer Totals:	**1**	**100%**	**$3,500.00**
Inspection Database	**$3,500.00**	Code Enforcement	3	43%	$1,500.00
		Planning, Development, Tourism	1	14%	$500.00
		Public Works - Building & Grounds	1	14%	$500.00
		Weights & Measures	2	29%	$1,000.00
		Layer Totals:	**7**	**100%**	**$3,500.00**
Inspection Database (Handheld)	**$2,500.00**	Code Enforcement	1	100%	$2,500.00
		Layer Totals:	**1**	**100%**	**$2,500.00**

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Interactive VRML Photos	**$3,000.00**	Planning, Development, Tourism	1	100%	$3,000.00
		Layer Totals:	**1**	**100%**	**$3,000.00**
Job Opening Database	**$2,500.00**	Employment and Training	1	50%	$1,250.00
		Public Citizens	1	50%	$1,250.00
		Layer Totals:	**2**	**100%**	**$2,500.00**
Keyword Database	**$3,000.00**	Planning, Development, Tourism	1	25%	$750.00
		Public Works - Building & Grounds	1	25%	$750.00
		Public Works - Engineering	1	25%	$750.00
		Public Works - Highway	1	25%	$750.00
		Layer Totals:	**4**	**100%**	**$3,000.00**
Lab Analysis Database	**$3,000.00**	Public Health	1	33%	$1,000.00
		Refuse Disposal District	2	67%	$2,000.00
		Layer Totals:	**3**	**100%**	**$3,000.00**
Landfills	**$8,500.00**	Environmental Health	2	17%	$1,416.67
		Planning, Development, Tourism	2	17%	$1,416.67
		Public Citizens	1	8%	$708.33
		Public Health	1	8%	$708.33
		Refuse Disposal District	4	33%	$2,833.33
		Soil, Water Conservation District	2	17%	$1,416.67
		Layer Totals:	**12**	**100%**	**$8,500.00**
Landuse	**$500.00**	Industrial Development	2	17%	$83.33
		Planning, Development, Tourism	4	33%	$166.67
		Public Citizens	1	8%	$41.67
		Real Property Tax Service	2	17%	$83.33
		Soil, Water Conservation District	3	25%	$125.00
		Layer Totals:	**12**	**100%**	**$500.00**
Leak Locations	**$9,000.00**	Water District	1	100%	$9,000.00
		Layer Totals:	**1**	**100%**	**$9,000.00**
Legislative Districts	**$2,200.00**	Environmental Health	2	50%	$1,100.00
		Industrial Development	1	25%	$550.00
		Public Citizens	1	25%	$550.00
		Layer Totals:	**4**	**100%**	**$2,200.00**
Lighting Districts	**$800.00**	Industrial Development	1	20%	$160.00
		Public Citizens	1	20%	$160.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Lighting Districts	**$800.00**	Real Property Tax Service	3	60%	$480.00
		Layer Totals:	**5**	**100%**	**$800.00**
Liquor Stores	**$500.00**	Probation	1	25%	$125.00
		Sheriff	3	75%	$375.00
		Layer Totals:	**4**	**100%**	**$500.00**
Maintenance History Database	**$4,500.00**	Sewer District	1	100%	$4,500.00
		Layer Totals:	**1**	**100%**	**$4,500.00**
Meter Pit Locations	**$6,500.00**	Water District	2	100%	$6,500.00
		Layer Totals:	**2**	**100%**	**$6,500.00**
Meter Reading Database	**$6,500.00**	Water District	3	100%	$6,500.00
		Layer Totals:	**3**	**100%**	**$6,500.00**
Meter Reading District Outlines	**$2,500.00**	Water District	4	100%	$2,500.00
		Layer Totals:	**4**	**100%**	**$2,500.00**
Municipal Boundaries	**$200.00**	Board of Elections	1	2%	$3.33
		Environmental Health	7	12%	$23.33
		Industrial Development	4	7%	$13.33
		Planning, Development, Tourism	3	5%	$10.00
		Probation	3	5%	$10.00
		Public Citizens	2	3%	$6.67
		Public Health	3	5%	$10.00
		Real Property Tax Service	4	7%	$13.33
		Refuse Disposal District	2	3%	$6.67
		Risk/Insurance	3	5%	$10.00
		Sheriff	7	12%	$23.33
		Social Services	7	12%	$23.33
		Soil, Water Conservation District	3	5%	$10.00
		Veterans Services	1	2%	$3.33
		Water District	8	13%	$26.67
		Weights & Measures	2	3%	$6.67
		Layer Totals:	**60**	**100%**	**$200.00**
Network Schematic	**$6,500.00**	Data Processing	1	100%	$6,500.00
		Layer Totals:	**1**	**100%**	**$6,500.00**
New World AS400 Database	**$13,000.00**	Fire & Emergency Services	1	50%	$6,500.00
		Sheriff	1	50%	$6,500.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**2**	**100%**	**$13,000.00**
Nurses Addresses	**$500.00**	Public Health	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Nursing Homes	**$500.00**	Fire & Emergency Services	2	100%	$500.00
		Layer Totals:	**2**	**100%**	**$500.00**
Occurrence Database	**$3,000.00**	Public Health	1	100%	$3,000.00
		Layer Totals:	**1**	**100%**	**$3,000.00**
Parcel Outlines	**$1,000.00**	Board of Elections	2	2%	$17.70
		Code Enforcement	2	2%	$17.70
		Data Processing	2	2%	$17.70
		Environmental Health	7	6%	$61.95
		Fire & Emergency Services	7	6%	$61.95
		Industrial Development	3	3%	$26.55
		Planning, Development, Tourism	13	12%	$115.04
		Public Citizens	1	1%	$8.85
		Public Health	6	5%	$53.10
		Public Works - Building & Grounds	6	5%	$53.10
		Public Works - Engineering	7	6%	$61.95
		Public Works - Highway	9	8%	$79.65
		Real Property Tax Service	8	7%	$70.80
		Refuse Disposal District	4	4%	$35.40
		Risk/Insurance	2	2%	$17.70
		Sewer District	4	4%	$35.40
		Sheriff	7	6%	$61.95
		Social Services	5	4%	$44.25
		Soil, Water Conservation District	7	6%	$61.95
		Veterans Services	1	1%	$8.85
		Water District	8	7%	$70.80
		Weights & Measures	2	2%	$17.70
		Layer Totals:	**113**	**100%**	**$1,000.00**
Parks	**$5,000.00**	Planning, Development, Tourism	1	20%	$1,000.00
		Public Citizens	1	20%	$1,000.00
		Public Health	1	20%	$1,000.00
		Refuse Disposal District	1	20%	$1,000.00
		Sheriff	1	20%	$1,000.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**5**	**100%**	**$5,000.00**
Paths & Trails	**$1,500.00**	Planning, Development, Tourism	3	60%	$900.00
		Public Citizens	1	20%	$300.00
		Refuse Disposal District	1	20%	$300.00
		Layer Totals:	**5**	**100%**	**$1,500.00**
Patient Addresses	**$3,750.00**	Public Health	1	100%	$3,750.00
		Layer Totals:	**1**	**100%**	**$3,750.00**
Pavement	**$4,500.00**	Public Works - Building & Grounds	1	11%	$500.00
		Public Works - Engineering	2	22%	$1,000.00
		Public Works - Highway	3	33%	$1,500.00
		Refuse Disposal District	1	11%	$500.00
		Soil, Water Conservation District	1	11%	$500.00
		Weights & Measures	1	11%	$500.00
		Layer Totals:	**9**	**100%**	**$4,500.00**
PeopleSoft Database	**$8,500.00**	Data Processing	1	100%	$8,500.00
		Layer Totals:	**1**	**100%**	**$8,500.00**
Pharmacy Locations	**$750.00**	Public Citizens	1	50%	$375.00
		Public Health	1	50%	$375.00
		Layer Totals:	**2**	**100%**	**$750.00**
Phone CDs	**$500.00**	Weights & Measures	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Phone Wires	**$12,000.00**	Data Processing	1	17%	$2,000.00
		Public Works - Building & Grounds	1	17%	$2,000.00
		Public Works - Engineering	2	33%	$4,000.00
		Public Works - Highway	1	17%	$2,000.00
		Refuse Disposal District	1	17%	$2,000.00
		Layer Totals:	**6**	**100%**	**$12,000.00**
Picnic Sites	**$1,000.00**	Planning, Development, Tourism	1	50%	$500.00
		Public Citizens	1	50%	$500.00
		Layer Totals:	**2**	**100%**	**$1,000.00**
Plume Outline	**$2,500.00**	Fire & Emergency Services	1	100%	$2,500.00
		Layer Totals:	**1**	**100%**	**$2,500.00**
Police Districts	**$1,500.00**	Probation	1	13%	$187.50
		Public Citizens	1	13%	$187.50

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Police Districts	**$1,500.00**	Sheriff	6	75%	$1,125.00
		Layer Totals:	**8**	**100%**	**$1,500.00**
Police Stations	**$500.00**	Probation	1	25%	$125.00
		Public Citizens	1	25%	$125.00
		Sheriff	2	50%	$250.00
		Layer Totals:	**4**	**100%**	**$500.00**
Polling Places	**$500.00**	Board of Elections	2	100%	$500.00
		Layer Totals:	**2**	**100%**	**$500.00**
Pre-plan Printouts	**$1,500.00**	Fire & Emergency Services	3	100%	$1,500.00
		Layer Totals:	**3**	**100%**	**$1,500.00**
Preventative Maintenance Database	**$9,000.00**	Sewer District	1	100%	$9,000.00
		Layer Totals:	**1**	**100%**	**$9,000.00**
Probation Database	**$6,000.00**	Probation	1	20%	$1,200.00
		Sheriff	4	80%	$4,800.00
		Layer Totals:	**5**	**100%**	**$6,000.00**
Project Database	**$2,000.00**	Planning, Development, Tourism	2	100%	$2,000.00
		Layer Totals:	**2**	**100%**	**$2,000.00**
Project Outline Polygons	**$1,500.00**	Environmental Health	3	25%	$375.00
		Planning, Development, Tourism	3	25%	$375.00
		Public Works - Building & Grounds	1	8%	$125.00
		Public Works - Engineering	1	8%	$125.00
		Public Works - Highway	1	8%	$125.00
		Real Property Tax Service	2	17%	$250.00
		Sewer District	1	8%	$125.00
		Layer Totals:	**12**	**100%**	**$1,500.00**
Projection Metadata	**$2,500.00**	Soil, Water Conservation District	1	100%	$2,500.00
		Layer Totals:	**1**	**100%**	**$2,500.00**
Pump Stations	**$1,200.00**	Water District	1	100%	$1,200.00
		Layer Totals:	**1**	**100%**	**$1,200.00**
Railroads	**$15,000.00**	Industrial Development	3	27%	$4,090.91
		Planning, Development, Tourism	4	36%	$5,454.55
		Public Citizens	1	9%	$1,363.64
		Real Property Tax Service	3	27%	$4,090.91

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**11**	**100%**	**$15,000.00**
Recreational Equipment (swing sets, benches, picnic tables, etc.)	**$500.00**	Refuse Disposal District	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Red Line Layers	**$1,200.00**	Real Property Tax Service	2	100%	$1,200.00
		Layer Totals:	**2**	**100%**	**$1,200.00**
Resident Phone Numbers	**$500.00**	Public Health	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Sample Data Locations	**$1,200.00**	Sewer District	3	100%	$1,200.00
		Layer Totals:	**3**	**100%**	**$1,200.00**
Sample Data Results	**$750.00**	Sewer District	2	100%	$750.00
		Layer Totals:	**2**	**100%**	**$750.00**
Saved Extent Files	**$800.00**	Water District	1	100%	$800.00
		Layer Totals:	**1**	**100%**	**$800.00**
SCADA Sites	**$800.00**	Sewer District	1	25%	$200.00
		Water District	3	75%	$600.00
		Layer Totals:	**4**	**100%**	**$800.00**
Scanned As-Built Drawings	**$1,750.00**	Data Processing	1	8%	$134.62
		Planning, Development, Tourism	2	15%	$269.23
		Public Works - Building & Grounds	2	15%	$269.23
		Public Works - Engineering	2	15%	$269.23
		Public Works - Highway	3	23%	$403.85
		Real Property Tax Service	2	15%	$269.23
		Sewer District	1	8%	$134.62
		Layer Totals:	**13**	**100%**	**$1,750.00**
Scanned Brochures	**$750.00**	Planning, Development, Tourism	1	100%	$750.00
		Layer Totals:	**1**	**100%**	**$750.00**
Scanned EA-5217 Forms	**$500.00**	Industrial Development	1	33%	$166.67
		Real Property Tax Service	2	67%	$333.33
		Layer Totals:	**3**	**100%**	**$500.00**
Scanned Floor Plans	**$9,000.00**	Employment and Training	1	13%	$1,125.00
		Fire & Emergency Services	5	63%	$5,625.00
		Public Works - Building & Grounds	1	13%	$1,125.00
		Sewer District	1	13%	$1,125.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**8**	**100%**	**$9,000.00**
Scanned Index Cards	**$1,500.00**	Public Works - Building & Grounds	1	33%	$500.00
		Public Works - Engineering	1	33%	$500.00
		Public Works - Highway	1	33%	$500.00
		Layer Totals:	**3**	**100%**	**$1,500.00**
Scanned Maintenance Manuals	**$4,000.00**	Sewer District	1	100%	$4,000.00
		Layer Totals:	**1**	**100%**	**$4,000.00**
Scanned or Digital Photos	**$1,000.00**	Data Processing	1	11%	$111.11
		Industrial Development	2	22%	$222.22
		Planning, Development, Tourism	1	11%	$111.11
		Public Works - Building & Grounds	1	11%	$111.11
		Public Works - Engineering	1	11%	$111.11
		Public Works - Highway	1	11%	$111.11
		Soil, Water Conservation District	2	22%	$222.22
		Layer Totals:	**9**	**100%**	**$1,000.00**
Scanned Plot Book Pages	**$1,500.00**	Public Works - Highway	1	33%	$500.00
		Real Property Tax Service	2	67%	$1,000.00
		Layer Totals:	**3**	**100%**	**$1,500.00**
School Districts	**$800.00**	Board of Elections	1	13%	$100.00
		Environmental Health	2	25%	$200.00
		Industrial Development	1	13%	$100.00
		Public Citizens	1	13%	$100.00
		Real Property Tax Service	3	38%	$300.00
		Layer Totals:	**8**	**100%**	**$800.00**
Schools	**$200.00**	Employment and Training	1	7%	$14.29
		Fire & Emergency Services	2	14%	$28.57
		Industrial Development	1	7%	$14.29
		Probation	2	14%	$28.57
		Public Citizens	1	7%	$14.29
		Public Health	2	14%	$28.57
		Sheriff	4	29%	$57.14
		Social Services	1	7%	$14.29
		Layer Totals:	**14**	**100%**	**$200.00**
Septic Tank Locations	**$7,500.00**	Environmental Health	2	40%	$3,000.00
		Soil, Water Conservation District	3	60%	$4,500.00

APPENDIX H3: *for Niagara County*

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	*Layer / Data Development Cost*	*Department*	*# Requests for this data (by dept)*	*% of Total requests for this data*	*Portion of Cost to be Paid by Department*
		Layer Totals:	**5**	**100%**	**$7,500.00**
Service Provider Locations	**$1,200.00**	Social Services	2	100%	$1,200.00
		Layer Totals:	**2**	**100%**	**$1,200.00**
Service Recipients (geocoded addresses)	**$2,750.00**	Veterans Services	1	100%	$2,750.00
		Layer Totals:	**1**	**100%**	**$2,750.00**
Sewer Districts	**$800.00**	Environmental Health	2	29%	$228.57
		Industrial Development	1	14%	$114.29
		Public Citizens	1	14%	$114.29
		Real Property Tax Service	3	43%	$342.86
		Layer Totals:	**7**	**100%**	**$800.00**
Sewer Facilities	**$3,500.00**	Environmental Health	1	10%	$350.00
		Public Citizens	1	10%	$350.00
		Public Works - Building & Grounds	1	10%	$350.00
		Public Works - Engineering	2	20%	$700.00
		Public Works - Highway	1	10%	$350.00
		Sewer District	4	40%	$1,400.00
		Layer Totals:	**10**	**100%**	**$3,500.00**
Sewer Mains	**$3,000.00**	Environmental Health	1	9%	$272.73
		Public Citizens	1	9%	$272.73
		Public Works - Building & Grounds	1	9%	$272.73
		Public Works - Engineering	2	18%	$545.45
		Public Works - Highway	1	9%	$272.73
		Refuse Disposal District	1	9%	$272.73
		Sewer District	4	36%	$1,090.91
		Layer Totals:	**11**	**100%**	**$3,000.00**
Sex Offender Database	**$6,500.00**	Sheriff	2	100%	$6,500.00
		Layer Totals:	**2**	**100%**	**$6,500.00**
Shoreline Current Data	**$4,000.00**	Planning, Development, Tourism	1	100%	$4,000.00
		Layer Totals:	**1**	**100%**	**$4,000.00**
Shoreline Structures	**$2,000.00**	Planning, Development, Tourism	1	100%	$2,000.00
		Layer Totals:	**1**	**100%**	**$2,000.00**
Shorelines Historic Data	**$3,000.00**	Planning, Development, Tourism	1	100%	$3,000.00
		Layer Totals:	**1**	**100%**	**$3,000.00**

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
SIC Code Information	**$500.00**	Industrial Development	1	50%	$250.00
		Weights & Measures	1	50%	$250.00
		Layer Totals:	**2**	**100%**	**$500.00**
Sign Inventory Database	**$9,000.00**	Public Works - Highway	1	100%	$9,000.00
		Layer Totals:	**1**	**100%**	**$9,000.00**
Sign Locations	**$9,500.00**	Public Works - Highway	1	100%	$9,500.00
		Layer Totals:	**1**	**100%**	**$9,500.00**
Significant Users	**$2,200.00**	Sewer District	3	100%	$2,200.00
		Layer Totals:	**3**	**100%**	**$2,200.00**
Snowmobile Trails	**$1,200.00**	Planning, Development, Tourism	1	50%	$600.00
		Public Citizens	1	50%	$600.00
		Layer Totals:	**2**	**100%**	**$1,200.00**
Soils	**$500.00**	Environmental Health	1	8%	$41.67
		Planning, Development, Tourism	1	8%	$41.67
		Refuse Disposal District	3	25%	$125.00
		Soil, Water Conservation District	7	58%	$291.67
		Layer Totals:	**12**	**100%**	**$500.00**
Solar Power Grids	**$1,500.00**	Planning, Development, Tourism	1	100%	$1,500.00
		Layer Totals:	**1**	**100%**	**$1,500.00**
SPEDES Permits	**$200.00**	Environmental Health	2	100%	$200.00
		Layer Totals:	**2**	**100%**	**$200.00**
Spill Locations	**$200.00**	Fire & Emergency Services	1	100%	$200.00
		Layer Totals:	**1**	**100%**	**$200.00**
Sprinkler Systems	**$6,000.00**	Fire & Emergency Services	1	100%	$6,000.00
		Layer Totals:	**1**	**100%**	**$6,000.00**
State Crime Database	**$9,500.00**	Sheriff	1	100%	$9,500.00
		Layer Totals:	**1**	**100%**	**$9,500.00**
State DSS Database	**$3,500.00**	Probation	1	50%	$1,750.00
		Social Services	1	50%	$1,750.00
		Layer Totals:	**2**	**100%**	**$3,500.00**
Steep Slope Regions	**$1,300.00**	Public Citizens	1	33%	$433.33
		Soil, Water Conservation District	2	67%	$866.67
		Layer Totals:	**3**	**100%**	**$1,300.00**
Storm Drainage Receivers	**$6,000.00**	Soil, Water Conservation District	1	100%	$6,000.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**1**	**100%**	**$6,000.00**
Street Centerlines	**$500.00**	Board of Elections	2	2%	$8.40
		Code Enforcement	2	2%	$8.40
		Data Processing	2	2%	$8.40
		Employment and Training	3	3%	$12.61
		Environmental Health	7	6%	$29.41
		Fire & Emergency Services	7	6%	$29.41
		Human Resources	1	1%	$4.20
		Industrial Development	3	3%	$12.61
		Planning, Development, Tourism	13	11%	$54.62
		Probation	4	3%	$16.81
		Public Citizens	1	1%	$4.20
		Public Health	6	5%	$25.21
		Public Works - Building & Grounds	6	5%	$25.21
		Public Works - Engineering	7	6%	$29.41
		Public Works - Highway	9	8%	$37.82
		Real Property Tax Service	3	3%	$12.61
		Refuse Disposal District	4	3%	$16.81
		Risk/Insurance	3	3%	$12.61
		Sewer District	4	3%	$16.81
		Sheriff	8	7%	$33.61
		Social Services	8	7%	$33.61
		Soil, Water Conservation District	4	3%	$16.81
		Veterans Services	1	1%	$4.20
		Water District	9	8%	$37.82
		Weights & Measures	2	2%	$8.40
		Layer Totals:	**119**	**100%**	**$500.00**
Street Names	**$3,800.00**	Environmental Health	2	33%	$1,266.67
		Public Citizens	1	17%	$633.33
		Water District	3	50%	$1,900.00
		Layer Totals:	**6**	**100%**	**$3,800.00**
Subdivisions	**$6,650.00**	Industrial Development	1	25%	$1,662.50
		Public Citizens	1	25%	$1,662.50
		Real Property Tax Service	1	25%	$1,662.50
		Soil, Water Conservation District	1	25%	$1,662.50

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
		Layer Totals:	**4**	**100%**	**$6,650.00**
Survey Station Points	**$4,000.00**	Soil, Water Conservation District	1	100%	$4,000.00
		Layer Totals:	**1**	**100%**	**$4,000.00**
Training Center Locations	**$800.00**	Employment and Training	2	100%	$800.00
		Layer Totals:	**2**	**100%**	**$800.00**
Trip Database	**$3,500.00**	Probation	1	50%	$1,750.00
		Social Services	1	50%	$1,750.00
		Layer Totals:	**2**	**100%**	**$3,500.00**
Underground Storage Tanks	**$200.00**	Planning, Development, Tourism	2	100%	$200.00
		Layer Totals:	**2**	**100%**	**$200.00**
Unemployment Database	**$6,250.00**	Employment and Training	1	50%	$3,125.00
		Industrial Development	1	50%	$3,125.00
		Layer Totals:	**2**	**100%**	**$6,250.00**
Variance Permit Files	**$1,000.00**	Soil, Water Conservation District	1	100%	$1,000.00
		Layer Totals:	**1**	**100%**	**$1,000.00**
Vegetation	**$800.00**	Planning, Development, Tourism	4	50%	$400.00
		Public Citizens	1	13%	$100.00
		Soil, Water Conservation District	3	38%	$300.00
		Layer Totals:	**8**	**100%**	**$800.00**
Vehicle Coordinates (GPS points)	**$5,500.00**	Fire & Emergency Services	1	33%	$1,833.33
		Public Works - Highway	1	33%	$1,833.33
		Sheriff	1	33%	$1,833.33
		Layer Totals:	**3**	**100%**	**$5,500.00**
Vehicle Database	**$3,500.00**	Environmental Health	1	17%	$583.33
		Fire & Emergency Services	1	17%	$583.33
		Planning, Development, Tourism	1	17%	$583.33
		Public Works - Building & Grounds	1	17%	$583.33
		Public Works - Highway	1	17%	$583.33
		Sheriff	1	17%	$583.33
		Layer Totals:	**6**	**100%**	**$3,500.00**
VFW Posts	**$500.00**	Veterans Services	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Video Clips	**$2,500.00**	Planning, Development, Tourism	1	50%	$1,250.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Video Clips	**$2,500.00**	Public Works - Highway	1	50%	$1,250.00
		Layer Totals:	**2**	**100%**	**$2,500.00**
Voice Recordings	**$2,500.00**	Code Enforcement	1	100%	$2,500.00
		Layer Totals:	**1**	**100%**	**$2,500.00**
Voter Registration Database	**$6,800.00**	Board of Elections	1	100%	$6,800.00
		Layer Totals:	**1**	**100%**	**$6,800.00**
Water Districts	**$750.00**	Environmental Health	2	25%	$187.50
		Industrial Development	1	13%	$93.75
		Public Citizens	1	13%	$93.75
		Real Property Tax Service	3	38%	$281.25
		Water District	1	13%	$93.75
		Layer Totals:	**8**	**100%**	**$750.00**
Water Facilities & Valves	**$500.00**	Environmental Health	1	8%	$38.46
		Industrial Development	1	8%	$38.46
		Public Citizens	1	8%	$38.46
		Public Works - Building & Grounds	1	8%	$38.46
		Public Works - Engineering	2	15%	$76.92
		Public Works - Highway	1	8%	$38.46
		Water District	6	46%	$230.77
		Layer Totals:	**13**	**100%**	**$500.00**
Water Mains	**$500.00**	Environmental Health	1	5%	$26.32
		Fire & Emergency Services	4	21%	$105.26
		Industrial Development	1	5%	$26.32
		Public Citizens	1	5%	$26.32
		Public Works - Building & Grounds	1	5%	$26.32
		Public Works - Engineering	2	11%	$52.63
		Public Works - Highway	1	5%	$26.32
		Refuse Disposal District	1	5%	$26.32
		Sheriff	1	5%	$26.32
		Water District	6	32%	$157.89
		Layer Totals:	**19**	**100%**	**$500.00**
Water Quality Database	**$3,500.00**	Environmental Health	3	100%	$3,500.00
		Layer Totals:	**3**	**100%**	**$3,500.00**
Water Sample Points	**$750.00**	Environmental Health	3	50%	$375.00
		Refuse Disposal District	1	17%	$125.00

APPENDIX H3: for Niagara County

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	Layer / Data Development Cost	Department	# Requests for this data (by dept)	% of Total requests for this data	Portion of Cost to be Paid by Department
Water Sample Points	**$750.00**	Soil, Water Conservation District	2	33%	$250.00
		Layer Totals:	**6**	**100%**	**$750.00**
Water Tanks & Towers	**$500.00**	Water District	2	100%	$500.00
		Layer Totals:	**2**	**100%**	**$500.00**
Watersheds	**$100.00**	Planning, Development, Tourism	1	13%	$12.50
		Public Citizens	1	13%	$12.50
		Refuse Disposal District	3	38%	$37.50
		Soil, Water Conservation District	3	38%	$37.50
		Layer Totals:	**8**	**100%**	**$100.00**
Well Locations	**$7,000.00**	Environmental Health	1	25%	$1,750.00
		Refuse Disposal District	3	75%	$5,250.00
		Layer Totals:	**4**	**100%**	**$7,000.00**
Wetlands	**$100.00**	Environmental Health	1	6%	$5.88
		Industrial Development	2	12%	$11.76
		Planning, Development, Tourism	4	24%	$23.53
		Public Citizens	1	6%	$5.88
		Public Health	1	6%	$5.88
		Real Property Tax Service	2	12%	$11.76
		Refuse Disposal District	2	12%	$11.76
		Soil, Water Conservation District	4	24%	$23.53
		Layer Totals:	**17**	**100%**	**$100.00**
Wind Contour Maps	**$4,500.00**	Planning, Development, Tourism	1	100%	$4,500.00
		Layer Totals:	**1**	**100%**	**$4,500.00**
Windmill sites	**$500.00**	Planning, Development, Tourism	1	100%	$500.00
		Layer Totals:	**1**	**100%**	**$500.00**
Wooded lots	**$3,000.00**	Public Health	1	100%	$3,000.00
		Layer Totals:	**1**	**100%**	**$3,000.00**
Work Order Database	**$6,000.00**	Public Works - Building & Grounds	2	67%	$4,000.00
		Public Works - Highway	1	33%	$2,000.00
		Layer Totals:	**3**	**100%**	**$6,000.00**
Zip+4 Outlines	**$1,000.00**	Probation	1	33%	$333.33
		Public Citizens	1	33%	$333.33
		Risk/Insurance	1	33%	$333.33
		Layer Totals:	**3**	**100%**	**$1,000.00**

APPENDIX H3: *for Niagara County*

DISTRIBUTION OF DATA CONVERSION COSTS ACROSS DEPARTMENTS

Data Layer	*Layer / Data Development Cost*	*Department*	*# Requests for this data (by dept)*	*% of Total requests for this data*	*Portion of Cost to be Paid by Department*
Zoning Areas	**$8,500.00**	Industrial Development	3	43%	$3,642.86
		Planning, Development, Tourism	3	43%	$3,642.86
		Public Citizens	1	14%	$1,214.29
		Layer Totals:	**7**	**100%**	**$8,500.00**

Total Layer Conversion Costs **$761,250.00**

APPENDIX I: EXECUTIVE SUMMARY

Exec Summary - Computer Needs

Organization: Niagara County

Year 1 Recommendations:

Hardware

	Department	# Requested	Unit Cost	Total Cost
Color Desktop Scanner	Planning, Development, Tourism	1	$300	$300
Color Desktop Scanner	Public Works - Engineering	1	$300	$300
Color Desktop Scanner	Public Works - Building & Grounds	1	$300	$300
Color Desktop Scanner	Public Works - Highway	1	$300	$300
Color Ink Jet Printer	Industrial Development	1	$500	$500
Color Ink Jet Printer	Planning, Development, Tourism	1	$500	$500
Color Ink Jet Printer	Public Works - Engineering	1	$500	$500
Color Ink Jet Printer	Social Services	2	$500	$1,000
Digital Camera	Public Works - Building & Grounds	1	$300	$300
Large Format Plotter	Water District	1	$10,000	$10,000
LCD Projector	Data Processing	1	$3,000	$3,000
New PC	Environmental Health	3	$2,000	$6,000
New PC	Public Works - Engineering	1	$2,000	$2,000
New PC	Water District	1	$2,000	$2,000
NT Server	Data Processing	1	$12,000	$12,000
Upgrade to current PC	Environmental Health	3	$1,000	$3,000
Upgrade to current PC	Planning, Development, Tourism	2	$1,000	$2,000
Upgrade to current PC	Public Works - Engineering	1	$1,000	$1,000
Upgrade to current PC	Social Services	5	$1,000	$5,000
Upgrade to current PC	Public Works - Building & Grounds	2	$1,000	$2,000
Upgrade to current PC	Public Works - Highway	2	$1,000	$2,000

Miscellaneous

Map server set-up	Data Processing	1	$3,000	$3,000
Map server set-up	Planning, Development, Tourism	1	$3,000	$3,000

Software

ArcIMS	Data Processing	1	$7,500	$7,500
ArcView 3.x	Environmental Health	3	$900	$2,700
ArcView 3.x	Planning, Development, Tourism	2	$900	$1,800
ArcView 3.x	Public Works - Engineering	2	$900	$1,800
ArcView 3.x	Real Property Tax Service	1	$900	$900
ArcView 3.x	Water District	3	$900	$2,700
ArcView 3.x	Public Works - Building & Grounds	2	$900	$1,800
ArcView 3.x	Public Works - Highway	2	$900	$1,800

Organization: Niagara County

	Department	# Requested	Unit Cost	Total Cost
Training				
ArcIMS End User (3 hours)	Environmental Health	30	$50	$1,500
ArcIMS End User (3 hours)	Fire & Emergency Services	10	$50	$500
ArcIMS End User (3 hours)	Industrial Development	2	$50	$100
ArcIMS End User (3 hours)	Planning, Development, Tourism	12	$50	$600
ArcIMS End User (3 hours)	Public Health	35	$50	$1,750
ArcIMS End User (3 hours)	Public Works - Engineering	2	$50	$100
ArcIMS End User (3 hours)	Real Property Tax Service	6	$50	$300
ArcIMS End User (3 hours)	Refuse Disposal District	2	$50	$100
ArcIMS End User (3 hours)	Sewer District	4	$50	$200
ArcIMS End User (3 hours)	Sheriff	10	$50	$500
ArcIMS End User (3 hours)	Social Services	70	$50	$3,500
ArcIMS End User (3 hours)	Soil, Water Conservation District	4	$50	$200
ArcIMS End User (3 hours)	Water District	6	$50	$300
ArcIMS End User (3 hours)	Weights & Measures	4	$50	$200
ArcIMS End User (3 hours)	Human Resources	4	$50	$200
ArcIMS End User (3 hours)	Public Works - Building & Grounds	3	$50	$150
ArcIMS End User (3 hours)	Public Works - Highway	4	$50	$200
ArcView Course	Environmental Health	5	$600	$3,000
ArcView Course	Planning, Development, Tourism	4	$600	$2,400
ArcView Course	Public Works - Engineering	2	$600	$1,200
ArcView Course	Water District	3	$600	$1,800
ArcView Course	Public Works - Building & Grounds	2	$600	$1,200
ArcView Course	Public Works - Highway	2	$600	$1,200
Intro to GIS	Data Processing	3	$250	$750
Intro to GIS	Sheriff	12	$250	$3,000
PC Basics	Social Services	20	$250	$5,000
Pictometry training (3 hours)	Fire & Emergency Services	4	$50	$200
Pictometry training (3 hours)	Real Property Tax Service	6	$50	$300
Pictometry training (3 hours)	Sheriff	20	$50	$1,000
Pictometry training (3 hours)	Soil, Water Conservation District	3	$50	$150
Pictometry training (3 hours)	Public Citizens	50	$50	$2,500

Total Year 1 Recommendations: **$115,100**

Organization: Niagara County

Year 2 Recommendations:

Hardware

	Department	# Requested	Unit Cost	Total Cost
Color Ink Jet Printer	Employment and Training	1	$500	$500
Color Ink Jet Printer	Environmental Health	1	$500	$500
Color Ink Jet Printer	Social Services	2	$500	$1,000
Color Ink Jet Printer	Public Works - Building & Grounds	1	$500	$500
Digital Camera	Water District	1	$300	$300
Digital Camera	Public Works - Highway	1	$300	$300
GPS Survey Unit	Public Works - Engineering	1	$8,000	$8,000
Hand Held PC	Code Enforcement	1	$600	$600
Large Format Plotter	Planning, Development, Tourism	1	$10,000	$10,000
Network Card (Gigabit)	Data Processing	80	$200	$16,000
Network Switch (Gigabit)	Data Processing	5	$2,000	$10,000
New PC	Environmental Health	2	$2,000	$4,000
New PC	Fire & Emergency Services	2	$2,000	$4,000
New PC	Planning, Development, Tourism	2	$2,000	$4,000
New PC	Public Health	4	$2,000	$8,000
New PC	Public Works - Engineering	2	$2,000	$4,000
New PC	Sewer District	1	$2,000	$2,000
New PC	Social Services	5	$2,000	$10,000
Upgrade to current PC	Employment and Training	2	$1,000	$2,000
Upgrade to current PC	Environmental Health	3	$1,000	$3,000
Upgrade to current PC	Industrial Development	2	$1,000	$2,000
Upgrade to current PC	Planning, Development, Tourism	2	$1,000	$2,000
Upgrade to current PC	Probation	4	$1,000	$4,000
Upgrade to current PC	Public Works - Engineering	1	$1,000	$1,000
Upgrade to current PC	Refuse Disposal District	1	$1,000	$1,000
Upgrade to current PC	Social Services	10	$1,000	$10,000

Software

ArcIMS Annual Maintenance	Data Processing	1	$1,000	$1,000
ArcIMS Route	Human Resources	1	$2,000	$2,000
ArcPad	Code Enforcement	1	$500	$500
ArcSDE	Data Processing	1	$8,000	$8,000
ArcView 3.x	Employment and Training	3	$900	$2,700
ArcView 3.x	Environmental Health	2	$900	$1,800
ArcView 3.x	Fire & Emergency Services	2	$900	$1,800
ArcView 3.x	Industrial Development	2	$900	$1,800
ArcView 3.x	Planning, Development, Tourism	2	$900	$1,800
ArcView 3.x	Public Health	4	$900	$3,600
ArcView 3.x	Real Property Tax Service	2	$900	$1,800
ArcView 3.x	Refuse Disposal District	1	$900	$900
ArcView 3.x	Sewer District	1	$900	$900
ArcView 3.x	Sheriff	2	$900	$1,800
ArcView 3.x	Social Services	4	$900	$3,600
ArcView 3.x	Public Works - Highway	1	$900	$900
Microsoft Access	Real Property Tax Service	4	$300	$1,200
Microsoft Access	Weights & Measures	2	$300	$600
Network Analyst	Social Services	4	$1,295	$5,180

Organization: Niagara County

	Department	# Requested	Unit Cost	Total Cost
Training				
Access Basics	Real Property Tax Service	3	$200	$600
Access Basics	Weights & Measures	2	$200	$400
Access Database Design	Real Property Tax Service	1	$300	$300
Access Database Design	Weights & Measures	1	$300	$300
ArcIMS End User (3 hours)	Environmental Health	4	$50	$200
ArcIMS End User (3 hours)	Fire & Emergency Services	5	$50	$250
ArcIMS End User (3 hours)	Planning, Development, Tourism	2	$50	$100
ArcIMS End User (3 hours)	Probation	12	$50	$600
ArcIMS End User (3 hours)	Public Health	30	$50	$1,500
ArcIMS End User (3 hours)	Social Services	5	$50	$250
ArcIMS Route class	Human Resources	4	$400	$1,600
ArcPad Class (0.5 day class)	Code Enforcement	1	$150	$150
ArcView Course	Employment and Training	3	$600	$1,800
ArcView Course	Environmental Health	5	$600	$3,000
ArcView Course	Fire & Emergency Services	2	$600	$1,200
ArcView Course	Industrial Development	2	$600	$1,200
ArcView Course	Planning, Development, Tourism	4	$600	$2,400
ArcView Course	Public Health	4	$600	$2,400
ArcView Course	Real Property Tax Service	2	$600	$1,200
ArcView Course	Refuse Disposal District	2	$600	$1,200
ArcView Course	Sewer District	2	$600	$1,200
ArcView Course	Sheriff	4	$600	$2,400
ArcView Course	Social Services	4	$600	$2,400
ArcView Course	Soil, Water Conservation District	2	$600	$1,200
ArcView Course	Public Works - Building & Grounds	1	$600	$600
GIS Administration	Data Processing	3	$1,000	$3,000
GIS Administration	Water District	1	$1,000	$1,000
Intro to GIS	Code Enforcement	1	$250	$250
Network Analyst class	Social Services	4	$400	$1,600
PC Basics	Code Enforcement	1	$250	$250
PC Basics	Social Services	5	$250	$1,250
Pictometry training (3 hours)	Public Works - Engineering	3	$50	$150
Pictometry training (3 hours)	Public Works - Highway	3	$50	$150

Total Year 2 Recommendations: **$186,680**

Year 3 Recommendations:

Hardware

	Department	# Requested	Unit Cost	Total Cost
Color Desktop Scanner	Real Property Tax Service	1	$300	$300
Color Desktop Scanner	Refuse Disposal District	1	$300	$300
Color Desktop Scanner	Social Services	1	$300	$300
Color Ink Jet Printer	Fire & Emergency Services	1	$500	$500
Digital Camera	Code Enforcement	1	$300	$300
Large Format Plotter	Sheriff	1	$10,000	$10,000
Network Card (Gigabit)	Data Processing	160	$200	$32,000
Network Switch (Gigabit)	Data Processing	10	$2,000	$20,000
New PC	Environmental Health	3	$2,000	$6,000
New PC	Planning, Development, Tourism	2	$2,000	$4,000
New PC	Water District	1	$2,000	$2,000
Upgrade to current PC	Employment and Training	3	$1,000	$3,000
Upgrade to current PC	Environmental Health	3	$1,000	$3,000
Upgrade to current PC	Probation	4	$1,000	$4,000
Upgrade to current PC	Refuse Disposal District	1	$1,000	$1,000
Upgrade to current PC	Social Services	5	$1,000	$5,000

Software

ArcGIS 8.x	Planning, Development, Tourism	1	$7,500	$7,500
ArcGIS 8.x	Water District	1	$7,500	$7,500
ArcIMS Annual Maintenance	Data Processing	1	$1,000	$1,000
ArcLogistics Route	Environmental Health	1	$5,000	$5,000
ArcSDE Annual Maintenance	Data Processing	1	$1,500	$1,500
ArcView 3.x	Employment and Training	7	$900	$6,300
ArcView 3.x	Environmental Health	3	$900	$2,700
ArcView 3.x	Fire & Emergency Services	2	$900	$1,800
ArcView 3.x	Risk/Insurance	1	$900	$900
Network Analyst	Probation	1	$1,295	$1,295

Training

ArcGIS	Planning, Development, Tourism	1	$1,600	$1,600
ArcGIS	Water District	1	$1,600	$1,600
ArcIMS End User (3 hours)	Environmental Health	4	$50	$200
ArcIMS End User (3 hours)	Fire & Emergency Services	5	$50	$250
ArcIMS End User (3 hours)	Probation	10	$50	$500
ArcIMS End User (3 hours)	Public Health	5	$50	$250
ArcIMS End User (3 hours)	Social Services	5	$50	$250
ArcLogistics Route class	Environmental Health	2	$400	$800
ArcView Course	Employment and Training	7	$600	$4,200
ArcView Course	Fire & Emergency Services	2	$600	$1,200
ArcView Course	Sewer District	2	$600	$1,200
ArcView Course	Risk/Insurance	2	$600	$1,200
GIS Administration	Planning, Development, Tourism	1	$1,000	$1,000
GPS training	Public Works - Engineering	2	$1,000	$2,000
PC Basics	Social Services	5	$250	$1,250
Pictometry training (3 hours)	Industrial Development	2	$50	$100
Pictometry training (3 hours)	Planning, Development, Tourism	3	$50	$150

Organization: Niagara County

Department	# Requested	Unit Cost	Total Cost
		Total Year 3 Recommendations:	$144,945

Organization: Niagara County

Year 4 Recommendations:

Hardware

	Department	# Requested	Unit Cost	Total Cost
Color Ink Jet Printer	Board of Elections	1	$500	$500
Color Ink Jet Printer	Code Enforcement	1	$500	$500
Color Ink Jet Printer	Environmental Health	1	$500	$500
Color Ink Jet Printer	Real Property Tax Service	1	$500	$500
Digital Camera	Refuse Disposal District	1	$300	$300
Network Card (Gigabit)	Data Processing	240	$200	$48,000
Network Switch (Gigabit)	Data Processing	15	$2,000	$30,000
New PC	Board of Elections	1	$2,000	$2,000
New PC	Code Enforcement	1	$2,000	$2,000
New PC	Environmental Health	2	$2,000	$4,000
New PC	Planning, Development, Tourism	1	$2,000	$2,000
New PC	Probation	1	$2,000	$2,000
New PC	Public Health	1	$2,000	$2,000
New PC	Real Property Tax Service	1	$2,000	$2,000
Upgrade to current PC	Environmental Health	3	$1,000	$3,000

Software

ArcGIS 8.x	Real Property Tax Service	4	$7,500	$30,000
ArcGIS Annual Maintenance	Water District	1	$3,000	$3,000
ArcIMS Annual Maintenance	Data Processing	1	$1,000	$1,000
ArcIMS Route	Weights & Measures	1	$2,000	$2,000
ArcLogistics Route	Code Enforcement	1	$5,000	$5,000
ArcLogistics Route	Planning, Development, Tourism	1	$5,000	$5,000
ArcLogistics Route	Probation	1	$5,000	$5,000
ArcLogistics Route	Public Health	1	$5,000	$5,000
ArcSDE Annual Maintenance	Data Processing	1	$1,500	$1,500
ArcView 3.x	Board of Elections	1	$900	$900
ArcView 3.x	Environmental Health	2	$900	$1,800
ArcView 3.x	Fire & Emergency Services	2	$900	$1,800

Training

ArcGIS	Real Property Tax Service	4	$1,600	$6,400
ArcIMS End User (3 hours)	Environmental Health	4	$50	$200
ArcIMS End User (3 hours)	Fire & Emergency Services	5	$50	$250
ArcIMS End User (3 hours)	Public Health	5	$50	$250
ArcIMS End User (3 hours)	Social Services	5	$50	$250
ArcIMS Route class	Weights & Measures	1	$400	$400
ArcLogistics Route class	Code Enforcement	1	$400	$400
ArcLogistics Route class	Planning, Development, Tourism	2	$400	$800
ArcLogistics Route class	Probation	2	$400	$800
ArcLogistics Route class	Public Health	2	$400	$800
ArcView Course	Board of Elections	2	$600	$1,200
ArcView Course	Fire & Emergency Services	2	$600	$1,200
PC Basics	Social Services	5	$250	$1,250
Pictometry training (3 hours)	Public Works - Building & Grounds	3	$50	$150

Total Year 4 Recommendations: $175,650

APPENDIX J: INTERVIEW SUMMARIES

Niagara County – Office for the Aging
January 23, 2002
Nancy Smegelsky, Coordinator of Aging Services

I met with Nancy Smegelsky from the Office for the Aging located in the Switzer Building in Niagara County. Nancy reviewed with me the wealth of programs available for the older community they serve, which is comprised of individuals 60 years old and older. Nancy also heads up the newest program offered called the "Caregivers Program". This program offers assistance to people who assist an aging person.

Nancy said that their department does interact with the State office for the Aging as well as Emergency Management. They interact with the Legislature and Planning when they need to know demographics and age of citizens of the County. Other departments will call them with the same type inquiry.

Currently, the department does not use maps for any reason. We talked about "Home Delivered Meals" and the need for assistance here and while we were talking, the person who heads up this area came in. He stated the program has 63 volunteers and they deliver approximately 250 meals per day throughout the County. Meals on Wheels is a private organization, possibly based in Niagara Falls that is <u>not</u> part of their department, Home Delivered Meals. Volunteers from throughout the County have a check point where they receive the meals to be delivered along with a list which changes from day to day. Deliveries are made Monday through Friday with Friday being a heavier day as frozen meals are delivered to assist persons on the weekend.

Databases are kept, primarily in Access, which are updated at least weekly. These databases are available for all of the 10 or so programs sponsored by the Department. The key information to be gotten from these databases include name, age statistics (60+, 75+, etc.) frail?, veteran?, special requirements, poverty level, race, live alone?, etc. The one piece of information they wish they had is up to date census information. Funding is based upon accurate information by community and they need to know if services that are needed are being provided where they should be.

Besides routing assistance for the Home Delivered Meals volunteers, the department also has a Medical Van. Transportation is available only if no other resources are available for elderly people 60 years and older. There is only one vehicle and one driver and the vehicle pre-books one week in advance due to volume demands.

Nancy concluded by telling me she prepares quarterly reports to the State to report financial statistics as well as the number of units and sources for all their programs. The department subcontracts with various agencies and needs to prepare a report for the County with these statistics also.

<u>Applications for Office for the Aging:</u>

1. **Automated Vehicle Locator (AVL)** - application to track or map van services. Would allow the user to see real time location of van facilitating more efficient dispatching.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Hydrology
d. Municipal boundaries
e. Service recipients (geocoded addresses)
f. Computed routes and directions
g. Vehicle coordinates (GPS points)

2. **Home Delivered Meals** – 63 volunteers deliver approx. 250 meals per day. Application that imports orders from an existing database, then schedules and computes efficient routes.

Data Layers:

a. Street centerlines
b. Municipal boundaries
c. Hydrology
d. Service recipients (geocoded addresses)
e. Delivery base location(s)
f. Special dietary requirements
g. Computed routes and directions

3. **Section 8 Housing Tool** - targeting application to analyze and determine the predominant areas of low-income seniors.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Municipal boundaries
d. Churches
e. Community centers
f. Census data (demographic data)
g. County tax roll database containing Date of Birth records

4. **Case Resolution Application** - application to track and keep historical information about why a case is closed (transfer to a nursing home, relocation out of county, death, etc…).

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Municipal boundaries
d. Service recipient addresses
e. Service recipient "treatment" database
f. Death certificate database

Niagara County – Audit
March 19, 2002
Sharon Sacco, Director

Sharon is currently directing the Audit department as well as Management and Budget.

We began our discussion by talking about GIS and how it's been used in one County to reclaim thousands of dollars using geocoding of all addresses during an audit of a cable company versus just checking one of every hundred records.

Although Sharon was interested in this, she explained that the only thing the Niagara County Audit Department is responsible for is Accounts Payable. The County contracts with the accounting firm of DeLoitte and Touche for their audit control. Further, the County does not contract with such companies; this is handled directly through the Towns and Cities.

I asked about other account functions such as Accounts Receivable and Collections and Sharon explained that each department has the responsibility of receiving and collecting for their own department. She explained that the County departments are each "stand-alone units". The Treasury Department handles tax collections.

We concluded by determining that GIS would not assist the Audit Department at this time.

Niagara County – Board of Elections
March 4, 2002
Nancy Sharpe, Democratic Commissioner & Michael Norris, Republican Commissioner

Both Ms. Sharpe and Mr. Norris were unable to attend the GIS Educational Seminars, so we began by discussing what GIS is and the capabilities that can accomplished using GIS. I showed them the example of how when GIS is applied to current databases, a nice visual representation can be used for planning or displaying various information within the department.

The Board of Elections department is responsible to maintain all voting records for every individual in all of Niagara County. Their office runs all elections except Village elections and School elections. Their office does assist in these elections by providing lists of voters, however, the villages and school boards are responsible for their own elections. Nancy mentioned that all voting equipment is owned by the individual towns and cities.

The Board of Elections department uses a computer program system called NTS. The County contracts with this computer company to have access to use this system. Both Nancy and Michael are very pleased with the current system and it provides them all the information they currently need.

The department has limited interaction with other departments because of the "nature of their business", and so there is no data sharing or requesting of information from this department and any other.

The maps currently used within the department are a County map by legislative district, a small map of each legislative district and a map of each town and each city. County redistricting is done every 10 years, so the maps currently used are usually good for that period. City and Town redistricting is done periodically and the department is notified of these changes.

The only databases kept are those in the NTS computer system. The information is updated on a daily basis, as needed. The NTS system has no mapping capabilities. When asked if mapping capabilities or directions would be something the department could use, Nancy replied that if a voter called and needed directions to a particular polling location, for example, they have enough staff from various locations throughout the County, that they can generally assist them with where they need to go.

Both Nancy and Michael are happy with their current computer system and its capabilities. They said there was nothing that they would need that they are not able to access now. Querying for information is easy with their current system and they could think of nothing they would like to have that they do not have now.

We concluded by talking about what other programs or capabilities they're desktop computer can do for them. Their only program on their desktop is the NTS package. There is one computer in the department currently that has Internet and e-mail access and is hooked to the County system for payroll and budget information.

Applications for Board of Elections:

1. **Election District Verification** – an application to verify that a voter's address falls within the correct election district or has been assigned the correct district value. Experience has proven that because the NTS system does not have a mapping component, errors are made in the assignment of voters to districts. This most often occurs along borders of districts, but some points that fall squarely in the middle of a voting district, may have been assigned the wrong district value.

   Data layers

   a. Street centerlines
   b. Parcel outlines
   c. Election districts
   d. Polling places
   e. NTS database
   f. Municipal boundaries
   g. School districts

2. **Polling Location Map** – Internet based map application to display the location of polling locations based on a voter's address. This application would be useful for new residents or for people who have never voted before (a get out to vote campaign).

   Data layers

   a. Street centerlines
   b. Parcel outlines
   c. Election districts
   d. Polling locations
   e. Geocoded addresses

3. **Redistricting tool** – application to create a series of proposed election district boundaries for public review and approval. The tool uses the census block groups and population data to group or aggregate block groups into districts. The software would report total population assigned to each new district to comply with Federal guidelines for population balance (i.e. the population within each proposed district must be within 4%).

   Data layers

   a. Census block groups
   b. Election districts

Niagara County – Data Processing
March 18, 2002
Larry Helwig, Director; Jeff Evanson, Microcomputer Coordinator

We began our meeting with introductions and an overview of the DP department's support role within the county. Larry mentioned there are five campuses that are managed by Data Processing; the courthouse being the largest. There were several diagrams, photographs, flow charts and County sites posted throughout Larry's office. Larry explained that they display locations of wireless communication, T1 lines, fiber cables and frame relay through the County. He also stated that a topology map between the Visio map and the County map would be very helpful. Currently, the many photos displayed were taken using a traditional camera. The department now has and uses a digital camera. We then discussed the various County buildings, connectivity and keeping track of connections and wiring. Currently, the HUB room/location is unknown in most buildings. Larry did show us paper copies of building floorplans which were created in AutoCAD with hand drawn room numbers and comments. Unfortunately, the building interior changes from time to time and the drawings do not get updated. Everyone agreed that if the drawings were scanned and stored electronically, the process of updating them and keeping track of the HUB closets or where the fibers are run would be easier to maintain. The location of where the equipment and wiring is in each floor of each building would be very helpful. Larry stated this process would be an "evolving tool to document infrastructure".

DP does not have a detailed inventory of all the hardware throughout Niagara County – they know a PC exists and the date it was purchased, but details like brand, CPU speed, memory, etc., were not recorded in a clear manner. Larry said the way assets are currently entered into the computer varies. Consistent and accurate data is not always used, processor speed is not entered so it makes tracking machines by speed very difficult. Currently, processor speed is gauged based upon the year of purchase – not a very accurate way of tracking. An inventory tool prepared by the GISRG was suggested to assist in accounting for specific information on the hardware throughout the County and Larry said as a budgeting and inventory tool this would be helpful. This program would work with the old asset management system and could be integrated with PeopleSoft, the current package used for maintaining hardware inventory. For the most part, 75% of the machines used throughout the County are a Pentium 200 or greater, 75% of the machines have 64 MB or more of RAM and 95% of the machines have CD ROMS. Larry mentioned that Win 95/98 runs on approximately 95% of the County. There are a couple Novel servers, a couple NT servers and one 2000 server, also. Larry also stated that conversion by year-end to Win 2000, including MS Office 2000 would be taking place based on his 2002 budget. Larry mentioned that the estimated life of their hardware is 4-5 years for desktop PCs and approximately 5-7 years for servers. The County cannot donate old PCs, so instead, they are loaned to various groups within the County and remain on the County inventory system. Some machines are stripped of parts for possible replacement pieces and are given up to auction.

Each department is responsible for budgeting for their computer hardware and software needs. Data Processing oversees the signing of requisitions for software and hardware before it is purchased. DP has a maintenance budget for global packages and site licenses, however, new desktop purchases are controlled by each department. Server costs are shared by the primary users of the campus where the server resides.

Jeff Evanson primarily supports Real Property, Engineering and Planning due to his AutoCAD and GIS experience. The Engineering Department, Real Property and Planning Department are heavy GIS and AutoCAD users and so are currently equipped with power stations. Currently, there is one server to support those three departments. The Sheriffs Department also has top-notch computers. The balance of the machines across all departments are primarily used by clerical staff who run MS Word or Excel. A problem noted by both Jeff and Larry is that most of the users in these departments are "keepers of their own data". Each person is running and saving data independently on their desktop. A problem noted is that often days are spent finding the latest "current" copy of CAD drawing, and then even more time updating it to include all available and current information. No data sharing is being done between these departments at this time. The feeling has been by Larry and Jeff that data sharing isn't welcomed now because people in general just don't like others manipulating their document and then when they go back to use it, the document is completely messed up and creates further work. It was agreed that new concepts need to be introduced to the County staff to educate then on what data and information is available, and educate folks on proper data sharing techniques.

Graham discussed ArcIMS as a possible way to get GIS to as many users as possible. He explained that this can allows you to host maps on an intranet or allow public access behind a firewall. The County does host its own website and server issues were discussed along with the capabilities of this option.

Applications for Data Processing:

1. **Computer Inventory Tool** – application to analyze a given computer and to record the owner name, department name, hardware configuration (CPU speed, memory, diskspace, network and video card speed, etc.), operation system and selected software packages. The data resultant data records would need to import into the PeopleSoft asset management tool currently used by the County.

   Data Layers:

   a. PeopleSoft database – computer inventory

2. **Cabling Display Tool** – application to display the location of network cables either inside buildings or buried underground. The locations of cabling will be supported by scanned or digital photos of cable runs, hub closest, trench locations, etc., tied to parcels, ROWs, building floor plans (scanned images, CAD drawings or GIS layers).

   Data Layers:

   a. Aerial Photos (Pictometry)
   b. Building Footprints
   c. Building Floorplans
   d. Cable Lines
   e. Digital Ortho Photos (DOQs)
   f. Parcel Outlines
   g. Phone Wires
   h. Scanned or Digital Photos
   i. Scanned As-Built Drawings
   j. Street Centerlines
   k. Building and Room Database

3. **GIS Network Integration Tool** – application to integrate a Novell / Visio network schematic with the cable display tool. Each connecting line of the schematic between servers, routers and campus buildings could be related to a physical cable location on the GIS display.

    Data Layers:

    a. Building Footprints
    b. Building Floorplans
    c. Parcel Outlines
    d. Street Centerlines
    e. Novel Network Drawing
    f. Network Schematic

4. **FTP Site** – as a means of distributing GIS data to local municipalities in standard formats, an FTP site containing the latest version of GIS data layers for each community could be setup. End users could copy the data themselves rather than asking a GIS user for help.

5. **ArcIMS Server** – this application provides intranet or Internet access to GIS layers via web browsers. Even though the DP department would not be heavy users of this application, they would assume a support role for administering the site and the underlying data layer.

    Data Layers:

    a. Directory Structure for own data by Town
    b. Server

Niagara County – Employment and Training
February 7, 2002
David See (MIS Supervisor), Douglas Linderman (Training Coordinator), and Judith Terderous

Our discussion began with David explaining that their department administers job training for Niagara County. They serve mainly low income and now, a wide population of adults looking to upgrade job skills, and youths who meet eligibility requirements. The Department of Labor is in the same building and they are set up as a "one-stop-shop". A person comes in to the DOL and the process is as self-serve as possible. They get registered, receive some literature and are directed to a computer to search for available job openings. If this is not sufficient, they are referred to areas such as the Employment and Training department for resume assistance, etc. If a person needs training for example, they are referred and registered under the Workforce Investment Act. There are DOL locations in Niagara Falls, Lockport and North Tonawanda and the systems are not linked together. Employers also call here and referrals go to the job developers at this office.

Currently databases are kept on all clients in Excel format. These databases include demographics, ethnicity, age, DOB, if counseling is received, activities currently involved in, etc. Clients coming in to the DOL use a DOS based program.

Social Services works in conjunction with Employment and Training to sponsor a Welfare-to-Work Program. The application process begins at Social Services. If a case worker feels this program would assist a client, a paper referral to the program is made, they are entered into the Social Services computer system and an interview at Employment and Training is scheduled. Because the referral is made in writing from Social Services, the information about this client would be entered into the computer a second time once it reached the Employment and Training department.

The department has other programs, such as the Youth Program which matches certain school age students to part time work either after school or during the summer. All applications are filled out manually and are only stored in paper format. Job Developers speak with employers and economic developers. They also assist with identifying pockets of unemployed population within the County related to a business closure, for example.

Three to four years of applications and paperwork are maintained on-site and the remainder are all stored at off-site facilities. The department has two scanners, but does not currently use the scanner to store information or applications digitally.

Currently, maps are created from the Internet (such as in MapQuest) to prepare directions for jobseekers to local businesses. Paper bus schedules are also copied and distributed. It was stated that it would be most helpful to have this information available on the desktop along with locations of day cares, schools and other locations to assist the wide range of clientele they serve who have varying and complex needs. A very customized approach needs to be given to each person who comes in because each person has their own circumstances and needs. (i.e. a single mom, with two small children and one in school, needs to drop young children off, head to an interview, and only has bus transportation).

When asked what information the department does not have now, that they would really like to have in the future, one thing they suggested is information on County business closures and the economic impact for the surrounding businesses if suddenly there were large pockets of displaced workers. Also, if a new business comes into the area and they would like to know certain criteria of unemployed persons living within a 20 mile radius of their location (for possible placement). A database to include things like schooling/degree, training, location of these people would be most helpful to assist in this regard. The other thing mentioned is digitized floor plans that could be available for their clients who are sent to the many training sites such as BOCES, Niagara Community College (and even their own office), to assist in locating training sites and office/room locations of training. Maps to these sites should include streets, main building outlines, schools and other landmarks.

Applications for the Employment and Training:

1. **Database Integration –** this application would create a new database or tie together existing database to share common data and eliminate the need to enter redundant data. DOL office systems should be networked to create a single repository of job information. This would be beneficial to the Job Counselors, employers looking to hire, and to individuals searching the system for possible job openings. This system should be web based and available to DOL, Social Service caseworkers, Employment and Training counselors. The system should be broken into an employer database (job openings) and a client database (job seekers). When employer information is entered into the system (one time) it is available to all users of the system. Client database would be available only to DOL, Social Services, or Employment and Training counselors. Any counselor should be able to access the system and refer a client for a job interview.

    Data Layers:

    a. DOL job database
    b. Employment & Training database
    c. Employer database (company name, company address, contact name, phone number, e-mail, etc., job openings, skills required, work hours, location(s) of openings, pay scale, etc.)
    d. Client database (name, address, DOB, skills, origination date, last job held, interview date, time scheduled, outcome, next step, etc.)

2. **Job Search Tool –** application to provide an easy to use query and display interface to locate job openings, transportation, training, and daycare facilities close to the work place or home address. This tool would integrate the Employer and Client databases with a map interface and a radius search tool.

    Data Layers:

    a. Integrated DOL and Employment & Training database
    b. Street centerlines
    c. Geocoded job opening addresses
    d. Geocoded client home addresses
    e. Daycare facilities
    f. Bus stops
    g. Bus routes

3. **Maps & Directions –** application to allow end users (general public or job counselors) to create maps and directions for job seekers to locate interviews, training facilities and means of transportation. RouteMap IMS is a probable solution for this application. The printout should include detail at the campus and floor plan level to assist individuals to find specific buildings or rooms.

   Data Layers:

   a. Integrated DOL and Employment & Training database
   b. Street centerlines
   c. Geocoded job opening addresses
   d. Geocoded client home addresses
   e. Training center locations
   f. Detailed campus maps
   g. Detailed floor plans
   h. Bus stops
   i. Bus routes

4. **Employment / Unemployment Maps –** application to allow job counselors and planners to display the current distribution of active versus inactive employers (with employee counts) as well as the addresses of unemployed individuals. Density maps can be calculated to target areas for job training, counseling, and to encourage economic development.

   Data Layers:

   a. Integrated DOL and Employment & Training database
   b. Street centerlines
   c. Demographic data
   d. Geocoded employer addresses
   e. Geocoded unemployed addresses
   f. Training centers
   g. Churches
   h. Shelters
   i. Schools

Niagara County – Fire Coordinator / Code Enforcement
January 28, 2002
Jim Volkosh (Fire coordinator), Dan Gregory (Code enforcement)

We started the discussion with a brief overview of the concepts of GIS tying maps and databases. Both Jim and Dan had attended a GIS educational seminar and were familiar with what the technology could provide for their departments.

Jim stressed his desire for simplicity and standardization. "If it is not simple and consistent, the GIS will not be used or trusted". As an example, Jim discussed the need for Emergency Plans to be very concise (3 pages max – something that can read on the way to a fire). He would like to show a map of the fire response location, building outlines, mains and hydrants. Jim felt that main size could be more readily acquired and trusted more than reported hydrant flows, although he and Dan could see the value of hydrant flow reports as the database was improved over time. Jim would like to have hotlinks setup to hazardous material databases for a given property as well as scanned floor plans, digital images of the building, as well as drawings of sprinkler systems and locations of stand pipes. Dan would like to see the location of all elevators in buildings. Jim would love to have AVL and mapping capability in every emergency vehicle, but saw that as a future dream.

Jim mentioned that they were moving into a new building and changing over their communications systems using New World for CAD and Plant Equipment for 911 all tied to an AS400. I mentioned that we had developed interfaces between AS400 and GIS in the past using Visual Basic to communicate between the systems, so that what he was asking for was very doable. The only limitation evident in our cursory review of the AS400 program was a lack of a common key to tie the records back to a map (i.e. an SBL number). We discussed several options for using address values to match the AS400 records to parcel addresses and then passing the SBL number back to the AS400 to act as a direct link.

Dan discussed the wide range of buildings and properties his department is responsible for (all county owned buildings and all IDA properties). Dan shared a few checklists he has developed over the years trying to streamline and standardize the inspection process. The punch list he provided had 117 specific items for potential inspections covering topics like:

1) Maintenance (1 item)
2) Fire Department and Emergency Service Access (2 items)
3) Means of Egress (16 items)
4) Equipment & Systems (20 items)
5) Electrical Systems (7 items)
6) Commercial Cooking Equipment (3 items)
7) Fire Protection Systems (2 items)
8) Water Supply (2 items)
9) Sprinkler System (4 items)
10) Standpipe Systems (3 items)
11) Fire Pumps (2 items)
12) Yard Hydrant Systems (1 item)
13) Portable Fire Extinguishers (3 items)

14) Fire Alarm Systems (4 items)
15) Fire and Smoke Detectors (2 items)
16) Elevator Equipment (2 items)
17) Hoistways and Shafts (2 items)
18) Flammable and Combustible Liquids (19 items)
19) Hazardous Materials (3 items)
20) Organic Coatings (3 items)
21) Fire Safety Practice (1 item)
22) Exterior Protection (2 items)
23) Interior Protection (8 items)
24) Fire Safety Training (5 items)

Each item in the punch list has 3 check boxes C=conforms; V=violations; NA=not applicable. The inspectors go out to the site, perform the inspection and then write up their findings. The owner or contractor either passes or fails and are given a series of steps they must perform to alleviate any problems to comply with the inspection process. Even though the inspection form / checklist is generated on the computer, there is not a database to record or manage the results of the inspection process, only paper files. To transfer the information from the paper form to a computer would double the workload. A hand held computer with the check list could help accomplish both tasks without increasing the staff workload. We discussed the benefits of using vehicle routing to help schedule annual or bi-annual inspections of restaurants, elevators, alarm systems, etc.

Jim would like to see a simple Access data entry form that could be e-mailed or sent to corporations on disk to help them comply with hazardous material inventory procedures. It would be easier for the companies and the results would be standardized for the fire coordinator.

Applications for Fire:

1. **General Query Tool** - allow users to query and display fire related data including parcels, building outlines, hydrants, mains and hazardous material locations. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen display.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Geocoded fire locations
    d. Fire district boundaries
    e. Fire house locations
    f. Pre-plan printouts
    g. Hydrants
    h. Water mains
    i. Digital orthophotos
    j. Hazardous material inventory
    k. Scanned floor plans
    l. Sprinkler systems
    m. Elevators

2. **Simplified Hazmat Data Collection Tool** – application to allow users to easily record the types and volumes of hazardous material stored at their business locations following the SARA Title III guidelines . The application should be simple enough to be run across the Internet or small enough to fit on a floppy or CD which can be mailed to every business address. The reasoning is that if the tool is simple and helps businesses to keep track of their hazardous materials, they will more readily comply. The tool should provide links to EPA regulation tables and chemical look-ups to define the proper chemical handling and storage procedures. The tool should also direct the user to a County web site with a map showing what fire district the business resides in and what fire house they should send their database results to.

   Data Layers:

   a. Company information (company name, company address, contact name, phone, etc.)
   b. Hazardous material inventory (chemical name, type and volume, etc.)
   c. Scanned floor plans
   d. Fire district boundaries
   e. Fire house locations

3. **Arson Assessment Tool** – application to allow users to display the location, and timing of previous fires for arson investigation. Allow the user to filter data by date and time windows, by cause of fire, by extent of damage, fire behavior, names of perpetrators, suspects, witnesses, etc.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Fire history database
   d. Geocoded addresses of previous fires
   e. Scanned floor plans
   f. Water mains
   g. Hydrants
   h. Hazardous material inventory

4. **911 Call Display Tool** – application to allow 911 dispatchers to display and zoom to the emergency call location. Basemap data including street names, house numbers and owner names should display on the map at an appropriate zoom scale.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Geocoded 911 call location
   d. Fire district boundaries
   e. Fire house locations
   f. Water mains
   g. Hydrants
   h. Scanned floor plans
   i. Hazardous material inventory
   j. Pre-plan printouts
   k. Hospitals
   l. Nursing homes

m. Schools

5. **Evacuation Planning / Response Tool** – application to compute, display and overlay a chemical plume or spill on the GIS basemap (based on the characteristics of the chemical released, wind direction and speed). The system should display affected areas, emergency evacuation sites, decontamination sites and medical assistance sites. This tool could be used as a planning tool or in the event of a real emergency.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Spill location
   d. Plume outline
   e. Water mains
   f. Hydrology
   g. Hydrants
   h. Digital orthophotos
   i. Hazardous material inventory
   j. Scanned floor plans
   k. Pre-plan printouts
   l. Demographics
   n. Hospitals
   o. Decontamination sites
   p. Command Center
   q. Nursing homes
   r. Schools

6. **Legacy Database Integration** – procedure to link the existing AS400 database records to the GIS basemap to display previous emergency events. The primary effort would involve matching the AS400 records to GIS parcels based on addresses, geocoded locations and populating the AS400 tables with a common key like SBL.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. AS400 database

7. **Pictometry Query Tool –** application to allow end users to view oblique photos related to a particular area of interest. The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.

   Data Layers:

   a. Oblique photos
   b. Digital orthophotos
   c. Street centerlines
   d. Parcel outlines
   e. Hazmat database

8. **Automatic Vehicle Locator (AVL) –** application to allow emergency response vehicles, ambulances, fire trucks, vans, etc. to be tracked and located on a map in real-time using GPS and radio transmitters. Dispatchers will be able to see the status (moving, parked, engine on,

engine off), location, and travel direction of any vehicle within the fleet. The system also creates an archive of travel patterns to document the location of all vehicles, which can be played back for any vehicle in question. For example, "Where was truck XYZ at 2:00 AM on a given date?"

Data Layers:

a. Street centerlines
b. Parcel outlines
c. GPS locations
d. Vehicle database

Applications for Code Enforcement:

1. **General Query Tool** – application to allow users to query and display code enforcement information. The type of project, status of the inspection, or any other criteria that is managed in the database, could be used to symbolize the active inspection projects. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. County owned properties
   d. IDA projects
   e. Geocoded inspection locations
   f. Elevator locations
   g. Desktop inspection database

2. **Hand Held Data Entry Tool** – application to allow users to enter code enforcement data for inspection information in the field. Basic information regarding the project would be entered into a desktop database. The inspector would download the records for his day's worth of inspections to a hand held computer and report the findings of the inspection process using check boxes (C=conforms; V=violations; NA=not applicable) and pick lists for comments to minimize data entry in the field. The system can also record voice comment to minimize manual data entry with the unit in the field. Images from a digital camera can also be integrated to the database to document findings.

   Data Layers:

   a. Desktop inspection database
   b. Handheld inspection database
   c. Digital photos
   d. Voice recordings

3. **Inspection Schedule Tool** – application to schedule and route code enforcement inspections. The tool would assess inspections locations and timing (annual or bi-annual) and would lump or cluster stops that could be inspected within a given time frame (1/2 day or full day). Inspection dates maybe adjusted in order to conduct all inspections within a neighborhood on the same day. The purpose is to minimize the drive time for inspectors and to reduce redundant trips to the same areas in the county.

   Data Layers:

a. Street centerlines
b. Parcel outlines
c. County owned properties
d. IDA projects
e. Geocoded inspection locations
f. Desktop inspection database

Niagara County - Department of Health - Environmental Division
January 24, 2002
James J. Devald, P.E.

I met with James Devald, Director of Environmental Health along with Paul Dicky, the Supervisory Public Health Engineer, and Ron G. Gwozdek, Principal Public Health Engineer.

Jim Devald began by showing me the Environmental Health Information Permit System (EHIPS) used to track and record all incidents within the County (such as inspections, violations, complaints, spills, dog bites, etc.). A field crew of 25 people are dispatched to respond to the various calls and scheduled inspections. The department teams are responsible for annual and semi annual inspections of restaurants, public pools and beaches, mobile home parks, migrant worker camps, children's summer camps, hospitals and clinic X-ray facilities temporary residences (bed & breakfast operations, rooming houses, campgrounds, hotel & motels), drinking water supplies. A paper form is completed while onsite and brought back for the field staff to enter into the EHIPS system, thus creating a duplication of time and resources. Mosquito tracking for West Nile is also done and tracked through the eHIPS system. The field crews do not currently use portable devices or laptop computers to record this information, however they do have two GPS units to record sample locations.

Jim also mentioned at this time, that the Public Water Supply Enhancement program work plan has a component to map well water locations for the entire County, however, the data is incomplete and not easily retrievable. Some data may be available on old well driller records – however, this would have been private companies where the County would have no record of them. As calls come in, or inspections are done, tracking is now being kept for private well locations filed by street & address (road files). Having this data tied to parcels would be very helpful for the department.

The discussion with the whole group now began and I asked if the information from the EHIPS system could be exported to another format (such as Access or Excel). It was mentioned that you could export files to Excel, which is done currently. A number of other databases are managed in Excel including – fiscal database, bathing beach water quality, plan reviews, dye trace monitoring, drinking water quality and others. A mosquito program with Niagara University is in place with a professor acting as the West Nile Virus liaison between the County and University. Tracking of all reported incidents of dead birds and mosquito and larvae sampling are kept and monitored. Follow up to these sites is conducted and mapping the locations with a positive/negative result would be very helpful.

Currently, the only emergency based resident notification tool in place is the Community Alert Network (CAN) telephone based system, which is operated through the Niagara County Fire Coordinator's office. It has the capability of notifying up to 400 calls per minute with a redial up to three times. It also has the ability to leave a message on an answering machine. This system is reserved for major emergencies and not general notification. At this point, Environmental Health notifies residents in the community via press releases to warn them of risk of West Nile or other hazards. A tool to generate mailing labels to notify residents within a given radius of a hazard would be useful.

Another software program used by the department is SDWIS. This is EPA software built on Access technology and used for tracking public drinking water supplies. Inspection data, supply constraints and lat/long locations of sample points, are recorded. The NCHD-Environmental Health Division would greatly benefit from access to mapped waterlines, hydrants, valves, meters, storage facilities, physical plants, intake structures, pump stations, etc., entered by local water suppliers. The department felt this would provide additional oversight to the municipal water suppliers. The group thought the Water departments would provide additional information to us on this system and the process.

Currently, maps are not used for routing or pinpointing locations. Most of the field crew have been with the department in excess of 15 years and are quite familiar with all locations within the County. Maps for routing would certainly be helpful as 25 field personnel are deployed each day for inspections that change day-to-day.

When asked what is something the department would really like to have their computer help them with, they said aerial photos (Pictometry), and parcel data with property owner, phone numbers and addresses. Access to property transfer information, presence or absence of septic systems, septic to parcel size, leach field size, etc. The data may be out there, but it just isn't being used by this department to its full potential. Communication between the local building inspectors (septic / sewer connections), the assessors (change of use permits) and local fire districts (hazardous materials) would be useful in keeping the department informed of status of potentially hazardous conditions. Access to zoning maps to tie cross connection data to parcels is desired. Accuracy on past records is also a problem which is constantly being updated as crews go out in the field.

The department currently uses a digital camera for photographing inspection sites, etc., but the photos are not tied to the location, etc. All manual records are kept in many file cabinets in the department and no scanner is currently used (but the department asked for a recommendation of a good one with a document feeder).

Applications for Environmental Health:

1. **General Query Tool** - allow users to query and display public health information. Occurrences would be automatically geocoded to show clusters and they would be able to be symbolized by the type of disease, by age of the infected or any other criteria that is managed in the current database. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen display.

    Data Layers:

    a. Street centerlines
    b. Aerial photos
    c. Geocoded complaint locations
    d. Complaint database (eHIPS extract)
    e. Parcel outlines (parcel data-owner, address, zoning, etc.)
    f. Municipal outlines
    g. Project outlines (reference to reports and studies)
    h. DEC spill list
    i. SPEDES permits
    j. Districts (legislative, fire, sewer, water, school, etc.)

k. Hydrology
l. Water mains
m. Water facilities (tanks, pump stations, valves, etc.)
n. Septic systems
o. Sewer lines & sewer connections data (who is connected and who is not connected)
p. Sewer facilities (manholes, pump stations, etc.)
q. Water quality sample points (beaches, pools, ponds, streams, public drinking water)
r. Water quality database
s. Soils
t. Landfills
u. Hazardous sites (active, inactive, brownfields, etc.)

2. **Rabies / Lyme Disease / West Nile Monitoring Tool** - allow the users to display locations rabies, Lyme or West Nile or any other communicable disease cases. Users would have the ability to identify areas where incidents of rabies, Lyme disease or West Nile disease occur. Users should have options to pan, zoom, select features with a mouse or by a query, and to create hardcopy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Geocoded occurrence locations
   c. Rabies, Lyme disease, West Nile disease database
   d. Parcel outlines
   e. Municipal outlines
   f. Wetlands
   g. Hydrology

3. **Resident Notification Tool** - application to allow incidents of West Nile disease or rabies to be located and then allow the user to specify a radius of residents to notify. Application then queries the existing parcel database and returns names and addresses of parcels within the specified radius and exports them to a database file. The resulting database can be used to send form letters to residents notifying them of incidents of West Nile disease or rabies.

   Data Layers:

   a. Street centerlines
   b. Geocoded incident locations
   c. Parcel outlines with RPS data
   d. Municipal outlines

4. **Vehicle Routing** – application to determine the best sequence and optimal route to visit inspections sites on a daily basis.

   Data Layers

   a. Inspection locations
   b. Street centerlines
   c. Parcel outlines
   d. Municipal boundaries
   e. Street names
   f. Vehicle database

5. **Project Reference** – data administration tool to create a polygon outline of a study area and to create a keyword record with the report name, date, author, study type, report location, etc.

    Data Layers

    a. Project outlines (reference to reports and studies)
    b. Street centerlines
    c. Street names
    d. Parcel outlines
    e. Municipal boundaries

6. **Water Quality Monitoring** – tool to display the type and locations of water quality samples and test results. The user should be allowed to filter or symbolize the data by type of sample (pool, beach, surface water, domestic drinking water, etc.), type of tests performed on the sample, as well as level of contamination.

    Data Layers

    a. Water quality sample points (beaches, pools, ponds, streams, public drinking water)
    b. Water quality database
    c. Hydrology
    d. Street centerlines
    e. Parcel outlines
    f. Aerial photos
    g. Municipal outlines

7. **Public FOIL Response** – tool to find and report all known hazardous materials, spills, complaints and conditions within a given search radius. The tool should generate a listing and a hard copy map of the area of interest will all pertinent layers displayed.

    Data Layers

    a. Water quality sample points (beaches, pools, ponds, streams, public drinking water)
    b. Water quality database
    c. Hydrology
    d. Street centerlines
    e. Parcel outlines
    f. Aerial photos
    g. Municipal outlines
    h. Geocoded complaint locations
    i. Complaint database (EHIPS extract)
    j. Project outlines (reference to reports and studies)
    k. DEC spill list
    l. Districts (legislative, fire, sewer, water, school, etc.)
    m. Septic systems
    n. Landfills
    o. Hazardous sites (active, inactive, brownfields, etc.)
    p. SPEDES permits
    r. Well locations (status)

Niagara County – Human Resources
March 19, 2002
Bruce R. Fenwick, Director

Bruce is currently responsible for the departments of Human Resources and Risk/Insurance.

Human Resources involves all matters related to personnel, labor relations and employee benefits throughout the County. Health insurance benefits are handled through the Risk/Insurance Department.

The majority of the job openings are competitive under civil service and also under human resource law. These positions are posted and a bidding process is used. If positions are not filled internally, they are generally posted to the public. Civil Service exams are posted on the County web site.

Human Resources does have a website and positions and information relating to human resources are shared through the County intranet system.

We talked a little about new employee orientation, the duration and location of such orientation, and Bruce mentioned that generally this is a one-day orientation – 70% handled by HR and 30% by the receiving department. There are no "outside" training issues or needs, as these are civil service positions, and generally specialized in nature.

Occasionally, there is the need to use the Internet for acquiring directions for candidates to get to a certain location for an interview. Bruce said it would be nice to have the locations and directions of the County campus sites on a map and available on the desktop – but it is not imperative.

Bruce then explained that all County employees have access to PeopleSoft, although some folks have limited access. There are individuals who are authorized to input data, and there are others who can just view and query to data. Bruce mentioned that he gets requests constantly from all departments in the County for everything from salary ranges to employee category (civil service or internal County employee). He stated it would be nice if everyone learned the new software package and could eventually query for this data directly. Bruce also mentioned that PeopleSoft does have a very good querying capability as well as graphical interface. He also said exporting data for other packages is done easily.

We concluded that although Bruce finds this technology interesting and worthwhile, there is little it can do to assist the Human Resources Department. They are fortunate in that the County employees are continuing to learn and use PeopleSoft, which seems to suffice for their needs at the current time.

<u>Applications for Human Resources</u>:

1. **Maps & Directions** – application to provide maps and directions from a client location to a known County building or facility. This tool would allow visitors to the Niagara County web site to compute routes from a given address to any public building, training facility, or department office location.
   Data Layers

a. street centerlines
b. geocoded addresses
c. county building locations

Niagara County – Industrial Development
February 15, 2002
John Simon, Executive Director

I met with John Simon, Executive Director of Industrial Development in their beautiful new offices in the Vantage Centre. John explained that their office services Niagara County in showcasing and selling properties to bring in business to the Niagara Region.

John was familiar with GIS and explained that it is currently being used on their website at www.ncida.org. The website has much information to offer prospective developers, and uses NY Site Finder software which contains a GIS component. Potential users can use GIS maps for selection criteria and contains viewable layers by map. Detailed information on various featured information is also accessible including congressional, senate and assembly district information.

Developers and businesses looking to come into the region generally receive information by word-of-mouth and by searching the internet. The mapping software which is part of the NY Site Finder is where clients are referred to find specifically what they may be looking for. John and his team have password entry to various areas of the software where they can enter new sites and locations for potential developers to view. The technology used in this process is only about 5-6 months old, so John and his team are still learning all the capabilities it can offer. So far though, the software seems very promising.

The IDA has a team of individuals from this office as well as the County Planning office who assist potential developers with locating and developing property in the Niagara Region. This team is made up of various individuals from varying backgrounds, so any aspect of building, development, location, companion industry, accessibility, amenities, etc. can be addressed upon meeting with prospective developers.

Two areas we discussed where a GIS may assist Industrial Development in Niagara County is with retrieving data on specific properties (ie: SBL number) which is currently not always accurate. Also, title issues come up occasionally, and having access to nail down titles on property would assist the department.

1. **General Query and Display Tool –** ArcView or ArcIMS application to allow end users to query and display features in the GIS. The tool would allow for basic GIS functionality like address matching, search, overlay, pan, zoom, identify and printing. Basemap layers, specific to Planning, would be added for increased functionality.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Digital orthophotos
    d. Utilities (water, sewer, electric, gas, phone, cable, etc.)
    e. Economic Development Zones
    f. Industrial Parks
    g. Railroads

h. Contours
i. Hydrology
j. Landuse
k. Brownfields
l. Landfills
m. Airports
n. Floodplains
o. Wetlands
p. Ag districts
q. Municipal boundaries
r. Zoning

2. **Pictometry Query Tool –** application to allow end users to view oblique photos related to a particular area of interest. The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.

   Data Layers:

   a. Oblique photos
   b. Digital Orthos
   c. Street centerlines
   d. Parcel outline

3. **Business Display Tool –** application to display the location and types of businesses (based on SIC code) throughout the area of interest. Provide the ability to geocode business addresses and to color code the symbols based on SIC code, number of employees, revenue, years in business, etc.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Business locations
   a. Business database

4. **Title Search Tool –** application to display title information (scanned images or database records) related to a property of interest within Niagara County by clicking on the property from a map interface.

   Data Layers:

   a. Parcel outlines
   b. Scanned documents
   c. Title database

5. **Site Selector Preparation Tool –** application to search and filter properties within a given area of interest that are suitable for automatic submission to the State Site Finder tool. The idea behind this tool is to automatically transfer information to the State Finder Site without key entering property information available from the County GIS site. This process would save data entry time and reduce errors. The IDA staff would visit the County's GIS to query and display potential sites to showcase on the NYS site finder. But rather than printing the information out and key entering the data again into the NYS site, the IDA employee could select one or more properties of interest and press a submit button. All of the key

information regarding site location, acreage, owner name, distance to thruway, landuse class, assessed value, etc., would be transferred to the NYS finder site.

Data Layers:

a. Parcel outlines
b. Street centerlines
c. Digital orthophotos
d. Utilities (water, sewer, electric, gas, phone, cable, etc.)
e. Economic Development Zones
f. Industrial Parks
g. Railroads
h. Contours
i. Hydrology
j. Landuse
k. Brownfields
l. Landfills
m. Airports
n. Floodplains
o. Wetlands
p. Ag districts
q. Municipal boundaries
r. Zoning

Niagara County – Management and Budget
March 19, 2002
Sharon Sacco, Director

Sharon described her responsibilities as director the County's Management and Budget office. She stated her department is responsible for the development and monitoring of the annual budget and for the purchasing for the County.

We reviewed the budget process which involves many steps and deadlines – all processed through the computer using PeopleSoft. Monthly budget reports and on-line monitoring is also accomplished through this software and delivered to County staff through the internal e-mail system.

Purchasing is all accomplished by an on-line requisition form, also using PeopleSoft. Sharon explained how all County employees have access to the PeopleSoft system, however, some department have greater access to its capabilities.

Currently, the department is very satisfied with the capabilities that PeopleSoft provides. The software does provide easy query options, as well as exporting of desired information to Excel if graphs are warranted for presentations. Maps are currently not used and Sharon could not think of an instance where they could be used. We did discuss the possibility of plotting out capital acquisition purchases and locations, but again, Sharon did not see any usefulness in this application.

We concluded with discussing the advantages of GIS to specific departments, but we could not collaborate on any applications that would be specific to the Management and Budget office. Sharon is however, very interested in GIS and what it may do to assist the County in other departments.

Niagara County - Office of Real Property Services
February 5, 2002
Bill Budde, Jackie Reynolds, Helen Robinson and Sue Simon

I met with Bill and his staff to discuss the roles and responsibilities of the staff within the department. A number of their TMT (Tax Map Technicians) could not attend the meeting, but the rest of the group filled in quite well.

The Office of Real Property Services is responsible for:

1) Maintaining the tax maps (splits and merges)
2) Performing research to resolve errors on existing maps and to verify splits and merges
3) Printing monthly sales reports for Assessors
4) Printing hard copies of the tax maps for
    a. Municipalities
    b. Assessors
    c. County departments
    d. Public
5) Maintaining the tax rolls
6) Assisting local tax Assessors with maintaining the tax rolls
7) Responding to questions from:
    a. The public (assessed value, who owns that land, is it in a floodplain, etc.)
    b. Realtors
    c. Title searchers
    d. Utility companies
    e. Banks
    f. Insurance companies
    g. Developers
    h. Other county departments
8) Sending out tax notification notices
9) Updating the UNIX database
10) Updating index cards
11) Updating "THE BOOK"
12) Reporting on address discrepancies between old and new RPS data files (PCM = Parcel Card Management).
13) Interacting with County Clerk, Treasurer, Attorney's Surveyors, municipalities, county departments, DOT, abstract title preparors, and the general public.

One of the things I was most impressed by, was the amazingly short 2 week lag time or backlog time within the department for updating parcel maps. That is truly amazing!!! Most other counties operate in terms of months or even years.

Even though the tax maps are updated in a very timely manner, the data are not released to the Assessors or other departments because they don't want to release the current tax assessment information until after the official tax status date. Instead Assessors and other departments must wait a year before they receive updated maps and RPS data. A compromise should be reached to allow the early release of parcel outlines, but still maintain the previous assessment information. This could be achieved by joining 2 tables to the parcel outlines. The first table would contain all

parcel information excluding the current assessment info and the second table would contain the previous assessed information. The result would satisfy both the Assessor's desire to keep the new assessment numbers confidential and the need for end users to see the latest parcel outlines and ownership information.

Of the duties listed on the department workflow chart, several activities could be enhanced or eliminated by integrating database information or by tying existing information to the GIS. Namely, keeping historic records for sales information with hooks to track old and new SBL numbers (RPS Rev 4, dumps history after a user defined time). The plot books have served a useful function in the department, but represent duplicate effort in that the drawing files are updated in CAD (and in the plot book), the new owner information is key entered into the RPS system (and by hand into the plot book).

The benefits of having the plot book include:

1) The book can't "crash" and doesn't need to reboot
2) It's easy to walk over and pull the book off the shelf
3) All the history about a property is there in one place

The negative issues related to the plot book includes:

1) Duplicate drawing effort
2) Duplicate data entry (by hand)
3) If the book is misplaced, there is no backup
4) Only one person can view the book at a time
5) Someone has to physically visit the ORPS to view the book (no remote access)

Suggested solution:

1) Create GIS or CAD tool to capture the owner text information from RPS (eliminate double entry)
2) Scan existing pages and relate to parcel data by SBL to preserve historic value.
3) Create a red line data layer in CAD or GIS to markup and comment on the parcel layer or scanned layer.
4) Develop a tool to print the parcel sketch, red line comments, and the pertinent owner information to update the book.
5) Create an access point for remote users to call up the plot book scan to view as a related document.

Several other steps that are somewhat manual could be enhanced through automation. For example, after completing a split or join, a letter size copy of the map changes are printed and mailed to the Assessors. The generation of the maps and the cover letter could be automated from the GIS. Furthermore, if the Assessors had e-mail, they could be notified electronically, or if they used GIS, the new shape file could be e-mailed to them directly or they could be notified to download the latest copy from an FTP site.

Applications of Real Property Services:

1. **FTP Site** – application to allow end users to download current tax maps for their community. OPRS staff could post latest versions of parcel outlines and filtered RPS data for each municipality.

   Data Layers:

   a. Ag Districts
   b. Election Districts
   c. Fire Districts
   d. Hydrology
   e. Lighting Districts
   f. Municipal Boundaries
   g. Parcel Outlines
   h. Railroads
   i. School Districts
   j. Sewer Districts
   k. Street Centerlines
   l. Subdivisions
   m. Water Districts

2. **CAD to GIS Conversion** – application to verify the quality of CAD data for readiness to convert to GIS (QC steps to confirm label errors, dangles and overshoots). Could be run on a scheduler or manually. Intermediate results include an error layer to notify CAD operators of errors in CAD data. End result is a converted GIS coverage or shapefile from the CAD source.

   Data Layers:

   a. County Tax Roll Database
   b. Parcel Outlines

3. **Scanned Documents Integration** – tool to integrate scanned images to map features in the GIS. Specific to OPRS would integrate scanned images from the plot book tied to the parcel outlines.

   Data Layers:

   a. County Tax Roll Database
   b. Municipal Boundaries
   c. Parcel Outlines
   d. Project Outline Polygons
   e. Scanned As-Built Drawings
   f. Street Centerlines
   g. Scanned Plot Book Pages
   h. Red Line Layer

4. **Red Line Application** – tool to allow ORPS end user to markup suggested changes or to associate notes with scanned image or drawing files.

   Data Layers:

   a. County Tax Roll Database
   b. Parcel Outlines
   c. Project Outline Polygons
   d. Scanned As-Built Drawings
   e. Scanned Plot Book Pages

f. Red Line Layer

5. **General Query Tool** – application to view data layers

Data Layers:

a. Ag Districts
b. County Tax Roll Database
c. Digital Ortho Photos (DOQs)
d. Easements
e. Fire Districts
f. Floodplains
g. Hydrology
h. Landuse
i. Lighting Districts
j. Municipal Boundaries
k. Parcel Outlines
l. Railroads
m. School Districts
n. Sewer Districts
o. Water Districts
p. Wetlands
q. RPS Database

6. **Pictometry Display Tool** – general description

Data Layers:

a. Aerial Photos (Pictometry)
b. Municipal Boundaries
c. Parcel Outlines
d. Street Centerlines

7. **Parcel Filter Tool** – application to keep parcel outlines current and filter the assessor information to show last year's assessment information.

Data Layers:

a. County Tax Roll Database
b. Parcels Outlines
c. Previous Years RPS Database

8. **Countertop Kiosk Query Tool** – allow end users to research parcel and related data from the front counter.

Data Layers:

a. Ag Districts
b. County Tax Roll Database
c. Digital Ortho Photos (DOQs)
d. Easements
e. Fire Districts
f. Floodplains
g. Hydrology
h. Landuse
i. Lighting Districts

j. Parcel Outlines
k. Railroads
l. School Districts
m. Sewer Districts
n. Water Districts
o. Wetlands

9. **ArcIMS site** – tool to allow general access to parcel data via the Internet.

Niagara County - Department of Planning
February 5, 2002
Sam Ferrarro – Commissioner

I met with Ed Sullivan (environmental planner), Mark Passuite (environmental assistant) & Jeff Degnan (graphic artist) to discuss the current and future use of GIS within the department, which is made up of three divisions – Planning, Economic Development and Tourism. Ed and Mark focus their attention on environmental and landuse planning issues like watershed protection, brownfield reuse, habitat restoration, farmland protection. They work with the Highway Department and NFTA to develop parks, trails and signage to promote connectivity of different trail and path systems in the County.

Mark and Ed work with the USDA and the Soil and Water Conservation Agency to identify prime soil for farming and the WNY Land Conservancy to promote farmland protection, landuse easements and the sale and purchase of development rights. They would like to have better soils maps to aid in this effort and they use GIS to help them assess, manage and mitigate the inevitable residential sprawl.

They are involved with the planning efforts of the Towns by invitation only. Most of the Towns welcome their involvement, but Ed and Mark wish they could step in earlier before the growth becomes problematic or farmland has already been developed.

They would like to see easy access to all the basic data layers for planning including wetlands, roads, parcels, hydrology, floodplains, ag districts, soils, aquifers, surface and bedrock geology, watersheds, EPA sites, brownfields, underground storage tanks, landfills, airports, zoning, vegetative cover, landuse, contours, digital aerial photos, etc.

Mark is very interested in monitoring Lake Ontario's water level and works closely with the Army Corp of Engineers on related shoreline protection issues. Mark also promotes educational efforts regarding household hazardous wastes and recycling programs for the County. He is very interested in getting information out to the public via the web to show the location and progress that has been made in cleaning up existing sites. They envision a one-stop-shop for environmental information on the web. They want to provide, clear, honest, understandable information to the public. The County could supplement the EPA information with more timely and detailed information and could showcase success stories where cleanup efforts have made a difference. A GIS based brownfield inventory has already been assembled that could be presented as a layer for query and display on the County ArcIMS site.

Mark also expressed a desire to develop a creative approach to do what seems impossible – "to map the wind". Actually he wants to promote the development of alternative energy resources by showcasing windmill farms that are starting to be developed in Niagara County. An Internet based map showing contours of prevailing wind speeds, the location of wind farms and hotlinks to photos and other information about the cost benefits of wind power generation would be good education and good PR.

Mark would also like to include air quality monitoring sites and acid rain monitoring sites to showcase either the problems we face to show the progress they have achieved.

Jeff has been with the department since 1980 and has done everything from cartography, graphic art, photography, brochure generation, and grant applications, etc. In the past, Jeff has maintained a set of hand drawn land ownership maps of each of the 12 towns. The D-size maps depict the parcel outlines and the names of the landowners in each of the towns. The careful placement of the text far surpasses anything that can be done automatically with computer, but the effort is so time consuming that Jeff has not updated the maps for a number of years. It is hoped that between the Real Property Service department and the CAD and GIS conversion efforts, that a similar service or product may be made available once again, but with less staff involvement to produce the final product. However, with the wide range of parcel sizes and the orientation of the text to fit odd shaped parcels, it would be a very tall order to fully automate such a map at a standard scale. An alternative would be to provide access to the parcel outlines and the underlying RPS data to the public through an ArcIMS site and setup scale tolerances to automatically label polygons with the owner names as a function of zoom scale. If the individual needs to see the ownership at a subdivision level, they could zoom into a scale that would allow the text to be displayed within each parcel (or most parcels) and then print the map with that level of detail. It may take some re-education to get people to accept the idea of replacing a very useful, but time consuming approach of hand drawing these paper maps, without investing an equal amount of "manual" effort to replicate the same maps in a digital format. There is no gain in shifting from paper to digital except that the author can zoom in and can make the text standardized and legible. The real gains will come from automating the text from the underlying RPS database and allowing people to plot their own maps.

In the past, Jeff has helped Towns and Cities develop zoning maps. He also assisted the Cornell Cooperative Extension by creating agricultural district maps for the Eight Year review process to the present. This includes a composite parcel map and a map used for public hearing notification. This has been a very time consuming effort and Jeff is hoping for GIS to ease his involvement and to make the process more standardized and automated.

Jeff is involved with Historic Preservation efforts within the County as well as the generation of grant applications and brochures to promote public awareness of these resources. Jeff was interested in the generation of on-line maps and "hotlinks" from the digital maps to photos and other information related to produce a virtual walking tour of historic sites. He'd also like some kind of on-line information and application to allow people to register historic sites (or at least start the registration process).

Jeff noted that Tourism receives the Lion's share of requests for recreation maps including snow mobile trail maps, bike paths, walking trails, parks, fishing spots, boat ramps, etc. and he would like to be able to direct people to a website where they could download a PDF and print the map at home.

Niagara County is a prime stopping off point for migratory birds and Jeff would like to promote birding within the County by creating an on-line bird habitat and sighting map. A number of endangered species stop in Niagara County and they would like to highlight those locations.

Mike Casale of the Economic Development division (not present at the meeting) works closely with the Niagara County IDA and local Chambers of Commerce to retain existing businesses and to promote new businesses coming in to Niagara County. Mike and his team are always on the road

visiting existing businesses listening to their needs for manpower, training, customers, tax relief, warehousing, shipping, transportation issues, power, water, sewer, etc. A review of scheduled visits may show ways to increase staff efficiency by visiting multiple businesses on a given trip to maximize the staff time while on the road.

Economic Development would like to see an interactive, map-based, web site with available sites for review. Even though the state has a site search tool, the flashing red "check downstate" button is counter-productive to Niagara County. The web maps should display all available sites with photos, descriptions of the site, contact names, proximity analysis (distance to airports, thruways, railroads, water, etc.), availability of power, sewer, water, telecommunication, taxes, work force profile within X miles, etc. Since the utility companies are reluctant to show the actual locations of their facilities on the Internet, the availability of utilities should be computed in advance and associated with the parcels. Visitors to the site should be able to search for available retail, commercial office, industrial, warehouse, manufacturing, and open space. Layers like zoning, wetlands, environmentally sensitive sites, brownfields, landuse, vegetative cover, and flood zones should also be displayed. All the information should be downloadable in printable PDF files.

Mike is also a strong advocate of the protection and promotion of fisheries resources within Niagara County. Printed brochures and maps on the Internet of boat ramps, fishing locations, restrictions and daily limits would be very useful to both the department staff and the public. Hotlinks between stream reaches and the DEC species habitat and classification system would also be very useful in protecting environmentally sensitive areas, and educating the public.

The topic of training and integration came up in our discussion. All present stressed the need for adequate training and the opportunity to use what they learn. Hardware and software must be available to used by staff. Even though one or two copies of ArcView exists in the department, and it gets used whenever possible, no has had the chance to integrate the software into their daily routine.

We talked about the future possibility of accessing the Pictometry images and tying the oblique photos to related parcel information through the GIS. Ed and the other members of the department were adamant that Pictometry should not be viewed as a replacement for GIS, for traditional aerial photography, or for remote sensing for environmental assessments. They were concerned that Pictometry and GIS were being viewed as an either or option not as complementary technologies.

The staff would like to see GIS deployed for comprehensive county-wide planning and capital budgeting coordination between departments (e.g., replace the water lines BEFORE the highway department resurfaces a road).

We discussed several options for scanning, archiving, and integrating existing paper documents into the GIS.

1) Scanning the existing paper maps to create a digital archive (no direct hook to the GIS).
2) Scanning the paper drawings and creating polygon outlines on the parcel base map to tie the drawing to a known area on the GIS.
3) Scanning and georeferencing the drawings to match the existing parcel and digital orthophoto data layers to allow drawings to be viewed as the user zooms and pans around in the GIS.

Ed felt that if the GIS was deployed in the Planning department with adequate hardware, software, training and data, each of the 5 staff members could save about 4 hours a week using the GIS to access data and engage in comprehensive planning. Because of the nature of the department's responsibilities and the level of interest in GIS technology, the Planning Department is a prime candidate for the inclusion of GIS into its daily work activities.

Applications for Planning Department:

1. **General Query and Display Tool –** ArcView or ArcIMS application to allow end users to query and display features in the GIS. The tool would allow for basic GIS functionality like address matching, search, overlay, pan, zoom, identify and printing. Basemap layers, specific to Planning, would be added for increased functionality.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. EPA site locations
   d. EPA database
   e. Digital orthophotos
   f. Utilities (water, sewer, electric, gas, phone, cable, etc.)
   g. Contours
   h. Hydrology
   i. Soils
   j. Geology (surface and bedrock)
   k. Landuse
   l. Vegetative cover
   m. Brownfields
   n. Landfills
   o. Underground storage tanks
   p. Bike paths
   q. Airports
   r. Floodplains
   s. Wetlands
   t. Ag districts
   u. Aquifers
   v. Watersheds
   w. Municipal boundaries
   x. Zoning

2. **Web Based Site Selection –** application to allow visitors to query and display potential sites for locating a business. This ArcIMS site would promote the available manufacturing, industrial, commercial office and retail space within Niagara County. Property descriptions, photos, contact names would be available to the end user to filter and print from downloadable PDF files.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines

c. Business locations
a. Business database
d. Demographics
e. Employment database
f. Zoning
g. Wetlands
h. Brownfields
i. Hydrology
j. Flood zones
k. Railroads
l. EPA sites
m. Landuse
n. Vegetative cover
o. Digital photos
p. Digital orthophotos

3. **Registration of Scanned Images** – the process would take the scanned project record drawings and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.

   Data Layers:

   a. Scanned drawings (D to E size)
   b. Digital orthophotos
   c. Georeferenced scanned images (world files)
   d. Street centerlines
   e. Parcel outlines

4. **Document Management Tool –** this tool would tie scanned images of record drawings, brochures or photos, etc. to the GIS. Images could be integrated by creating polygon outlines that define the extent of the drawings and storing the image name with each polygon. As the user clicks the polygon area, the image is displayed in the default Windows imaging tool.

   Data Layers:

   a. Scanned drawings (D to E size)
   b. Scanned brochures
   c. Scanned or digital photos
   d. Keyword database
   e. Project outline polygons
   f. Street centerlines
   g. Parcel outlines

5. **Environmental Awareness Site –** web based application to display the location and status of environmentally sensitive sites. Users will be allowed to turn layers on and off, enter an address and zoom to the extent of the found property. Layers will be symbolized to indicate

status and risk assessment. Basic functions like identify, pan, zoom and find will be included.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. EPA sites
d. Brownfields
e. Landfills
f. Underground storage tanks
g. Zoning
h. Wetlands
i. Hydrology
j. Flood zones
k. Railroads
l. Landuse
m. Vegetative cover
n. Digital photos
o. Digital orthophotos

6. **Land ownership maps –** application to manage and automate the generation of annotated land ownership maps. The process of plotting ownership maps on a town-wide basis has traditionally been a manual effort. Because of the time required to maintain, and update the ownership information on the paper maps, this activity has been put on hold. Although, annotation placement can be automated, text for the smallest parcels will have to be placed by hand, or plotted at a different scale.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Municipal boundaries

7. **Power & Energy Awareness Site –** web based application to display the location and status of traditional and alternative energy resources (hydro-electric, solar, wind, hydrogen fuel cells, natural gas, etc.). Users will be allowed to select specific energy resources, turn layers on and off, select a site of interest (for example a windmill farm) and zoom to the extent of the selected property. Photos and video clips of the site would be provided to increase interest and awareness of alternative power sources. Information regarding re-licensing and deregulation would also be available. Basic functions like identify, pan, zoom, and find will be included. Layers will be symbolized to indicate status, cost, power generation, potential savings, etc.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Windmill sites
   d. Wind contour maps
   e. Digital photos
   f. Video clips
   g. Hydrology

8. **Project Georeference Tool –** application to allow staff to record the location and key information about previous and current recommendations or problem area reviews and tie that to manual or digital reports. This tool would allow for the capture and sharing of institutional knowledge. The data creation step would establish polygonal areas that define the rough outline of the study area. The name of the reviewer, the date of the report or study, the type of study, the results of the study and the name and location of the final report would be key entered. If the document is digital, a hotlink to the document would be created. If the document or report is hardcopy, a room number, file cabinet or shelf location would be provided. Layers listed below indicate the basic layers that would help orient the user for placement of the project outlines.

    Data Layers

    a. Parcel outlines
    b. Street centerlines
    c. Project polygons
    d. Project database
    e. Hydrology
    f. Municipal boundaries

9. **Project Display Tool** – application to allow end users to search for and display previous project reviews based on type of study, area of interest, name of study, reviewer's name, year and other keywords. Legends would allow the user to symbolize the project areas by the above classifications. The layers are limited to only the project polygons since this display tool would work as an overlay in conjunction with any layers of interest.

    Data Layers

    a. Project polygons
    b. Project database

10. **Shoreline Erosion Monitoring –** application to display the status of current and historic lake levels and the effects or risks of shoreline erosion. Users will be allowed to turn layers on and off, zoom to the extent of an area of interest. Layers will be symbolized to indicate status and risk assessment. Basic functions like identify, pan, zoom and find will be included. Time-lapse animation can be achieved by displaying historic data from oldest to youngest. Rates of change can be measured between time stamped shorelines and lake levels. Zones of erosion and deposition could be denoted as the difference between current and historic shorelines. Hotlinks from map locations to digital or scanned photos would allow comparison of current and historic conditions.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Historic shorelines
    d. Lake levels
    e. Building outlines
    f. Shoreline structures (docks, piers, jetties, break walls, etc.).
    g. Shoreline current data
    h. Historic aerial photos
    i. Digital photos
    j. Digital orthophotos
    k. Erosion zones

11. **Historic Preservation –** web based application to showcase historic locations. Visitors would be able to search and find historic sites of interest, to view the location on a map and take part in a virtual tour if the site of interest. The user would be directed to neighboring historic sites with directions to the next site on a virtual walking tour of a historic preservation district.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Historic site locations
    d. Walking paths
    e. Bike trails
    f. Hydrology
    g. Railroads
    h. Digital photos
    i. Interactive VRML photos
    j. Digital orthophotos

12. **Recreation Map Generation –** application to create digital and hardcopy maps or brochures of bike trails, campsites, parks, picnic sites, bird viewing sites, hiking trails, boat ramps, fishing sites, snowmobile trails, etc.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Bike paths
    d. Hiking paths
    e. Boat ramps
    f. Fishing sites
    g. Snowmobile trails
    h. Parks
    i. Picnic sites
    j. Campsites
    k. Bird viewing sites
    l. Wetlands
    m. Hydrology
    n. Flood zones
    o. Railroads
    p. Landuse
    q. Vegetative cover
    r. Digital photos
    s. Digital orthophotos

13. **Vehicle Routing –** application to allow the efficient scheduling and routing of vehicles to a collection of sites. The system would create optimal routes to maximize staff time and minimize travel costs, and to visually communicate the routes for a given day. This application would allow the environmental / fisheries / economic development teams to plan site visits or inspections based on schedules and proximity.

    Data Layers:

a. Street centerlines
b. Parcel outlines
c. Business locations
b. Business database
d. Inspection sites
e. Inspection database
f. Vehicle database

14. **Pictometry Query Tool –** application to allow end users to view oblique photos related to a particular area of interest. The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.

    Data Layers:

    a. Oblique photos
    b. Digital Orthos
    c. Street centerlines
    d. Parcel outline

Niagara County – Probation
March 11, 2002
N. James DiCamillo, Probation Director

We began our discussion with Mr. DiCamillo describing his department which is made up of 3 supervisors and 22 probation officers. This staff serves a population of over 222,000 people in Niagara County. The Probation Department's primary functions are to protect the community, rehabilitate offenders and to preserve family life. Their services are broken into three main groups: Intake, Investigation and Supervision. The Probation Department provides services to all the courts within the County including Justice Courts, City Courts (for all three cities), County Court, Family Court and Supreme Court.

Currently, the department does not use a computer system for databases or referrals. All of this information is recorded and processed by hand. The information kept includes name, address, SS#, NYSID#, (the state assigned number), the offence, action and sentence. The department keeps card files containing manual records and typed reports that are kept for 10 years and then discarded. There is a statewide case management system that is planned to be implemented in June of 2002. The department didn't want to start inputting information somewhere and then have to convert to the new system. What they've opted to do is wait until the new system arrives in June of 2002 and add new records from that day forward into that system.

Probation does use the B.I., Inc. electronic monitoring system. The County has approximately 30-40 individuals on the program which involves wearing a monitoring ankle bracelet which is linked back to an electronic monitoring company. Detection can be made if the offender removes the device, leaves the area he is restricted to, etc. The offender can wear this device for anywhere from 3-6 months and is an alternative to incarceration. The cost is $5 per day and the offender is responsible for this fee. The department saves the county over $300,000 per year with the program, (not having to incarcerate these individuals) which ultimately saves the county taxpayers.

The probation department is responsible for collections of other fees as well. The combined collections for restitution, fines and fees (which include electronic monitoring, investigations, drug and alcohol fees, etc.) total close to a half-million dollars in revenue for the department.

Probation is constantly feeling the strain of being understaffed. Unfortunately, preventative programs and educational sessions in the schools and at local community centers are few and far between. There aren't any programs in place currently and so monitoring of outcomes isn't done.

The probation officers do make some scheduled and unscheduled home and work visits to offenders on probation. Again, due to the staff shortage, on-site visits are not always practical, instead, phone calls are made and offenders are asked to come into the department.

There is some data sharing between the court system, social services and the sheriff's office. Most information received at the probation department is sealed and confidential. Mr. DiCamillo said it would be great to have a computer system tied to other departments to acquire information on referrals coming in as to the reason if known and some standard information such as name, address, social security number, etc.

We concluded with Mr. DiCamillo saying he wished he had offender information available on his computer to help with compiling his monthly statistics. Having the information available on the computer would be a huge timesaver in compiling and reporting the department statistics. Because no information has ever been compiled electronically into a database or spreadsheet in the past, this has been a difficult process to even begin to consider, especially with the lack of staff to help enter the data.

Applications for Probation:

1. **General Query Tool** - allow users to query and display probation client information. Clients would be automatically geocoded to show clusters and they would be able to be symbolized by the type of offense, by "tickler" date or any other criteria that is contained in the case management system. Users would have the ability to analyze concentrations of clients to enable efficient caseload distribution. Users should have options to pan, zoom, select features with a mouse or by a query and to create hardcopy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Geocoded client locations
   c. Access to case management system
   d. Municipal outlines
   e. Jail locations
   f. Detention facility locations
   g. Court house locations
   h. School locations
   i. Counseling agency locations
   j. Geocoded address - place of employment

2. **Electronic Home Monitoring Tool** - allow the users to display locations of electronic home monitoring cases. In Niagara County, the location of offenders installed with ankle bracelet would be displayed. Users would have the ability to define "dead zones" that are off limits to the client and would cause an alarm. Users should have options to pan, zoom, select features with a mouse or by a query and to create hardcopy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. GPS location of clients
   c. Case management system
   d. Municipal outlines
   e. Jail locations
   f. Detention facility locations
   g. Court house locations
   h. School locations
   i. Counseling agency locations
   j. Inclusion / Exclusion zones

3. **Database integration** – tool to tie existing databases together. Probation would benefit from access to Social Services, Sheriff and Police, Court databases.

Data Layers:

a. State database
b. DSS database
c. Probation database

4. **Vehicle Routing** – tool to create optimal routes to schedule vehicles to a series of locations. Probation officers could use this system to define efficient routes for visiting a series of parolee home and work locations.

   Data Layers:

   a. Street centerlines
   b. Geocoded addresses – parolee locations
   c. Trip database (date, time, to-from locations, client code, mileage)
   d. Municipal outlines

5. **Crime Analysis** – application to display current and historic crime locations as a analysis tool for crime prevention and pattern recognition. User should be able to symbolize data using a variety of criteria depending on the analysis desired (ie. time of day, day of week, type of incident, etc. Users should have the options to pan, zoom, select features and to create hard copy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Municipal outlines
   c. Geocoded incident locations
   d. Demographic data

Niagara County – Public Health
January 29, 2002
Paulette Kline, R.N., M.Ed, M.P.H., Public Health Director

We met with Paulette Kline, Director of Public Health today to discuss the areas under her direction and possible GIS applications that may assist the department in creating efficiencies and productivity.

Paulette began by describing the various health agencies under her direction. These include Environmental Health, Nursing, Early Intervention, Children with Special Needs, Finance as well as Speech, Hearing and Language.

Paulette gave an overview of each of the departments beginning with Environmental Health which is responsible for water and air quality, environmental issues, food and water investigation and surveillance. They are responsible for inspections of restaurants, food prep in schools, private water wells, waste management, and landfill site monitoring. They also perform water inspections at public pools, parks, club pools, etc. Surveillance of standing water and testing of mosquito larvae for West Nile tracking is also maintained through Environmental Health. Rabies control is also the responsibility of the department which uses an air-drop bait system to vaccinate wildlife.

We then discussed the Healthy Neighborhood Model which is currently in effect in Niagara Falls. This program does door-to-door home inspections for lead, fire inspection, radon and other risk factors. Paulette said they are looking to significantly expand this program to other areas; possibly with the help of grant monies.

We also talked about the Emergency Response plan and how Public Health is working together with Jim Volkosh, the Fire Coordinator in that regard. The Fire department is designated as the first response for the County disaster plan and Public Health is designated as the first response to emergency plan. Currently, these departments share data to assist in these efforts. Unfortunately, bio-terrorism and attacks at industrial complexes are a real threat. Any GIS tools that can help with developing emergency response plans and notifying residents of health risks would be a tremendous benefit to Niagara County.

The Nursing Department provides access to care to the County, particularly to underprivileged families. They are responsible for tracking and caring for under immunized children, caring for those without medical coverage and education and care of reproductive health (birth control). Their department includes the Visiting Nurses, an STD clinic, TB control among others. The largest program is communicable disease tracking. Having the locations of patients and service areas mapped out for transportation and a plan for emergency situations that included areas people would be referred to (i.e. schools, churches, etc.) in the event of an emergency would be vital. Currently, the Nursing Department uses a software package called Clindoc, which is a Windows based program used by the nurses to record data from their home visits. Paulette mentioned that simplifying the process for the nursing staff would be a huge help for the department. Currently, each of the approximately 45-50 nurses can only see about 4 patients per day due to drive time, time spent with patient, the paperwork and computer entry time. A good portion of these nurses currently have laptop computers available to them. However, additional computer training and streamlining the data entry process would help increase productivity. An effort to match nurses and patients based

on, patient's addresses and condition, and nurses' home address and specialties, would create much needed efficiencies and increase the quality of life (and time) for nurses currently working under the stress of meeting the demands of patients and balancing travel time and paper work.

The Early Intervention Program also provides home visits from birth through 3 years old. Patients with an established risk factor or who are developmentally delayed (i.e. speech, mental) would receive an in home assessment and may qualify for this program. An individual plan is created with a case manager. There is one nurse in this program as well. Plotting the location of families in the program as a visual assessment of the distribution of needs and resources would provide a valuable planning tool for management. Creating maps of efficient routes between visits would also improve efficiencies.

Children with Special Needs is a State funded program designed to care for patients from birth to 20 years old for patients who do not qualify for insurance programs including Medicaid. This is the last payor of resort. A potential GIS application we discussed was monitoring and tracking areas that may be at greatest risk (due to toxins, etc.).

The Finance Department currently has two billing systems in use. The department is looking into increased efficiencies by looking at other systems currently being used in a similar fashion. We discussed a couple possible applications of GIS for the finance department and talked about Risk and Spending maps and perhaps monitoring savings using home health care, etc.

Speech, Hearing and Language is a department mainly at the Health Building at the Mt. View Campus where patients come in for testing, hearing aid fitting, etc. Some patients need home visits for these services and this is provided when appropriate.

Applications for Public Health:

1. **General Query Tool** - allow users to query and display public health information. Occurrences would be automatically geocoded to show clusters and they would be able to be symbolized by the type of disease, by age of the infected or any other criteria that is managed in the current database. Users should have options to pan, zoom, and select features with a mouse or by a query and to create hardcopy maps of the screen display.

    Data Layers:

    a. Street centerlines
    b. Geocoded occurrence locations
    c. Occurrence database
    d. Parcel outlines
    e. Municipal outlines
    f. Clinic locations
    g. Hospital locations
    h. School locations
    i. Parks
    j. Community center locations

2. **Human & Environmental Communicable Disease Monitoring Tool** - allow the users to display locations of any communicable disease cases such as HIV, Hepatitis, TB, or

environmental disease outbreak such as rabies, Lyme disease, or West Nile virus. The application would allow users to display health risks as a function of disease type, significance of risk, or to filter the data by time windows. Users would have options to pan, zoom, and select features with a mouse or by a query and to create hardcopy maps of the screen display.

Data Layers:

a. Street centerlines
b. Geocoded occurrence locations
c. Disease database
d. Parcel outlines
e. Municipal outlines
f. Schools
g. Parks
h. Hydrology (ponds, lakes, streams)
i. Wetlands
j. Landfills
k. Wooded lots

3. **Resident Notification Tool** - application to allow incidents of disease, industrial accidents or bio-terrorist attacks to be pinpointed and to notify residents within a specified radius of the risk. The application finds the starting point and queries the existing parcel database and returns names and addresses of parcels within the specified radius and exports them to a database file. The resulting database can be used to send form letters to residents notifying them of non-emergency risks (i.e. incidents of West Nile virus, Lyme disease or rabies). For emergency situations, a technology called Reverse 911 could also play a role. Instead of just creating mailing labels, the system could call all phone numbers within a given radius and play a pre-recorded message.

   Data Layers:

   a. Street centerlines
   b. Geocoded incident locations
   c. Parcel outlines
   d. Municipal outlines
   e. Resident phone numbers

4. **Outcome Assessment Tool** - application to display the location of and results of home inspections, public outreach programs, mosquito larvae testing, etc. For example, locations of lead paint, radon, and fire inspections and test results could be posted on a map. A series of maps could be generated to show changes in the distribution and severity of health related problems relative to the concentration of public outreach programs. This could be used as an assessment tool and as a planning tool to redirect resources from month to month, year to year to maximize the benefits to the participants.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Geocoded test results
   d. Census data
   e. School locations
   f. Clinic locations

5. **Nurse – Patient Matching Tool** – this application would compare the home addresses of all nurses on staff against the addresses of patients with regularly scheduled visits. Based on proximity, the nurses' specialties and the patient's needing those services, the tool would find the closest patients to assign to a given nurse. Maps of effective routes and schedules could be generated, but may be viewed more as "big brother" interference than as a help. Instead, simply helping the nurses reduce their travel time and comfortably increasing the number of visits made per day, will help improve efficiency and keep jobs.

   Data Layers

   a. Street centerlines
   b. Parcel outlines
   c. Patient addresses
   d. Nurses addresses
   e. Clinic locations
   f. Pharmacy locations
   g. Census data

6. **Vehicle Routing Tool** – this application would define efficient routes for scheduled visits. This tool could be used for restaurant inspections, home care nurses, early intervention – literally any situation where multiple visits have to be made within a set schedule with a limited number of resources. Because of the general nature of this application, the addresses database is listed below and an event database. The event could be a patient address, a scheduled stop for an inspector, (i.e. restaurant, pool, school, etc.).

   Data Layers

   a. Street Centerlines
   b. Parcel outlines
   c. Geocoded addresses
   d. Generated routes
   e. Census data

Niagara County - Department of Public Works
February 5, 2002
Kevin O'Brien – Commissioner of Public Works

I met with Kevin O'Brien – Commissioner of Public Works, Bruce McNutt – Senior Civil Engineer, Joel Wendt – Assistant Civil Engineer, Rob DeVoe – Deputy Commissioner of Building and Grounds, and Carl Allen – Deputy Commissioner of Highway, Bridges and Structures.

There are three divisions under the department of public works – Highway, Engineering and Building and Grounds.

Engineering is responsible for the design, oversight and inspection of all new county construction projects (buildings, bridges, road reconstruction, etc.). They also provide surveying for construction projects.

Highway maintains all county roads, bridges, signs and drainage within the ROW. They are also responsible for snow plowing operations on county roads. Towns and Cities manage all traffic signals.

Building and Grounds maintains 21 County owned buildings and properties as well as the County telecommunication system.

There is a high degree of data sharing and cooperation between the three departments. There are some CAD capabilities within the departments, but the majority of the historic and even some current drafting is done using manual techniques. Files are stored and managed in active files within their offices with archives in an offsite "cold storage". Gary Hinton manages the file storage within the highway department.

Highway maintains detailed information about road projects in paper file folders as well as summary information on 3x5 index cards. Both systems are kept up to date. They maintain an active paper storage system and a cold storage archive system for maps, drawings and plans for older projects. Finding drawings for recent projects is relatively straightforward. Finding drawings for older projects is tougher because the old drawings may not correspond to the same project boundaries as the more recent project. We discussed several options for scanning and archiving drawings, scanning and associating the drawing to a feature on the GIS (i.e. road centerline), scanning and tying the drawings to polygons that represent the outline of the project boundaries and scanning and registering the drawings as a back ground image behind vector data.

Road projects since 1950 are very well documented and cross-referenced, however earlier projects in cold storage are harder to find because the project outlines don't match across history.

We discussed several options for scanning, archiving, and integrating existing paper documents into the GIS.

1) Scanning the exiting paper maps to create a digital archive (no direct hook to the GIS).
2) Scanning the paper drawings and creating polygon outlines on the parcel base map to tie the drawing to a known area on the GIS.

3) Scanning and georeferencing the drawings to match the existing parcel and digital orthophoto data layers to allow drawings to be viewed as the user zooms and pans around in the GIS.

A bridge, by definition, is any structure greater than 25' in length. Anything less than that is considered a culvert and has a different set of guidelines for inspection and maintenance. Maintenance information for each bridge is kept in a paper file folder. The folder will contain the last couple bridge inspection reports, a handful of photos, maybe a VCR tape, drawings of the bridge, etc. The bridges are inspected bi-annually and the folders tend to get very thick and somewhat disorganized. Older data is routinely removed and sent to offsite storage. According to Bruce, the location of the bridge is of less importance to them than to the legislator in who's district the bridge exists. Bruce suggested that it would be useful to look at the rate of deterioration and use that to plan bridge renovation or replacement projects.

Carl Allen was very interested in an AVL system that could record and report the location of vehicles. Example he gave involved a snowplow that damaged a vehicle that may have been parked illegally within a no parking time window (no parking from 2:00 AM to 7:00 AM). The plow reportedly sideswiped the car at 1:45 AM. If they had a time stamp as to the actual location of the plow, they could avoid the associated costs. They have 6 such litigation cases pending this year. The AVL system could also help them recover funds from the state for plowing state roads. The drivers currently call in when they turn onto and off of a State road. An automated approach would save them time and money.

Any kind of road side marking system to indicate the presence of high manhole covers and other obstructions would save them repairs on their plow blades.

They are currently developing a road sign inventory system on the computer, but there is no mapping component to this system at this time. Road sign locations are defined by distance from pavement edge, centerlines, intersections, etc.

Carl indicated that there were "probably hundreds of applications that could be defined if they thought about it long enough".

Rob suggested that Buildings and Grounds could use a system to manage all paper and CAD files for each of the 21 building floorplans. A system to track conditions and maintenance records would be useful to plan inspections and preventative maintenance on roofs, HVAC units. He also wanted a means to compute shared use charges to State agencies that rent space from the County (i.e. the court system) based on floor space used, operations and maintenance as well as depreciation costs.

Applications for Department of Public Works (common to all departments):

1. **Document Management Tool –** this tool would tie scanned images of record drawings, index cards or photos for road projects, bridges, etc. to the GIS. Images can be integrated by creating polygon outlines that define the extent of the contract and storing the image name with each polygon. As the user clicks the polygon area, the image is displayed in the default Windows imaging tool.

Data Layers:

a. Scanned drawings (D to E size)
b. Scanned cards (index cards)
c. Scanned or digital photos
d. Keyword database
e. Project outline polygons
f. Street centerlines
g. Parcel outlines

2. **Registration of Scanned Images** – the process would take the scanned project record drawings and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.

   Data Layers:

   a. Scanned drawings (D to E size)
   b. Digital orthophotos
   c. Georeferenced scanned images (world files)
   d. Street centerlines
   e. Parcel outlines

3. **CAD to GIS integration –** application to integrate CAD drawings and GIS. The integration can take place at several different levels. At very low level the CAD drawings can be hot-linked to features in the GIS and AutoCAD can be automatically started to view and modify the CAD drawings. At a mid-range level, a world file can be created which allows the CAD drawing to be overlaid on the GIS basemap as a set of layers from the drawing. Or the integration can be achieved at a higher level where the CAD drawings are converted to GIS and attributes are permanently attached to the drawing entities within the GIS.

   Data Layers:

   a. CAD drawings
   b. CAD world files
   c. Hotlinks to features
   d. Street centerlines
   e. Parcel outlines

4. **General Query and Display Tool –** ArcView or ArcIMS application to allow end users to query and display features in the GIS. The tool would allow for basic GIS functionality like address matching, search, overlay, pan, zoom, identify and printing. Basemap layers, specific to DPW, would be added for increased functionality.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Pavement database
   d. Bridge database
   e. County owned properties
   f. County owned Building footprints locations

g. Digital orthophotos
h. Water mains
i. Water facilities (hydrants, valves, tees, etc.)
j. Sewer mains
k. Sewer facilities (manholes, pump stations, laterals, etc.)
l. Utilities (electric, gas, phone, cable, etc.)

5. **Pictometry Query Tool –** application to allow end users to view oblique photos related to a particular area of interest. The user could also call up parcel information (and other related GIS data) by associating a mouse click on the photo to the related GIS layers.

   Data Layers:

   a. Oblique photos
   b. Digital Orthos
   c. Street centerlines
   d. Parcel outlines
   e. Pavement database
   f. Bridge database
   g. County owned properties

<u>Applications for Building and Grounds:</u>

1. **Facility Management Tool –** application to integrate scanned or CAD floorplans with a rooms database. The tool should be able to calculate square footage by use by department. Information in the database should include the construction costs, depreciation, operations and maintenance costs, history of repairs, condition of the room, photos of room, department name, contact name, occupant name, room use (office, meeting room, laboratory, bathroom, etc.), fire code for occupancy, etc.

   Data Layers:

   a. CAD drawings
   b. Scanned floorplans
   c. Rooms database
   d. Digital photos
   e. Equipment maintenance database
   f. Work order database

2. **Work Order / Inspection Scheduler –** application to allow the maintenance crews to plan and visually communicate work orders based on repairs, inspection schedules at a single facility based on previous history of repairs or scheduled, preventative maintenance. The system would track calls for repairs and assign additional jobs to crews based on proximity and timing or scheduled maintenance. For example if the work order system dispatched a crew to a given site, the inspection scheduler would look for any other routine maintenance that should be performed at that site, within a user defined timeframe (e.g. 1 month, 2 weeks, etc.), and create a new work order ticket for the same crew.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. County owned properties

d. County owned building footprints
e. Equipment maintenance database
f. Work order database
g. Inspection database
g. Rooms database
h. Vehicle database

Applications for Engineering:

1. **UFPO tool –** application to allow the end user to see the location of all known utilities before a crew is sent out to dig. The routine would read the UFPO tickets and zoom to the location of the proposed dig to determine the presence or location of buried utilities.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Digital orthophotos
   d. Water mains
   e. Water facilities (hydrants, valves, tees, etc.)
   f. Sewer mains
   g. Sewer facilities (manholes, pump stations, laterals, etc.)
   h. Utilities (electric, gas, phone, cable, etc.)

2. **Survey Data Integration –** application to allow the easy integration of GPS field data into the GIS. The process would involve conversion of the GPS data from Lat-Long to the County coordinate system (e.g. state plane feet, UTM meters, etc.) and appropriate datum (NAD 27 or NAD 83). If a data logger is involved, attributes for each map feature would also be extracted and associated with the GPS coordinates.

   Data Layers:

   a. GPS survey data
   b. Ground control points
   c. Street centerlines
   d. Parcel outlines
   e. Pavement database
   f. Bridge database
   g. Digital orthophotos

Applications for Highway:

1. **Sign Management Tool –** application to capture, manage and display the condition of any given road sign in the County. Information to be stored includes sign material, age, type, size, condition, number of uprights, base material (concrete, gravel, dirt, etc.), replacement cost, etc. The system would display the location of all signs by type, material, age, condition, etc. for inspection schedules and asset management. Existing database records would be selected and sign locations would be assigned to each record to create a GIS entry.

   Data Layers:

   a. Street centerlines

b. Parcel outlines
c. Sign locations
d. Sign inventory database
e. Digital orthophotos
f. Digital photos of signs

2. **Automatic Vehicle Locator (AVL) –** application to allow DPW vehicles, plows, trucks, vans, etc. to be tracked and located on a map in real-time using GPS and radio transmitters. Dispatchers will be able to see the status (moving, parked, engine on, engine off), location, and travel direction of any vehicle within the fleet. The system also creates an archive of travel patterns to document the location of all vehicles, which can be played back for any vehicle in question. For example, "Where was truck XYZ at 2:00 AM on a given date?"

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. GPS locations
   d. Work order database
   e. Vehicle database

3. **Bridge Inspection Tool –** application to capture, manage and display the condition of any bridge within the County. Information to be stored includes bridge class, weight limits, surface material, age, condition, number of lanes, contractor name (if under warranty), contract price, expected resurfacing date, etc. The system would display the bridges by class, weight limits, material, age, width, resurfacing date, etc. to aid in capital improvement planning and hazard assessment. Digital photos and video clips of the inspection process can be stored and associated to each bridge.

   Data Layers:

   a. Bridge database
   b. Digital photos of bridge
   c. Digital video clips of bridges
   d. Record drawings of bridge design and construction
   e. Pavement database
   f. Digital orthophotos
   g. Street centerlines
   h. Parcel outlines

4. **Pavement Management Tool –** application to capture, manage and display the condition of any given road segment in the County. Information to be stored includes surface material, age, condition, number of lanes, contractor name (if under warranty), contract price, expected resurfacing date, etc. The system would display the streets by material, age, width, resurfacing date, etc. to aid in capital improvement planning.

   Data Layers:

   a. Pavement database
   b. Digital orthophotos
   c. Street centerlines
   d. Parcel outlines

Niagara County – Refuse Disposal District
February 5, 2002
Richard Pope, Director

I spoke with Richard Pope, Director of Refuse Disposal District for Niagara County by telephone today. Mr. Pope is an environmental engineer who is aware of GIS and uses it, " wherever and whenever" he can.

Being familiar with GIS and a lot of its capabilities, Mr. Pope discussed some ideas he had for GIS uses within the department. He discussed the resolution his department currently works under which is IL-29-00. They are currently conducting REM preliminary Phase 1 on-site environmental site assessments. He added that this is because they are responsible for the County foreclosures on properties who's owners are delinquent on their payments and they need to assess the property for any contamination or environmental hazard.

Mr. Pope also stated they are responsible for prior land use records and assessment of contaminate pathways. He added they could also use a resident notification tool for citing new solid waste management or recycling facilities.

Lastly, we talked about the Refuse Disposal District being called to perform "Special Capital Projects" for the Parks and Public Works departments throughout the County. These projects include designing of a new park, where the necessary data would include topography, water & sewer, residential development entrances, etc. A GIS would certainly assist them in accessing and maintaining data for these and future projects throughout the County.

Applications for Refuse Disposal District:

1. **General Query Tool** - application to assist in on-site environmental assessment, determining soil classification, as well as retrieving information on nearby wells or septic systems. Users should have the options to pan, zoom, select features, and to create hard copy maps of the screen display.

    Data Layers:

    a. Street centerlines
    b. Parcel outlines
    c. Landfill sites
    d. Foreclosed properties
    e. Lab analysis database for sample locations
    f. Hydrology
    g. Wetlands (DEC & Federal)
    h. Flood Zones
    i. Soils
    j. Watersheds
    k. Well locations
    l. Septic system locations
    m. Digital orthophotos

n. Contour lines
o. Geology (surface and bedrock)
p. Agricultural districts
q. Aquifers

2. **Historical Data Retrieval** - application to allow information about current and past jobs to be input to allow for more efficient future retrieval. Attribute information stored for current and future job sites would be accessed and placed into pre-formatted reports replacing the reports that are currently generated. The application should also allow the user to create hard copy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Landfill sites
   d. Lab analysis database for sample locations
   e. Soils
   f. Digital orthophotos
   g. Hydrology
   h. Building footprints
   i. Wetlands (DEC & Federal)
   j. Flood Zones
   k. Watersheds
   l. Well locations
   m. Septic system locations
   n. Contour lines
   o. Utilities (electric, gas, water, sewer)
   p. Geology (surface and bedrock)
   q. Agricultural districts
   r. Aquifers

3. **Resident Notification Tool** - application to retrieve address information of property owners for notification of new waste management or recycling facility. Application queries the existing parcel database and returns names and addresses of parcels along a specified area and exports them to a database file. The resulting database can be used to send form letters to residents.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Municipal outlines
   d. Landfill sites

4. **Park Planning Tool** - application to compile existing basemap data and to use simple drawing tools to generate proposed plans for new parks & recreation sites.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Landfill sites
   d. Digital orthophotos

e. Hydrology
f. Pavement edge
g. Paths & trails
h. Building outlines
i. Recreational equipment (swing sets, benches, picnic tables, etc.)
j. Water mains
k. Sewer lines
l. Utilities (gas, electric, phone, etc.)
m. Contour lines
n. Flood Zones
o. Soils
p. Watersheds
q. Well locations
r. Lab analysis database for sample locations
s. Municipal outlines

Niagara County – Risk/Insurance
March 19, 2002
Bruce Fenwick, Director

Bruce began by identifying himself currently overseeing the Risk/Insurance Department as well as him main role as Director of Human Resources.

The Risk/Insurance Department consists of three main areas: 3rd Party Liability, Workers Compensation, and Health Insurance.

PeopleSoft is used for all database and records pertaining to the Risk/Insurance area. We discussed the type of things it would be nice to be able to query, track and display if possible and Bruce mentioned a few ideas.

When retirees leave, they can be maintained on the County health insurance rolls. Bruce said it would really be helpful to see where retirees lived within the County and where they live now.

Another application we discussed was how and where workers compensation cases occur throughout the municipalities of the county. Specifically, Bruce would like to see which areas of the County have the most occurrences, which departments have claims and tracking of these claims.

We concluded by talking about whether the GIS could also track various types of accidents which occur on County roads or on County property, the cause of these occurrences and factors which led to the accident. Having the ability to track and locate such instances could prevent further accidents in the future.

Applications for Risk/Insurance:

1. **County Retiree Tracking** – this application would track former County employees from their location as employees to the location they retired to.
    a. County retiree database
    b. Municipal boundaries
    c. Geocoded addresses
    d. Street centerlines
    e. Zipcode centroids

2. **Workers Compensation Tracking** – this application would track workers compensation throughout the County. It can also track department of origin and areas having the most claims.
    a. County employee database
    b. Street centerlines
    c. Parcel outlines
    d. Parcel address database
    e. Municipal boundaries

3. **Accident Tracking Tool** – application to track the location and type of accidents on County streets and property. This application should also report road conditions and weather status and other factors that may have caused the accident.
    a. Street centerlines
    b. Parcel outlines
    c. Municipal boundaries
    d. Geocoded addresses
    e. Accident database
    f. Aerial photos
    g. Pictometry photos

Niagara County – Sewer District
February 6, 2002
Frank A. Nerone, P.E., Superintendent

I met with Frank Nerone who is the Chief Operator at the Niagara Sewer District Plant. This facility is the main treatment plant and final termination of the sewer lines for the communities of Wheatfield, Pendleton, parts of Niagara, Lewiston, Cambria and Lockport. Each of the cities has their own facilities. The town sewer systems are run locally and discharged into the Niagara County Sewer District #1 lines.

The basic functions of the department include collection and treatment of wastewater for release into the Niagara River. On the financial side (for budgeting purposes), the costs for wastewater treatment are split among the six towns depending on use. These charges are based on assessed value, water use and unit charges.

Currently, the department records (engineering drawings) of the collection and interceptor system are kept on paper. Two-thirds (2/3) of the plans are blue prints, while one-third (1/3) are in CAD format and are with the original consultants (Krehbiel or Wendel-Duchscherer). We discussed the amount of good data that is available currently in the department, however, it's all gathered piecemeal and it's all on paper (ie: depth of lines, invert elevation, etc.) To access something now, there are many drawings they need to go through. Having a computerized system where this data was available to pull up layers of necessary data would be a huge timesavings (especially to one not familiar with the system) and create efficiency.

The department also stores information and databases using Excel, Access, and R-base (which moves over to Access/Excel). Water uses data for commercial/industrial users and is collected on paper from the six towns' water departments on an annual basis and manually inputted to R-base. Change reports are then generated and sent to town assessors who make changes on the tax-rolls. Summaries of totals (assessment, units) are reported back from the County Real Property Director and are used in conjunction with budget data to compute (Excel) tax rates for the following year.

Lab data generated by the in-house laboratory (25-30 points daily) and commercial labs (50 points monthly) are recorded on paper reports. Portions of this data are summarized monthly and manually entered into Excel spreadsheets. Reports are generated in Excel for submittal to State and Federal (manually entered) agencies.

The department is responsible for routine and non-routine, announced and unannounced sampling of approximately ten (10) Federally regulated "significant industrial users". Annual reports for these users are compiled from individual inspection and sampling reports and submitted with a narrative report to State and Federal agencies.

The department does track capital assess with a bar code system (with Industrial Appraisal Company) and has recently converted this data to an Excel spreadsheet format for capital asses reporting.

Preventative maintenance records for equipment at the wastewater treatment plant and six (6) pump stations has been maintained in a "Basic" computer program originally written in 1984. It is not linked to the fixed asses or any GIS system.

The Sewer District as well as the Niagara County Water District use SCADA (Supervisory Control and Data Acquisition) system. This system continuously monitors and controls thousands of data points/equipment status on a real time basis.

Of the approximately 15,000 parcels in the District, the county district personnel really only get involved in the ten (significant" industrial users and maybe ten more potentially significant industrial users, leaving the remainder to be handles by the respective town jurisdictions.

The Sewer District does little detailed review of information from RPTS (except for the annual totals noted previously). If data from the RPTS could be imported to Access or Excel and subjected to sorting and filtering sequences, errors/omissions in classifications could more easily be identified.

The greatest desire for Frank would be to have the physical plant in an electronic format. He stated that there are approximately 3-4 guys who really know the system now. Having all the systems centralized and the data more easily attainable would be extremely beneficial. There are many systems used for many different things currently, with no integration of these systems.

Applications for Sewer Department:

1. **Water Sample Analysis** – a query and display tool to allow the end user to view sample data by date, chemical agent or reading, volume, compliance with State and Federal regulations. The user could ask to see the results of all water sample tests by date window, or to see only lab results that exceed a given threshold for any chemical agent that is analyzed in a map form.

   Data Layers:

   a. parcel outlines
   b. street centerlines
   c. sample point locations
   d. sewer mains
   e. sewer facilities (manholes, pump stations, etc.)
   f. hydrology
   g. significant users
   h. sample database

2. **Plant Management Tool –** application to display the layout of the plant floor plan including the location of all equipment, filters, pumps, valves and mains. Digital photos of each piece of equipment could be related to the floorplans as well as scanned versions of the maintenance manuals for each piece of equipment. The maintenance history and future scheduled preventative maintenance for the equipment could also be collected and displayed. Valve status and sequencing for procedures like back flushing of filters could be illustrated graphically for new hires.

   Data Layers:

a. digital photos of equipment
b. scanned maintenance manuals
c. floor plans
d. maintenance history database
e. preventative maintenance database

3. **Data Entry/Retrieval Tool** – to expedite the generation of standard State and Federal reports, an Access database should be developed with the sole purpose of reducing the manual data entry and reformatting that goes into the creation of each monthly report. By capturing the data electronically at the earliest possible point in the sampling and analysis step, time can be saved and errors reduced.

   Data Layers:

   a. sample data results (need details as to the type of information gathered)
   b. report templates
   c. sample point locations
   d. parcel outlines
   e. street centerlines
   f. sewer mains
   g. sewer facilities (manholes, pump stations, etc.)

4. **SCADA Interface –** display tool to show the real time SCADA results for the 3,000 sampling points.

   Data Layers:

   a. parcel outlines
   b. street centerlines
   c. SCADA monitoring stations
   d. sewer mains
   e. sewer facilities (manholes, pump stations, etc.)
   f. sample point locations
   g. significant users

5. **Image Archive and Retrieval System –** tool to allow the storage and retrieval of record drawings and as-built drawings of sewer lines and facilities across the county. Convert all the existing paper maps and drawings to scanned images and reference them to the GIS parcel basemap.

   Data Layers:

   a. parcel outlines
   b. street centerlines
   c. project outline polygons
   d. scanned drawings
   e. sewer mains
   f. sewer facilities (manholes, pump stations, etc.)
   g. significant users

Niagara County - Sheriff
1/28/02
James Wesolowski, Senior Officer

Officer Wesolowski was very aware of how GIS capabilities could enhance his department's efforts. He had explored GIS in the recent past and would like to implement a number of GIS functions within his department if the funding was available.

He discussed a number of computer-aided systems that run on their department's AS400 New World System as well as a number of State databases for reporting accidents, incidents, and arrests. A number of data elements would be useful for crime analysis.

His department vehicle fleet is composed of 16 marked cars, 10-12 unmarked and 6 special command post vehicles. Each one is fitted with 2 way radios and some have on-board computers for communication between the dispatcher and other vehicles. He would like to see AVL and GIS mapping in the vehicles in the future.

Personnel are assigned to municipal boundaries. There are no beats or sections. They are responsible for the whole community. Maps depicting trouble spots, complaints, arrests, etc. would be very useful for officers coming on duty.

The 911 system has map display function, but they are currently not using that. James is eagerly awaiting the changes in the cellular phone network to allow more precise locations of cell phone calls.

James would like to see emergency response plans assembled for every public school in their jurisdiction with floorplans and even 3D imagery if possible. He worries about the diskspace required to house the VRML photos for the 3D viewer tools.

They have a great network infrastructure in place, but still have to wrestle with different legacy database systems. James would like to share information with other County agencies including Social Services, Probation, District Attorney and others, but can't at this point.

<u>Applications for Sheriff:</u>

1. Automatic Vehicle Locator – application to display the location and status of all emergency response vehicles. GPS locations of the vehicles will be transmitted to the dispatch computer via radio signal and displayed in real time. By using different symbols and color halos, the dispatcher can determine the type of vehicle (squad car, undercover, ambulance, fire truck, etc.) and it's status (stationary, inactive, active, etc.).

Data Layers
1. Street centerlines
2. Parcel outlines
3. GPS vehicle locations

4. Vehicle database
5. Geocoded addresses
6. 911 call database
7. Police Districts
8. Municipal Boundaries
9. Fire districts
10. Fire halls
11. Police stations
12. Hospitals

2. Sex Offender Notification – tool to allow the public to view the locations of sex offenders relative to their home addresses. This ArcIMS based tool would allow end users to visit the county web site, enter an address and determine if there were any known sex offenders within a defined radius. Basic functions like pan, zoom, identify and print would also be available.

Data Layers

1. Street centerline
2. Geocoded addresses
3. Sex offender database
4. Schools
5. Churches
6. Daycare centers
7. Parks
8. Municipal Boundaries

3. Accident Analysis – tool to display the location, severity and cause of highway accidents. The analyst can filter and color code the data by a time window, type of accident, severity, cause, weather conditions, visibility, response time, etc.

Data Layers

1. Street centerlines
2. Parcel outlines
3. Geocoded addresses
4. Accident database
5. Police Districts
6. Municipal Boundaries
7. Fire districts
8. Fire halls
9. Police stations
10. Hospitals

4. 911 Call Display – application to intercept the caller address, geocode the address and zoom to the area of interest. Symbolize the call location by type of call (crime, domestic, fire, accident, hostage, etc.). Integrate GIS with the New World Systems Aegis 911 package.

Data Layers

1. Street centerlines
2. Parcel outlines
3. Churches
4. Community centers
5. Schools
6. Daycare centers
7. Bars
8. Adult entertainment
9. Liquor stores
10. Geocoded Addresses
11. Parolee database
12. Crime database
13. Police Districts
14. Municipal Boundaries
15. Hydrants
16. Water mains
17. Digital Orthophotos

5. Beat maps – generate hard copy maps to show all complaints and crime activity during last X hours within a given Police service area (beat). Display all crimes by standard symbology to show type of crime and time of day.

Data Layers

1. Street centerlines
2. Parcel outlines
3. Churches
4. Community centers
5. Schools
6. Daycare centers
7. Bars
8. Adult entertainment
9. Liquor stores
10. Geocoded Addresses
11. Parolee database
12. Crime database
13. Police Districts
14. Digital Orthophotos
15. Municipal Boundaries

6. Crime analysis – applications to assess the location of crimes relative to outside factors over time. Allow the user to query, filter and display crimes by time window, type of crime. Develop walking and drive distance rings around crime locations and find all parolee locations within reasonable distance. Perform cluster analysis to find similar crimes within a spatial distance, etc. Display locations of parolees, bars, liquor stores, adult entertainment, churches, schools, community centers, etc.

Data Layers

1. Street centerlines
2. Parcel outlines
3. Churches
4. Community centers
5. Schools
6. Daycare centers
7. Bars
8. Adult entertainment
9. Liquor stores
10. Geocoded Addresses
11. Parolee database
12. Crime database
13. Police Districts
14. Digital Orthophotos
15. Municipal Boundaries

7. Complaint Logger tool – database application to track current and historic complaints, their status and outcome. Locations and status can be displayed by different colors and symbols. Repeat calls can be symbolized by size of the symbol. Complaints can be filtered by time windows and by complaint type.

Data Layers

1. Police Districts
2. Municipal Boundaries
3. Street Centerlines
4. Parcel Outlines
5. Complaint database
6. Geocoded addresses

8. Backyard address generator – application to generate a backyard parcel address for each parcel in the database to assist dispatchers to direct backup police squad cars to a house number corresponding to the house in the backyard. The backup unit could be sent the street behind the call address to cutoff an escape route. The routine would use the same logic to compute the ROW address points. In this case, all inside points would be selected that had different street names (name and type – Ave, Rd, Ct, etc.).

Data Layers

1. Parcel outlines
2. Street centerlines

Niagara County – Social Services
February 15, 2002
Anthony Restaino - Commissioner, Sharon Sloma - Deputy Commissioner, Burt Marshall - Director of Social Services

Since Mr. Restaino, Ms. Sloma and Mr. Marshall had not been able to attend the GIS Educational Seminars, we discussed the capabilities of GIS and I showed them the example of how when GIS is applied to current databases, a nice visual representation can be used for planning future programs and activities within Social Services.

Social Services encompasses five locations: two in Lockport, two in Niagara Falls and one in North Tonawanda. We talked briefly about the department and services of the department and Sharon provided us with a booklet describing some of the programs available. I mentioned meeting with the Employment and Training department and discussing the Welfare to Work program that these departments are jointly involved with.

We discussed some of the transportation issues with the programs offered through the department. Several programs require transportation and there is a person within the department who schedules the County operated transport van. All schedules are completed by hand each day. Scheduling is done in advance. The van is scheduled to various locations within Niagara and Erie County.

There are approximately 70 caseworkers in Social Services. Each caseworker manages their own driving schedule. There are currently about 500 home care cases that are seen an average of once every three months. (that translates to 500 * 4 = 2,000 visits / year. 500 / 70 caseworkers = 7 cases each and they make approximately 29 visits over a year (one every other week) – not a very busy schedule).

Currently, referrals come in to the department from churches, community centers, and through other departments such as Employment and Training, etc. There is no website or reference sources for these places other than phoning directly to Social Services for the recommended action. HEAP gets a number of referrals through outside agencies and organizations.

People are put into the system through a paper application. The application is entered into the computer multiple times, as the department utilizes three systems: *Welfare Management System (WMS),* which is a state system that lists client-specific information like address, case type, case composition, services authorized, etc. The Welfare Management System is used to track people through the various programs they are involved in. This system can also monitor the length of time a person remains in the system and on certain programs. This is the system with the most critical information for the majority of DSS staff. *Connections* is a State reporting system and *Child Support* is a system which lists name, address, number of children, school district, case number, activities, etc. There is no integration of State and County systems currently, which means there has to be some repetition of data entry. There are a number of smaller databases kept in Excel and Access by the department.

As a person needs to be referred to another department or area, a paper referral is completed for each individual. Nothing is generated through the computer. A copy of some information (demographics mainly) is given to the client to take to their next location so duplicate information doesn't have to be acquired (although it may have to be entered again wherever the person is referred to).

When asked about planning for programs in "demand" or trends in certain programs (such as youth crime, teen pregnancy), the group stated these issued are discussed and planned for at Legislature Meetings.

One issue the Social Services staff face is responding to requests for certain information that currently takes time to create manually. Information such as high concentration of certain conditions in various pockets throughout the County (such as teen pregnancy) is something the department would like to be able to display and demonstrate to the Legislature. Also, being able to locate and show areas of the County where there are higher concentrations of Juvenile Delinquents and PINs (Person in Need of Supervision) would be most helpful to plan and secure new programs in suitable locations. Something a GIS can do very readily.

It is important to note that even though we often talk about sharing data between some departments using GIS, sensitive data would not be shared. Shared layers include – parcels, streets, municipal boundaries, etc. DSS would overlay their data on top of the shared layers, but the database info and locations of service recipients would **only** be viewed by select DSS staff.

Applications for Social Services:

1. **Resolve address issues (geocode service recipients)** – this application/service is key to all other applications since the location of the service recipient must be accurately depicted on the map for reliable analysis to be performed. The process would involve the analysis of the existing address information and the cleanup and standardization of the addresses. In the case of rural routes and PO boxes, they would be researched and manually placed or tied to street intersections or parcel outlines.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines and RPS data
   c. Names/address database
   d. Service recipient address files
   e. Municipal outlines

2. **Job training match program** – routine would attempt to link job seekers with companies hiring (as in the Welfare to Work Program) by performing a link or a join between tables based on job openings and job skills. Secondarily, the routine would determine the closest bus routes or driving directions from the seeker's location to the employer. Additionally, schools and day care centers would be displayed to give the job seeker assistance to locate these amenities.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. Bus routes
   d. Bus stops
   e. Job locations - companies with job openings (geocoded addresses), type of job, pay, hours, skills required, etc.
   f. Day Care Centers
   g. Schools
   h. Geocoded addresses

i. Applicant database (name, skills, age, etc.)
j. Computed routes and directions
k. Municipal outlines

3. **Routing for case workers** – a primary cost savings could be realized if case workers were matched to cases based on skills AND location. Cluster analysis would help define natural distribution of the workload and reduce travel time for caseworkers. By pairing up people in need with the nearest caseworker with the matching skills, the cost to deliver required services would be reduced.

   Data Layers:

   a. Street centerlines
   b. Geocoded addressed - case worker base locations (home or office)
   c. DSS database - case worker skill set
   d. Service recipient address (resolved addresses)
   e. DSS database - daily case schedule database – name, address, case details, service to be provided, time for service, time of scheduled appointment, etc.
   f. Municipal outlines

4. **Reports to the Legislature** – map and summary table showing the number of cases and results of programs. A map showing the distribution and volume of services extruded out from the map (3D view) may provide an easy to read visual tool to present to the County Legislature.

   Data Layers:

   a. Municipal outline
   b. Geocoded addresses of service recipients
   c. DSS database - summary database of services provided by type, count, dollars spent, and benefit derived

5. **Integrate State and local databases with GIS parcels or geocoded addresses** – access to up-to-date information is key to analyzing services and benefits to the service recipients within the given budget. Options include direct integration at the code level, sharing databases and extracts on a regular basis.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines and database
   c. State database
   d. DSS database
   e. Geocoded addresses
   f. Municipal outlines

6. **Bus route and van service analysis** – access to routing and scheduling on the desktop for ease preparing transportation by either the department van or bus routes.

   Data Layers:

   a. Street centerlines
   b. Bus routes
   c. Service provider locations
   d. Geocoded addresses - client pickup locations
   e. Trip database (date, time, to-from locations, client code, mileage)

f. Municipal outlines

7. **HEAP** – based on the number of applicants for this program, it is recommended that department workers work with local community centers or churches to gather HEAP applications.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines and RPS database (owner names)
   c. Geocoded addresses of HEAP participants
   d. 2000 Census data
   e. Church and community center locations
   f. Municipal outlines

8. **General display tool** – a map interface to review the distribution, number and types of services being provided on a daily basis. The user could display cases by type, by level of risk, by caseworker name, by cost of service, by outcome measures, etc.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines
   c. 2000 Census data
   d. Geocoded addresses of services recipients
   e. DSS databases
   f. Bus routes
   g. Churches and community center locations
   h. Municipal outlines

9. **Census tracking tool** – as population trends change over time, it would assist Social Service to track the changes in age, ethnicity, income, educational attainment, etc. within the County on an on-going basis.

   Data Layers:

   a. Street centerlines
   b. Parcel outlines and database
   c. Census block & tracks
   d. DSS - census database
   e. Municipal outlines

10. **Service provider lookup** – a tool to enable caseworkers and counselors to match people in need with service providers based on location and ease of access (bus routes, etc.) Services to include are shelters, soup kitchens, daycare, drug programs, job training, counseling, churches, adoption centers, public defenders, thrift stores, etc. The tool would provide an easy search tool to match the person in need with the closest services available.

    Data Layers:

    a. Street centerlines
    b. Service provider database (service type, hours of operation, contact names, address, funding source, insurance acceptance, fees (if any).
    c. Bus routes
    d. Computed routes and directions
    e. Municipal outlines

Niagara County – Soil, Water Conservation District
March 18, 2002
Mark Seider

Mark shared that his primary client base includes the farming community and municipalities. Some services performed for local municipalities include land permit evaluations, and ditch surveys, etc.

Mark expressed some of the challenges with the current GIS they work with which includes maps not matching up because of different projections. Mark's co-worker, Brian Richards attended some ArcView training, but agrees the department could use additional training. NCSWCD currently has two ArcView licenses. Mark also added that they probably don't know enough about what data is available and the sources of that data.

The Soil Water Conservation District is responsible for Ag Assessments which is a program where agricultural land is assessed a dollar value based upon soil quality. Currently, this is done by hand using paper tax maps and soil maps from the books.

Another program the department is involved in is the Stressed Stream Analysis. This process involves selecting locations during storm events to pin point problem areas and analyzing the water. Water samples are sent to SUNY Brockport for processing and analysis. Paper reports are generated and returned to SWCD. Mark thought that the results may also be available in digital format if requested.

Graham asked if there is any type of follow up once the initial analysis is performed. Mark stated that they look at the location of problems and work with farmers, etc. to resolve issues and sometimes there is grant monies available to assist them.

Erosion control issues in streams is also monitored by the department. Mark mentioned a demonstration project from Chemung County and their GIS and how they may implement something similar. Graham asked Mark if he was aware of Pictometry and their contract with Niagara County. He also explained how the Pictometry license works and how all departments would benefit from this data, including SWCD.

Mark mentioned that data sharing isn't really happening now. SWCD has Internet access, but they are not connected to the County for tax map and other data that may be available. The department does have three computers that are networked together, one having a CD burner. They also have a scanner and a plotter. The department also has a website that is partially completed. Mark has become the webmaster for the site which needs to be addressed. Web site enhancements and ideas were exchanged. There may be public datasets available that may be useful. Forms for programs such as seedling ordering could also be available on the site along with availability of specific varieties offered.

The department does not utilize any GPS units or digital cameras currently. The USDA office (located adjacent to the SWCD office) has a hand held GPS unit (accurate to about 50') that they share with SWCD for off site data input.

We concluded by discussing some of the data that Mark and the department would find helpful in their department. Old datasets to overlay with current data to note erosion and see how much the streams are moving would be most useful. Grant monies may be available to assist with this process if seen that this program is being compiled and monitored regularly.

Other datasets that would be very helpful to have include soils, streams, watershed boundaries, etc. The FEMA flood maps would also be helpful. Aerial photography would also be good to have in determining agricultural versus woodland areas.

The department currently stores approximately 100-250 per series, 24 x 24 inch images that could be scanned and digitized for locations throughout the County.

Applications for Soil, Water Conservation District:

1. **Ditch survey tool** – application to assess a proposed ditching project and to record proper elevations for grading ditches. The user can enter the location and the elevation of the stationing points.

   Data Layers:

   a. Aerial Photos (Oblique - Pictometry)
   b. Bridges
   c. Contours
   d. Digital Ortho Photos
   e. Elevation Monumentation
   f. Environmentally Sensitive Sites
   g. Geology – surface
   h. Hydrology
   i. Parcel Outlines
   j. Pavement
   k. Scanned or Digital Photos
   l. Soils
   m. Storm Drainage Receivers
   n. Subdivisions
   o. Variance Permit Files
   p. Wetlands
   q. Ditches
   r. Survey Station Points

2. **Ag Assessments** – tool to assign a dollar value to a parcel based on the quality of the soil data for farming. The tool should overlay, clip and assign proportional percentages of soil type to the parcel polygon and compute a property value.

   Data Layers:

   a. Ag Districts
   b. Contours
   c. Digital Ortho Photos
   d. Erosion Zones
   e. Floodplains
   f. Hydrology
   g. Landfills

h. Landuse
i. Parcel Outlines
j. Soils
k. Street Centerlines
l. Vegetation
m. Watersheds
n. Wetlands

3. **Stream Erosion Monitoring tool** – application to compare historic aerial photos, trace current and previous stream banks and determine the area in square footage or acreage of erosion.

Data Layers:

a. Ag Districts
b. Aerial Photos (Oblique – Pictometry)
c. Contours
d. Digital Ortho Photos
e. Erosion Zones
f. Floodplains
g. Geology – bedrock
h. Geology – surface
i. Hydrology
j. Landuse
k. Parcels Outlines
l. Scanned or Digital Photos
m. Soils
n. Steep Slope Regions
o. Watersheds

3. **Water Quality Entry tool** – allow users to place a water sampling location on a map and to assign a unique id to link to the sample analysis database.

Data Layers:

a. Ag Districts
b. EPA Site Locations
c. Hazardous Material Sites
d. Hydrology
e. Landfills
f. Municipal Boundaries
g. Parcel Outlines
h. Septic Tank Locations
i. Soils
j. Street Centerlines
k. Water Sample Points

4. **Water Sample Analysis**

Data Layers:

a. Ag Districts
b. EPA Site Locations
c. Hazardous Material Sites
d. Hydrology

e. Municipal Boundaries
f. Parcel Outlines
g. Septic Tank Locations
h. Soils
i. Street Centerlines
j. Water Sample Points

5. **General Query tool**

Data Layers:

a. Ag Districts
b. Archeology Sites
c. Contours
d. Digital Ortho Photos
e. Digital Historic Ortho Photos
f. Environmentally Sensitive Sites
g. Erosion Zones
h. Floodplains
i. Geology – bedrock
j. Geology – surface
k. Historical Sites
l. Landuse
m. Municipal Boundaries
n. Parcel Outlines
o. Septic Tank Locations
p. Soils
q. Steep Slope Regions
r. Street Centerlines
s. Vegetation
t. Watersheds
u. Wetlands

6. **Pictometry** – end user tool to view oblique photos

Data Layers:

a. Ag Districts
b. Aerial Photos (Oblique – Pictometry)
c. Floodplains
d. Parcels Outlines
e. Soils
f. Wetlands

7. **Projection Wizard** – tool to help end users resolve projection problems

Data Layers:

a. Projection Metadata

8. **FTP site** – access to Niagara and Erie County GIS data for download.

Data Layers:

a. Access to County Data

9. **Vegetative Assessment** – image analysis tool to determine the type and percentages of vegetation based on pixel signatures.

    Data Layers:

    a. Digital Ortho Photos
    b. Landuse
    c. Vegetation

Niagara County – Veterans Services
January 23, 2002
Donald Thompson, Director

Today I met with Donald Thompson, Director of Veterans Services and his assistant Mary Kay. They explained that their office is responsible to provide services to all Veterans within the County. To qualify as a Veteran, one must have been in active duty for a minimum of 2 years.

The services offered by this department range from a counseling liaison between any level of government and the veteran, assisting with various applications (i.e. property tax exemptions, State Park applications, free Thruway driving, etc.) and basically providing assistance to the veteran and their wife/widow.

They do not interact much with other County departments except occasionally with Social Services (who will generally refer a client to the Veterans office first if they are dealing with a Veteran before they assist them) and possibly the Office for the Aging. The department does not share information or databases with any other department in the County.

Currently, maps are not used for any reason in the department. The Veterans Service department cannot directly help a veteran locate lost buddies for other veterans, but instead, the department can forward a letter to another veteran who may then choose to make contact directly. A database of about 25,000 names is maintained of known veterans from all branches of military service.. Of this list, approximately 13,000 are veterans believed to be living in the County. Tracking and updating is done as best they can from obituaries in the local papers or calls from family. Generally, Veterans who use this office are not in the best of situations and are seeking assistance in some way.

The department does not get many requests for information, however, they may get an occasional call for example from the local VFW Post when a veteran is applying for membership. They may want to verify dates of services, etc. With the proper authorization from the Veteran, this information can be verified.

The Veterans Services department prepares a monthly report to the State of the number of requests made by Veterans within the County. The report is broken down by war period and contains approximately 30 categories of information. The department assists approximately 500 veterans and/or widows per month.

Mr. Thompson thought it would be helpful to have different ways to display and query the data they keep. As far as computerized information on their Veterans, all information is maintained in an Excel spreadsheet currently. The department did not feel the need for maps of any kind now, however, the ability to draw information on a particular category or subject within this database would prove helpful.

<u>Applications for Veteran Affairs</u>

1. **Veterans Services Planning** – application to determine location of existing veterans that may be eligible for benefits. Users should have the options to pan, zoom, select features and to create hard copy maps of the screen display.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Municipal boundaries
d. Agency locations
e. Census data
f. Service recipients (geocoded addresses)
g. VFW halls
h. Hospitals

Niagara County – Water Department
January 28, 2002
Ron Johnston (administrator), Dave Branch (water maintenance II) & John Coleman (superintendent)

We started the discussion with a brief demo of GIS from ECWA (leaks) and Newark (valves and hydrants) to show the relationship between the graphic features and the database records.

The primary data source for information concerning the Niagara County water system is contained on a series of 18 contracts each composed of a bundle of drawings (approximately 40 drawings in each). Each page contains three illustrations – a strip photo, a strip map with planimetric features (pavement edge, building outlines (house #s), poles, contours, elevation points, road centerlines (road names), easements, trees, gas lines, water mains, valves, meter pits, stationing points ties (to poles, building corners and centerlines), and a profile with stationing points, invert elevations and depth below existing ground surface. The original drawings are on Mylar or Sepia. Updates to the drawings are made as crews go out for digs. Any changes to measurements (depth, distance to centerline, pipe diameter, etc.) are made and noted only on the paper maps, not on the Mylar maps.

We discussed a range of approaches for capturing the data into the GIS including:

1) Scanning the exiting Mylar maps to create a digital archive (no direct hook to the GIS)
2) Scanning the Mylar drawings and creating polygon outlines on the parcel base map to tie the drawing to a known area on the GIS
3) Scanning and georeferencing the drawings to match the existing parcel and digital orthophoto data layers
4) Performing heads-up digitizing of the water facilities (mains, valves, blowoffs, boosters, treatment plant, tanks, etc.) and assigning attributes to each of the features (size, age, make, model, condition, inspection history, etc.)
5) Conducting field surveys using GPS units to locate and attribute the features in the field.

We talked about the pros and cons and costs of each approach. A project was suggested to use BOCCES students to transfer the changes and new information to the Mylar before scanning or conversion to insure the latest updates were on the maps and drawings. We also talked about using raster-editing software that would allow the update of the drawings after they had been scanned.

After this discussion we talked about the fact that Wendel had already developed a hydraulic model for the County and had the majority of the mains, valves and meters in a GIS ready format. The accuracy of the placement of the features would need to be verified and altered, but Dave and John indicated that best visual fit would be adequate to represent the location of the valve clusters around each of the meter pits.

John has a set of notes entered into Excel for each of the valves associated with each contract. Each record indicates the valve number, the size, the type, presence or absence of a bypass, the location (house number or intersection), comments, and reference to other contracts. I asked John to check if the data was entered into a single cell or multiple columns in Excel to assist in the creation of a valve database. Each valve has been assigned a unique, numeric ID that will make the conversion to a GIS attribute database very easy.

John also has a small number of CAD drawings that depict the location of valve clusters and planimetric features surrounding meter pits. The drawings are schematics, not drawn to scale and do not include ties. John hopes to tie these drawings to the associated meter pit in the GIS.

The County sells bulk water to local municipalities. The amount of water consumed is measured at a series of meters (all but one are located in confined space pits or vaults). The one meter outside of a pit is tied to an RPZ and enclosed in a temperature controlled structure. Each meter is physically read on a monthly basis. At that time, the field personnel conduct a visual inspection of the meter pit and the valves. They also conduct air quality tests (confined space requirements) and record chlorine and pressure levels. The meter readings and the chlorine and pressure values are recorded on hand held units. The units are returned to the office and the information is downloaded into a custom Access database. Each meter has been assigned a unique number in the Access database and could be hooked back to the GIS by assigning the same ID number to the features in the GIS. There are 130 meters in the County. The County is divided up into three meter reading zones and a hand held unit is assigned to each zone. At this point there is not a defined sequence to visit the sites. Often a pit may be flooded with water and the sump pump needs to be activated. While that one is pumped out, the crew will go to the next closest meter pit.

Wendel has developed a hydraulic model for the County and has digitized the general location of all mains, valves, tanks and pump stations in the system. The team also expressed a desire to see the integration of the municipal systems pipe network into the GIS and into the hydraulic model. Integration of the hydraulic model with the GIS is more of a procedural approach than an application. Required parameters for the hydraulic model should be added and populated in the water facilities tables in the GIS (roughness, age of pipe, material, size, etc.). Likewise, results from the hydraulic model should be transferred back to the GIS for future revisions to the model. The latest versions of commercial hydraulic models embrace ESRI's geodatabase approach for storing rules, attributes and behaviors with the map features. With this level of integration, the integration of the hydraulic model with the GIS will be more automatic in the future. It is important, however, to design and build the GIS data layers with this in mind now.

Elevation data either derived from DEMs or read off scanned USGS topo maps would be useful to confirm pressure readings in the Meter Reading database and to calibrate the hydraulic model.

The County also has a SCADA system with 12 (?) meters with telemetry units that report the current state of pressure at each site. The SCADA system also reports tank water levels and pump status.

Between the hydraulic model, the SCADA system, John's CAD drawings, the Meter Reading database and John's valve database, the Water department is in great shape for moving forward with a GIS.

Applications for the Water Department:

1) **Database Integration – (**Integration of Meter Reading Access database and GIS) – this application would integrate the contents of the Meter Reading database and the GIS to allow users to click on a given meter and see the current and historic readings at that site.

   Data Layers:

a. Meter pit locations
b. Meter Reading database
c. Meter reading district outlines
d. Street centerlines
e. Parcel outlines
f. Tanks
g. Pump stations
h. SCADA sites
i. Water mains
j. Water facilities (valves, meter pits, blowoffs, etc.)
k. Municipal boundaries
l. Digital orthophotos
m. House numbers
n. Contours

2) **Scanned Image Integration** – this tool would tie scanned images of contracts (bundles of Mylar record drawings) to the GIS. Images can be integrated by creating polygon outlines that define the extent of the contract and storing the image name with each polygon. As the user clicks the polygon area, the image is displayed in the default Windows imaging tool.

Data Layers:

a. Street centerlines
b. Contract polygons
c. Scanned contracts
d. Parcel outlines
e. Water mains
f. Water facilities (valves, meter pits, blowoffs, etc.)
g. Municipal boundaries
h. Digital orthophotos
i. House numbers

3) **Registration of Scanned Images** – the process would take the scanned contracts and georeference the images to the GIS basemap. This would provide the end user with all the detail of the contract record drawings as an overlay to the GIS basemap and would be a starting point for heads-up digitizing of the water feature locations. A world file would be created for each image with information regarding the image location, rotation and scaling to display in real-world coordinates. The registered images would be stored in an image catalog. Display tolerances would be defined to allow the images to be turned on and off at appropriate scales.

Data Layers:

a. Street centerlines
b. Contract polygons
c. Georeferenced scanned contracts
d. Parcel outlines
e. Water mains
f. Water facilities (valves, meter pits, blowoffs, etc.)
g. Digital orthophotos
h. Municipal boundaries
i. House numbers

4) **Integration of SCADA with GIS** – provide links between the GIS and current SCADA data associated with specific water facilities (meter pits, tanks, pump stations). Allow the display of pressures, tank levels, flow rates, and pump performance on the GIS basemap.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Water mains
d. Water facilities (valves, meter pits, blowoffs, etc.)
e. SCADA sites
f. Municipal boundaries

5) **Data Entry/Retrieval Tool** – tool to allow end users to digitize the location of water facilities (mains, valves, tees, meters, tanks, pump stations, etc.). The user can record the age, size, material, condition and maintenance history for each water facility feature.

Data Layers:

a. Street centerlines
b. Parcel outlines
c. Water mains
d. Water facilities (valves, meter pits, blowoffs, etc.)
e. Municipal boundaries
f. Digital orthophotos
g. Georeferenced scanned contracts
h. House numbers

6) **General Query and Display** – tool to allow the display of the water system by size, material, age, pressure, water use, etc. This interface would resemble ArcView, ArcExplorer, or ArcReader. It would provide basic GIS functions to identify features, query underlying tables to find specific records, turn layers on and off, zoom and pan, and display layers by colors or symbols to show size, age, condition, material, etc.

Data Layers:

a. Meter pit locations
b. Meter Reading database
c. Meter reading district outlines
d. Street centerlines
e. Parcel outlines
f. Tanks
g. Pump stations
h. SCADA sites
i. Water mains
j. Water facilities (valves, meter pits, blowoffs, etc.)
k. Municipal boundaries
l. Digital orthophotos
m. Georeferenced scanned contracts
n. Street names
o. House numbers
p. Contours

7) **Zoom to Saved Extents** – a simple tool to zoom to a specific municipality, project area or saved extent. The user can select the name of a town, village or city from a pulldown menu and zoom directly to the extent of that area of interest. Likewise, users can save a current map extent and return to that extent by reselecting the saved extent from an explorer-like dialog.

   Data Layers:

   a. Municipal boundaries
   b. Meter reading district outlines
   c. Contract polygons
   d. Saved extents files
   e. Street centerlines
   f. Parcel outlines

8) **CAD Integration** – this tool would tie existing CAD drawings to map features by storing the drawing name with the water facility. As the user clicks the map feature, AutoCAD starts and displays the drawing of choice. Another approach would integrate the CAD drawings by adding the drawings to the GIS layer list and creating world files to register the CAD drawings to the GIS basemap. The CAD drawing would be displayed as the user zooms into the area of interest.

   Data Layers:

   a. CAD Drawings
   b. World files
   c. Street centerlines
   d. Parcel outlines
   e. Water mains
   f. Water facilities (valves, meter pits, blowoffs, etc.)
   g. Municipal boundaries
   h. Digital orthophotos

9) **Leak Database** – application to record the location and type of leaks as well as the maintenance and repair history for affected pipes. The user could filter and display leaks by type, by age, by frequency to help identify problem areas. This information would be very useful to include in the hydraulic model to calibrate water use and pressure drops to indicate possible water leak locations. It would also be useful in long term capital improvement planning. Leak locations would be reported by address, parcel ID or by a graphic click on the map to associate the leak to the correct main.

   Data Layers:

   a. Water mains
   b. Water facilities (valves, meter pits, blowoffs, etc.)
   c. Leak locations
   d. Meter reading district outlines
   e. Parcel outlines
   f. Street centerlines
   g. Municipal boundaries
   h. Street names

10) **Vehicle Routing** – application to determine the best sequence to visit the meters on a monthly basis. Because the meter readers don't have a set schedule or routes to visit the

meter pits, it may be worthwhile to periodically assess the efficiency of the current routes and determine if a defined sequence would be helpful in reducing travel costs.

Data Layers:

a. Meter pit locations
b. Meter Reading database
c. Meter reading district outlines
d. Street centerlines
e. Municipal boundaries
f. Street names

Niagara County – Weights and Measures
February 28, 2002
Robert Kinne, Director

I met with Mr. Robert Kinne, the Director of the three-person department of Weights and Measures. Mr. Kinne began by discussing the responsibilities of the two individuals in his department. One person is primarily responsible for the inspections of gas stations, fuel oil trucks, taxi cabs, pharmacies and calibration of milk trucks. The other person primarily inspects supermarkets, butcher and fish markets, hardware stores, individual scales and non-commercials.

The department is responsible to maintain the Niagara County standards and re-certify them every five years. The department has over 600 sites to inspect within the County and makes approximately 1,100 site visits per year. Some inspections are scheduled, but most are done randomly. When a new business comes into the County, it is their responsibility to arrange with Weights and Measures if inspections are necessary to stay in compliance. This is not always the case and sometimes by random site visits, some new clients are discovered. Mr. Kinne expressed the importance of establishing a rapport with clients, both old and new.

Each client throughout Niagara County has a paper file maintained at the Weights and Measures office. When a site visit for an inspection is made and a citation is given, a copy goes into the file. The department generally gives three notices before turning the case over to the Attorney General for compliance.

Access databases are also maintained with address information, type of business, inspection dates, etc. In addition to keeping date records in these databases, Mr. Kinne uses them for efficient routing of his drivers. When inspections are due, Mr. Kinne sorts by zip code and then device or store that is due for inspection. The resulting effect has been less and less travel expenses for the drivers and more inspections done in a day.

One government funded program through the Sealer of Weights and Measures is gasoline sampling. There are over 140 gas stations in Niagara County and random stations are selected and samples are collected and couriered to a lab in New Jersey for testing. If the proper octane is not found through the testing, warnings are given and this department has the authority to shut down any gas station who does not comply.

Mr. Kinne concluded by saying they do not have internet access currently and this is something he feels would be a huge benefit and advantage to their department. Often the department has a real need for local data and information and this would be the source of obtaining it without having to go to another physical location. The department does have e-mail access. They are sometimes dependant on acquiring information from the County Clerks Office or Real Property because they do not have the ability to look up accurate owner name and legal addresses of clients from their location on Davison Road.

Applications for Weights and Measures:

1. **General Query Tool** - application that allows the user to query and display inspection information. Users may query and display data by municipality (or zip code), by inspection pass or failed, or by date to see what inspections are coming due or can be scheduled for random visit. Users should have the options to pan, zoom, select features and to create hard copy maps of the screen display.

   Data Layers:

   a. Street centerlines
   b. Pavement edges
   c. Building footprints
   d. Hydrology
   e. Parcel outlines
   f. Municipal outlines
   g. Inspection Locations

2. **Vehicle Routing** – Application to create further efficiency in the scheduling of inspections by location and device/store type.

   Data Layers:

   a. Inspection Database (type of inspection needed, location, etc.)
   b. Street centerlines
   c. Parcel outlines
   d. Client locations
   e. Geocoded addresses
   f. Municipal outlines

3. **Internet Access**– To have the ability to research and detect new inspection sites and verify local data and information without traveling to other locations.

4. **Database Integration** – Application to store and manage business data by SIC code to help identify new businesses that would require inspection.

   Data Layers:

   a. Building permit database
   b. Code information
   c. Inspection database
   d. Economic Development database
   e. Chamber of Commerce database
   f. Phone CDs
   g. Business License database

Mr. Kinne thought the GIS would be cool, but he doesn't really see using it too much.

Application name	Rank order	X times	Unit	T/I tangible	Type of savings	Time	Unit	$ Savings
Database integration	1	2	Month	T	New functionality	5%		
General Query Tool	2	1	Week	T	Access to information	20	Min	
Internet Access	3	1	Week	I	Up to date information	30	Min	
Vehicle Routing	4	2	Week	T	Cost savings	1	Hr	5% maintenance

APPENDIX K: POTENTIAL INTERNET SOURCES FOR GIS DATA

SOCIOECONOMIC DATA

http://www.205.232.252.23/nysdc/
Source: New York State Data Center, NYS Dept. of Economic Development, Bureau of Economic and Demographic Information
Data: Several New York state specific datasets at the state, County, and some sub-Town levels including population data such as estimates, components of change, age, and families, as well as economic characteristics including personal income, employment, and data collected for the Economic Censuses.

http://venus.census.gov/cdrom/lookup
Source: Census Bureau
Data: 1990 Census Lookup Service (server often too busy to extract data)

http://www.census.gov/epcd/cbp/view/cbpview.html
Source: Census Bureau
Data: Town Business Patterns 1993, 1994

http://www.census.gov/datamap/www/index.html
Source: Census Bureau
Data: County statistics reports

http://www.census.gov/econ/www/econ_cen.html
Source: Census Bureau
Data: Economic Censuses

http://www.empire.state.ny.us/nysdc/
Source: New York State Data Center
Data: Provides information for towns, villages, and counties for New York State, including population estimates and economic data.

http://fisher.lib.virginia.edu/
Source: Social Sciences Data Center, University of Virginia Library
Data: Good site for various socioeconomic data including County & City Data Books

http://parep2.lbl.gov/cdrom/lookup
Source: Lawrence Berkeley National Laboratory
Data: 1990 Census Lookup Service

http://govinfo.kerr.orst.edu/
Source: Government Information Sharing Project, Oregon State University
Data: Good site for various socioeconomic data including census, Regional Economic Information Service (REIS), and School District Data Book (SDDB)

http://www.ciser.cornell.edu/
Source: Cornell Institute for Social and Economic Research
Data: Good site for various socioeconomic data, particularly for local New York State data

http://www.clark.net/pub/lschank/web/ecostats.html
Source: Mansfield University Library
Data: Links to sources of business and economic data

http://www.fedstats.gov/regional.html
Source: Fedstats
Data: Links to various Federal Agencies' statistics

http://stats.bls.gov/
Source: Bureau of Labor Statistics (BLS)
Data: various economic data

http://www.wessex.com/
Source: Wessex, Inc.
Data: Population estimates and projections, street line files

http://www.claritas.com/
Source: Claritas
Data: Various socioeconomic, business, and healthcare data

PHYSICAL FEATURES
http://nysgis.nysed.gov/gis/
Source: New York State GIS Clearinghouse's Data Sharing Cooperative
Data: Potential source for a variety of spatial datasets.

http://www.usgs.gov/
Source: US Geological Survey
Data: Hydrography from Digital Line Graphs (DLGs); Topography from Digital Elevation Models (DEMs)

http://www.dec.gov/
Source: Department of Environmental Conservation
Data: Wetlands; Environmentally Sensitive Areas

CULTURAL/MUNICIPAL FEATURES
http://www.census.gov/; - http://www.claritas.com/
Source: US Census Bureau; Claritas
Data: Counties, minor civil divisions, landmarks, Congressional districts

http://www.claritas.com/
Source: Claritas
Data: Media Coverages (*e.g.*, radio, cellular, television, etc.)

http://nysgis.nysed.gov/gis/
Source: New York State GIS Clearinghouse
Data: Local government data

http://www.ctg.albany.edu/gis/directory.html
Source: The Center for Technology in Government at SUNY Albany
Data: Ever-growing source of spatial data for various areas in New York State; currently has school district boundaries for entire state.

http://plue.sedac.ciesin.org/plue/ddcarto/htmls/ny.html
Source: Consortium for International Earth Science Information Network (CIESIN) and the Socioeconomic Data and Applications Center (SEDAC)
Data: ArcInfo coverages are available overnight for the following census geographies for Niagara County: Town, tracts/BNA's, block groups, and blocks.

APPENDIX L: NYS GIS TASK FORCE METADATA CAPTURE REQUIREMENTS

The New York State GIS Task Force has streamlined the metadata capture to the following 129 fields, organized into fourteen categories:

1. **Organization Information**
   Name of Organization
   Department
   Room/Suite #
   Number and Street Names
   City
   State
   Zip Code
   Phone Number
   Fax Number
   Contact Person
   Phone Number/Extension
   Email Address
   Organization Internet Address
   Comments

2. **Reference Information**
   Filename
   File Format
   Availability
   Cost
   File Internet Address
   Metadata Created By
   Date Metadata Created
   Metadata Updated By
   Date Metadata Updated
   Metadata Standard Name
   Comments

3. **Object/File Name Information**
   Filename
   Data Object Name

4. **Data Object Information**
   Distribution Filename (Same as Filename in Reference Information)
   Data Object Name
   Type
   Data Object Description
   Spatial Object Type
   Comments

5. **Attribute Information**
   Data Object Name
   Data Attribute Name
   Attribute Description
   Attribute Filename
   Code set Name/Description

Measurement Units
Accuracy Description
Comments

6. **Data Dictionary Information**
   Data Object Name
   Data Attribute Name
   Data Type
   Field Length
   Required
   Comments

7. **Spatial Object Information**
   Data Object Name
   Spatial Object Type
   Place Name
   Projection Name/Description
   HCS Name
   HCS Datum
   HCS X-Offset
   HCS Y-Offset
   HCS Xmin
   HCS Xmax
   HCS Ymin
   HCS Ymax
   HCS Units
   HCS Accuracy Description
   VCS Name
   VCS Datum
   VCS Zmin
   VCS Zmax
   VCS Units
   VCS Accuracy Description
   Comments

8. **Source document information**
   Data Object Name
   Spatial Object Type
   Source Document Name
   Type
   Scale
   Date Document Created
   Date Digitized/Scanned
   Digitizing/Scanning Method Description
   Accuracy Description
   Comments

9. **Lineage Information**
   Data Object Name
   Data Object 1

Data Object 2
Description of Spatial Operation and Parameters
Accuracy Description
Comments

10. Update Information
Data Object Name
Update Frequency
Date
Updated By
Comments

11. Archive Information
Data Object Name
Retention Class
Retention Period
Data Archived
Archived By
Date to be Destroyed

12. Source Documents
Source Document Name
Source Document ID#
Source Organization
Type of Document
Number of Sheets (map, photo)
Source Material (paper, Mylar)
Projection Name
Coordinate System
Date Created
Last Updated
Control/Accuracy (map, photo)
Scale
Reviewed by
Review date
Spatial extent
File format
Comments

13. Entities Contained in Source
Source ID#
Entity Name
Spatial Entity
Estimated Volume of Spatial Entity
Symbol
Accuracy Description of Spatial Entity
Reviewed by
Review Date
Scrub Needed (yes/no)
Comments

14. Attributes by Entity

Source ID#
Entity Name
Attribute Description
Code Set Name
Accuracy Description of Attribute
Reviewed By
Review Date
Comments