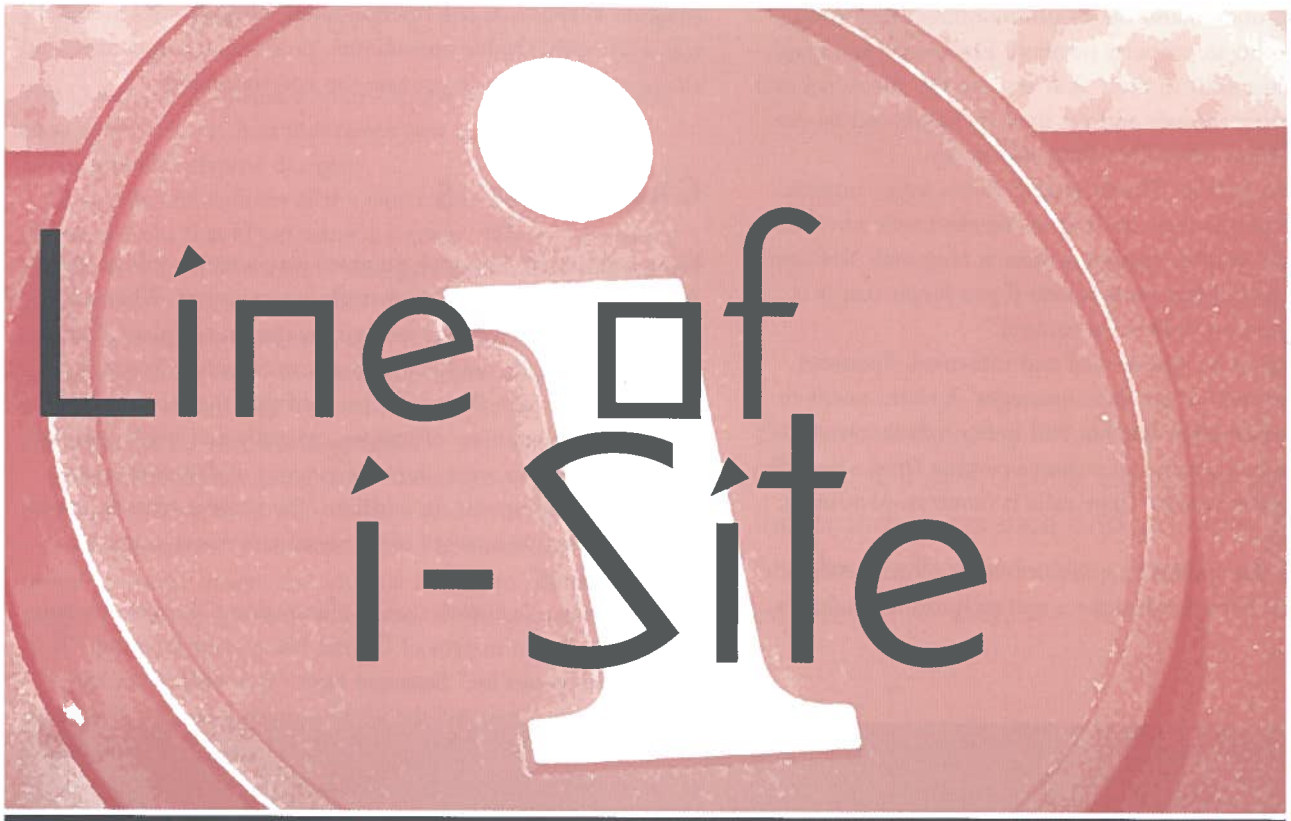

Line of i-Site

by Nora Richter Greer

Visit Johns Hopkins University's Homewood Campus in Baltimore and you will quickly encounter one of sixteen i-Site kiosks that dot the 128-acre campus. At first glance, each unit seems to be a simple wayfinding tool—a neat, tidy, thin, unobtrusive kiosk that gently switches on as you approach. But on closer inspection you quickly realize this is not a typical kiosk, but a highly sophisticated machine. It shows what the SEGD 2003 Design Awards jury called "great vision and foresight in challenging technology for complex wayfinding in an exterior environment."

Photo: Tom Crane Photography


i
North Gate
Directory
Access
Events
Parking
Help Desk

Installed in October 2002, the i-Site Information System represents a revolution in moving people from point A to point B. Through the use of cutting-edge technology and product design, the kiosk system not only provides wayfinding through a static map, but also additional information from a touch-screen. And it does so in an exterior environment; each unit is totally exposed to Baltimore's wind, rain, and sun around the clock and throughout the year.

It's no accident that i-Site breaks new ground. That's what Johns Hopkins' wayfinding committee had in mind in 2000. Committee members felt that a dynamic system was needed to reflect both the revitalized Homewood campus and the university's desire to foster innovation. Hopkins hired the Philadelphia design firm Cloud Gehshan Associates; together, they quickly rejected the idea of a traditional vehicle and pedestrian wayfinding system. Meanwhile, the board of directors and an anonymous donor requested a high-tech yet low-key solution that didn't take away from the park-like

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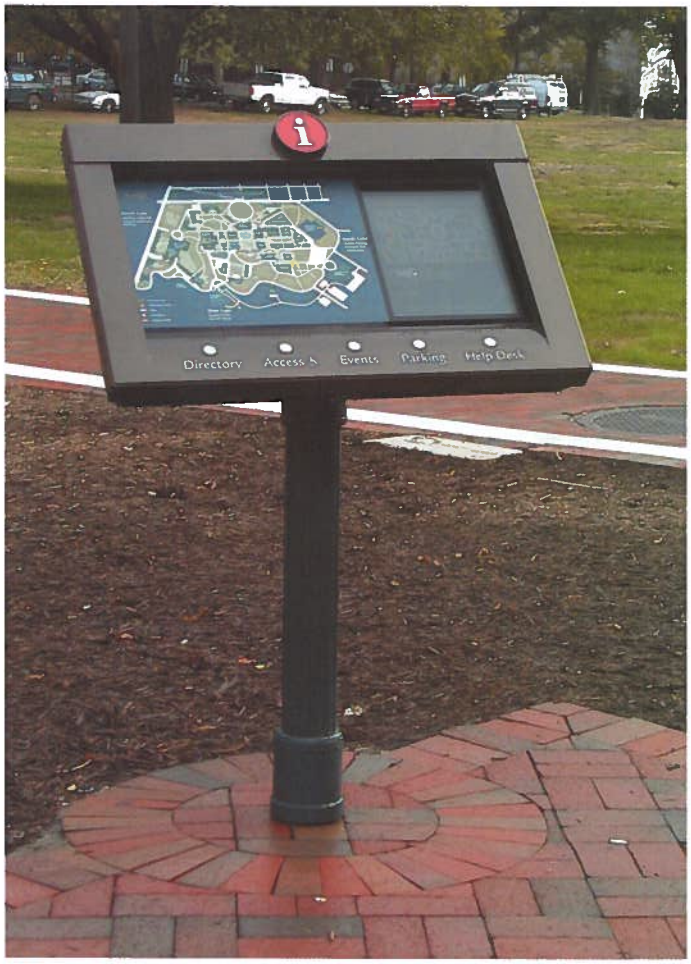


Above: The project mantra of "simplicity" was to make retrieving information as quick and straightforward as possible. The kiosk can be activated by touching the map, touching the LCD screen, or touching a button.

atmosphere of the newly renovated Homewood Campus.

Under the direction of Virginia Gehshan, principle in charge, and Barbara Schwarzenbach, Senior Designer, Cloud Gehshan began researching kiosk design. They challenged themselves and Hopkins officials, and brought others into the collaboration. "We learned how many hundreds of tiny details must be worked through when putting components together that have never been put together before," Gehshan says. "This is another order of magnitude."

The first challenge was where and how to locate the CPU for the system. Would each unit have its own CPU? How would units be connected? Research led Cloud Gehshan to the idea of a central computer, located away from the kiosk units, and connected to them through fiber optic cables. More research led to Dolch Touch Controls, a California-based company that specializes in touch screens, kiosks, and remote computing like movie theater ticketing kiosks. Touch Controls would develop the software necessary to run the system. At about the same time, the industrial design firm Concept to Products (C2P) joined the team as the project's mechanical engineer.

The team developed a user-friendly product—all a visitor needs to do is touch the screen. The interactive kiosk features a system of infrared beams projected in a grid pattern over a 20" by 32" kiosk display, which includes both a static map of the campus and an LCD monitor. Within that grid, a visitor may touch areas on either the static map or the LCD screen to activate information displays. Alternately, through a hidden, hands-free microphone, the visitor can be connected to a person in the security office. If power is disrupted, the static map can still provide wayfinding guidance. "Even if the whole system goes down, someone can walk up to it and still find their way around," Schwarzenbach says. "It is located where they are and the map is oriented to how they are standing on the campus."

Behind the scenes, the system is technically loaded. It's the first of its kind; no such kiosk has existed before. "The JHU kiosk is as complex as it gets for an information kiosk," says Roberto Frulla, President of Touch Controls.

To begin, there was a need to protect units against the ravages of nature—rain, snow, heat, and wind—and against vandalism. The screen needed to be bright enough to be read at all times, despite glare from the sun and darkness of night. The screen had to be sensitive enough for the touch of a finger, but not a drop of rain. Through trial and error, the issues were resolved.

The kiosk is made of powder-coated aluminum and Lexan®, strong yet lightweight industrial products introduced by C2P. On the surface of the kiosk, both the map and the LCD are protected from the harmful effects of sunlight, rain, and snow by a thick, clear panel of Lexan®. Much effort was spent on the development of the buttons. The goal, of course, was to create a vandal-proof button, somewhat of an oxymoron as that component is usually a moving part and typically can be damaged.

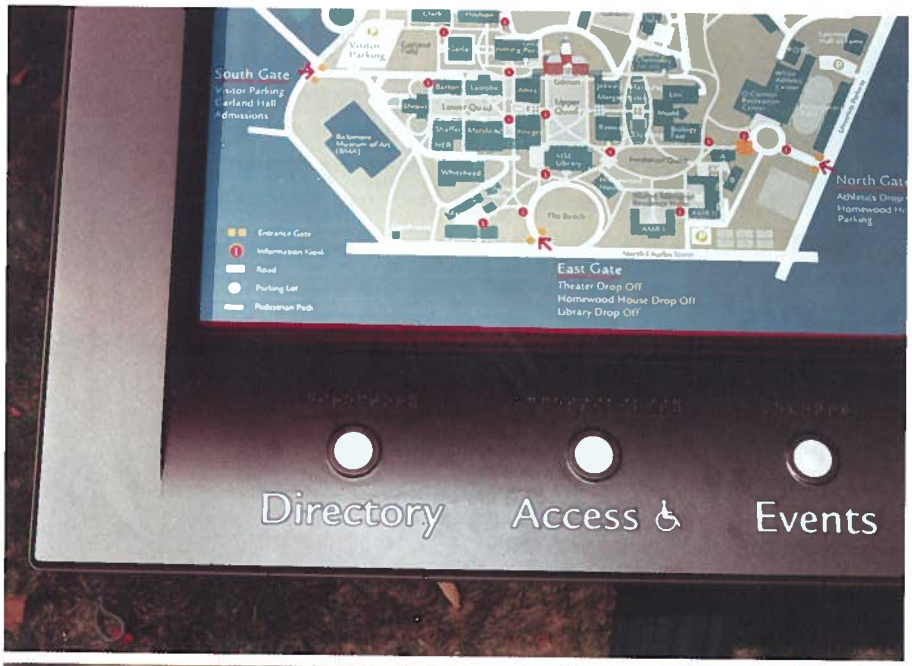
The solution is the use of Touch Thru Metal buttons, which are actually "touch-through" switches developed by Touch Controls for heavy industry. These non-moving switches are activated upon touch to emit shear acoustic wave technology. "You can hit the kiosk with a hammer and you won't break it," says Frulla of Touch Controls.

The help button actually activates a hands-free telephone that dials out to live assistance by calling the security office. The microphone and speaker are discretely concealed in the kiosk frame and protected from the natural elements.

Conventional touch screens require skin contact with the

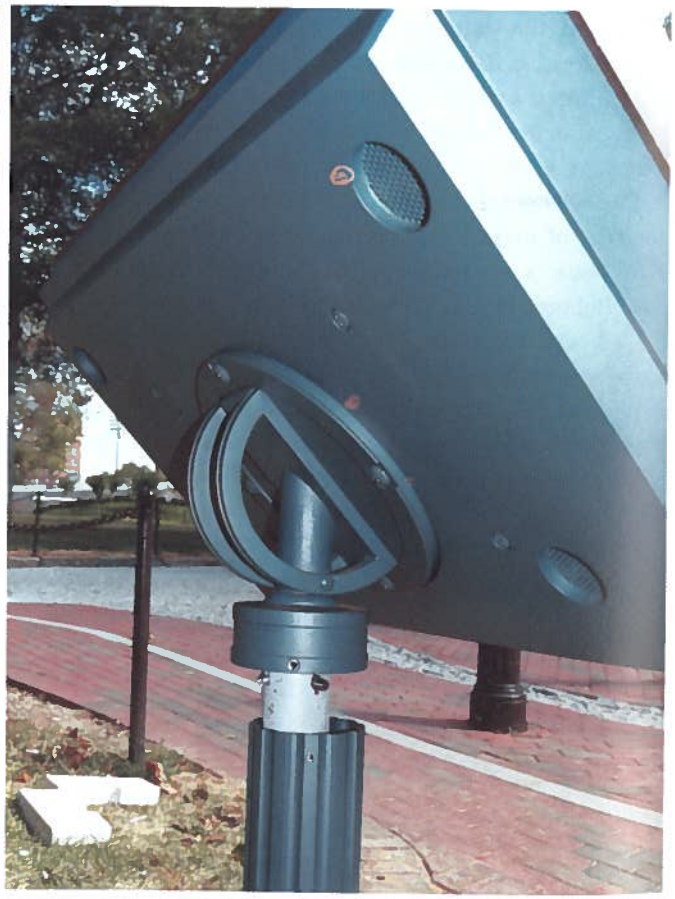
Above: The anodized aluminum map works like a conventional, static map but is also interactive. The map panel sits below a grid of infrared beams. When a finger touches the map the beam is interrupted, activating the LCD screen.

Conventional touch screens require skin contact with the screen surface to close the switching circuit. The i-Site uses infrared beams projected in a slightly elevated grid pattern over the touch surface.



LEFT: Buttons labeled with tactile letters and Braille instantly call up requested information on the LCD screen. Touch-through button technology uses sound waves, preventing moisture penetration; buttons have no moving parts.

BELOW: Speakers for the hands-free phone are located on the back of the kiosk. Motion detectors activate the LCDs from sleep mode when a visitor steps within a three-foot radius.



screen surface to close the switching circuit. The i-Site uses infrared beams projected in a slightly elevated grid pattern over the touch surface. The light beams are invisible to the human eye and can even be operated by a gloved human hand.

Motion sensors activate the screen from sleep mode when a visitor steps within a three-foot radius. Tactile/Braille markings and proximity systems aid the visually impaired.

Special hot-mirrored glass reflects the sun's infrared radiation, which would otherwise render the LCD crystals nonfunctional. The units face upward at a 45-degree angle, carefully oriented to minimize sunset glare. Automated cooling and heating systems shield the LCD screen and other electronic components from exposure to temperatures above or below safe operating ranges.

Touch Controls developed the system's software platform to be Web-based, which means it can literally be operated from any location. The Hopkins kiosks are connected by fiber optics; the information is transmitted and displayed digitally. Capable of transmitting 1.65 billion light pulses per second, the software (patented under the name RayFire™) enables instant retrieval of even large video clip files. Updates are made easily and from several locations.

Seen as a one-stop shop for campus visitors, the kiosk shows the JHU shuttle schedules, a daily calendar of Homewood events, and the operating hours of various facilities on campus. It also contains regular and handicapped accessible routes, parking lots, current photos of university buildings, and a listing of departmental offices located in each building.

To help determine what information should be included in the kiosks, and where the kiosks should be located, the team hired environmental psychologist Dr. Peter Hecht of Philadelphia. Dr. Hecht conducted extensive usability tests of the prototype units with students, visitors, visually impaired people, and other handicapped persons. Any surprises among the responses? "The Hopkins students were keen on the shuttle bus schedules," Dr. Hecht said.

Environmental psychology also plays a role in aesthetics. If an object looks aesthetically pleasing, or at least familiar, it will be readily approached. Hopkins and the team wanted something traditional looking. Says Alex Chong of C2P, "The design criteria were a little bit different than the projects that C2P is usually involved with as industrial designers. The units we design are usually slick and high-tech in appearance. This is much calmer, more inviting, a bit nostalgic."

Although designed specifically for Johns Hopkins' Homewood Campus, a similar kiosk system would be very appropriate for other universities, gardens, arboreta, or self-contained complexes.

The Johns Hopkins University i-Site Kiosk System has set the standard for the immediate future. In the words of one of the jurors who awarded the SEGD Design Award to the project, "The kiosk demonstrates the power of interactive digital communications media to tailor wayfinding to the individual needs of a diverse range of users. As technology becomes increasingly affordable and reliable, hopefully more wayfinding design solutions will continue this exploration." ●

Above: The angle and height of the kiosks were tested for wheelchair users.

Location
Baltimore, MD

Design
Cloud Gehshan Associates, Philadelphia, PA

Design Team
Virginia Gehshan, Principal-in-Charge;
Barbara Schwarzenbach, Senior Designer;
Ken Olschewske, Peter Kelly, Dorothy Funderwhite, Designers

Fabricator
Dolch Touch Controls

Engineering and Fabrication
Concept to Product: Alex Chong, Al Castagna, Dennis Kappen, Chris Stewart

Client
The Johns Hopkins University