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Route Planning, Delivery with Mobile Navigation Enhances Book Delivery Program

The great children's author Dr. Seuss once said, "The more that you read, the more things you will know. The more that you learn, the more places you'll go." From learning new things to developing imagination and improving comprehension, the value of reading is immense. The City of Burnaby, the local government for the third-largest city in British Columbia, has a decades-old program to deliver library services to Burnaby residents who are unable to visit the library themselves.

The Home Library and Accessible Service (HLAS) is a branch of Burnaby Public Library. The HLAS delivers library materials to Burnaby patrons who are challenged by health, mobility, or transportation issues or by other obstacles that make visiting the library not feasible. Hundreds of patrons currently use the service.

Challenged to deliver so many books, the HLAS team partnered with the City of Burnaby's geographic information system (GIS) division to improve the route-planning and delivery process. The deployment of a professional-level mobile navigation app has automated the planning of daily routes, ultimately helping HLAS staff improve efficiency in making deliveries and serving its patrons.

Challenge

Currently, library materials are delivered to patrons four days a week by two HLAS employees. The schedule is based on a four-week rotation beginning every Tuesday and ending the following Friday, and each day has anywhere from 10 to 25 stops in the city. The previous process had involved the HLAS team either using their database to search addresses of the delivery stops, then using Google Maps to create the routes for the following day's deliveries, or posting a paper map on the wall, marking the delivery addresses with pins, and then finding the best route. Each manual process was time-consuming and inefficient, taking time away from packing, preparing, and executing deliveries.

Having attended the Esri Canada User Conference in Vancouver, Canada, several years ago, Jorge Cardenas, acting branch manager for Burnaby Public Library, discovered the value of GIS and believed it could benefit the HLAS book delivery program. He contacted the City of Burnaby GIS division for technical support to modernize HLAS's current routing workflow and mapping approach.

Cardenas wanted a new solution that could help automate route mapping to streamline day-to-day operations. Chad Huntington, Manager of GIS & Engineering Systems, says, "We had never worked with the library before, so I want to emphasize the fact that we had a GIS champion in Jorge, who saw how [GIS] would be helpful for HLAS."

Solution

Simone Behrens, previously a practicum student at the British Columbia Institute of Technology and now a Mapping Technician II for the City of Burnaby, was tasked with streamlining HLAS's existing workflow. Huntington requested that Behrens try ArcGIS Navigator because the GIS team had not previously worked with it and he wanted to gain some familiarity with the application.

ArcGIS Navigator is a mobile navigation app that uses GIS software to route field personnel and create customized travel routes. The app, says Huntington, "seamlessly integrated" with HLAS's existing systems, making implementation straightforward.

Behrens created four different web maps for every week of the month for use with ArcGIS Navigator. All routes created by HLAS staff can be easily added to the web maps. Each week contains the stops for individual delivery days, which eliminates manual cancellations; the user simply selects the specific day they want a route for, and then clicks the Route to All button to create their customized delivery route.

Key Takeaways

User
City of Burnaby

Challenge
Coordinate a home delivery system for the Burnaby Public Library's book delivery program.

Solutions
ArcGIS Navigator

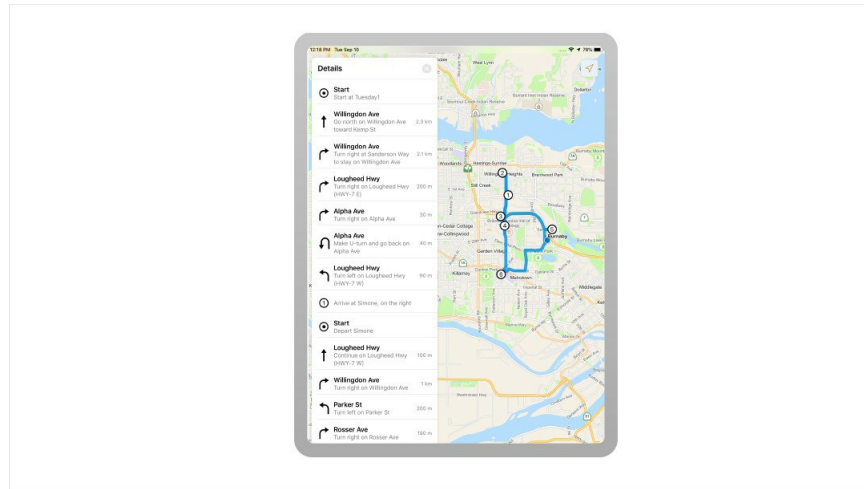
Results
ArcGIS Navigator has streamlined planning and route creation. Staff have moved from a manual system to automatically creating routes in a matter of seconds.

When users are creating their routes, they have the option of either determining the stop order manually or choosing the fastest route. For example, if they know a certain patron has to receive deliveries in the morning, they can change the chronological order of stops to accommodate this. The user can opt for the fastest route if there are no special considerations.

Training HLAS staff was fairly simple, according to Behrens. Based on notes and processes she had used when developing the new automated system, Behrens created two manuals for HLAS staff to learn how to use ArcGIS Navigator. One had step-by-step directions on how to create routes and use the app, and the other included standard operating procedure workflows.

Behrens says that aside from staff having a bit of a learning curve with the using app and switching from a manual process to an automated service, ArcGIS Navigator has been well received. Currently, three HLAS staff members are using ArcGIS Navigator, as are auxiliary workers who help with driving.

"The drivers themselves are happy with it. They've learned how to use this new technology in their day-to-day practices," says Behrens. "It's really been beneficial to show them the benefits of GIS, and they can expand off of it in the future."



Optimized routes for more efficient home delivery in ArcGIS Navigator

Results

ArcGIS Navigator has streamlined planning and route creation for the city library. Huntington says that going from the manual system to automatically creating a route in a matter of seconds has enabled the team to assist the community more effectively.

"This is the first opportunity we've had to provide an application that can provide turn-by-turn directions in an automated fashion," says Huntington. "I think this is really useful for [staff] just to be able to open up their app, click on the day and where they're delivering to, and have all the information there already."

The route automation is also helpful for auxiliary staff who may be unfamiliar with the HLAS system or the delivery area. Behrens says that because it's much easier to obtain routes, automation increases staff's comfort level and helps them be more efficient.

ArcGIS Navigator provides several features that help with route planning to keep drivers safe on the roads, including the ability to avoid various obstacles. For example, ongoing construction in Burnaby previously made it difficult for staff to navigate and reroute their path. However, ArcGIS Navigator automatically creates a new route when the original path is deviated from, allowing the driver to better navigate construction and roadway obstacles.

HLAS always staffs one driver and one passenger in each van. Because ArcGIS Navigator is available on mobile devices and tablets, the passenger can use an iPad to look at the route and dictate directions or relay the voice navigation step by step, allowing the driver to focus on the road.

"The key advantage of the new Navigator system is that delivery no longer requires years of experience of driving around Burnaby," says Damian Trasler, Home Library and Accessible Service clerk for City of Burnaby. "I've been working for HLAS for almost three years, but I still have trouble remembering the best routes for deliveries. It's nice to be able to pass the responsibility onto the iPad rather than the passenger."

Another beneficial feature of the new system is that it delivers important details about patrons. HLAS staff can click on any point in the portal web map and see all the attributes associated with each patron such as their reading likes or dislikes and telephone number. All details are kept confidential while the portal allows easy access to the information via iPad in the field.

"The information is visible right away, and everyone's information is available with the click of a button," says Behrens.

Huntington says the initial goal of creating a new system was to have something that's self-serve for the library due to the limited availability of support staff. "We're unable to provide a daily or a weekly support system to them, so the new system [with ArcGIS Navigator] is very user-friendly. Somebody who's unfamiliar with GIS can go into it, log into the portal, create routes, and then deploy them to drivers," he explains.

"If [staff are] spending less time trying to figure out where to go and navigate through the city, and more time is spent either getting recommended books for the customer or staying with them at their homes, they're better able to build relationships," says Huntington. "If they have an extra five minutes to spend with the customer to chat with them and help them with their daily lives, then that's something that we're happy to be a part of."