

“GOING MOBILE” - GIS at the City of Kitchener

By Jeff Ham, O.L.S., O.L.I.P., C.E.T.

GOING MOBILE!

Innovation has long been cited as a key strategic factor in the success of applying Geographic Information Systems (GIS) technology to many day-to-day operations at the City of Kitchener. For several years, GIS has been used by internal staff to fulfill many operational responsibilities of their daily work. Recently, the City of Kitchener has developed and implemented a suite of innovative mobile GIS products to support our public works/operations staff. Collectively known as “Going Mobile” these GPS enabled innovations include a tree inventory application, a trail capture application, a rare vegetation application and most recently a road patrol application. This suite of innovative products was developed in-house by a team lead by Yogesh Shah, GIS Application Specialist, and supported by business experts for various departments across the City. The mobile products have improved our ability to maintain accurate asset inventories, such as public trails, trees and more recently, road conditions. The applications have also reduced risk to the Municipality by enhancing our ability to meet legislative requirements in patrolling, recording and ultimately repairing defects in our municipal road networks. You might say that the City of Kitchener is “Going Mobile” with its unique GIS products.

KEY FEATURES OF “GOING MOBILE”

Key features of “Going Mobile” include: A Tree Inventory application which enables Park Planning, Development and Operations staff to capture and edit tree points and related attribute information in the field. It also enables staff to plan planting programs, capture, edit and check-in/check-out data related to a

tree’s health inspection. The Trail Capture application enables operations staff to sketch trail segments in wooded areas, where trails cannot be captured from our Ortho photography. It also provides functionality to maintain attributes for the trail segment, as well as capture point features such as signs and monuments along the path. Our Rare Vegetation Species application is used by staff to identify, capture and edit rare and uncommon flowers, plants and other vegetation species found in the City.

Most recently, the City developed a very unique mobile GIS product known as “Road Patrol.” The City of Kitchener developed the application to comply with provincial road patrol regulations and minimum maintenance standards for roads. Road Patrol captures the date and time that each city street is patrolled and the locations of all road defects, such as potholes and damaged street signs. A daily automated process transfers data from a tablet PC to our Enterprise GIS. Each day field crews get an updated road dataset that is rendered based on which roads are due for patrolling. Operations staff use the Enterprise GIS application to generate work orders, monitor the status of road patrolling and manage the repair of logged road defects.

The suite of applications has truly improved out-dated past practices of using paper-based maps and documents to track tree inventory, trail inventory and road patrolling activities. Kitchener is improving public safety and benefiting from being innovative leaders by using GIS to diligently track our core operational responsibilities.

IMPACT OF “GOING MOBILE”

“Going Mobile” in Kitchener represents a significant advancement in the use of GIS technology at the City. Parks and Operations staff are taking an active role in this endeavor, which has increased the

buy-in of our Enterprise GIS across the organization. The benefit of having mobile GIS applications that support the availability and accessibility of critical business information to those who need it in the field has proven to be germane to the success of our GIS. To that end, “Going Mobile” provides that information to operations managers, supervisors and workers who make decisions on a daily basis that affect our park and road infrastructure. More importantly, the suite of applications helps to ensure that all users of our enterprise GIS are viewing accurate and up-to-date information. To our knowledge, no other municipality has implemented a comparable mobile GIS for managing these core operational responsibilities. Staff in operations have adopted the technology with open arms, and have often commented that it is delivering results that are “beyond our expectations.” From a customer and due-diligence standpoint, the application has improved the City’s turn-around time on repairing many common road defects such as potholes and traffic sign repairs from (in some cases) weeks to less than a day.

“Road patrollers have been able to make an easy transition from paper-based reporting to the pen tablet and software used in their patrol vehicles, and are very positive about this application.” - Craig Morton, Operations.

OVERALL BENEFITS OF “GOING MOBILE”

In summary “Going Mobile” (GM) at the City of Kitchener has delivered the following benefits and results:

- GM applications facilitate more timely capture of new trail/vegetation inventory and road defect information.
- GM applications capture more information, which is recorded more accurately and efficiently than ever before. GM applications use pick-lists

to avoid data entry errors, resulting in better, more accurate reporting.

- GM is fully compliant with Ontario Regulation 239/02, which sets minimum standards for road patrolling in municipalities. The GM application maintains proof that roads were patrolled in accordance with legislation. With this proof in hand, there are fewer claims awarded to persons making unfounded claims against the City.
- GM is easy to use - many operations staff who are using the applications had no previous GIS/computer training. The buy-in by our end users has been tremendous.
- GM offers enhanced public safety through faster response times and repairs to our City streets.
- GM enhances the safety of operations staff, as the GPS logs routes traveled automatically, with less distraction to the drivers when patrolling the roads.
- GM facilitates a better tree inventory with more frequent health inspections. This helps in planning and minimizing effects of pest infestations such as the Emerald Ash Borer and Asian Long-horned Beetle.
- GM applications provide a more complete and up-to-date trail map for our citizens, especially in wooded areas.

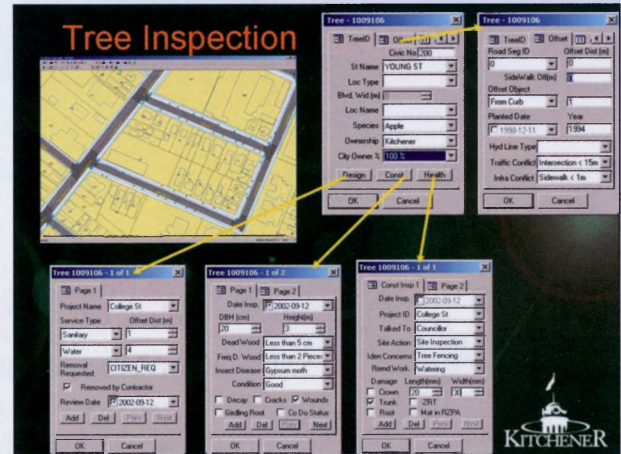
In closing, from the onset staff were very hungry for "Going Mobile," and it has whetted their appetites for more extensions and enhancements to the technology. By all accounts, the implementation of GM went smoothly and we encountered no significant hurdles along the way. Since every municipality across Ontario must adhere to road patrolling legislation, and have similar needs for other mobile GIS applications, we believe Kitchener's solutions could easily be implemented in other municipalities - and we'd be happy to share our experience!



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This image shows how the information captured in the field is displayed in our Enterprise wide GIS. This information is then made available to city staff using Orion Technology's OnPoint Professional web based GIS application.



This image shows the "Going Mobile" GIS application used by Operations staff to capture Tree Inspection information in the field. The application is built on ESRI's ArcPad application environment.