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GEOMATICS INFORMATION MANAGEMENT - ANNUAL REPORT 2006

The Planning and Economic Development Committee recommends the following:

1. The presentation by Nancy Prout, Director, Geomatics, be received; and

2. The recommendation contained in the following report November 21, 2006, from the Commissioner of Planning and Development Services, be adopted:

1. RECOMMENDATION

It is recommended that this report be received for information.

2. PURPOSE

This report informs Committee and Regional Council about the Geomatics Information Management activities in 2006 and highlights its achievements.

3. BACKGROUND

Geospatial information and knowledge management is fundamental to the decision making process in York Region. Access to current, accurate information is essential to address complex growth management challenges and is used in current practices and planning for the future by York Region, its partners and stakeholders.

The focus of Information Management is the efficient creation and management of quality spatial data to address growth management. This is accomplished through the development of procedures, standards, models and documentation. Efficiencies are realized in the reduction of duplication and the enhancement of sharing with clients and partners through standards and continuously improving and documenting data quality.

Information Management provides access to spatial data to the corporation and the YorkInfo Partners which consists of the Towns of Aurora, East Gwillimbury, Georgina, Markham, Newmarket, Richmond Hill, Whitchurch-Stouffville, Township of King, City of Vaughan, Toronto and Region Conservation Authority, Lake Simcoe Region Conservation Authority, York Catholic District School Board, York Region District School Board and the public.

4. ANALYSIS AND OPTIONS

4.1 Information Management Highlights

Significant advances were made in Information Management in 2006. In addition to maintaining core databases and creating new information, the foundation was laid for an expanded knowledge environment in 2006 including enhanced quality models, standards, processes and routine scheduling.

4.1.1 Core Database Maintenance

Among the more than 200 geospatial databases that are maintained, the two that are core to Regional Operations and Growth Management are the Single Line Road Network (SLRN) and Parcel Fabric. Both databases are valuable to the delivery of services such as property notification, development tracking, site location, emergency response and significant growth. In 2006, 83 Plans of Subdivision, 54 Registered Plans, 925 Reference Plans and 52 Condominium Plans were registered which resulted in significant changes to these two databases. The information is used by the Regional Departments, the YorkInfo Partners and the public and private sectors.

New registered plans also precipitated the addition of over 3,900 parcels to the regional Parcel Fabric database. In enhancing the geospatial information available to the corporate users and partners the parcel underwent a review of the Reference Plans to signify the further subdivision of a parcel. This resulted in close to 5,500 “virtual” parcels being created for situations such as horizontal condominiums where the Region’s Emergency Services need to see a parcel further subdivided to include condos, townhouses and semi-detached houses to better route and locate their destination.

In addition, the Region completed the process of adjusting the existing parcel geometry to the 2005 Orthophotography. The adjustment process utilized a combination of georeferenced scans overlaid on the 2005 Orthophotography. Additional scans were collected from the participating YorkInfo Partner municipalities where needed and when available. The parcel geometry was then altered in relation to these two sources of data with the Orthophotography taking precedence. The conversion process was completed in April of 2006 with the final QC finishing up in May of 2006.

As part of the process, the Towns of Markham and Richmond Hill participated in parcel information exchange toward the development of one parcel fabric and eliminating duplication of effort around the creation and maintenance of this information.

In 2006, maintenance of the Road Network Geodatabase (RNG) continued, expanding the database by 130 ‘proposed’ roads and approximately 590 new roads built in the Region. The database can be obtained via electronic data, hardcopy maps and through the internet. In addition, a rigorous delivery schedule was followed to provide the most recent information to the York Regional Police and EMS in order to aid in the delivery of their services.

4.1.2 Maintenance of Digital Information

The maintenance schedule was implemented through the GIS data warehouse (SDW) in March of 2006 to provide current, up-to-date quality geospatial information to the corporation. Information would be updated weekly, monthly quarterly, bi-annually or at a minimum, annually. There may not be changes every cycle, however it is reviewed for potential updates, changes or enhancements. As well, we hosted geospatial information from other York Region departments and from other organizations such as the Ministry of Natural Resources (MNR) that is updated as a part of the schedule. To date over 270 feature classes are included in the maintenance schedule with over 100 of these feature classes being added just this year.

4.1.3 Acquisition of Digital Information

Digital Orthophotography (air photos) has become essential information in support of Regional and local municipal operations, programs and strategies which supports the acquisition of Orthophotography and the accompanying raw images in 2006 along the centres and corridors. Detailed digital aerial images and elevations have proved to be a high-impact tool that provides rich geographic context for infrastructure, community and long range planning activities, emergency response, and communication with the public. The Region has received quality information which has proven valuable through the adjustments of core databases and supporting projects such as the 3D modelling program. The digital information is available through the warehouse and the web for use by the Corporation and the YorkInfo Partners.

4.1.4 Advancing Information Management towards Knowledge Management

SDE Migration

Migration of the Region's geographic information into the new relational database structure (ArcSDE) continued in 2006 by maintaining a secure editing environment, Operational Data Storage (ODS) and a warehouse of data called the Spatial Data Warehouse (SDW) allowing for a more efficient environment for users. The ODS is where the Information Management group creates and maintains datasets before being moved to SDW the viewing environment for all data accessible by the Corporation.

Accomplishments include:

- 100 new spatial databases added to SDW
- 2005 Regional Orthophotography and accompanying information loaded into SDW
- 2006 Orthophotography along the centres and corridors loaded into SDW
- Of the 140 Corporate users of Geomatics information 39 were new to the SDW environment
- Creation of 2 Metadata stylesheets to provide a specific view that displays only the required information on a specific geospatial database

Parcel Fabric and Address Point Modelling

York Region's Parcel Fabric was migrated from a simple Coverage model to a relational Geodatabase model specifically developed to meet York Region, and the needs of the

Region's clients. This model was created by deriving best practices and methods from the Ontario Data Model (ESRI). The model would allow for any associated information (such as the Teranet Transfer and Easement Reports and the MPAC Oasys data) to be stored separately but related to the parcel. In developing the model in such way allowed for the utilization and access of the associated information but maintaining the Region's legal obligation on the use of such information.

There are several advantages of moving to a Geodatabase model. For example, all users have immediate and easy access to up-to-date information. The creation of a robust, flexible model also enables the increase of functionality, value and ease of use for all users while still supporting legacy information and procedures as well as, additional attributes and the linking of non-spatial data to spatial.

As well the Address Points database was modelled as a part of the parcel fabric which allows a relationship between a parcel and an address point. The address points database was generated from the parcel model and its associated information. The availability of this geospatial information allows for corporate users to get quick access to a location such as the Region's emergency response units, EMS and Police.

Extract, Transform and Load (ETL)
As part of increasing efficiencies, the use of the new technology allowed for streamlining the movement of spatial information from the Operational Data Store (ODS) to the Spatial Data Warehouse (SDW). This process allowed for the scheduling of the task of moving the roads information from the maintenance area to the production environment. Using this technology semi-automates the transfer of data from the complex Road Network Geodatabase editing environment to scaled down version for corporate use, with no interruptions to end users.

This new technology also, allowed the spatial information to appear as the familiar Single Line Road Network to provide Police and other clients with an uninterrupted and unchanged format. This process was then semi-automated to move this data to an FTP site where the client can download the data at their convenience. This process ensures that York Regional Police have access to the most up to date data at all times. Similar processes are undergoing development to provide this level of service to other Geomatics' clients.

4.1.5 Information Access and Distribution

Numerous requests are made for snapshots of the Region's various databases, usually originating from consultants working on behalf of the Region or the YorkInfo Partners. These requests may be for various databases (roads, parcels, infrastructure) relating to a specific area for their study and decision making purposes that may be required for the completion of a project. Licence agreements are provided to the consultants before they receive any Region data so that there is an understanding of what is allowable use of the data received. In some cases, the version they receive may be modified slightly to remove information that cannot be released to the general public or are covered by intellectual

property issues. We foresee these requests increasing as the quantity, quality and awareness of these databases continues to increase in 2006.

As part of the YorkInfo Partnership, updates of spatial data are provided to the Partners quarterly. The partners received approximately 61 databases in total of which updates were provided for development plans, parcels, the single line road network, schools, hospitals, water and wastewater, and numerous of other databases updated by Information Management. Additional new databases which were made available in 2006 were significant forests and proposed roads.

The work that Information Management undertook in 2006 was the assigning of geographic coordinates to approximately 150,000 response calls for the York EMS Services unit for inclusion in their Deployment Planner Application. And along with IT developed and implemented a process that would remove the duplicate records, so that only addresses that have not been previously assigned will be sent to Geomatics for the creation of geographic coordinates. This creates efficiencies as it prevents the duplication of effort when the EMS Call Response database is refreshed with an entirely new database.

In addition, Information Management participated in generating databases for number of projects such as:

- Subway Expansion
- Southeast Collector Visualization Project
- Natural Heritage Workshop
- West Nile Virus
- Realignment of waterbodies and watercourses along the Centres and Corridors
- Points of Interest utilized in the Street Atlas
- Deployment Planner Geographic Coordinates for EMS.

4.1.6 Corporate Spatial Database Inventory and Records Management

Information Management continues to organize and maintain the spatial database inventory in accordance with the Corporate Records Management System. Therefore in 2006, a continuation of the inventory of databases was reviewed for projects created in 2002. The goal was to reduce the data storage space used on the server by minimizing duplication, archiving old and unused databases, or projects and removing or correcting files that had been corrupted. Data for 363 projects from 2002 were reviewed, documented and archived on CD or DVD which will allow for future retrieval of historical data. Upon completion, over 17 Gigabytes (GB) of data were archived and removed from the server.

4.2 Future Directions

Information Management will continue to be a key activity to provide quality geospatial information infrastructure in support of Regional Operations and Growth Management. The capture, organization, and assessment of quality information in efficient processes are in demand by stakeholders. Information Management will do this through the

implementation and completion of the ArcSDE environment and with the modelling and migration of the required databases and the creating and updating of metadata. Also, the addition of new databases such as address points would give us precise locations of buildings which would be available to the Police and EMS for dispatching purposes and assist the York Region Mobility Transit in location where a passenger resides.

5. FINANCIAL IMPLICATIONS

There are no financial implications associated with this report as ongoing Information Management activities are included in the operating budget.

6. LOCAL MUNICIPAL IMPACT

The Region, along with the members of the YorkInfo Partnership, recognize the impact of managed spatial data and are working together to achieve this through the sharing of existing data and the collaboration on the creation of new databases. This allows for the creation of robust databases, participation in creating standards and data sharing protocols. Sharing knowledge amongst the Partners will allow for the reduction of the duplication of information. Partners as well as residents of the Region will have access to these databases.

7. CONCLUSION

The goal of managed information has been established and is being delivered through processes, standards, models, documentation and records management to ensure up-to-date and easy to access spatial information in a dynamic environment. Having the databases in an ArcSDE environment will allow for a managed environment and faster, easier access to data, either over the Intranet or the Internet.

For more information about this report, please contact Susan Chin Snelgrove, GIS Analyst, Geomatics Branch at (905) 830-4444 ext. 1564 or susan.chinsnelgrove@york.ca.

The Senior Management Group has reviewed this report.