REGION OF OTTAWA CARLETON — REPORT
RÉGION D'OTTAWA CARLETON — RAPPORT

Our File/N/Réf. 17-97-0125.1
Your File/V/Réf.

DATE 10 November 1998

TO/DEST. Coordinator, Planning & Environment Committee

FROM/EXP. Planning & Development Approvals Commissioner

SUBJECT/OBJET **GIS AND THE MUNICIPAL APPLICATIONS PARTNERSHIP - OVERVIEW AND STATUS REPORT**

DEPARTMENTAL RECOMMENDATION

That the Planning and Environment Committee receive this report and a presentation from staff on the status of GIS in the Region and the Municipal Application Partnership (MAP) for information.

PURPOSE

On 4 Jan 99, the Region of Ottawa-Carleton, the Cities of Ottawa, Nepean and Kanata, and the Township of Osgoode will be going *LIVE* with the MAP application after a three year GIS product development, testing and acceptance process. Later in the year, we expect Gloucester, Vanier, Cumberland, and the remaining Ottawa-Carleton municipalities to begin deploying the MAP application suite. Over 500 users will be accessing MAP by the 2nd quarter of 1999. At the Region, this will be a major milestone in the history of GIS in terms of business applications development.

This report provides an overview of GIS activities in the Region and an update on the Municipal Applications Partnership (MAP) involving the Region of Ottawa-Carleton, SHL VISION* Solutions (a business unit of SHL Systemhouse and the Region's supplier of geographic information system software), and the Area Municipalities of Ottawa-Carleton.

BACKGROUND

The Geographic Information System (GIS) program at RMOC was approved by Council in 1986, following a feasibility study and cost/benefit analysis. Council acknowledged that the payback was lengthy, but recognized that the automation of geographic data was inevitable, and that there were substantial benefits from cost-avoidance, improved data quality, and reduction in duplication.

At that time, Council also recognized the value of a coordinated approach to GIS, and asked staff to ensure that the requirements of the Area Municipalities were considered throughout its various stages of development.

Following approval of the GIS program by Council, staff proceeded with a number of activities including: purchase of GIS software & hardware, conversion of geographic data, and development of a number of custom applications. Since then, the Region has come a long way in its GIS capabilities and today, all maps, reference plans, engineering drawings, and other geographic information in the Region are digital in format and are created in one form or another using GIS capabilities and data. Geographic data has been consolidated into common database, and is replacing the traditional manual system of map drawers, filing cabinets and vaults. The Municipal Applications Partnership and Internet/Intranet are further extending the accessibility and availability of GIS capabilities to staff, elected officials, and the public.

HIGHLIGHTS (1991-1998)

Since 1991, when the first GIS workstation and database server were installed at the Region, there have been many notable accomplishments which demonstrated the value of the GIS program, as well as how it has evolved with technological and organizational changes over the years.

In the early years, the initial focus was on building and acquiring the base geographic data, including topographic mapping, road centreline networks, water distribution system, collector sewer system, and various planning-related themes. While this is an ongoing process, the majority of these data themes were completed in 1994, and are now being maintained in the GIS database. Some of this data was also used in conjunction with computer-aided design (CAD) software for road and transitway design projects.

A number of custom applications were developed using GIS in the 1993/94 timeframe, which were designed to meet specific business needs of the Region. A Street Name Registration and Inquiry System (SNARIS) was deployed in the Planning Department, for example. An application called D-Plots was developed to enable staff in the Environment & Transportation Department to produce water distribution maps “on demand” in a variety of pre-determined formats and sizes. A Water/Wastewater Master Plan application was also developed in ETD to calculate and present various long range infrastructure alternatives and recommendations.

More recently, the Region acquired a complete database of property data called POLARIS (Province of Ontario Land Registration Information System) from Teranet Land Information Services, which is being integrated into MAP and linked to address and assessment data.

How has GIS Been Used in the Region?

The *Planning and Development Approvals Department* was one of the earliest users of GIS capabilities. One of the first applications was the 1991 Land Use Survey. The Department was able to quickly calculate the area of land that was being used for different purposes, by geographic regions e.g., by census tract or by ward. The Department was able to produce a land use map without using offset printing, at a fraction of the cost. Subsequently, the 1986 and 1995 Land Use Survey data were digitized into the GIS database. Land use changes over a ten year period now can be calculated quickly and accurately.

During the mid 90s, much of the GIS work in the Department was in support of the Official Plan review. A great deal of data were collected and loaded into the GIS on vegetation, geology, soils, animal habitat, environmentally sensitive areas, as well as population and population projections, existing Official Plan designations and land use. These data were used in the GIS in a variety ways including:

- complex analyses such as the growth allocation analysis that formed the basis of the Strategic Plan
- Land Evaluation and Area Analysis (LEAR) that formed the basis of the Agricultural Resource Area designation
- the Natural Environmental Systems Study (NESS)
- the Mineral Resource study
- "ad hoc" queries and overlays that allowed planners to view and measure the relationships between data 'layers' and thereby determine logical boundaries for designations, and,
- to produce plots for public information sessions that could be customised to illustrate, for example, changes in designations that were being proposed.

New data are continually being added to the database (e.g., watershed planning areas, fish habitat) and existing data are being improved. The GIS is being used regularly to query the database and to produce a wide variety of paper maps, which are also available to the public.

The *Environment & Transportation Department* was also one of the initial users of GIS capabilities, focusing initially in two areas:

- using base mapping in conjunction computer-aided design (CAD) software for detailed and functional design of regional roads, transitway, bridges and other structures
- water distribution system, which manages the thousands of kilometres of watermains, and related hydrants, valves and pumping stations

More recent projects include the following:

- Mapping and updating the garbage collection and yard and leaf contract areas
- Application to query garbage and bluebox collection days by street
- Various thematic maps including Bicycle Map, Regional Road Map (1998), Regional Road Atlas and Bylaw Maps

OC Transpo has been using GIS to assist staff with the planning and development of the bus routes and bus stop locations. GIS data is used as an input to specialized scheduling software.

The *Ottawa Carleton Regional Police Services* have been using GIS tools for several years within the Crime Analysis group. In more recent months, the Police have expanded the use of GIS to include road names, addresses and base mapping for the newly developed Computer Aided Dispatch System and creation of policing zones. A number of other potential applications and uses of GIS have been identified which OCRPS plan to pursue.

The Cities of *Gloucester and Nepean* are in the process of using our road centreline and address database as the source of all mapping data used by their fire dispatch systems. *Bell Canada* is also using the same data for the 9.1.1 PERS (Public Emergency Response System) initiative being implemented in Ottawa-Carleton.

The use of GIS within the *Health Department* has varied over the years. GIS capabilities were used to undertake numerous research and planning activities, including the deployment of resources for inoculation programs such as Hepatitis B. In more recent times, the need for GIS analysis has grown, and the department has also had the assistance of staff within the Geomatics Division to complete these projects. Statistics Canada Census data and administrative boundary information stored in the GIS database have been used on the following major projects including:

- research on Post-Natal Services within the Region
- creation of child/adolescent neighbourhood profiles for all schools within the region
- research for the development of the 1998 Healthy Sexuality program
- ad hoc census queries

The *Health Department* has also utilized GIS data to undertake the required planning studies related to the provision of ambulance services within the Region. In addition, it is anticipated by the department that use of GIS capabilities will be needed to support both the ongoing planning functions and the development of a new Computer Aided Dispatch System for ambulance. Experience gained with the provision of GIS services to OCRPS for their dispatch system will prove invaluable for this exercise.

The *Finance and Legal Departments* currently rely on the Geomatics division for provision of GIS related services. The Legal department in particular has been utilizing the services of the Surveys and Mapping Branch to fulfil their needs for GIS related work dealing with the legal aspects of land surveys, the Easements Registration project, and a variety of Planning process requirements.

The *Clerks, CAO's Office, Council and Chair's Office* have utilized the services of the Geomatics division to fulfil requests for information requiring the use of GIS capabilities.

To date, the use of GIS within the *Social Services Department* has been limited to occasional projects conducted on their behalf by staff in the Health Department or the Geomatics Division.

With 111 Lisgar as the command post during *Ice Storm 1998*, the Geomatics Division was able to quickly address the numerous requests for hard-copy and digital data from various groups involved in emergency response. Initial requests included published maps that showed all roads within the Region and/or extending beyond the RMOC boundaries. As requests for more detailed data started to arise, staff were able to respond, by generating custom maps that included, but were not limited to the following:

- Maps of all roads and access ways across eastern Ontario
- Detailed maps by municipality within the RMOC jurisdiction
- Emergency Shelter maps
- Emergency Facility maps
- Maps showing village locations throughout the RMOC
- Property Building Location Maps

During the Ice Storm, EMU staff had access to 'live' data on the GIS. This allowed emergency teams to query against the database and generate maps for specific needs, as they occurred. As an example, the local hydro companies used the GIS to update their 'hotspots' on a daily basis, and were able to set work plans in place based on location and resource availability. As a follow-up to the Ice Storm, 'tree damage' maps were used by the Regional Forester to help define the rehabilitation and re-planting plan for the Region.

As the Region and its Departments have evolved, so has the repository of geographically referenced information available for Regional staff. Annex "A" contains a partial list of existing data available from our GIS database.

THE MUNICIPAL APPLICATION PARTNERSHIP (MAP)

The Basis for the Partnership

Notwithstanding many of the accomplishments that resulted from the use of GIS capabilities, one of the drawbacks has been that, until recently, the software has been complex and required extensive customization, training and/or experience to use effectively. Access to geographic data and GIS capabilities has been restricted to "power users" and technical staff. Many of the potential benefits from GIS have been slow to materialize since there was insufficient "critical mass" to leverage the investments we had made in the technology and data.

The Municipal Applications Partnership was approved by Regional Council in September, 1994, as a public-private sector partnership designed to reduce the long term cost of Geographic Information System (GIS) technology to the RMOC and Area Municipalities, and leverage our investment in hardware, software, and data conversion. It was proposed as a Partnership between SHL Systemhouse, the Region, the Area Municipalities, Carleton University, and the Province of Ontario. MAP represented an innovative approach to achieving the diverse objectives of many organizations. MAP benefits all of the partners based on the principle that each organization brings to the table its specific expertise and knowledge of its core business.

The MAP initiative had 3 major objectives:

1. Develop a suite of municipal GIS applications that are required by Ottawa-Carleton and Ontario municipalities, and that can be marketed and "exported" to municipalities across Canada and around the world.
2. Reduce the cost of these applications to each partner and provide the "critical mass" necessary to realize the benefits from GIS over a shorter timeframe.
3. Strengthen SHL Systemhouse's Municipal GIS software products, thereby stimulating economic activity through domestic sales and exports of their products and services.

The MAP "Joint Development Agreement" (JDA) was negotiated and signed in 1995 between SHL Systemhouse, the Region, and the Area Municipalities.

Two notable changes were eventually made to the final JDA:

- Carleton University elected to withdraw from the Agreement, reflecting unexpected financial problems which developed during negotiations. Their responsibilities (namely training and education) has been assumed by SHL and the Municipal partners.

- The Province of Ontario elected not to participate as full Partners, but agreed to provide funding directly to SHL through an existing Research and Development Funding program with the Ministry of Economic Development & Trade, and which was applied to the MAP program. The Province did not want to give preferential treatment to any Municipality.

<u>Joint Development Agreement - Highlights</u>

The fundamental elements of the JDA include:

- Parties to the Agreement include SHL Systemhouse, RMOC, and all 11 Area Municipalities in Ottawa-Carleton.
- Term of Agreement is three (3) years, beginning December, 1995, and ending December, 1998. There is an option to renew.
- The Region's total cash contribution is $1.8 million over 4 fiscal years.
- Area Municipalities total cash contribution is $1.7 million over 4 fiscal years
- The Region and Municipal Partners contribute a minimum of 3,600 person days of "in-kind" resources over the term of the Agreement.
- SHL's "in-kind" contributions total $8.380 million, including software ($3.075 million) and resources ($5.305 million). Included in this total is a $4 million Research and Development contribution from the Province of Ontario.
- SHL is responsible for Project Management
- SHL retains ownership of any developed software, but the Region/Municipalities have a perpetual and unlimited right to use SHL's GIS core technology and software developed by the Partnership
- The Region and the Municipalities receive a perpetual right to use <u>any</u> software developed by SHL for other Municipalities AT NO COST

- SHL is responsible for marketing and any associated costs
- During the Term of the Agreement, SHL provides software maintenance and support AT NO COST to the Region and the Municipalities

Intellectual Property Rights and Royalties

SHL considered the ownership of Intellectual Property (IP) rights to be central to the financial viability of the initiative. The issue of royalties payable to the RMOC and Area Municipalities was discussed at some length in 1995. It was recommended that royalties not be negotiated as part of the JDA, but that in lieu of royalties, SHL would agree to a long-term software maintenance/support contract which ensures that annual operating costs are contained, or capped, for a period of at least 5 years beyond the 3-year term of the agreement, and a rate which was at least 50% lower than current market rates. A high level analysis, based on the current marketing approach for the MAP applications, would suggest that the royalties to be derived from a percentage of sales are relatively small.

Secondly, the current business model ensures that the Region and the Municipal partners benefit from future sales on the basis that approximately 1/3 of any revenues are directed to development of new applications, which are in turn available to Ottawa-Carleton partners at no cost. The remaining 2/3 of any revenues are used to further research and development of the core GIS product, and for any implementation and customization of the applications needed by the purchasing organization.

Current Map Status

Over the 3-year term of the JDA, MAP is developing a number of integrated applications, including:

- Property Information System
- Development Tracking System
- Roads & Traffic Application
- Water & Sewer Application
- GIS Data "Browser"
- Geographic Notification
- Permit Management System
- Official Plan & Land Use
- Request for Service
- Capital Projects
- GIS Project Analysis Toolkit
- Maintenance Management Interface/Translator

The first set of applications (Property, Development Tracking, Browser, and Geographic Notification) have been developed, implemented and tested during at the Region, Ottawa, Nepean and Kanata. All applications share a common database which is managed by the Region.
A second set of applications (Roads & Traffic, Water & Sewer) were implemented and tested in July 1998. The next Release of MAP (Release 1.2) incorporating the revisions from acceptance testing of the above applications will be available on 7 Dec 98. On 4 Jan 99 , the Region, the

Cities of Ottawa, Kanata and Nepean will be going *LIVE* with Release 1.2 applications, each municipality according to its needs and schedules. Over 500 users from the Region and Area Municipal staff will be accessing the MAP data base by the end of 1999. This number is expected to grow to 600-700 users in subsequent years.

When fully deployed, these applications will provide some of the following capabilities for staff at the Region and the Area Municipalities:

- property based queries which link assessment, inspection, licenses and any other information related to municipal address, assessment roll number, or administrative area.
- subdivision and site plan application tracking & circulation, including calculation of development charges, analyzing/reviewing applications, manage agreements/ conditions, building permits & inspections
- complete inventory of all road, water and sewer infrastructure including road and street networks, road allowance details (sidewalk, boulevard, roadway furniture, street light, poles), road structures (bridges, retaining walls, major culverts), pavement structure, traffic information (events/ accidents, observations/ traffic counts, speed, origin and destination), traffic zones, water network, , watermains, valves, pumps, pumping stations, water reservoirs, sewer network and sub networks, sewer pipes, maintenance holes, sewer pumps, outfalls
- access to planning related data including census information, natural environment, soils, geology, official plan schedules, etc.
- access by Regional Police, Fire Departments, Hospitals and other emergency units and agencies to up to date street and address information and other vital data
- notification to residents by geographic area
- management of official plan
- receive and respond to customer/public service requests, analyse trends affecting the level of delivery of services, issue work orders and permits to operating authority, and provide detailed service information by location, municipal address and owner
- process municipal permits, including water/sewer connection, traffic operation work orders, road cuts, etc.
- develop, maintain and present Official Plan and Land Use Information, including compliance reports, monitor and display consistency between actual and planned approvals, support policy design, short term forecasting of land usage, population and zoning, and support long term planning and forecasting.

Marketing Initiatives

SHL has achieved some success marketing the MAP applications. To date, the following municipalities have Council authority to acquire the MAP applications:

- Municipality of Clarington, Ontario
- Pinellas County, Florida
- City of Windsor, Ontario
- City of Vancouver, B.C.

Several municipalities have indicated that they intend to acquire the MAP applications, subject to Council approval and/or contract negotiation:

- City of La Plata, Argentina
- City of Estaban Echeverria, Argentina
- City of Buenos Aires, Argentina
- Beijing Municipal Government, China

Significant discussions are underway with several municipalities, but no statement of intent has been indicated:

- City of Santiago, Chile
- Orange County, Florida
- City of Calgary, Alberta

Benefits from MAP

The following financial benefits accrued to the Region from participation in the Partnership:

1. Unlimited site license for VISION*. (Approximate value = $1.3 million)
2. Unlimited site license for the MAP applications. This represents approximately 11,000 person days of software development (Approximate value = $10 million)
3. Reduced annual software Maintenance Rate of 10% per year. Normal software maintenance rates are typically 18-20% per year. (Approximate value = $75K per year)
4. New applications developed by other Municipalities and Partners outside Ottawa-Carleton are available to the Region at no cost. As new partners join there will be a flow of application benefits to the Region and other partners. (Based on Vancouver alone this will add over $1 Million of new development over the next 12 months.)
5. The Region has no responsibility (or effort required) to maintain and upgrade MAP applications as new releases of VISION* and general systems environment (e.g., Oracle, Operating systems) are introduced (Approximate value = $25K per year).

On this basis, one-time benefits of over $11 million and annual benefits of $100K are being realised from the MAP program, as compared to the Region's capital investment of $1.8 million.

It is also noteworthy that SHL committed to growth targets in order to receive the Provincial R&D funding. SHL has met these objectives, growing from a nucleus of about 25 employees within the VISION* business unit developing and supporting their GIS software, to a current staff complement of about 150 people working out of SHL's Ottawa office.

FUTURE OF MAP AND GIS IN OTTAWA-CARLETON

The Municipal Applications Partnership, in its current form, is just a few months away from achieving its primary objective of developing a suite of spatially-enabled, business applications. With formal acceptance of the Phase 2 applications expected by mid 1999, the Partnership will have reached a successful conclusion.

The primary emphasis in 1999 will be to move to deploy the MAP applications effectively, recognize and pursue opportunities to leverage the applications to re-engineer the way we do business, and achieve further benefits and cost savings. We will also be supporting the on-going marketing of the MAP applications to other jurisdictions, thereby encouraging and sustaining further development and enhancement of the application suite as well as job creation in Ottawa-Carleton.

The MAP initiative demonstrated the capacity of the public and private sector to work together to achieve common objectives. Over the coming months, the Partners will be considering other ways to maintain the momentum and build on the successes of MAP once the initial agreement ends in 1999.

A second major focus for GIS in 1999 will be the Internet. We are piloting both Intranet and Internet applications which will extend our GIS capabilities and data to the public - making our services more accessible and affordable.

Our objective is to become a "centre of excellence" in the Geomatics area. Already, MAP is being touted as an example of "Smart Partnering" in discussions, seminars and conferences in Ontario, Canada, and around the World.

SUMMARY

The history of GIS in the Region has seen steady progress in the collection, acquisition, and conversion of geographic data which were subsequently used for a variety of planning and engineering applications. Today, virtually all maps, reference plans and engineering drawings are created in one form or another using GIS capabilities and data.

Early in 1999, the Region of Ottawa-Carleton and many of the Area Municipalities will enter a new era with the launching **live** of the Municipal Applications Partnership. When fully deployed, MAP will enable staff to query the database on property assessment, licenses, roll numbers, subdivision and site plan applications, demographics, land use and zoning, development charges, building permits & inspections, street addresses, road, water and sewer infrastructure and a host of other data.

The GIS database will facilitate access and analysis of information used for planning, public works, policing, fire, hospitals and other emergency situations, as well as for public notification, requests for service, compliance and monitoring.

This will bring the Region a long way to accomplishing its objective of better, faster and cost-effective access to geographic information to serve its residents.

Approved by
N. Tunnacliffe, MCIP, RPP

ANNEX A

Region of Ottawa-Carleton

LISTING OF GEOGRAPHIC INFORMATION SYSTEM (GIS) DATA

1. BASE MAPPING

Road Centrelines

- Municipal road name
- Address ranges between intersections
- Ownership
- Municipality

Topographic Mapping

- Urban (road edges, buildings, hydrography, vegetation, contours, etc.)
- Rural (buildings, hydrography, vegetation, elevation data, railroads, transmission lines, etc.)
- NCC/OBM sheet indexes with numbers
- Control survey monumentation

Cadastral

- Township lots/concessions (polygons)

Administrative Boundaries

- Regional and Municipal boundaries
- Regional Ward boundaries, including population
- Greenbelt area polygons

Demographics

- Schools, including names, addresses, population (from IRIS system)
- 1986 census data by census tract/health neighbourhood
- 1991 census data by census tract/health neighbourhood
- Population, projections, dwelling units, employment
- Ottawa-Carleton community resource centres
- Ottawa-Carleton perinatal services
- 1992 Primips by census tract
- Health Department dental clinic locations
- District Health Council planning areas
- Health Connection Service areas
- Healthy Neighbourhood service areas
- Emergency food service sites

Community Associations

- Community association boundaries
- Community association names still to be added

Confidential

- General Welfare recipients
- Home care clients

2. INFRASTRUCTURE

Water Distribution Network

- mains, services, valves and hydrants
- billing districts (on a TK50 tape and plotfile only)
- water consumption, flow capacity

Water Pressure Zones

- high and low pressure polygons

Wastewater Network

- trunk sewers, manholes
- catchment areas
- monitored flows

Waste Collection

- waste collection areas (including pickup schedules)
- recycling collection areas (including pickup schedules)

Transportation (General)

- bike routes
- designated truck routes
- level of winter maintenance
- RIMS (Road Inventory Management System) data (for 1995/96 only)
- capital budget data (5-year capital program)
- traffic projections for planning future needs
- road capacity

Traffic Screenlines

- traffic counts
- vehicle classification
- type of vehicle occupancy

Traffic Zones

- 250 polygons (258 polygons with related data)

3. PROPERTY/LAND

Land Use

- 1991 urban area and villages:
- 24 categories of land use in urban area and villages. Data from field survey and photo interpretation. Urban area based on 1:2000 mapping. Rural village base maps varied.
- 1986 (urban area only).
- 1995 (urban area and villages). Additional categories of residential use and secondary uses included in 1995 data.

Assessment Mapping

- property mapping (derived from assessment)
- rural only

Property Data

- property mapping (from POLARIS - Province of Ontario Land Registration Information System)

OP Schedules

- 1988 plan - Schedules A & B
- 1997 plan - Schedules A, B, G, I, J, K

Subdivision/Condominium Index Maps

- Subdivision and condominium boundaries (polygons).
- Approval status (pending, draft approved, registered) file number and residential/industrial designation.
- Rural area only (urban in progress).

Assisted Housing Map

- Assisted (non-profit) housing projects.
- Project name, type of project, target group, number of units, number of accessible units.
- Current to end of 1995.

Publicly Owned Land (NCC)

- Lands in public ownership (municipal, regional, provincial, federal, NCC).
- Urban only.

Greenbelt Master Plan (NCC)

- National Capital Commission (NCC) greenbelt master plan designations.

4. NATURAL ENVIRONMENT

Wetlands (MNR)

- Provincially significant wetlands and adjacent lands (wetland name and class)

Areas of Natural and Scientific Interest (MNR)

- life science and earth science ANSIs.

Private Services Mapping

- Surficial geology, overburden thickness, depth to aquifer, bedrock aquifer recharge, terrain suitability for septic systems, development potential (based on hydrogeology). Also includes data base of well records to 1986. Study area includes rural RMOC (not urban area) and adjacent municipalities.
- These data are currently archived (July 1997).

Mineral Aggregates

- Bedrock formations, bedrock deposits within 1.5 M of surface, sand and gravel deposits, clay deposits, bedrock exposure points.
- Bedrock formation type, sand/gravel class (potential for exploitation as determined by mapping geologist).
- Coverage for all of RMOC.

Soils/Agricultural Capability

- Ontario Institute of Pedology soil mapping of rural RMOC (excluding urban area)
- Agricultural capability (CLI classes), soil type, slope, stoniness

Licensed Pits and Quarries (MNR data)

- Licensed pits and quarries in RMOC.
- Owner's name.

Watersheds

- Sub-watersheds (i.e. major tributaries of Rideau, Ottawa, Mississippi, Castor Rivers) and smaller 'drainage areas' in RMOC (polygons)
- Digitized from Conservation Authority maps and adjusted to fit OBM hydrography
- Watershed name, conservation authority.
- Bio-Solids spreading sites.

Ministry of Natural Resources Data

- Includes MNR managed land, woodland improvement areas, deer yards, cold water streams.
- Data were digitized from small scale paper maps, and need rectification to fit topo base

Vegetative Cover - (Natural Environment System Strategy - NESS)

- Based on air photo interpretation and forest inventory mapping
- Classifies non-agricultural land>2 hectares by:
- Type - e.g. Early successional Deciduous etc.
- 19 classes
  Age
  Species - dominant and subdominant species
  Planted Status - planted or natural
- Rural and urban
- Additional 'layers' of data have been created by merging some of the vegetation types.

Vegetative Cover (Small Areas) - (NESS)

- Vegetated areas less than 2 hectares classified using satellite imagery into 3 classes:
  Forested
  Swamp
  Marsh and Bog
- Note: The accuracy of the classification is questionable.

Vegetative Cover Reclassified - (NESS)

- Vegetative cover reclassified into 5 classes.
  Forested Wet
  Forested Dry
  Non-forested Wet
  Non-forested Dry
  Planted
- Rural and urban.

Soils Reclassified - (NESS)

- Ontario Institute of Pedology soils mapping reclassified into 6 classes:
  Coarse
  Moderately Coarse
  Moderately Fine
  Fine
  Organic
  Bedrock
- Rural and urban.

Ecological Units - (NESS)

- Classifies Region into 24 eco-unit types based on a combination of reclassified soils data and reclassified vegetation data.

Aquatic Habitat - (NESS)

- Classifies streams with the following attributes:
  Width - 5 classes
  Channel - disturbed or natural
  Bank Cover - woody or not woody
  Riffles - present or absent
  Dam - absent, natural, or man-made
- Emergent Vegetation - vegetation present or absent

Dam Coverage - (NESS)

- Dams classified as man-made or natural.

Agricultural Landuse Systems

- Classifies agricultural land by type of agriculture being practised e.g. corn system, mixed farming, etc.
- From Agriculture Canada mapping (1983) based on 1977 data.

Ontario Land Inventory

- Classifies land by soil texture, soil depth, and degree of brokenness.
- From Ontario Land Inventory - Land Classification, 1976.

Ministry of Natural Resources Data

- Includes MNR managed land, woodland improvement areas, deer yards, cold water streams.
- Digitized from small scale paper maps and need rectification to fit OBM base.

Landforms (surficial geology) - (NESS)

- 12 classes of landform/surficial geology
- Rural predominantly
- Additional 'layers' define forest cover and vegetation by landform and vegetation/landform by their degree of rarity within the Region.

Cores and Corridors - (NESS)

- NESS phase II - potential core environmental areas and linking corridors.

5. OTHER

Wards

- Regional ward.
- Population, ward number.

Census Tract Mapping

- 1991 census tract boundaries (urban area). Data include census tract number only.

Disposal Sites

- RMOC snow disposal, current and former landfill sites.

Utilities

- Cablevision areas, gas pipelines, transformers.

6. DATA FORMATS AVAILABLE

Coordinate Systems and Datums

- All coordinate/spatial data is in North American Datum 1927 (NAD 27) or 1983 (NAD 83)
  - 3 degree Transverse Mercator
  - 6 degree Universal Transverse Mercator
  - Latitude/Longitude (decimal degrees)

Data Exchange Formats:

- GINA 2.x and 3.x (VISION*)
- DXF (AutoCAD/MicroStation etc.)
- DGN ((MicroStation/Intergraph)
- MapInfo
- ARC/INFO
- SIF/ISIF (MicroStation/Intergraph)
- Trapsoft Exchange (OC Transpo)
- Delimited ASCII tabular data (TXT)
- ORACLE Export (7.x)
- PostScript (vector fonts only) Plotfile
- HPGL, HPGL/2 Plotfile
- Various raster image formats (BMP, TIFF etc.)

Media

- CD-ROM
- 3.5” floppy
- 8mm tape (compressed & non-compressed, high & medium density)
- Quarter Inch Tape (QIC-80)
- FTP (dial-out only)