

Enabling Infrastructure for the Vision Impaired



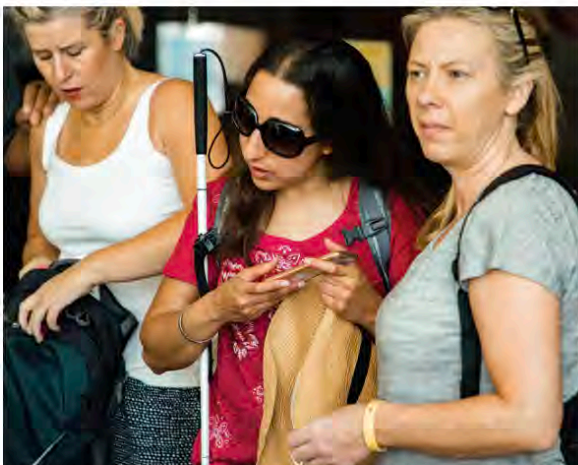
Bridging the gap between infrastructure and the people who are blind or have low vision

Imagine a world where your customers, particularly those facing unique barriers, can effortlessly navigate through and interact with your infrastructure. Beasmart does this through a personalised experience tailor-made for them. This innovative new product, 'Beasmart device', makes this a reality for the public and private sector.

Beasmart is a dynamic beacon with Bluetooth Low Energy (BLE) technology that can be installed in a variety of settings, including both public and private infrastructure.

It seamlessly interacts with devices like mobile phones and enables a wireless, two-way communication exchange, allowing personalised information and functionality for all users, particularly those facing additional challenges, such as people with disabilities or those with language difficulties. This two-way communication allows the user to control connected infrastructure.

BlindSquare App integration



Interact wirelessly with public infrastructure

It is the first of its kind, as current beacon-based BLE systems are simply broadcasters. This means they lack the ability to interact with users and the conveying of information goes just one way, instead of back and forth.

Current beacon-based systems also can't be integrated into existing private and public infrastructure, whereas Beasmart can be installed where this kind of interaction is sorely needed, such as pedestrian crossings or bus shelters.

Adroit founder and technical director Ulrich Frerk says Beasmart can perform complex two-way communication with devices by sending notifications, emitting customisable audio cues and triggers, and more.

"Most of the things that are similar are using what I call a 'passive' beacon. A beacon that just sits stationary in one area, which your phone detects and can assess where you are, allowing certain limited functionality," Frerk says.

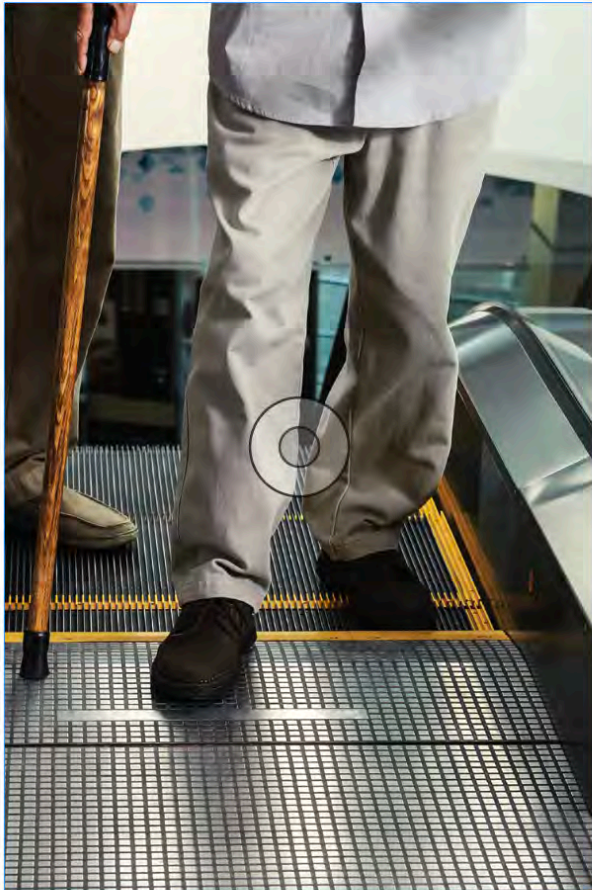
The technology isn't complicated to use, either. Beasmart automatically connects to users via Bluetooth, with no need for them to go through a pairing process.

A limitless wayfinding solution for many applications

This means it can help people navigate within buildings like malls, in public spaces or out in nature, such as on hikes. It can also give information tailored to that specific user, such as directions in the person's native language. Other potential uses include enabling gate or door access at someone's home once it senses they're within range of the beacon, and even act as a timesheet by tracking contractors on site.

In terms of future applications of Beasmart's technology, data analytics of users can be used to help to understand and improve people's overall experience of an environment.

"Its main purpose is to learn. For example, we could create a flow map of how persons who are vision impaired actually walk up Queen Street rather than assuming the way they walk. It could help councils plan for people with accessibility issues," Frerk says.



The possibilities are endless

Beasmart can be integrated with a wide range of public infrastructure.

- Elevators
- Escalators
- Trains
- Buses
- Retail stores
- Shopping centers
- Banks
- Airports

Why is Beasmart important to public infrastructure

The New Zealand Disability Strategy will guide the work of government agencies on disability issues from 2016 to 2026.

New Zealand is a non-disabling society - a place where disabled people have an equal opportunity to achieve their goals and aspirations, and all of New Zealand works together to make this happen.

It can also be used by any individual or organisation who wants to learn more about, and make the best decisions on, things that are important to disabled people.

Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;

To promote other appropriate forms of assistance and support to persons with disabilities to ensure their access to information;

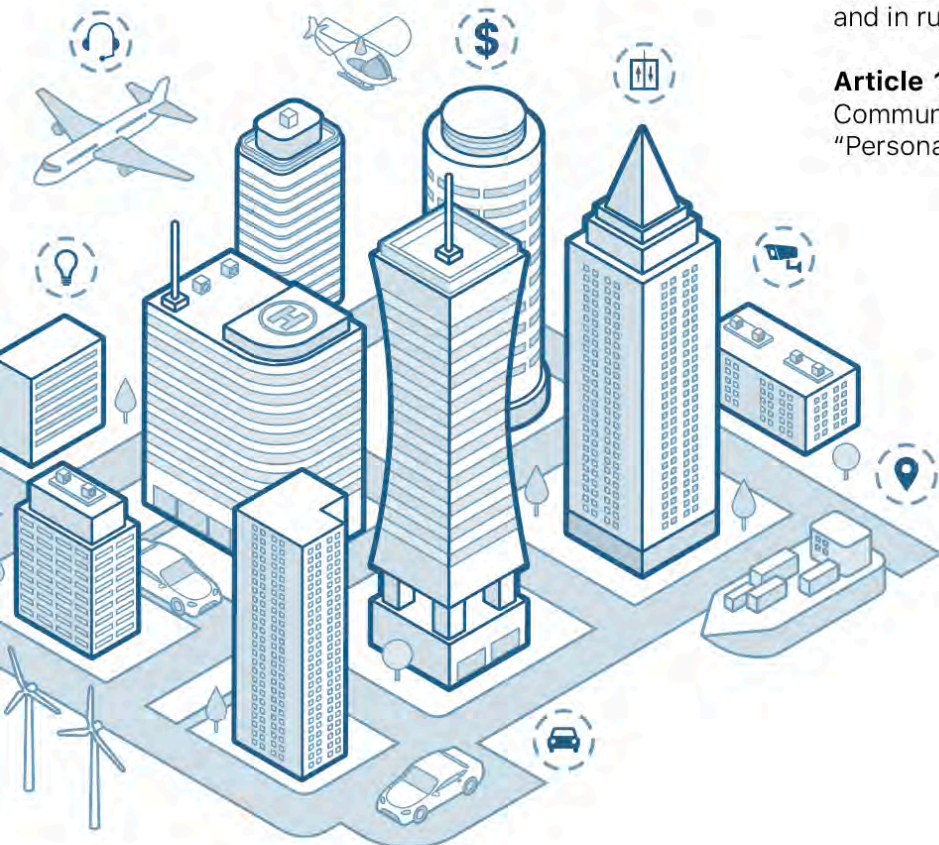
The UN Convention on the Rights of People with Disabilities (UNCRPD)

The UN Convention on the Rights of People with Disabilities (UNCRPD) is a foundational document for disabled people. All state bodies in New Zealand, including local government, have a responsibility to uphold the principles and articles of the UNCRPD. There are a number of articles pertinent to Public Infrastructure:

Article 3, which includes the principles 3(c) "full and effective participation and inclusion in society" and 3(e) "equality of opportunity".

Article 9, which states "To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas."

Article 19 – Living and Being Included in the Community and Article 20 "Personal Mobility"





Integrated with bus PID's to deliver bus info via BlindSquare

"Ours is really blue sky thinking because it's intelligent with complete two-way communication. We can literally send and receive anything to and from your phone. In essence, it's using public information and adding a layer of geo-location to it so that the user can interrogate what's happening, what's out there and what's around them and control enabled infrastructure."

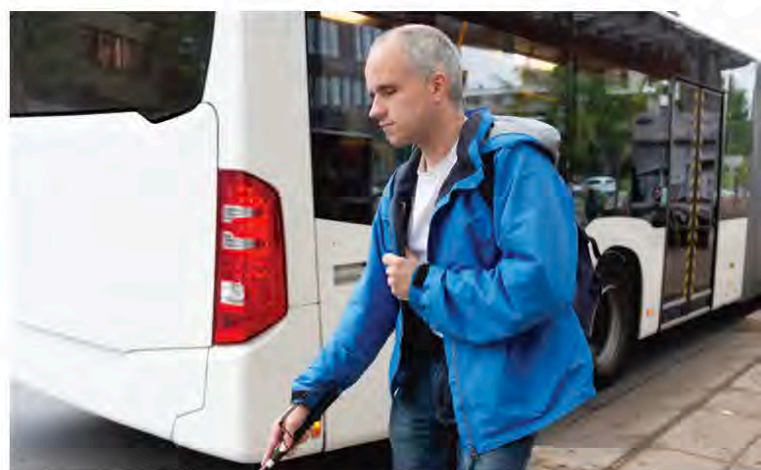
With a 28-metre range, the strength of the Bluetooth signal determines where the user is in relation to the beacon, which allows interactions to be personalised according to the user's location and the infrastructure it is connected to. It can also be configured to work with existing and custom-built Android and IOS Apps.

The technology is currently being used to help persons who are blind/partially sighted interact with traffic control systems at an intersection in Auckland City via integration with the most popular waypoint information App, BlindSquare.

The device then uses further audio cues to guide the user to the pedestrian crossing and, through the App, the user can remotely 'push' the pedestrian call button. It then alerts them to when the pedestrian crossing signal goes green allowing them to safely cross the road. Engaging the pedestrian crossing from the App saves the vision impaired user the inconvenience of locating the pedestrian call button on the pole.

On the other side of the crossing, a second Beasmart device with a different audio cue can guide the user as the crossing signal pulses red to help them know that the crossing time is almost over, while also leading them to the correct side.

In the bus shelter trial, the Beasmart device gives a vision impaired user the ability to trigger, using the BlindSquare App, the audio of the current bus itinerary through the built-in bus shelter speakers. This information around bus location and its services are normally available visually, or by manually cueing the audio via a button.

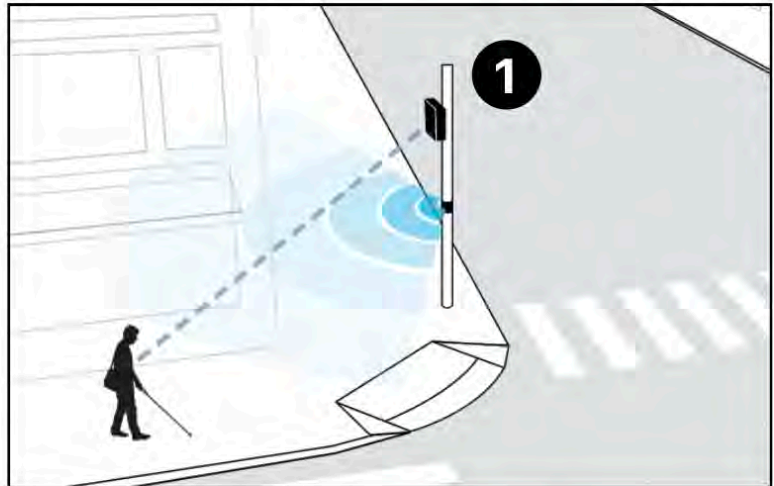


Uses audio tones to help call the users to their destination

Beasmart use case 'pedestrian crossings'

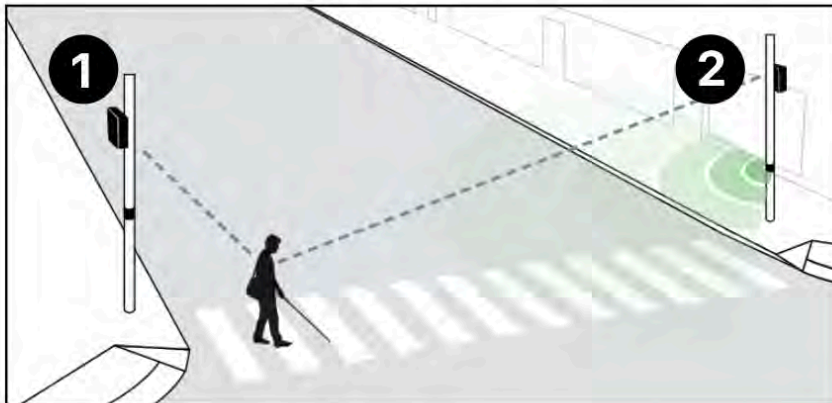
Step 1 *Locating and homing to crossing*

Using audio tones, a user can be guided to the pedestrian crossing at pole 1



Step 2 *Activate the crossing via a mobile App*

User is prompted to activate the pedestrian button remotely once they are within range of pole 1



Step 3 *Notify the user it is safe to cross via a mobile App*

The App notifies the user when it is safe to cross and a crossing tone is activated from pole 1 and 2. Then the user is ready to cross to pole 2.

Step 4 *Clearance warning*

The user is given feedback as the crossing phase is nearing the end, a tone is activated from pole 2 helping guide the user to their destination

Note: Traditional pedestrian noise from existing infrastructure is designed to stop when the user is halfway across the road, to stop new user initiating crossing when time is limited. However this means there is no homing tone for the blind user, Besmart solves this.



Step 5 *Crossing complete*

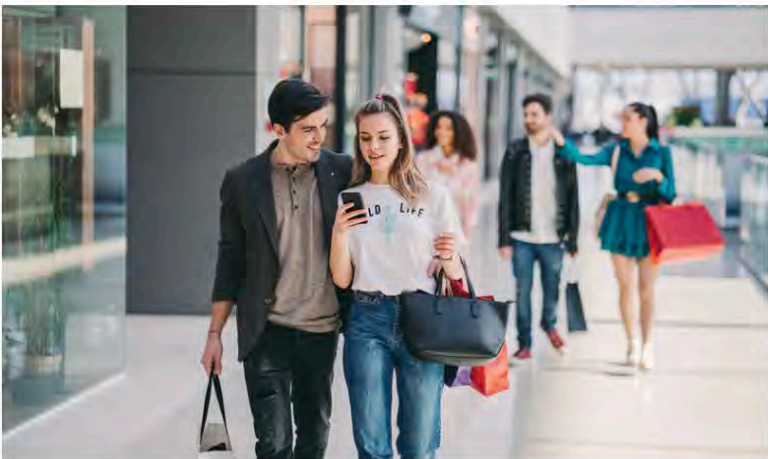
Works with existing and custom-built Android and IOS Apps

Once BlindSquare users are within range of a Beasmart device at an intersection, they'll receive a prompt through the App where they can trigger an audio cue to find the pedestrian crossing.

"A pedestrian who is blind will now be able to say 'I now know where I'm going', following the unique audio tones, clear enough that 'I can tell not only where, but how far I need to walk!' Ilkka Pirttimaa, MIPsoft CEO, creator of BlindSquare

"I have moved from fearful caution, to an independent state receiving information previously only available to me with a sighted guide. The daily risks in my simple travel now abated," one user said.

Possible applications of the Beasmart beacon are limitless, given its way-finding possibilities. Users can approach any piece of infrastructure, automatically connect and receive information and interact with that infrastructure.



Beasmart has been developed in partnership with CSL Infrastructure (CSLi), an infrastructure company that supplies and installs transport technology in New Zealand, with the firmware, programming and cloud services created by Adroit. And then enabled for BlindSquare, the World's most popular GPS-app developed for people who are blind or have low vision. BlindSquare describes the environment, announces points of interest and street intersections as you travel.

"The collaboration between CSLi, Adroit and BlindSquare bring the combination of a robust infrastructure and technical team, the market-leading App for the vision impaired together with the smarts of an IoT and new development industry leader, making us the ultimate full package for an end-to-end provider," CSLi Director Scott Hammond says.

Ulrich Frerk of Adroit says the businesses share one common vision: to join forces and build smarter accessible cities.

To find out more about the Beasmart beacon please contact us at

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