ArcNews

healthy GIS

A Little Geography in Everything

By Bill Davenhall, Global Marketing Manager, Esri Health and Human Services

Someone recently told me, "It's not all about geography." I quickly responded, "Give me a good example where that is true." We soon agreed that there is, in fact, a little geography in everything that we do, and that geographic information is always a part of every decision we make.

Those of us in the health and human services sector are already well aware of the intrinsic value of geography. Sometimes it is as simple as providing accurate travel directions to a referral location. Other times it is complex, as in figuring out where to locate vaccine stockpiles in an emergency.

Geographic information, in the context of human health and well-being, is a powerful fulcrum with which to leverage our understanding of what makes us sick and how we can avoid harm.

Geographic information system (GIS) technology is the handmaiden to better health, helping health and social professionals systematically interact with patients, clients, and health-seeking individuals using accurate, relevant, and reliable geographic information every day.

So what is our job in all this? First, we must take greater responsibility for the accuracy of the geographic data we provide and/or collect. Data without integrity is just dead data, be it your street address in your most recent retail transaction or your personal place history in your physician's new electronic health record.

Second, expect more from GIS. It does more than just make maps. GIS improves workflows and provides the analytics that give insights to benefit the people we serve. Making geographic information do something to improve the lives of those we serve could not be a better antidote to a complex world already filled with too much dead data.

For information, visit esri.com/health.

Finding and Keeping Quality Nurses

Stanford Medicine is taking a geographic approach to recruiting and retaining a top-caliber team of nurses.

"Recruiters have had hunches for decades about which features—such as pay, shift, and location—would be attractive to nurses," said David Schutt, who handles human resources workforce planning and analytics for Stanford University Medical Center. "GIS analysis has once and for all laid the location controversy to rest. We found that the nurse comfort zone for Stanford University Medical Center is about a 12-mile radius. Looked at another way, this is also a retention factor."

Stanford Medicine, located in Palo Alto, California, includes the Stanford University School of Medicine, Stanford Hospital and Clinics, and Lucile Packard Children's Hospital. With 885 licensed beds, Stanford University Medical Center serves as the primary teaching hospital for the Stanford University School of Medicine and provides a clinical environment for
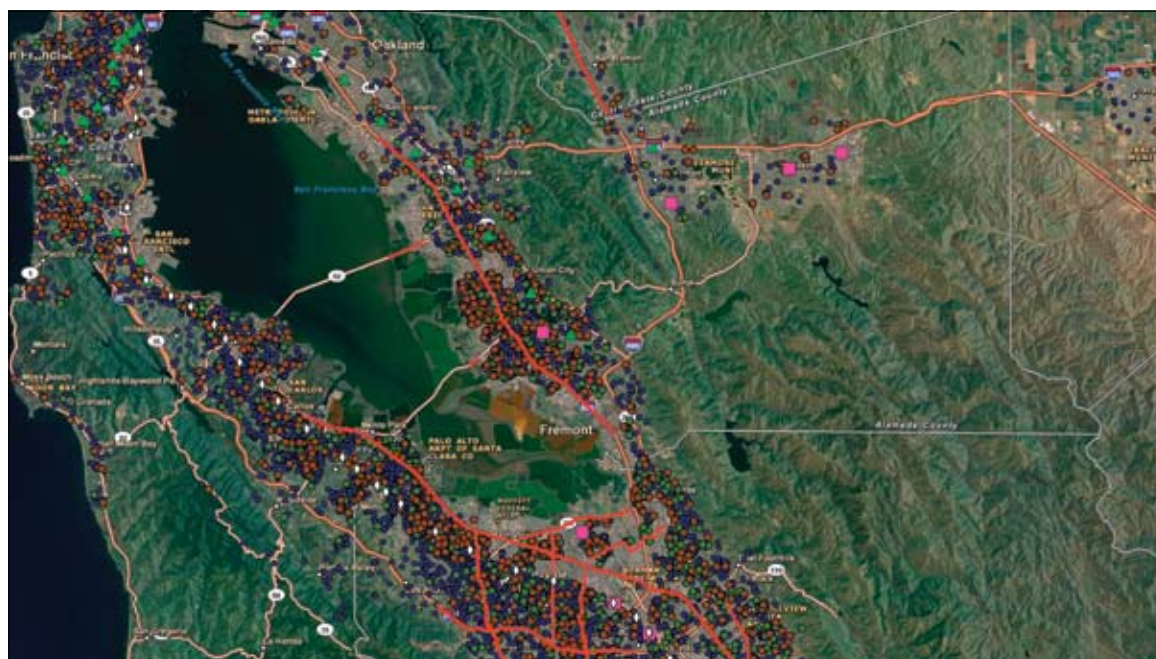
Shifts and commuting patterns are analyzed, with various shifts represented by blue, green, and brown dots. Commuting options are shown as white diamonds, green triangles, pink squares, and orange lines.

Shalem Medical Supplies Delivers

As Shalem Medical Supplies took on more patients, the durable medical equipment and supplies company needed a software system that could handle real-time coordination of pickups and deliveries.

The search led Shalem to ArcLogistics, a specialized application from Esri that helps users create optimized routes and schedules based on multiple factors such as customer needs, business rules, vehicle traits, and street restrictions.

With ArcLogistics, Shalem was able to save 15 percent in fuel consumption and decrease overtime costs by 25 percent. Most importantly, the company has been able to reduce its average delivery window to two hours, thereby meeting customer needs more quickly.

Hear more of the story from Zach Paton, operations manager for Shalem Medical Supplies, by watching the video at esri.com/arclogistics-medical.

Finding and Keeping Quality Nurses

research. The nursing staff occupies the largest clinical workforce category, with approximately 2,700 registered nurses.

Since practically every external clinical professional at any hospital must be state licensed and registered, Schutt said it is easy to map the geographic location of nurses. GIS analysis and mapping of this external data, combined with internal human resources workforce data, provides an overview of the hospital nursing supply and demand, as well as information about employee commute patterns and distance traveled to work.

With internal and external nurse populations mapped, GIS can then be used to answer questions related to workforce planning. Queries include How will we attract new entrants to our workforce given that many of our nurses living within a 6–12-mile radius of our hospitals are projected to retire in 10 years and the rise in home prices "mid-peninsula" has become far too expensive for just about any clinical professional? or What if we experience an earthquake in the middle of the night, but the majority of our nurses live on the other side of a major bridge affected by the quake?

"We have been able to ask and answer all these and many more questions," says Tony Redmond, director of nursing and allied health talent acquisition programs at Stanford University Medical Center. "Our human resources and hospital leadership are no longer experiencing a business intelligence deficiency as it relates to the development of actionable workforce plans."

Although Stanford Medicine's long-term planning related to GIS analysis is still in process, a large
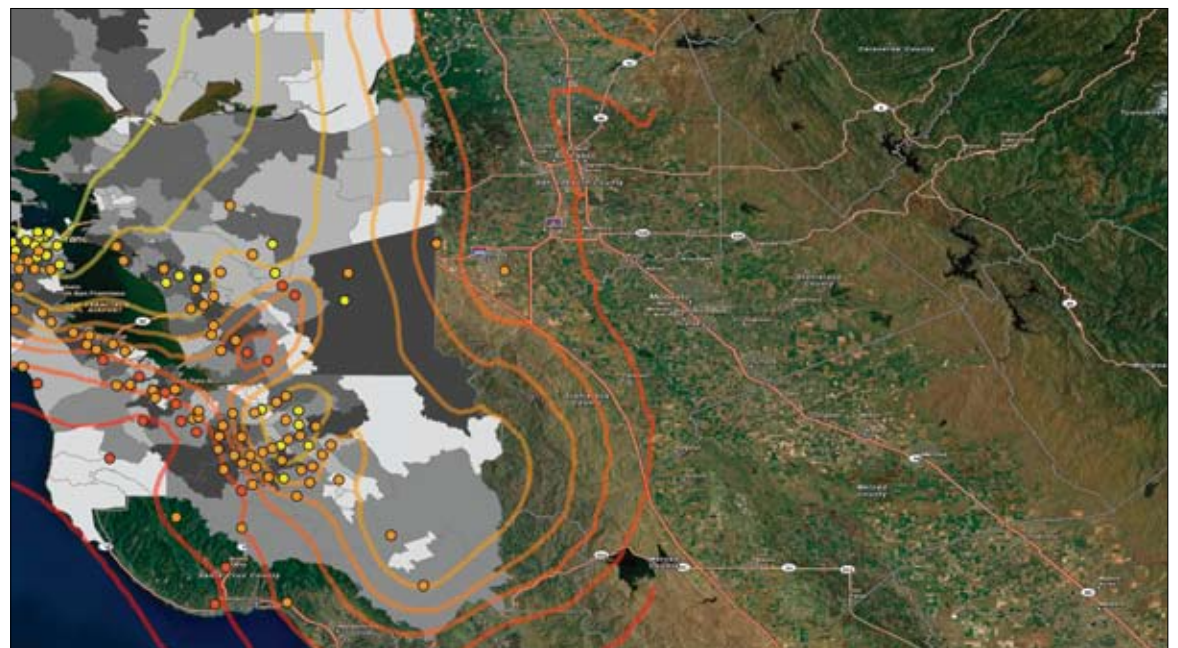
Hospital registered nurse age ranges are shown, with dark orange dots representing those closest to retirement, overlaid onto 2000 Census data of households with members 62 to 64 years of age for comparison. Contour lines show the predicted direction of aging.

return on investment is already being realized. The recruitment advertising budget has been reduced by at least 50 percent—a monumental amount considering the San Francisco Bay Area is one of the most expensive advertising regions in the United States.

GIS enables the hospitals to identify places where there are too few nurses or too much competition and stop wasteful advertising in those areas. Through GIS, the hospitals now precisely target candidates and can use direct mail to reach them.

Mapping and analysis of workforce retention data provide insight into why nurses leave Stanford University Medical Center to work elsewhere. Schutt performed a GIS analysis of all area hospitals with respect to the nurse comfort zone, the geographic location of each facility, and internal retention data. It became visually obvious that nurses just starting their careers could actually leapfrog from one hospital to another, up and down the San Francisco peninsula, looking for the right pay and the right shift.

"This knowledge helps anticipate and mitigate potential interruptions to continuity of care and avoid the astronomical costs associated with hiring and training replacements," Schutt said. "Because of GIS analysis, we can potentially free up approximately $22.5 million over the next two years that would otherwise be spent on replacement and training costs."

For more information on this GIS workforce planning solution, contact David Schutt by e-mail at dschutt@stanfordmed.org.

Esri Health GIS Conference Raises Awareness, Bestows Honors

At the 2010 Esri Health GIS Conference, talk centered on how GIS can help improve our health across major disciplines such as public health, human services, hospitals and health care delivery, academic health, research, and nonprofit organizations.

Held October 18–20, 2010, in Denver, Colorado, the event brought together health and social services practitioners, researchers, executives, and policy makers to examine innovative applications of technology to address health and human services challenges.

While the conference Map Gallery and paper sessions spotlighted the outstanding work of attendees, particularly inspirational efforts were recognized in an award ceremony.

The Communication Award was given to Sarah Cordivano, a student at the University of Pennsylvania, for her work on the transformation of access to maternity care in Philadelphia, Pennsylvania.

Amy Hillier, assistant professor, Penn Design, Department of City & Regional Planning, University of Pennsylvania, received the Vision Award.

The Service Award was presented to Shazia Naz Subhani, senior technical specialist of Head Registries Core Facility, Biostatistics Epidemiology and Scientific Computing (BESC) Research Centre, King Faisal Specialist Hospital & Research Centre, Riyadh, in Saudi Arabia.

This year, a new honor, the Stepping Up Award was given in acknowledgment of Direct Relief International for its rapid response to the Haiti earthquake.

Award winners, from left to right, Shazia Naz Subhani, Amy Hillier, and Sarah Cordivano.

Winners are chosen by an independent panel of five judges based on criteria including explanation of concepts, illustration of methods, and overall communication with maps.

In the Plenary Session, featured conference speaker Hillier talked about the importance of data capture. Information about the local environment can foster understanding, for example, about what causes people to purchase fresh fruits and vegetables instead of junk food.

"We need maps with attitude," Hillier said. "Maps are propositions and can be used to show what the world looks like and what the world should look like."

For more information on the Esri Health GIS Conference, visit esri.com/healthgis.

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Mapping Facilities and Assets inside the Hospital

A custom GIS application at the University of Kentucky (UK) now supports occupancy of the 16-floor, 1.2-million-square-foot Level 1 Trauma Center, called UK Chandler Hospital Pavilion A. Maps and room data sheets detail each room along with occupancy and accompanying assets including furniture, medical equipment, and technologies.

Built on an ArcGIS platform, the application was developed by Michelle Ellington, UK GIS coordinator, and Andrew Blues, UK information technology manager, along with 39°N, an Esri business partner.

"We have a lot of information silos, but this application will serve to analyze all that data in one centralized location," Ellington said. "We chose GIS because it is a scalable solution for integrating data types and university-wide systems."

Custom enhancements include the integration of CAD drawings, room data sheet generation, 360-degree panoramic pictures of rooms both fitted and in the predrywall stage, on-the-fly symbolization, Web site linking, and a powerful asset editing module. The system is being expanded to integrate other campuswide systems and support additional university needs.

"We built the custom ArcGIS Server application using the Flex API to maximize accessibility and ease of use," said Chris Walls, cofounder of 39°N. "We are extremely proud of this cutting-edge collaboration with the University of Kentucky. This kind of application will significantly streamline the administration of public facilities."

For more information, visit 39degreesnorth.com and esri.com/health or contact Michelle Ellington at michelle.ellington@uky.edu.
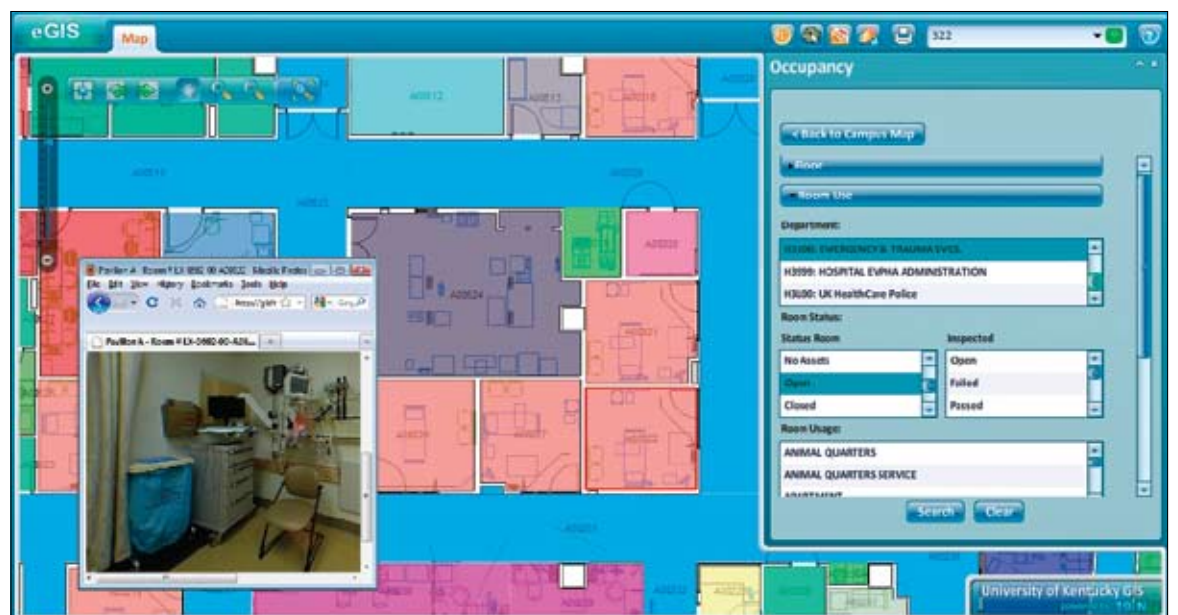
A custom GIS application allows the University of Kentucky to view and analyze data related to each room of the UK Chandler Hospital Pavilion A.