

Category: Universal Design

Project: Please touch! Designing an interactive tactile map for all

What was the challenge?

How can tactile maps aid in navigating cities, even when the "city" is a large university campus? With over 38,000 students, 6,000 faculty, 24,000 staff, an airport, and a fire department, the University of California, Davis is a city within a city. The campus comprises 21.5 square kilometers connected by a maze of roads, bike paths, and pedestrian walkways, making it challenging to find one's way around. The challenge is even greater for individuals who are blind or have low vision.

What was the solution?

The Student Disability Center and the Center for Design in the Public Interest at the University of California, Davis were awarded a Student Success Grant to design the first truly interactive tactile+audio UC Davis campus map. The project aims to improve and enhance physical access to the University for individuals with visual, learning, and mobility impairments as well as the greater campus community and its visitors.

The map depicts the physical features of the Davis campus including buildings and athletic fields, guides users to accessible routes, and informs users of what they can expect at each location such as offices housed within individual buildings. A SmartPen programmed with audible cues works in tandem with the map to assist users in quickly locating buildings, offices, and accessible routes.

In a hands-on group study course during two quarters, students in several disciplines collaborated to design and develop the interactive map and to evaluate its effectiveness through user feedback. The faculty-mentored student team, which included blind and low-vision

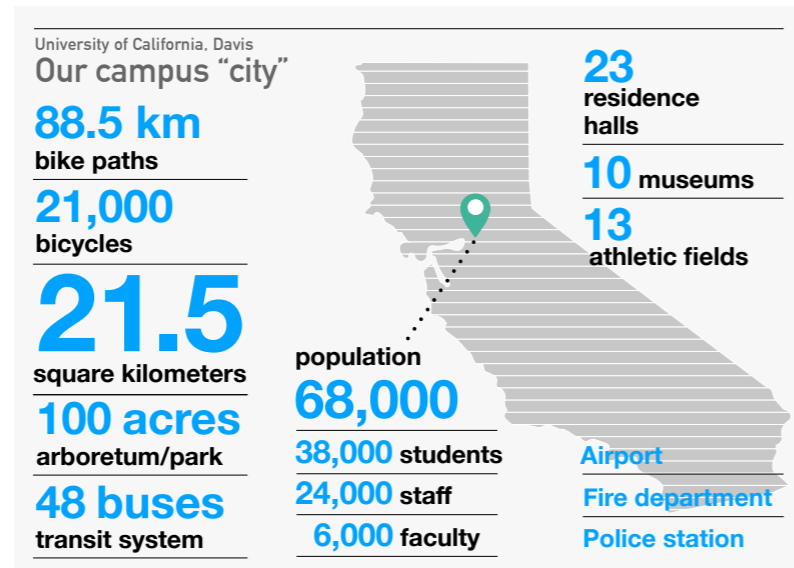
participants, identified the needs of community members and stakeholders, analyzed examples of tactile maps, researched audio pen technologies and tactile map best practices, developed a visual/tactile vocabulary, updated and organized facilities data for programming a SmartPen, and created a prototype for testing. Course instructors coordinated these efforts with an outside vendor to produce the final product.

Project team

Team members include Susan Verba, Joshua Hori, Bret Yourstone, Zoe Martin, Kenna Fallan, Connor Wong, Carla Scroggins, Hannah Hill, and Jennifer Billeci.

Contact

Susan Verba, Center for Design in the Public Interest (DiPi), University of California, Davis
sverba@ucdavis.edu
<http://dipi.design>



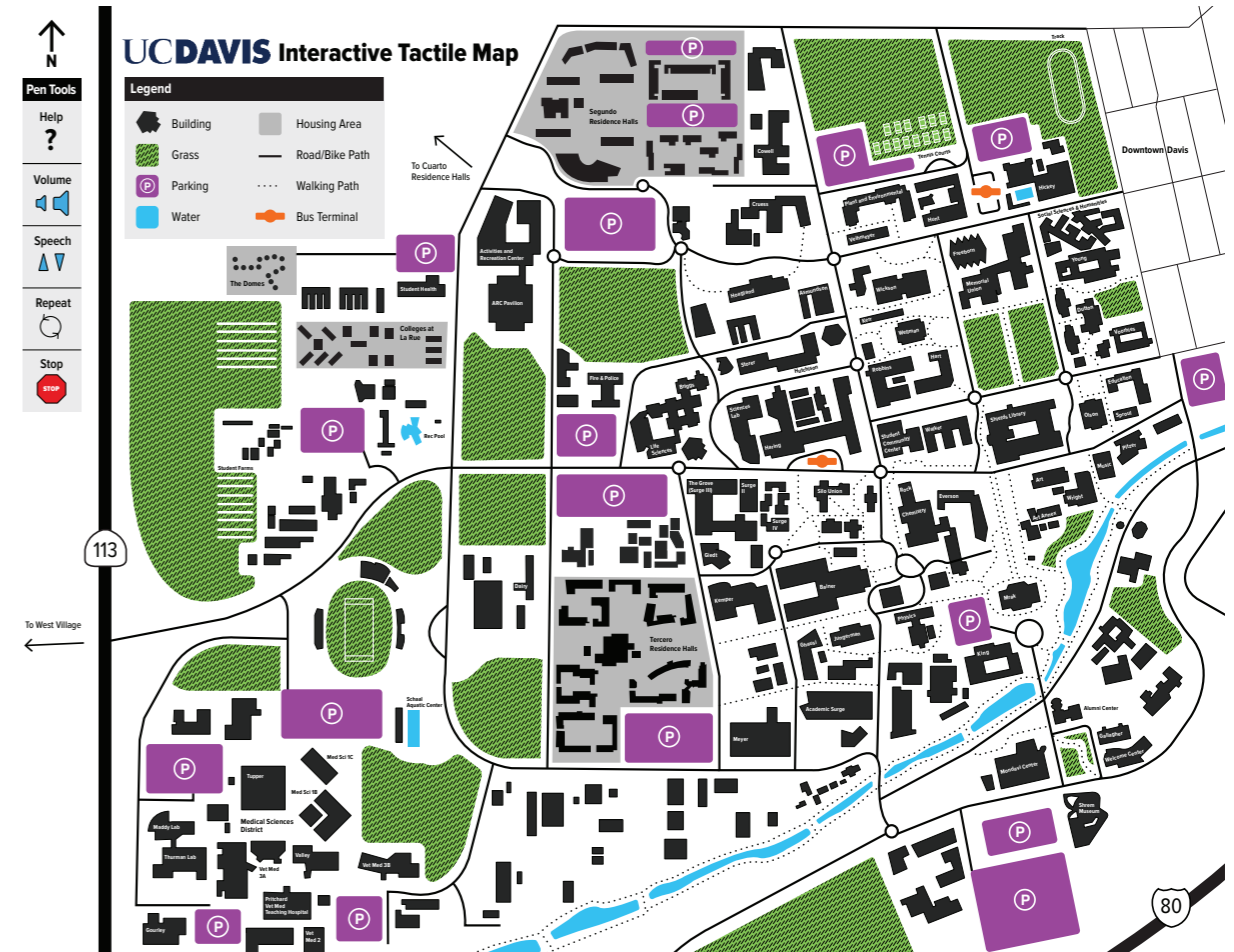
What was the effect?

To reach the widest number of users, the map will be available for public use at strategic campus locations, including the Student Disability Center, Student Community Center, Welcome Center, and Center for Design in the Public Interest.

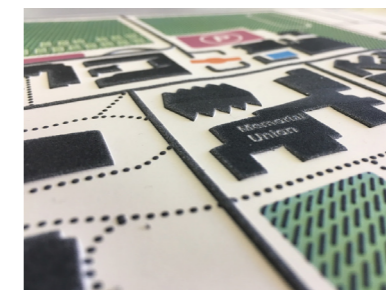
As we explore how to transform our campus "city" into a more understandable and accessible place, we hope to encourage others to develop their own interactive mapping projects and to learn from our collective experiences.



Frank Welte at LightHouse for the Blind and Visually Impaired in San Francisco puts the prototype map to the test.



A SmartPen, programmed to read aloud fine details such as accessible entrances and office locations within the building, works in tandem with the map.



A visual/tactile vocabulary was developed to include raised buildings, articulated pathways, and colorful landscapes with tactile patterns.

Map design process
Organizing data for the SmartPen audio

A	B	
254 5753	Lath House 013	Greenhouses
255 5754	Lath House 014	CBS Greenhouse/Conservatory
256 5755	Hogland Annex	Design
257 5756	Hogland Annex	General Organized Activity Programs, CABES
258 5756	Dairy	Animal Science Vivaria
259 5757	Animal Sciences Teaching Facility 1	Animal Science Vivaria
260 5758	Animal Sciences Teaching Facility 2	Animal Science Vivaria
261 5759	Dairy Cattle Feed	Animal Science Vivaria
262 5760	Dairy Cattle Shed	Animal Science Vivaria
263 5761	Agricultural Practices Shed	Plant Sciences
264 5762	Veg Crops Storage	Biological & Agricultural Engineering
265 3763A	Greenhouse 8B	Greenhouses
266 3763A	Greenhouse 8B	CBS Greenhouse/Conservatory
267 3763B	Head House 8B	CBS Greenhouse/Conservatory
268 3763B	Head House 8B	Land, Air and Water Resources
269 5764	Agronomy Field Building	Plant Sciences
270 5765	Water Science & Engineering Field Building	Land, Air and Water Resources
271 5766	Zoology Field Building	Neurobiology, Physiology & Behavior
272 5767	Aggie Sorplus & Custodial	Manure Management
273 5767	Aggie Sorplus & Custodial	Facilities Management
274 5767A	Custodial Storage	Facilities Management
275 5768	Animal Husbandry Dairy Scale	Animal Science Vivaria

A spreadsheet provided by Facilities was reworked to strip out nonessential data and edit and alphabetize building names for audio pen programming and easy updates.