Optimized Routing Delivers Efficiency in Atlantic County, New Jersey

For any fieldworker or delivery driver, managing a day's work spread over multiple stop locations can be tedious and difficult. It's often hard to know the best order for visiting the day's many destinations, and it's tough to determine the quickest routes to take.

In Atlantic County, New Jersey, this problem was presented to Matthew Duffy, a geographic information system (GIS) specialist for the Atlantic County Office of Geographic Information Systems (ACOGIS) within the Regional Planning and Development Department. Duffy and his team used their existing ArcGIS® Network Analyst software to create optimized routes that would help county workers route more efficiently. But they hit a roadblock when it came time to share those routes with drivers in the field. Then, Esri introduced the Navigator for ArcGIS app on Android. Right away, Duffy recognized Navigator as a simple, low-cost solution that his team could use to deliver optimized routes directly to drivers via smartphones or tablets.

To test Navigator for ArcGIS, ACOGIS created a project for the Home Delivered Meals (HDM) program, run by Alan Knudsen and the county's Human Services Department. The HDM program uses five food trucks to deliver nutritive meals to disadvantaged or elderly citizens who are unable to independently make or access meals. The program is supported by five regular drivers each day, with two or three backup drivers filling in when a regular driver is unavailable.

There were a number of requirements for setting up a Navigator solution for HDM. First, because the people served by the program often become attached to the drivers who deliver the meals, Knudsen and his team needed as much consistency as possible in driver route assignments. They also needed a routing solution in place for times that regular drivers are unavailable. Furthermore, the team needed a solution for when new routes are implemented in one of the county's municipalities—two new HDM program routes are expected soon in Atlantic City. And finally, there had to be flexibility to adjust any given route throughout the week, because there are day-to-day changes in stops when one of the regular meal recipients is away from home or does not need service.

Duffy and his team took all these constraints into account and, using a $2,000 transportation grant to fund the additional hardware and software needed, developed a solution using ArcGIS. HDM updates its delivery information in a Microsoft database. ACOGIS accesses this database to run an ArcGIS Desktop model each afternoon that assigns and sequences the stops, and outputs routes for each driver. These routes are then shared with the drivers, who access them via the Navigator app on Android tablets mounted inside delivery vehicles. This solution efficiently guides drivers to each meal delivery location. Offline capabilities of the Navigator app allow drivers to stay on schedule even when they pass through areas of the county that do not have wireless coverage.

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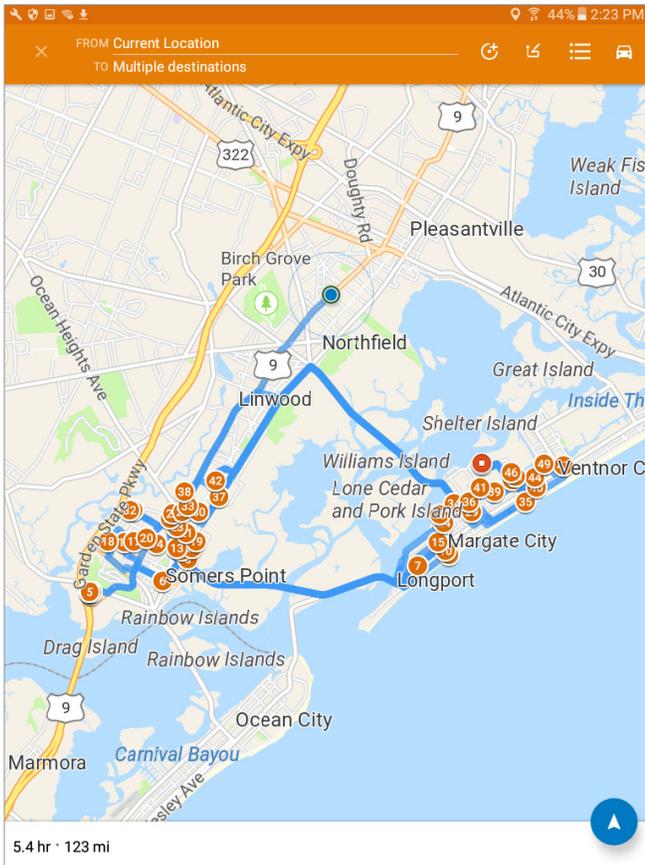
"Navigator has given us a lot more flexibility. Any driver can deliver to any route."

Alan Knudsen, Supervising Manager,
Atlantic County Human Services Department

For HDM program organizers and meal recipients, the Navigator solution is a success.

"It's increased efficiency," Knudsen said. "We have n oticed fewer calls from meal recipients inquiring about their deliveries."

The solution has been validated by the drivers who, despite initial skepticism, have accepted Navigator and affirmed its efficiency and ease of use. Knudsen reports that the drivers appreciate the ability to use the app when they need it or to turn down the volume of audible instructions when they don't.

"It's given us a lot more flexibility," Knudsen said. "With Navigator, any driver can deliver to any route, whether it is a regular driver following a familiar route or a new or backup driver who is unfamiliar with the routes."

The county's recent upgrade to ArcGIS Enterprise will enable county staff to also create custom Navigator maps, using the authoritative GIS data that is maintained in the office. This will allow the organization to consistently use its own data with Navigator in the field. Optimized routing saves the county money and improves reliability of services.

Learn more at esri.com/navigator.