IT'S TIME FOR ISOCHRONES

ISOCHRONES ARE POTENTIALLY ONE OF THE BEST REAL-WORLD USES FOR MOBILE GIS. HOWEVER, THEIR USE NEEDS TO BE TAILORED TO THE NEW PLATFORM, SAYS LOUISA BAINBRIDGE

The huge popularity of apps on consumer devices has had a knock-on effect on the mobile GIS landscape, driving analysis away from PDAs (personal digital assistants) or GPS-enabled devices out in the field to using mobiles and tablets. Smart location intelligence capabilities are now available on a wide variety of mobiles, with companies such as Esri, Mapbox, Carto and Geospock redefining what's possible.

The nature of most mobile devices means that complex actions are no longer possible, so many desktop GIS processes are stripped out and replaced with a more simplified user journey. These end result means that mobile products are often a lot easier to use and may require less training. Breaking this barrier begins to open the target audience for mobile GIS much bigger.

Mobile data collection company Fulcrum allows users to design apps to collect data on any iOS or Android device. Users create forms using a drag and drop builder and push changes into an app in real time. Users out in the field can download the app and upload content whilst on the go. For example, Fulcrum developed an app to map locations of tortoise burrows in the southeastern US. Anyone with the app can tag the tortoise burrow location and upload photos. The data is then synced to the cloud so it can be analysed using a web app by park staff and policy makers to track and protect the threatened species.

The on-the-go nature of mobile also means users have an immediate location-based need that can be fulfilled on mobile and take advantage of tools originally designed for traditional desktop GIS. Isochrones, the lines drawn on a map that show it takes the same time to travel to every point, are one way of using GIS-based technology on mobile.

Using isochrones on mobile

An isochrone, such as a 20-minute drive time area, can be used on mobile devices for business competition analysis or to show a user which petrol station is the quickest for them to reach. Users see a shape whose perimeter is comprised of a series of points. Each point is equidistant to the centre of that shape.

As an example, if a student at the University of California, in San Francisco, US wanted to find out which coffee shops were most convenient to visit, she could use mobile GIS to search and see where's reachable within 15 minutes' walk, the perimeter isochrones then showing that area.

Isochrones have a distinct advantage on mobile as the shape changes as the location and criteria change. A 15-minute walk for students attending Brown University, NY will look a lot different.

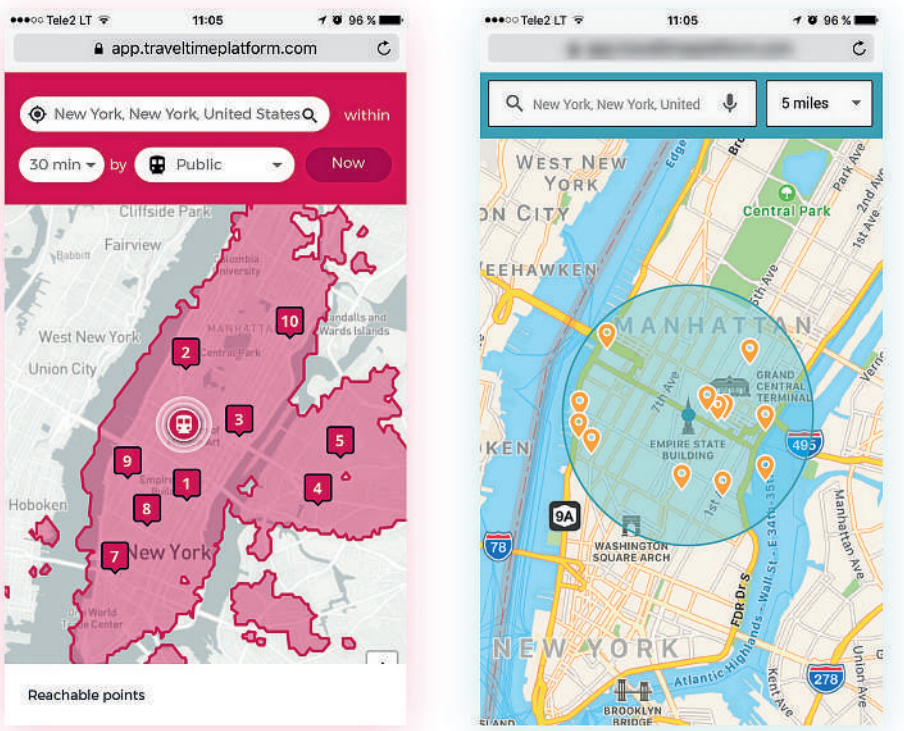
This shape will also depend on the mode of transport the user chooses.

In contrast to a map that measures a radial distance, travel-time maps only show locations that can be reached within the time specified. The user can follow the map with confidence of both location and travel time. Therefore, the results are more meaningful to them.

When out and about and using mobile GIS, users expect the information to be relevant to their location and up to date. Companies such as Google use predictions and live travel information to adjust routing suggestions for users navigating on mobile.

Google harnesses the power of its users to generate accurate travel data because anyone with the app opened and location services enabled sends real-time data back to the company that is used to estimate the level of congestion.

Combining powerful real-time data with isochrones means that the search area is always changing and adapting to fit with the user's surroundings. Increasing the level of personalisation of location data in an app improves the relevancy for what the user sees and means app providers increase conversion rates.



An isochrone showing everywhere that's 30 minutes by public transport from the Empire State Building in New York City (left) compared with a map showing everything within a five-mile radius

Displaying isochrones on mobile

However, GIS for mobile presents difficulties in terms of presentation. The screen is generally too small to show large amounts of data in a meaningful way. Whilst a map is useful for an overview of results, it is often the case that users make sense of the map by reverting to a separate list of results.

The best way to use isochrones with mobile GIS effectively is to prioritise what is viewable to the user. For example, you might not show the entire map or even all the results at once. This may mean zooming in on parts of the isochrones or reducing the resolution at different zoom levels.

Maps can be hard to understand on smaller handsets. Seeing a list view or a screen split between the two can help users make sense of the map. By showing only the relevant travel time results, content providers can also ensure that users are not overwhelmed with large amounts of data on a smaller screen.

Filters can also be a powerful tool when used correctly. A well-designed filter option means that users can quickly tailor large amounts of data to their specific needs.

The essential element in GIS mobile search is that results appear quickly. If filters are set before the search, this may delay the return of results. The best way to make sense of the data is to conduct a general search and filter from the initial results.

Mobiles also provide instant context by virtue of the fact that they are present at a location. If an area was showing public transport travel times that were high, the user would naturally filter to show 'walking' or 'driving' options.

The future of mobile GIS

The technology will, no doubt, continue to develop. This may mean location services with more accurate indoor mapping. Screen resolution may also be improved in the future, opening up opportunities for alternative presentations of isochrones on mobile.

The obvious challenge in the face of new technology will be to remember what the user needs and wants from GIS technology. There will surely be a temptation to over-engineer platforms as new features become available. Simplicity will be the key to monetising content.

However, that is not to say that innovations in different areas will not present new opportunities. The Internet of things offers increasing amounts of real-time data on the world around millions of objects and devices. This may help users understand, for example, how many seats are empty on an upcoming bus, or, the temperature on the Tokyo subway. These ideas have been circulating for a while, but the projects have yet to really take off.

Virtual reality and augmented reality may change the meaning of a map for a user by layering an alternative reality onto existing GIS data. Augmented reality in particular could transform the way we use maps on the go, and what decisions a user should make in their immediate surroundings.

Isochrones can vary significantly between forms of transport. How they're displayed should be tailored to the device displaying them

No matter which direction mobile GIS takes, the key to its long-term effectiveness will always be its use in solving a real problem, as simply as possible.

ISOCHRONES HAVE A DISTINCT ADVANTAGE ON MOBILE AS THE SHAPE CHANGES AS THE LOCATION AND CRITERIA CHANGE

Louisa Bainbridge is head of marketing at iGeolise (www.igeolise.com)