# Empathy Tool Manual White Cane





### Welcome

#### to the White Cane Empathy Tool Manual

Please carefully read this Empathy Tool Manual before using the assisted tools or simulators.

This manual is designed to help you understand the mobility challenges faced by visually impaired individuals through the use of a White Cane as an assisted tool. Please note that you can access video demos by an orientation and mobility specialist via the QR codes above.

The Empathy Library is exhibited within the Material Resource Centre, Room V510, 5/F, Jockey Club Innovation Tower, The Hong Kong Polytechnic University.

Visit **http://empathylibrary.design** or scan the QR codes on the last page of this manual to access the digital version and for more resources.

# 03





Video Demo Constant Contact Video Demo Two-Point Touch

#### Warning:

The White Cane is intended for educational and empathetic purposes only. While it simulates the navigation experiences of visually impaired individuals, it may not fully replicate the exact challenges faced. Exercise caution while using the White Cane to prevent accidents or injuries. Avoid using the assisted device in hazardous environments or engaging in activities that may pose a risk.

#### **Disclaimer:**

The use of empathy tools does not equal the full experiences of having a disability. It is best to aim to engage with your target audience, using the tools to prepare better. The White Cane and Empathy Tool Manual are not substitutes for professional advice or comprehensive knowledge of visual impairment. Consult a qualified healthcare professional for proper medical management and therapy if you have any medical condition. Use it responsibly, acknowledging limitations and potential risks. The School of Design, the Material Resource Centre, and the creators of this simulator and manual are not liable for any injuries, damages, or misuse of the simulator.

#### **Citation:**

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# 1. Description of the Device

What disability or impairment does this tool assist with? The **White Cane** is a mobility tool designed for individuals with **visual impairments**. It assists users in detecting obstacles, changes in surface texture, and other environmental cues, helping them navigate their surroundings safely and independently.

Some of the disabilities for which a white cane may be used include:

- Total Blindness
- Low Vision
- Cerebral Visual Impairment (CVI)



(Photo Credit: Initium Media)

#### Total Blindness:

• Complete loss of vision, requiring reliance on non-visual cues for navigation and interaction.

#### 2 Low Vision:

- Light Perception: Ability to detect light but not perceive movement or identify objects. Individuals can distinguish between light and dark but not shapes or details.
- **Motion Perception:** Ability to detect motion within close proximity but cannot identify objects or read. Vision is limited to sensing movement within a few feet.
- **Finger Counting Vision:** Ability to count fingers at a close distance but not much more. Vision is slightly better than motion perception but still severely limited.
- **Mobility Vision:** Enough vision to aid in walking and avoiding obstacles, but significant assistance needed for detailed tasks. Visual acuity ranges from 0.02 to 0.05 on the standard eye chart.
- **Tunnel Vision:** Also known as peripheral vision loss, this results in a narrowed field of vision. Individuals may see clearly within a small central area but cannot perceive objects outside this range.
- **Central Vision Loss:** Ability to have side vision but can't see detail in the center of one's field of vision. Indivisuals may have one or more dark or blurry spots.

#### 3 Cerebral Visual Impairment (CVI):

• Caused by damage to the visual processing areas of the brain. It can result in various visual impairments, including difficulties with visual attention, object and face recognition, and navigation in complex environments. Individuals with CVI may have fluctuating vision and difficulty with visual clutter, despite structurally normal eyes.

## 1. Description of the Device

What disability or impairment does this tool assist with? A long white cane is the mobility aid most people who are blind or have low vision choose to use. As it is so widely used, the white cane has become an internationally recognised symbol of blindness and low vision.

Despite commonly being called white canes, canes come in a range of colours and are also made from different materials. Sometimes, you may find different colours of the cane. Visually impaired persons would like to stick some fluorescent stickers on the cane to allow the passengers and drivers to see them more easily. Additionally, deafblind persons (those having both visual and hearing impairments) would use the cane in red and white colour.



(Photo Credit: Hong Kong Society for the Blind)

#### Key Features:

- **Material:** White canes are typically made from lightweight, durable materials such as aluminum or fiberglass, providing both strength and ease of use.
- Grip: They come with a comfortable handle, often equipped with a wrist strap for added security.
- **Tips:** White canes come with various tip styles, each designed to assist with navigating different types of terrain:



**Pencil Tip:** A thin, pointed tip that provides tactile feedback for detecting small changes in surface texture.



**Ball Tip:** A larger, rolling tip that is ideal for smoother surfaces and can help the user glide over cracks and bumps more easily.



**Marshmallow Tip:** A rounded tip that offers a good balance between tactile feedback and ease of movement over different surfaces.

Understanding the different types of white canes and their features can greatly aid in designing more inclusive environments and products, ensuring they meet the needs of individuals with visual impairments.

# 1. Description of the Device

Public Facilities for Visually Impaired Persons Hong Kong has implemented several public facilities to aid visually impaired persons (VIPs) in navigating their environment safely and independently.



Architectural Services Department Best Practices and Guidelines [3]

#### Electronic Audible Traffic Signals (eATS)

The function of electronic audible traffic signals (eATS) is to provide indication to the visually impaired persons on the prevailing pedestrian signals. These signals emit sounds to indicate when it is safe to cross the street. The sound changes in volume and frequency based on the ambient noise to ensure it is always audible.



(Photo Credit: Transport Department)



Tactile unit with a vibrator and directional arrow at the bottom (Photo Credit: Transport Department)

#### **Tactile Guiding Paths**

In large external areas and connecting spaces where access for the visually impaired can be rather challenging, tactile guide paths and detectable cues are particularly useful to facilitate orientation and way finding.



Directional tile with parallel raised bars laid along the travel direction



Hazard warning tile with raised dots arranged in square grid parallel to the sides of the tile, laid perpendicular to travel



Positional tile with staggered dots positioned at junction of tactile guide path to indicate possible change in travel direction

#### **Braille Plates**

To assist visually impaired persons, braille information on directional arrows and floor numbers are provided at the barrier-free access facilities such as the handrails or lifts.



Braille information on top handrail to identify the location and indicate travel direction



Tactile map with text, Braille and graphic information

# 2. Use & Operation

How to use it?

To experience the mobility difficulties that a visually impaired person may face, follow these step-by-step instructions:

#### **1** Folding and Unfolding:

• **Unfolding the Cane:** Hold the rubber handle securely in one hand. Pull the elastic loop up to release the sections with the other hand. The cane will extend into a straight line.





• **Folding the Cane:** Hold the rubber handle with one hand and pull the nearest section away from you with the other hand. Fold the sections together sequentially. Slide the elastic loop over the folded sections to secure them.





#### Grip:

Hold the cane in your dominant hand, centered in front of your body.

Common grips include:

- Index-Finger Grasp: Your index finger points down the shaft of the cane while your thumb and other fingers wrap around it.
- Handshake Grasp: Grip the cane as if you are shaking hands with it, with your thumb on one side and your fingers on the other.
- **Pencil Grasp:** Hold the cane as you would a pencil, with your fingers wrapped around the shaft and your thumb providing support from the other side.



Index-finger grasp



Pencil grasp



Handshake grasp

#### Movement:

- Start by practicing while standing still to understand the cane's movement and rhythm.
- Move the cane with wrist and finger movements only; **keep your arm still**.
- Sweep the cane in an arc slightly wider than your shoulders.

# 2. Use & Operation

How to use it?

#### 4 Contact/Touch:

Scan the QR code to watch videos of the two techniques demonstrated by a certified Orientation & Mobility Instructor. Alternatively, search for the video title respectively on YouTube.





Video Demo Constant Contact Video Demo Two-Point Touch

• **Constant-Contact Technique:** Let the cane tip slide continuously along the ground.



Blind on the Move. (2020, May 11) [1]

• **Two-Point Touch Technique:** Tap the cane tip with each arc, keeping it no more than an inch off the ground.



Blind on the Move. (2020, May 12) [2]

#### Rhythm:

- Move the cane in rhythm with your feet. When your **right foot is forward**, the cane tip should touch the ground on the **left** side, and vice versa.
- If tapping, **each step should correspond to one tap**. Keep a **light touch** to gather information about the terrain and obstacles.





#### Adjust and Practice:

- Practice without a blindfold first to build familiarity with the cane's mechanics, then gradually introduce the blindfold for a more realistic simulation, always ensuring safety and supervision.
- Adjust to the feedback from the cane and practice moving in different environments to understand how it interacts with various surfaces and obstacles.

# 3. DOs & DON'Ts

How to embrace and avoid?

### DOs



**DO** take the time to read and understand the information provided about the white cane and its use.



**DO** ensure you are in a spacious area to avoid hitting people or fragile objects.



**DO** ensure that the cane is properly fitted and adjusted for a secure and comfortable fit.



**DO** engage in various activities to experience the navigation challenges associated with visual impairments.



**DO** share your experiences and insights with others, fostering discussions and empathy.



**DO** use the cane as a tool to inform your design process and develop inclusive design solutions.



**DO** engage with visually impaired individuals during the design process to gain valuable insights and feedback.

### DON'Ts

**DON'T** engage in activities that require precise vision, such as driving, operating machinery, or performing tasks that may pose a risk to your safety or the safety of others.



**DON'T** use the cane as a substitute for professional training or guidance from certified mobility instructors.



**DON'T** misuse the cane or engage in any activities that may cause damage to the cane or others.

**DON'T** assume that the simulated experience fully replicates the actual navigation challenges of individuals with visual impairments.



(Photo Credit: Hong Kong Society for the Blind)

# 4. Suggested Exercises & Scenarios

How to build empathy with the users?

You can conduct many exercises and experiments with this white cane to better understand the daily life and challenges of a visally imparied person. We will suggest a few examples for you to start with; however, to better understand and ultimately become a better designer, you should try to design your own scenarios. The more specific and unique your scenario and experiments are, the more chance your research will lead you to a novel design breakthrough!

#### First, let's try some simple exercises:

Before you try a complex scenario, you should get used to the movement of the white cane and adjust accordingly. Here are some suggestions of basic tasks:

- **Try walking along a tactile paving.** Explore and feel different texture of the floor using your cane and your foot. Then try to sweep or tap your cane from side to side across the paving. Notice the tactile difference of different tactile paving. You may need to respond differently for warning paving.
- **Try walking up and down a ramp or a stair along a handrail.** Notice the difference between a ramp and a stair; walking down and up.
- **Try traveling through closed doorways.** Use your cane to detect changes to identify a doorway. Try different ways to position yourself so that you are in front of the door.

#### Next, let's try a scenario.

Imagine you are a visually impaired student in the School of Design and must get to your class. There are several challenges within this scenario: you may need to navigate yourself on campus and inside the building, use the elevator to get to your classroom, locate your classroom by looking at the infographics or by asking others for direction. Throughout the process, try to focus on all your senses that can help you to perform all the tasks. For example, paying attention to tactile changes through your cane, your foot, and your fingertips; be mindful of environmental sound.

Next, you should try and design your own scenario, **Re-read section 1.1 What disability or impairment does this tool assist with**. You could try applying one of these conditions to your experiment, wear the corresponding vision impairment simulator (glasses) or blindfold. To help you get started, you could try simulating:

- Walk inside a park, or;
- Navigate through a footbridge, or;
- Take public transport (MTR), or;
- Shopping at a convenient store or supermarket.

Remember to consider this research tool from multiple perspectives. You can empathise with the primary user or with the assistant or attendant who may be helping the user.

You can practice how to guide and communicate with a visually impaired person by switching roles with your peer. When guiding, let the person hold your arm just above the elbow. Walk slightly ahead, keeping a steady pace that matches their comfort. Use your cane to detect terrain changes and provide verbal cues for obstacles or narrow paths.

For more detailed guidance on how to assist a visually impaired person, refer to the *Hong Kong Society for the Blind's* resources on proper guiding techniques.



(Photo Credit: Hong Kong Federation of the Blind)



Guiding Techniques by Hong Kong Society for the Blind [4]

### 5. Designing for Intersectionality by Combining Empathy Tools

How to build empathy with the users?

As design students, it is essential to recognize that the individuals we are designing for may often have more than one impairment or condition. While the simulators provided in this manual offer valuable insights into specific aspects of the user's experience, it is important to remember that real-life situations can be complex and multifaceted.

To deepen your empathetic design methods and create more inclusive, innovative, and original solutions, we encourage you to consider using **a combination of empathy tools**. By combining simulators, such as wearing the Aged Simulation Suit along with a wheelchair simulator or a vision impairment simulator, you can gain a more comprehensive understanding of the challenges faced by individuals with multiple impairments or conditions.

By embracing this holistic approach, you will be better equipped to develop designs that address the diverse needs and experiences of your target users. Remember, empathy is at the core of meaningful design, and by continually expanding your understanding and perspectives, you can create truly inclusive and impactful solutions. Have you thought about using this simulator along with:



Vision Impairment Simulation Glasses



Hearing Impairment Simulator



Aged Simulation Suit



Arthritis Simulation Gloves

These are just some suggestions; you can get creative and try to create any combination of empathy simulators, including your own DIY simulators.





### Reference

- 1. Blind on the Move. (2020, May 11). How to Use a White Cane Constant Contact Blind and Visually Impaired [Video]. YouTube. https://www.youtube.com/watch?v=WuOmcog\_tsc
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# Empathy Tool Library

#### **Digital Version**



**Project Website** 





