



## Campus Navigation Solution for the University of Washington

### Highlights

- The University of Washington has a 640-acre campus that spans 21 million gross square feet
- GISinc implemented GeoMetri Navigator which provided a user-friendly interface that leveraged existing geospatial data to provide campus navigation for students and visitors
- GeoMetri Navigator is an off-the-shelf, highly scalable application that allows the university to consider adding additional features such as geofencing, pre-defined routes, alerts and notifications.

### Transforming Campus Navigation

The University of Washington was founded in 1861, and is known as one of the best medical schools in the world. The main campus in Seattle, Washington occupies 640 acres, 21 million gross square feet, 1,200 floors, and 250 buildings. With its large trees and many multi-level buildings, it has always been easy to get lost anywhere on the University of Washington campus.

Aaron Chevront, CAD/GIS Program Manager with the University of Washington Capital Projects Office, and his team began developing a geospatial proof of concept solution for the campus navigation challenge in the spring of 2012. Soon, the team had extremely robust interior GIS data for the university, but needed a well-functioning consumer-ready interface that would enable the data to be used to its full potential.

In search of a scalable, user-friendly out-of-the-box consumer interface for the university's navigation data, Aaron attended Esri's Annual User Conference in San Diego with thousands of other GIS managers hoping to discover and explore up-and-coming geospatial solutions. That year, GISinc was exhibiting and demonstrating a prototype, off-the-shelf indoor navigation application which would later become GeoMetri Navigator.

The general user interface of GeoMetri Navigator included animated screen transitions, point-to-point walking directions, searchable indoor and outdoor maps, and floor plans for each building that display multiple floors, stairs, escalators, and elevators. Using their own smartphone or device, users can search for and navigate to points of interest and alternative paths as well as ADA accessibility while waypoints are highlighted on the map as the user clicks through the list of directions.

Having decided that GeoMetri Navigator was the ideal solution to their navigation interface problems, Aaron and his team determined that they would need to begin developing the routing process by collecting the centerline for each hallway, stair, elevator, and walkway on the campus. The centerlines would provide a topologically accurate network of connected lines that model the flow of traffic for interior and exterior spaces. Centerlines would also need to factor in floor plan elements like door location, non-door entrances, stops, route lines from entrances to all rooms, route transitions to traverse floors, and room points as destinations.

The University of Washington CAD/GIS team took a novel approach to generating the path centerlines for interior routes by converting their 2D CAD drawings into a 3D geometric network using the Esri Network Analyst Extension. GISinc, then, populated the existing GIS data into a strict data schema that would allow the University team to build out preferred and restricted, or inaccessible, routes on the network. In collaboration with the university's Committee on Accessibility, Aaron's team worked to define ADA routes using a Boolean value of "yes" if the route is ADA accessible or "no" if it is not. The mobile application communicates parameters to the routing services, such as origin, destination, and what restrictions to use. If the app tells the routing service to use ADA restrictions, then only an ADA accessible route will be returned.

Altogether, the university estimated 500 hours of effort to complete the creation of the routes for both indoor and outdoor roads and paths.



### The Future of Campuses and Beyond

Looking forward, one feature of GeoMetri Navigator that the University of Washington wanted to explore is geofencing, which creates virtual perimeters for special monitoring, security, or campus events. Geofencing would allow the system to send alerts and notifications to campus visitors based upon their entering, leaving or staying in a location for any specified period. For example, the university could create geofences along the art tour and once a visitor enters the geofence, they would be alerted to more information about a piece of artwork nearest by. The university could also leverage geofence analytics to assess traffic patterns and changes based upon use and demand.

Geofencing, pre-defined routes, alerts, and notifications could have limitless uses to increase campus efficiencies. The University of Washington is setting foundational standards for the use cases of other universities who might also significantly benefit from implementing the GeoMetri Navigator application.