The Smart Cane Program

Building Confidence and Community

February 27th, 2017

WELLESLEY

BOSTON UNIVERSITY

BABSON

next generation
MOBILITY CHALLENGE
TOYOTA + NET IMPACT

Our Team

We are an innovative, diverse group of students

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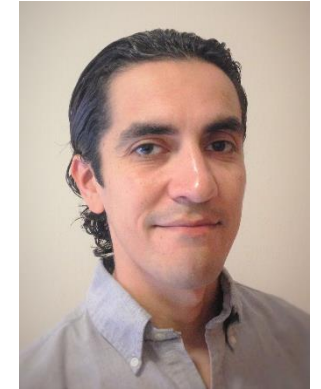
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Executive Summary

How can we help seniors navigate safely and engage with their community?

Our main **goal** is to enhance mobility and confidence for the elderly and individuals with physical limitations by **connecting** them to people with similar interests and destinations, making their journeys secure and fun.

The Smart Cane Program promotes **autonomy**, **safety** and **community building** by helping people to navigate in cities with the assistance of artificial intelligence and DSRC technologies, as well as facilitating social encounters, new relationships and outdoor activities.

Content

1. Problem definition

2. Project Design
   - Product Features
   - Target Audiences
   - Direct Outcomes
   - Implementation Schedule

3. Potential Challenges

4. Expected Results

5. Mentoring and Evaluation

Problem Definition

**Elder population willing to go places
but vulnerable when navigating in cities...**

- Physical disabilities: motor, eyesight, hearing

- Disorientation while walking or using transit

- Fear to go out alone, insecurity

- Lack of companion

Opportunity Elder population (65+ years old)
will grow significantly:

2 billion people worldwide by 2050*

*Source: United Nations: World Population Ageing. Retrieved from:
http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pd

Val

AGE
85

WANTS   COMMUNITY   FREEDOM   ENGAGEMENT
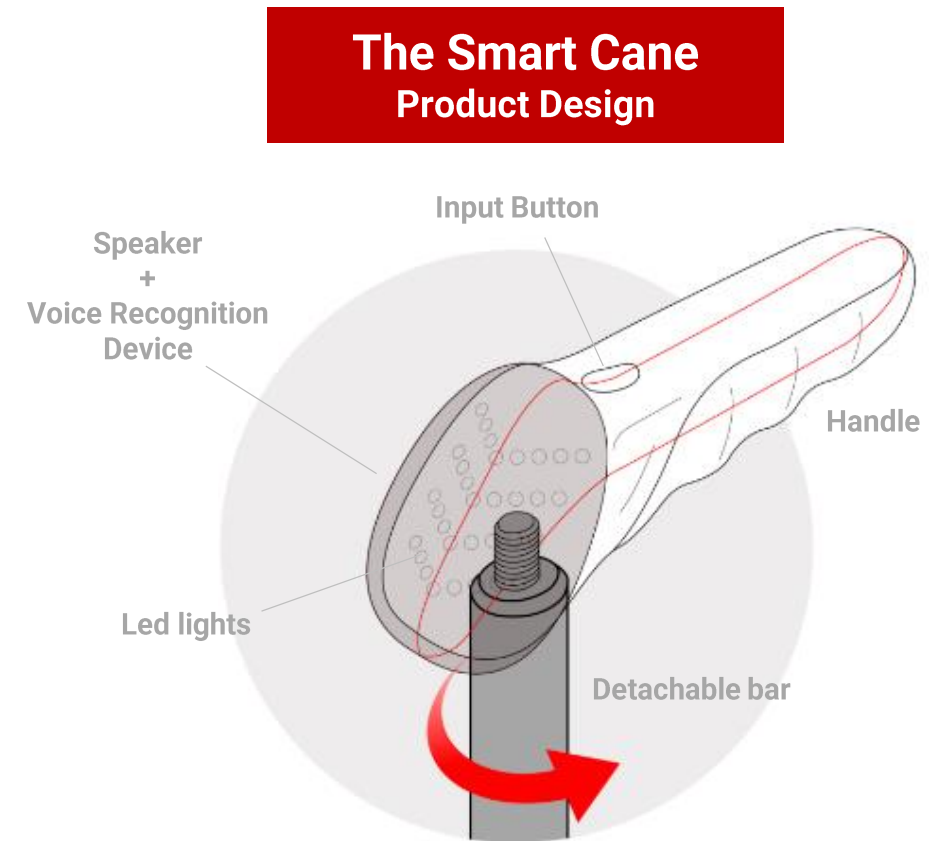
Project Design

Human-Centered Product Design

- **Simple, easy to use**

- **Various modes of use + accessories**

- **Voice recognition and GPS technology**

- **Dedicated Short Range Communications (DSRC)**

- **Compatible with Toyota Project Blaid**®

Plus...

- **An App for volunteer signups to assist Smart Cane users**

  Volunteers can participate by matching their daily journeys with those from users of The Smart Cane Program. They will get rewards such as frequent flyer miles, supermarket points, discounts on transportation, among other perks, from enterprises and foundations as part of their social responsibility programs.
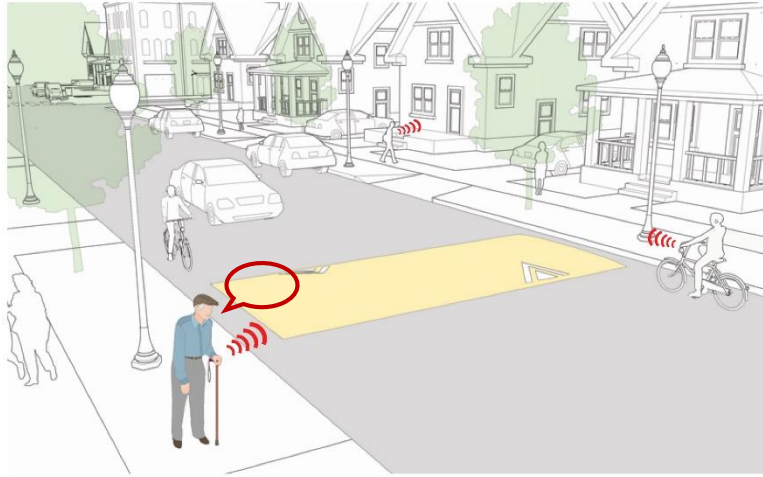
The Smart Cane
Product Design

Input Button

Speaker + Voice Recognition Device

Handle

Led lights

Detachable bar

Image© by Ruben Cerón – Boston University | Master of Urban Affairs 18'

Project Design

How does The Smart Cane Program work?

1

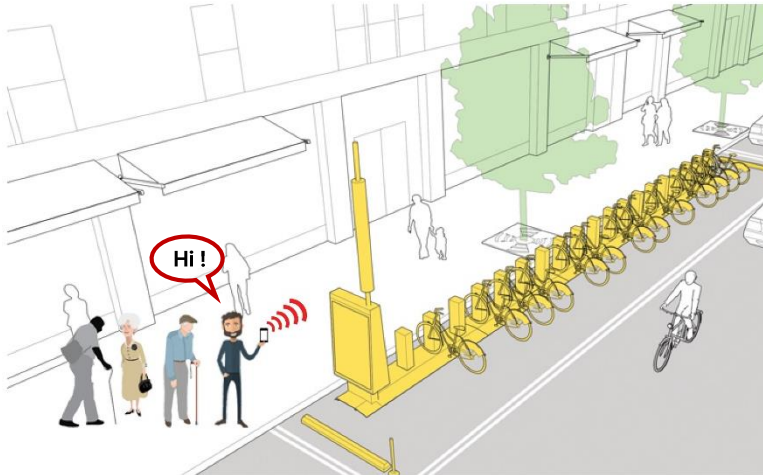Start a journey telling your Smart Cane where you want to go or what you want to do

2

Your Smart Cane will walk you through with verbal directions and connect you to people with similar interests and destinations!
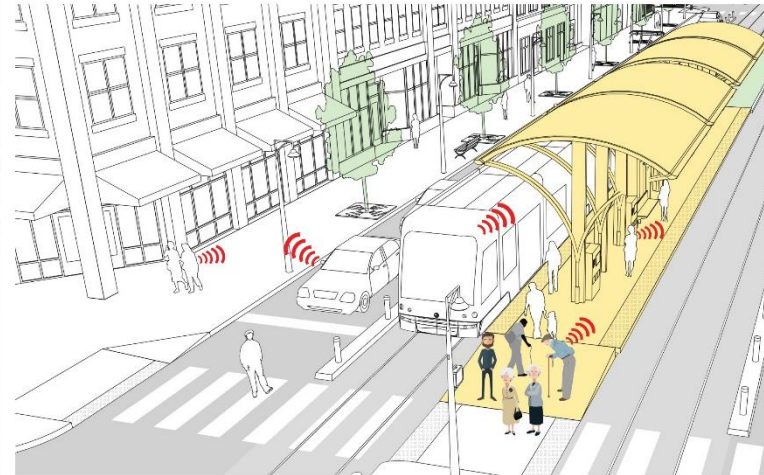
3

You can also meet young people* willing to assist you in your journey if you want

*Volunteers may find senior citizens through The Smart Cane Program Volunteer App

4

Your Smart Cane + Volunteers + DSRC will safely guide you throughout your journey!

Product Features

Representation of process sequence

Accessories

- Earbud + mic
- Necklace
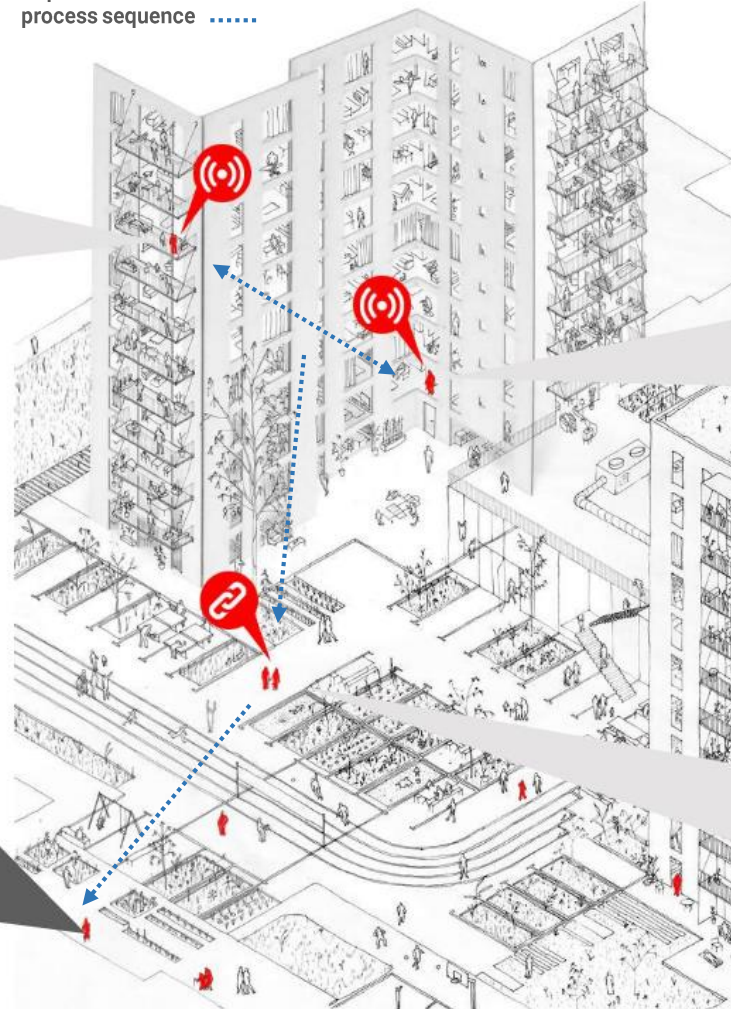
Simple

- Single button for verbal input
- Vibration and led lights to guide users

Works with existing tech

- GPS
- DSRC
- Voice recognition
- Smart Phone App

Versatile use

- Attached to Cane
- Belt-clipped
- Wheelchair
- Walker
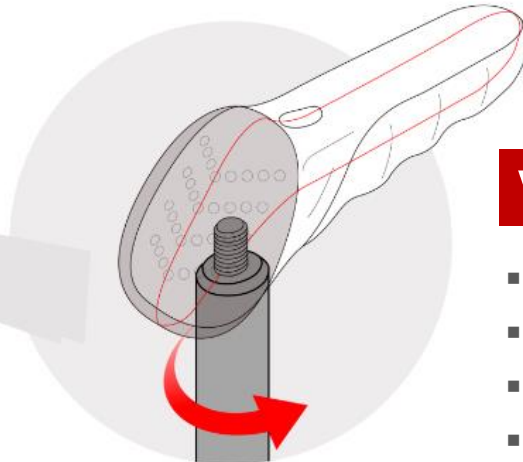
Target Audiences and Direct Outcomes

Primary Beneficiaries

- **Senior citizens (65+ years)**

- **People with physical limitations**

- **Youth**
  Volunteer Reward Program

Stakeholders

- **Local communities**

- **Municipalities**

- **Enterprises**
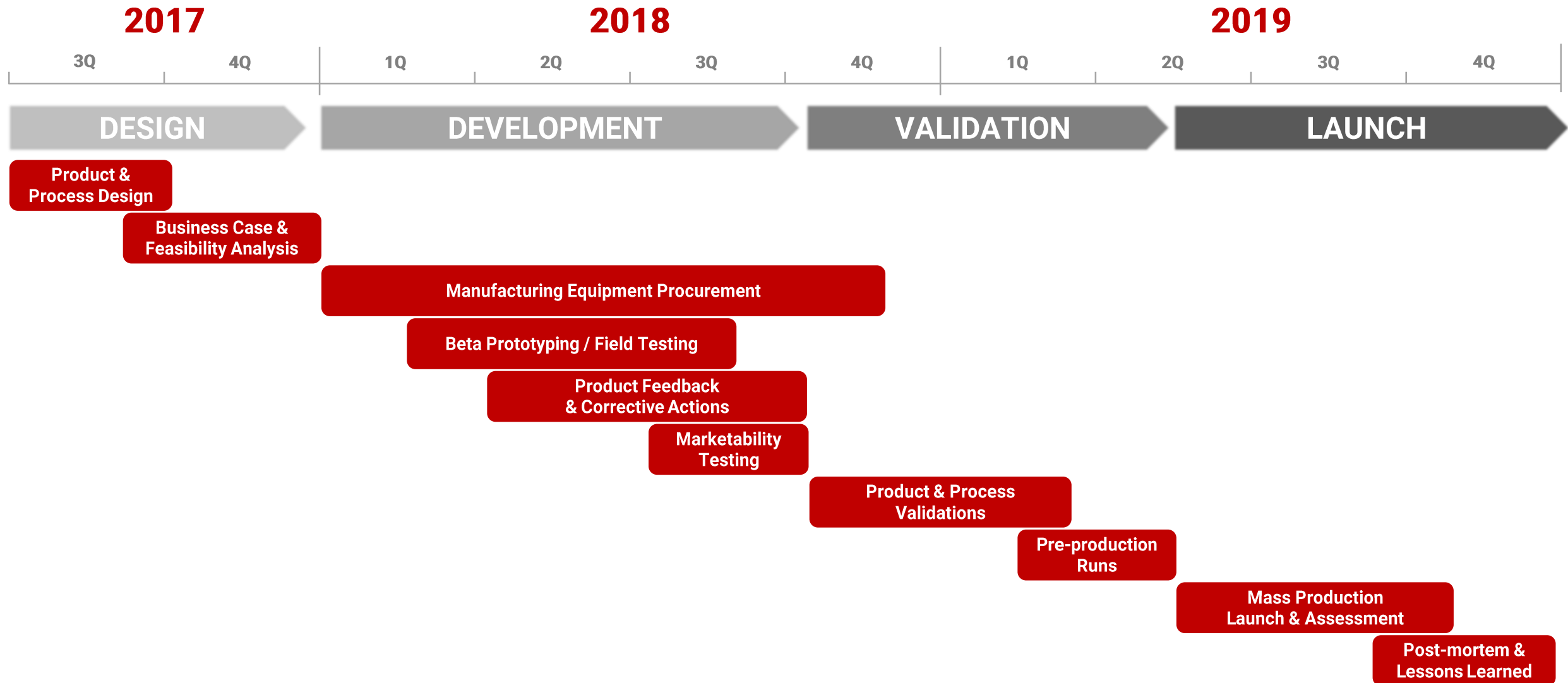 Corp. Social Responsibility Programs
  and Foundations

TOYOTA

Expected Direct Outcomes

- ✓ **Ability to travel autonomously and conveniently**

- ✓ **Community engagement through social connections via smart devices**

- ✓ **Safe journeys by means of simple directions, volunteer assistance and DSRC**

The Smart Cane Program

*Building **Confidence** and **Community***

Implementation Schedule

2017

2018

2019

| 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q |

DESIGN | **DEVELOPMENT** | **VALIDATION** | **LAUNCH**

Product &
Process Design

Business Case &
Feasibility Analysis

Manufacturing Equipment Procurement

Beta Prototyping / Field Testing

Product Feedback
& Corrective Actions

Marketability
Testing

Product & Process
Validations

Pre-production
Runs

Mass Production
Launch & Assessment

Post-mortem &
Lessons Learned

Potential Challenges

Obstacles that we foresee …

- Development cost / Affordability. Target retail price < $40 USD

- Aversion to technology

- Product limitations: Battery life, technology integration, robustness

We may find solutions by …

- Drawing on existing technology / infrastructure to optimize cost

- Using Human-Centered Design to create a senior-friendly product

- Simplifying product functions to extend battery and durability

The Smart Cane
Main Device
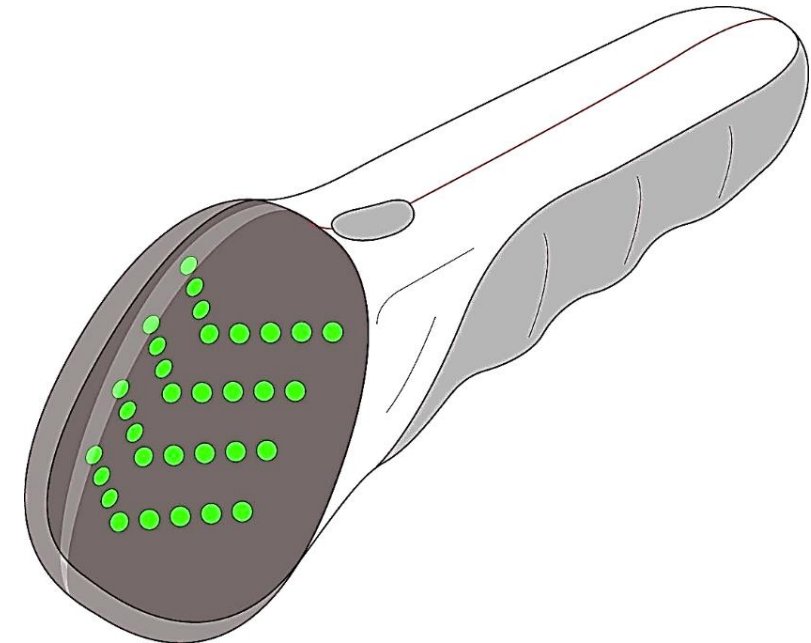
Image© by Ruben Cerón – Boston University | Master of Urban Affairs 18'

Expected Results

Short and long-term effects on society

Direct

- **Provide assistance to those with mobility challenges to safely navigate cities and enjoy life while strengthening their confidence**

- **Create a process to develop profitable and affordable technologies targeted to help those with mobility challenges around the globe**

Indirect

- **Consolidate community ties by raising awareness on the value of taking care of those in most need**
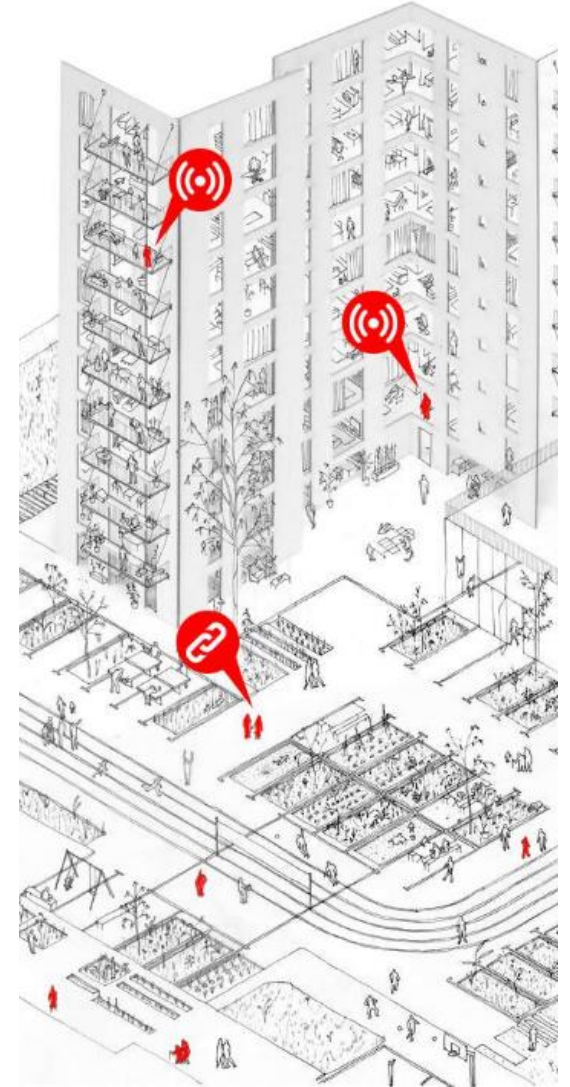
Monitoring and Evaluation

KPI's

- **Number of users (Monthly)**

- **Volunteer base growth (Monthly)**

- **Boost reward system for volunteers (Monthly)**

Monitoring + Evaluation

- **Automatic feedback mechanism in case of malfunctions**

- **Continuous improvements in hardware + software**

- **Qualitative feedback from users**

- **Data analytics to improve service and measure effects on society**

The Smart Cane Program

*Building **Confidence** and **Community***