

Proposal to Create an

Enterprise GIS Strategic Plan

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Proposal to Develop an Enterprise GIS (EGIS) Strategic Plan

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This is a proposal to work with staff at the City government, to generate a written document, the Enterprise Geographic Information System (EGIS) Strategic Plan. The plan will encapsulate a vision of the development of EGIS consistent with the needs of the departments and divisions of the City government, for a period of time, for example five years. The ultimate goal is to help staff and elected officials communicate and efficiently serve people through effective development of an EGIS.

A period of six months to a year sets an arbitrary deadline for providing a document that provides an overview of processes suggested for successful implementation of an EGIS. If more detail is required, arbitrary deadlines can be extended. Subsequent plan updates should be periodic and should be less rigorous.

GIS, EGIS and a Strategic Plan

Geographic Information Systems (GIS) are widely used and becoming an integral part of government operations (ESRI, 2003). They can be developed independently and can be tightly coupled with the capabilities of established information systems. Notable differences between these systems and those characteristically deployed and managed by IT departments include specialized equipment, software, geospatial datasets, capabilities, and personnel:

1. Hardware requirements: large format printers, scanners, imaging and data collection hardware (GPS), as well as specialized storage for large datasets.
2. Software requirements: customized user applications, web applications, desktop tools, COTS software, and capabilities to process data to create needed products or analysis.
3. Database requirements: geographic datasets (updates, metadata), ownership (stewards), security, collection, data-sharing agreements.
4. Product requirements: map production (annual, semi-annual cycles for formal government maps like land use, zoning, property), intranet (not for public), public internet applications and periodic analytical reports utilizing geoprocessing tools.
5. Personnel requirements: An enterprise system usually has a GIS Manager with any combination of Analysts, Specialists, Technicians and Data Stewards. GIS professionals are versed in technology and have an awareness of topics like: Systems Analysis & Design, Database Fundamentals, Programming, and Web Design. They may also have knowledge or training related specifically to GIS: Cartography, Projections, Physical Geography, and Geoprocessing. Other people include IT technicians, GIS Users and Data Stewards that are versed in technology, but are primarily skilled within their own disciplines: Information Systems, Planning, Engineering, etc.

The extent to which the City might invest in GIS can be characterized by an assessment of needs, and a resulting plan to implement an envisioned path to address these needs.

The Return on Investment (ROI) may be direct in some cases, but has been attributed to efficiency gains in existing enterprise systems (ESRI, 2008). There are numerous studies and papers related to determining the extent to which ROI might have been achieved concerning GIS within organizations. Generally, economies of scale are achieved through software, hardware, and database implementations, centrally managed for multiple departments or divisions. Information is managed and shared to reduce redundancy, consolidate maintenance, and improve business processes. This type of approach is described as an “enterprise” implementation, a best practice within Information Systems. GIS has evolved to adopt and incorporate this approach as a best practice.

It is well documented that establishing a strategic plan with involvement of potential stakeholders improves the chances of success by establishing “buy-in” early in the process. Technology is developing rapidly for all of types of requirements of an EGIS. An overall strategic plan to address a vision or direction should be established with this in mind. It is likely that the software and hardware will have been upgraded or changed significantly within a period of five years.

My experience with EGIS has evolved to recognize the importance in the ability to create and maintain quality geospatial datasets. Vendors who concentrate on software solutions may not adequately address data within strategic plans. GIS software and hardware continues to change rapidly. Geospatial datasets often govern what types of software and hardware are purchased and used. They are essentially, the heart of the system.

Maintenance and scale of geospatial data is paramount, and is what sets a city implementation apart from another city or perhaps the county or state (unique geographic area). Data at a quality suitable for city governments does not usually exist for free on the web, and is not cheap. This should be a priority consideration within the EGIS Strategic Plan for a municipality.

A Way to Get from Here to There

This section suggests use of a project management paradigm, where the product is the EGIS Strategic Plan. The City EGIS Strategic Plan should be managed like any other project. Generally, a vision and scope are described and defined. A method to gather and analyze information is planned then executed. Results are compiled, reviewed, revised, and delivered.

Common project management software should be used so that information can be shared. If standards regarding existing project management software, or methods are already in place they should be used. A review of strategic plans from other government agencies, even different time periods can help provide a starting place for collaboration (Kiel, 2007; McInnis, 1998; Ontario, 2008).

One of the important properties of an EGIS Strategic Plan results from engaging stakeholders of the envisioned system. Simply borrowing from the strategic plans of other, similar sized city governments is not adequate. Along the way, through the process of

building the plan, a number of work related documents, spreadsheets, and diagrams may be created. These are known as “artifacts”. They represent the results of engaging stakeholders of the envisioned system. A summary of the activities and artifacts that might exist are shown within Table 1.1.

Function or Property	Activity/Artifacts
Vision Statement and Scope	Identify the scope and vision of the EGIS for the next five years. Artifacts include: PowerPoint presentations, summary documents.
Gather Information	Identify the current state, products, data, holdings and assets of the existing system. Artifacts include: Lists of products, datasets, meta-data, software, hardware, budgets. Diagram identifying information outputs/inputs. System design diagrams. List by department of products: data, maps, reports, etc.
Needs Assessment	Identify products required or desired by existing enterprise departments, divisions, or offices. Identify data needed and maintenance cycles envisioned. Artifacts include: Interview recordings, spreadsheets, questionnaires, PowerPoint presentations.
GAP Analysis	Analyze and document differences between where we are (Gather Information) and where we want to be (Needs Assessment). Artifacts: Summarized findings by area (software, hardware, data, products, etc).
Address Gaps	
Funding	Identify how much it will cost to fill gaps: 1. How much will it cost to maintain the data, purchase new hardware and software? 2. How can funding occur? How is it done elsewhere? Artifacts: Five year expense summary. Funding model options (summary).
Personnel	1. Identify department data stewards and others that represent stakeholders. Make sure there are backups and “buy-off” to support plans. 2. Identify strengths and weaknesses of existing staff. What gets outsourced? Artifacts: Diagram identifying departments, and positions.
Management	Identify the best organizational context with respect to managing the implementation over time. Artifacts: Document and summarize: reporting, oversight responsibilities of standard and custom products (software, tools, analysis, maps, etc.), oversight responsibilities of data integration, agreements, standards, security, and budgeting.
Delivery	
Collate	Put plan together and deliver to departments for review.
Review	Plan reviews are gathered and the plan is edited and revised.
Delivery/Sign-Off	Revised plan is delivered to all stakeholders for sign-off.
Adoption	Plan is adopted. Stakeholders commit to support.

Table 1.1 – General Overview of Activities and Artifacts. Above is a useful summary of the types of activities and work products that are expected along the way during the creation of the EGIS Strategic Plan.

This is not an exhaustive list. The list is open to modification until the project scope is solidified. The most important artifact is the primary deliverable, the EGIS Strategic Plan

document. An intranet version of this plan should be made available, and an internet version could be considered (Ontario, 2008).

Resulting from the overview, a preliminary schedule is shown in Table 1.2. It is important to note that a project that is initiated with respect to a specific time frame (recommended) will be planned from the ending date backwards. This helps to ensure deliverables are achieved on time. Table 1.2 appears to be optimistic with consideration of artifacts listed within Table 1.1. The extent to which City staff can contribute will affect the amount of artifacts that can be generated, and the overall time.

The EGIS Strategic Plan should be considered a living document and should be constructed – to be modified. A steward of the plan should be identified.

Week*	Activity*	Description*
1-2	Kick-Off	<ol style="list-style-type: none"> 1. Prepare introductory presentation about the benefits of EGIS and case studies, the Strategic Plan process.** 2. Review existing systems, operations, departments. Identify users and stake-holders.** 3. Review products, applications, software, and hardware. 4. Review immediate needs and current vision of staff. 5. Meet with potential stakeholders to gain insight to needs assessment process: Has it been done before? Is there a standard?* 6. Document findings. Set project management tools. 7. Create GIS Strategic Vision Statement with City staff.**
3	Kick-Off	<ol style="list-style-type: none"> 1. Review existing GIS Strategic Plans available from other entities. 2. Create a rough draft incorporating elements of the other plans. 3. Prepare a demonstration of key sections and elements. 4. Prepare and set visioning workshop for upper level management.** 5. Document findings.
4-8	Needs Assessment (Gather Information)	<p><u>Needs with Respect to Existing GIS</u> **</p> <ol style="list-style-type: none"> 1. Perform needs assessment with existing city staff: <ol style="list-style-type: none"> a. questionnaires (no more than 30 minutes) b. interviews (no more than 30 minutes) 2. Examine current processes that involve maps/mapping or those that can be envisioned. 3. Examine current delivery mechanisms: <ol style="list-style-type: none"> a. external (internet) application b. internal (intranet) application <p><u>Needs with Respect to Visioned GIS</u>**</p> <p>Examine each of the topical areas of GIS to determine if all that is needed is there and is planned for:</p> <ol style="list-style-type: none"> a. Software – ArcGIS/AutoDesk, ArcServer, SDE, maintenance and upgrades. b. Hardware – Computers, peripherals, and other equipment. c. Data – What layers are needed – and when are they maintained. d. People – existing staff, data-stewards, gap analysis team e. Products – Map, Web Site (internet, intranet)

9-11	Needs Assessment (Follow-up)	Take all information gathered to this point and encapsulate into draft of the GIS Strategic Plan. (Incorporate into appendices and text.) Take a look at all data and prepare it for collation. Identify areas that require follow-up and gather needed information.
11-13	Needs Assessment (Collate Information)	Collate information into text and appendices of the draft GIS Strategic Plan.
14-16	GAP Analysis (Assessment)	Analyze differences from present system and those from envisioned system.
17-21	GAP Analysis (Set GAP Plans)	Document paths and procedures to bridge GAPs found above: 1. Review software: solutions, packages, costs. 2. Review datasets: solutions, collaborations, maintenance cycles. 3. Review products: solutions, improvements, additions, update cycles. 4. Review database, technology, security, improvements, update schedules, maintenance. Set GAP plans: 1. Financing 2. Personnel 3. Management
22-23	Create Draft Plan	Begin formalizing existing work into draft version of the EGIS Strategic Plan.
24	Deliver	Deliver electronic copies of draft plan.
25	Review/Updates	Accept changes per review, adjust plan with changes.**
26	Final Review	1. Review the plan with existing departments. 2. Get sign-off from each department.** 3. Adopt City, EGIS Strategic Plan.
* Estimates only, dependent upon scope.		
** Time frame dependence on city staff.		

Table 1.2 – Proposed Schedule for Creation of an EGIS Strategic Plan (est. 6 month time frame). The times and durations are estimated and should be considered as if a preliminary guide. If the overall time for the project is reduced, less time will be spent on the items as listed.

Deliverables

The deliverable is proposed to be a single document: The City EGIS Strategic Plan. The document will provide a guide for the development of EGIS at the City for the next five years or a time frame to be determined. It will be delivered electronically so that it can be modified and updated through time to reflect changes in vision or direction.

Low Cost Options

Vendors can provide many types of services to assist with the development of a strategic plan: coordination meetings, interviews, questionnaires, analyses, modeling and documentation. Plans can evolve at differing levels of detail and effort. Cities of a similar size could spend anywhere from \$10,000 to \$25,000 to \$100,000 to develop such a plan. Following are several possibilities for achieving an appropriate cost. It would be irresponsible to speculate on a total cost without knowledge of and agreement on scope:

I. Time & Materials

Following are estimates on hourly, annual, semi-annual bases:

1. \$100 hr. (time & materials), no medical or dental benefits, office supplies and travel waived.
2. \$80,000 yr. with benefits (set time frame) – like a temporary or part-time employee. City GIS office materials used.
\$40,000, one-half yr. with benefits (set time frame) – like a temporary or part-time employee. City GIS office materials used.
\$27,000, 4 mo. with benefits (set time frame) – like a temporary employee or part-time employee. City GIS office materials used.
3. Estimate based on agreement of attempted deliverables with a set cost and time frame. This will require further discussion and agreement to solidify scope. Similar to below, accept scope is reduced to fit cost and time frame if needed.
4. Reduced scope consultation (hourly rate, or combination of the above) – basically a part-time employee where EGIS Strategic Plan is managed by existing staff.

II. Deliverables

1. (Collaborative) Staff collaborates with loosely stated deliverable, scope, and time frame. A mutually acceptable no-fault contract is set. Staff dynamically sets priorities and cost allocation until satisfied with deliverables.
2. (Rigid) Staff and City create a formal, defined set of deliverables including sections within the EGIS Strategic Plan document. (not recommended)

Recommendation

The best plans are those that are used. A consultant or vendor can focus on the efficient production of an EGIS Strategic Plan document (least amount of time). A canned or systematic analysis (a template where “one size fits all”) can be conducted efficiently. Contrarily, a consultant or vendor can look at all possible aspects of EGIS and can spend an exorbitant amount of time, exhausting staff and resources (Cooley, 2004). In either case, a plan can be produced that is not used as it may be too obscure, or too detailed.

An approach that incorporates recommendations from engaging staff in a participatory environment may produce a better, more relevant document. Creating an EGIS Strategic Plan while working with the City, particularly from an established GIS program assures their peculiar concerns and ideas are addressed and incorporated. It helps to ensure key areas are addressed at an appropriate level, where alternatives are collaboratively analyzed. This approach can help to perpetuate the plan as a living document.

Some derivation of the set time frame options within “Time and Materials” would be optimal for proceeding with the creation of an EGIS Strategic Plan. A contract can be structured to allow for extending or condensing an associated time frame based on recommendations from staff. However, the contract will ultimately be dependent upon an agreement concerning the scope and duration of activities.

An EGIS Strategic Plan steward should be selected from existing staff. This person will be responsible for updates to the plan as time goes on. This person will also help to coordinate implementation with respect to the plan.

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