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GEOMATICS BRANCH ANNUAL REPORT

The Planning and Economic Development Committee recommends the adoption of the recommendation contained in the following report dated January 19, 2012, from the Executive Director, Office of the Chief Administrative Officer.

1. RECOMMENDATION

It is recommended that this report be received for information.

2. PURPOSE

This report informs Council on key program and project activities delivered by the Geomatics Branch in 2011, and future directions for 2012.

3. BACKGROUND

Geographic Information is key to regional service planning and delivery

From plans of subdivision to transit routes to water mains, features are captured, displayed and analyzed in relation to core geographic information including the road network, parcel fabric, address points and orthophotography. GIS is now embedded in several departments as part of their regular service planning and delivery processes. As the Region continues to urbanize, the maintenance of core data to reflect changes in the structure of the Region remains a core responsibility of the Geomatics Branch. Monitoring growth, and supporting the asset management systems and other corporate systems with locational information, is becoming a larger part of Geomatics' operations.

Some of the tools used for visualizing where programs are delivered have been developed by external vendors. Others have been developed internally. All rely on consistent, high quality data maintained by the Geomatics Branch. York Region has continued to invest in GIS since the mid-1990's, and has a program that serves most lines-of-business in the corporation, including first responders. Further, through the YorkInfo Partnership, the benefits from the investment are extended to local municipalities, conservation authorities and school boards in York Region.

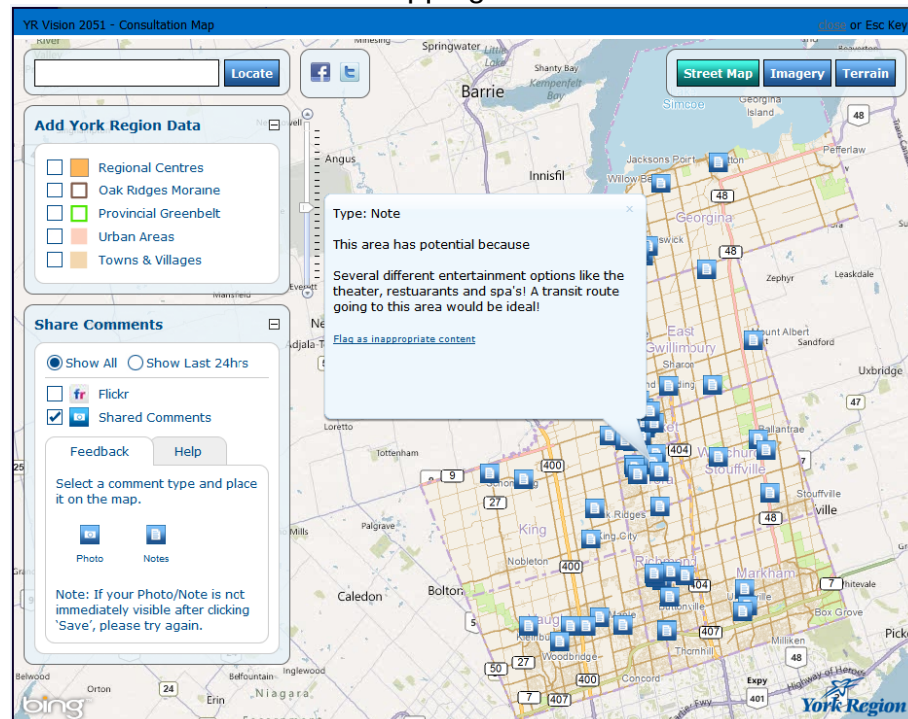
4. ANALYSIS AND OPTIONS

During 2011, the Geomatics Branch directly assisted Regional departments in their projects, and also provided GIS data and tools that enabled departmental staff to use GIS for themselves. GIS is now integral to regional service planning and delivery. The sections below highlight some of the key projects, and show how improved easy to use GIS systems and web mapping applications help make the Region's operations more efficient. Ease-of-use means that staff, partners and the public are more likely to use the broad array of GIS tools available to directly assist their decision-making with high-quality GIS data and cartographic products.

Place-based feedback through social media helps bring common understanding in Vision 2051 consultation

Geomatics assisted with the Vision 2051 consultation in 2011. Input from residents was sought through interactive maps, as part of the social media aspect of the public draft *Vision 2051* consultation. The map interface provided a means for the public to register the “where” of their ideas and comments, rather than each remark applying to the whole region (see Figure 1). The public were able to see and understand where others' comments applied. This is a new way of getting public feedback that is also successfully being taken up by other governments. Being able to capture location-specific feedback presents an opportunity for other public engagements in the future, including environmental assessments.

Figure 1
Screenshot of Social Media Mapping for draft Vision 2051 Consultation

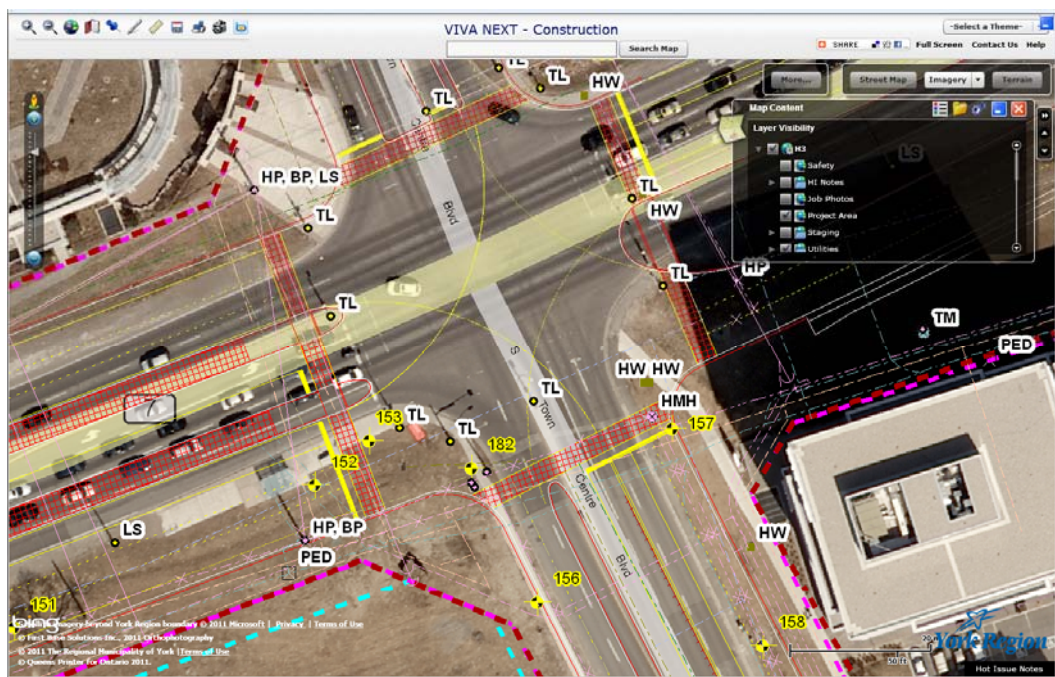


Enhanced access to regional mapping information through improved internet mapping helps manage construction projects and enriches Regional website

New capabilities were added to the yrGeoView web mapping application, furthering the ease-of-use strategy begun in 2010. Enhanced functionality was added to deal with time-series data (that enables users to track changes over time), GPS photos and videos, and easy access to travel directions, Streetview and Birds-eye views. The tool brings the most advanced features of mapping services such as Google and Bing together with content specific to York Region activities. Four new publicly-accessible interactive maps were added, thematically focused on Community Services, Recreation and Culture, Land Information, and Cycling. These maps are accessible from several areas on the York Region website.

Construction information for the Highway 7 VIVANext project was brought into yrGeoView to make project-wide information available to all the construction companies involved in the project. By consolidating CAD project linework, construction photos and scheduling information, yrGeoView provides a project management view of the whole project area (see Figure 2). Similar views are planned for other Regional infrastructure projects in the future. Besides project management, these sites potentially save on site visits, and are useful in the event of insurance claims, as they show change over time.

Figure 2
Screenshot of Construction Management Website for VivaNext



Local municipal staff are now able to access York Region's internal map views, through login screens. This improves sharing of information between the local and regional staff dealing with infrastructure. Web mapping services are now being provided to East Gwillimbury from the Region's servers.

Interactive tools that combine the GoogleMaps interface with York Region data as part of departmental internet pages proved popular, with maps on regional solid waste disposal facilities, sexual health clinic locations, YRT ticket agent locations, beaches (in the summer) and the Hollidge Tract forest trail being used most heavily.

Upgraded technology supports more robust mapping infrastructure, and improves data maintenance practices

Building on the review of GIS infrastructure completed in 2010, Geomatics worked with Information Technology Services Branch (ITSB) to implement new GIS servers that support high-availability of web mapping and other GIS services. This improved server environment reduces service outages as GIS is increasingly incorporated into other corporate and departmental systems. Security against internet attacks through the web mapping services was also addressed.

During 2011, York Region began the process of upgrading the GIS software platform. The upgrade is being co-ordinated with Windows 7 and Office 2010 upgrades and hardware replacement. The new technology is being rolled out to desktop GIS users in late 2011-early 2012. As part of the upgrade, the Region hosted a workshop for local municipal, school board and conservation authority staff. The workshop was attended by approximately 30 people, to share its experience and that of the software vendor, as many of these organizations will be going through the GIS software upgrade process in 2012.

Also in 2011, Geomatics completed a review of information management practices, engaging the Timmons Group, a consultant familiar with data practices in many jurisdictions. Timmons Group was asked to assess how well the Region managed GIS data, and recommend new technologies that would improve data management. The review was positive in regards to York Region's current practices in relation to best practices peer organizations. For the future, the consultant recommended streamlining data creation, editing and maintenance practices by incorporating rules-based editing routines. Among other technical recommendations, the consultant suggested corporate data discovery, archiving of historical data, and identified information gaps. Over the next few years Geomatics will work on implementing these changes.

GIS data continues to expand to meet Regional needs

Changes to the road network, parcel fabric, and address points are made daily, so that the information systems that guide planning decisions are as up-to-date as possible. There are now 309,650 land parcels in the Region, 303,000 separate addresses, and 5929 road

kilometers accurately mapped. Additional mapping datasets are added to the GIS data repository, reflecting the increasing sophistication and extensiveness of service planning and delivery systems. There are now over 650 geographic data layers in the spatial data warehouse on scheduled maintenance, and made available to GIS users across the corporation. Scheduled maintenance commitments are important: keeping address information up-to-date, for example, benefits first responders (Police, Fire, EMS) operationally.

New 2011 orthophotography available and distributed to partners

New aerial imagery, or orthophotography, was acquired for the Region in 2011. The imagery has been incorporated into web mapping and GIS hardcopy mapping. Higher resolution imagery, at 3cm resolution, was acquired for the Davis Drive area to support engineering of the D1 VivaNext project.

Orthophotography is distributed to the local municipalities, school boards and conservation authorities under a cost-sharing agreement through the YorkInfo Partnership, which yields great value and significant savings for both the Region and our partners.

GIS tools made available to corporate staff allows Geomatics Branch to concentrate on more complex GIS analysis and products

Departments increasingly incorporate mapping products and spatial analysis into their decision processes. Geomatics enables staff in other departments to create their own maps and perform GIS analysis by providing desktop tools and access to data, map templates as part of a self-service strategy that enables Geomatics to keep up with growing demand for geographic products. There are now over 250 staff with access to desktop GIS tools. Other staff use yrGeoView to view GIS data on-line. Geomatics also maintains an extensive on-line library of maps that staff can review and use again.

Geomatics in-house training program now comprises 8 standard courses. These are made available through the corporate learning centre. In 2011, 83 regional staff, 5 police and 48 local municipal staff attended these courses, with most participating in more than one course. Additionally, custom courses are delivered to support specific business groups (e.g., an on-line mapping course for Social Services case co-ordinators; a course on using web map services for Water and Wastewater staff). In December, Geomatics co-ordinated with ITSB to deliver a Regional technical showcase at three locations that exposed staff to GIS and IT applications used other departments. Approximately 400-500 staff participated.

As a result of enabling departmental staff to create their own maps for reports and publication, simple mapping tasks are being taken on by staff who have gone through in-house GIS training, allowing Geomatics staff to meet the demand for more complex products. Geomatics staff are now engaged in several types of analysis, including site

selection based on multiple criteria, land calculations, proximity of residents to grocery stores, year-by-year analysis of building permits, with over 30 analysis projects in 2011. They also created 3D visualization products, which allow for greater understanding of the current and proposed urban structure.

Emergency Management and Operation Collaborative Storm served by Geomatics

Geospatial information, technology, products and services were maintained to support the Region's Emergency Management activities. Geomatics staff are members of the Regional Emergency Operations Centre team. As emergencies are typically location based, GIS plays an essential role during all phases of emergency management. Geomatics works with emergency services professionals on the annual review and update of infrastructure critical to the Region's well-being, operations and continuity. This information and corresponding maps are distributed to each local municipality.

Geomatics contributed to the design of the corporate annual emergency exercise Operation Collaborative Storm. Emergency activities for simulated severe storm event were supported by conducting analysis and providing maps of population evacuation estimates, road closures, and critical infrastructure in the area.

Future directions include creating a single dataset representing Local and Regional water and wastewater infrastructure, streamlining data editing, and continuing to build on GIS integration with other business systems

Creation of a new core dataset, representing a single source of all Local and Regional water and wastewater infrastructure across the Region, is being pursued. The Geomatics Branch is currently conducting a study with Environmental Services and the local municipalities to assess the viability of bringing all this information into a single database. The study also explores methods to maintain and support this for both local and regional business and analytic purposes. If the study indicates that this is feasible, the Geomatics Branch will lead the creation of a water and wastewater system dataset encompassing both Region and local municipal infrastructure. This will be a major activity in 2012, and will utilize the streamlined data editing processes identified in the information management review conducted in 2011. The value of creating this dataset is that it will provide an overall integrated water and wastewater system view which will inform decisions around planning, capacity, ownership, responsibility and day-to-day operations of these vital systems.

Another important direction, partly related to creating the seamless GIS layer, is streamlining and creating workflows for creating, editing and maintaining the Region's spatial data.

A goal is to make data created in York Region the authoritative source in consolidated data sets at the provincial and national levels

While the Region shares data with local municipalities, the value of information increases the more it is used. A goal set for 2012 is to increase the availability and access to GIS data. On the technical level, the Geomatics Branch will implement a software package that allows for easy conversion of GIS data from one format to another, and enables this conversion against the most recent edition of data. This software will be used to make the data sharing process with the local municipalities more efficient, and potentially will be used to make data available to other public and private organizations. Data created in York Region should be the authoritative source in consolidated data sets at the provincial and national level.

GIS service to departments, through requests and projects will continue. Geomatics participation in corporate technology projects, particularly those that integrate GIS information with core delivery systems, will continue. Cityworks, the asset management system being implemented in the Transportation and Community Planning Department, is a GIS-based system. The Geomatics Branch will provide technical support and data hosting services as this system is implemented. GIS visualization of transit data will be developed as part of the business intelligence initiative. As the number of mobile devices used by regional staff increases, the need for mobile GIS applications becomes greater.

5. FINANCIAL IMPLICATIONS

There are no financial implications associated with this report. Geomatics Branch operations are included in the operating budget.

6. LOCAL MUNICIPAL IMPACT

Through the YorkInfo Partnership, local municipalities benefit from York Region geographic information, technology, products and services and engage with the Region's GIS technology through shared web map services and 3D GIS pilot projects. The YorkInfo Partnership's goal is to enhance collaboration through the sharing of existing data and creation of new databases, standards and data sharing protocols to reduce duplication and improve quality.

7. CONCLUSION

During 2011, the Geomatics Branch directly assisted Regional departments in their projects, and also provided GIS data and tools that enabled departmental staff use GIS for themselves. Improved ease-of-use for GIS systems and web mapping applications help make the Region's operations more efficient. Ease-of-use means that staff, partners and

the public are more likely to use the broad array of GIS tools available to directly inform their decision-making with high-quality GIS data and cartographic products.

Projects highlighted in this report include exploring social media interaction through web maps for Vision 2051 consultations, enhancing public access to detailed web mapping of the Region, upgrading the GIS server technology, and reviewing GIS data maintenance practices. The Geomatics Branch also acquired 2011 orthophotography for the Region and its partners, began the process of upgrading GIS software for desktop users, all the while continuing to provide access to over 650 geographic datasets under scheduled maintenance, providing analytic and cartographic services, as well as training to support a self-service environment for departmental GIS users. GIS is thus key to regional service planning and delivery.

In 2012, the Geomatics Branch expects to, build a model of all underground water and wastewater pipes in the Region to assist capacity planning, streamline data editing processes, improve data exchange, provide support to asset management and business intelligence systems, and lead the development of a plan to make corporate information centrally accessible to staff in all departments, as part of the 2011-2015 Strategic Plan objectives.

For more information on this report, please contact John Houweling, Director, Geomatics Branch at Ext. 1529.

The Senior Management Group has reviewed this report.