Improving Wayfinding and Safety for People with a Vision Disability

Montgomery County Department of Transportation
Toole Design Group
Metropolitan Washington Council of Governments

Meeting Goals

- Introduce project and inform you of future public input opportunities
- Develop understanding of people with vision disabilities and how they navigate
- Get feedback from people with vision disabilities on the navigation challenges they face
- Introduce and get feedback on design principles and tools for addressing navigation challenges

Agenda

- Housekeeping
- Introductions
- Project Introduction
- Understanding People with Vision Disabilities
- Understanding the Challenges People with Vision Disabilities Face Navigating Urban Environments
- Principles and Tools for Designing for People with Vision Disabilities
- Question & Answer
- Next Steps

Housekeeping

This call (and anything posted in the chat) is being recorded!

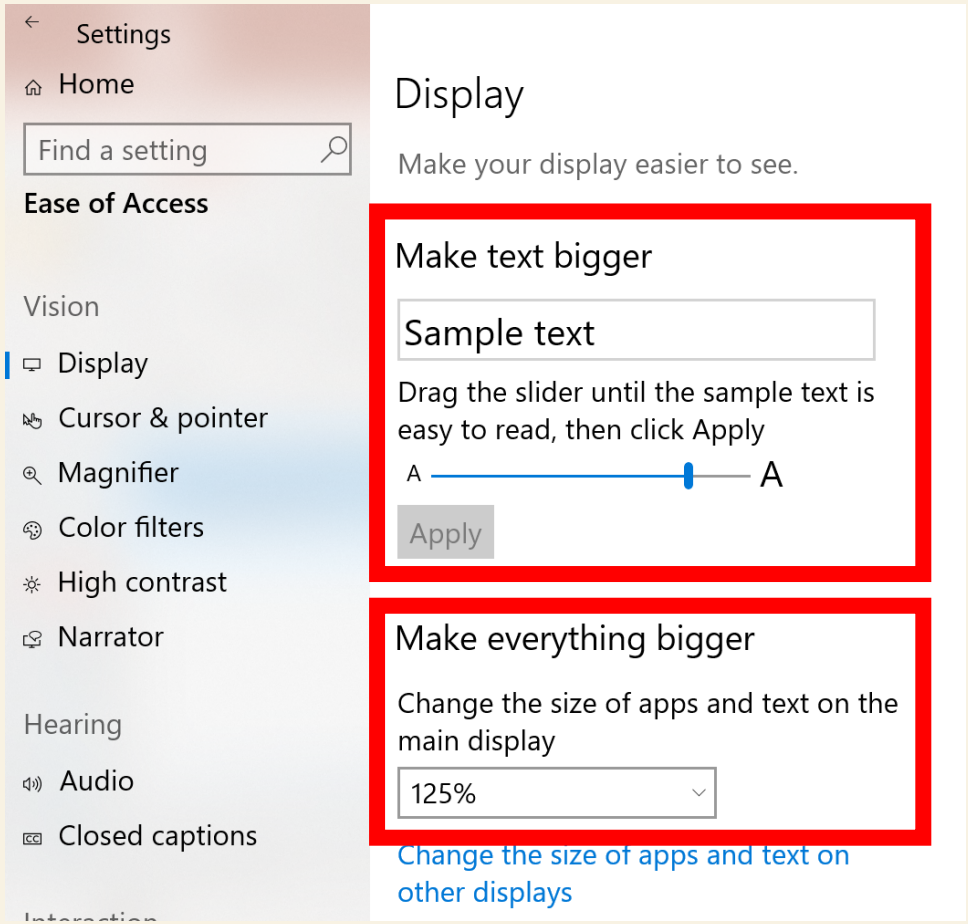
'Rules' for today's meeting

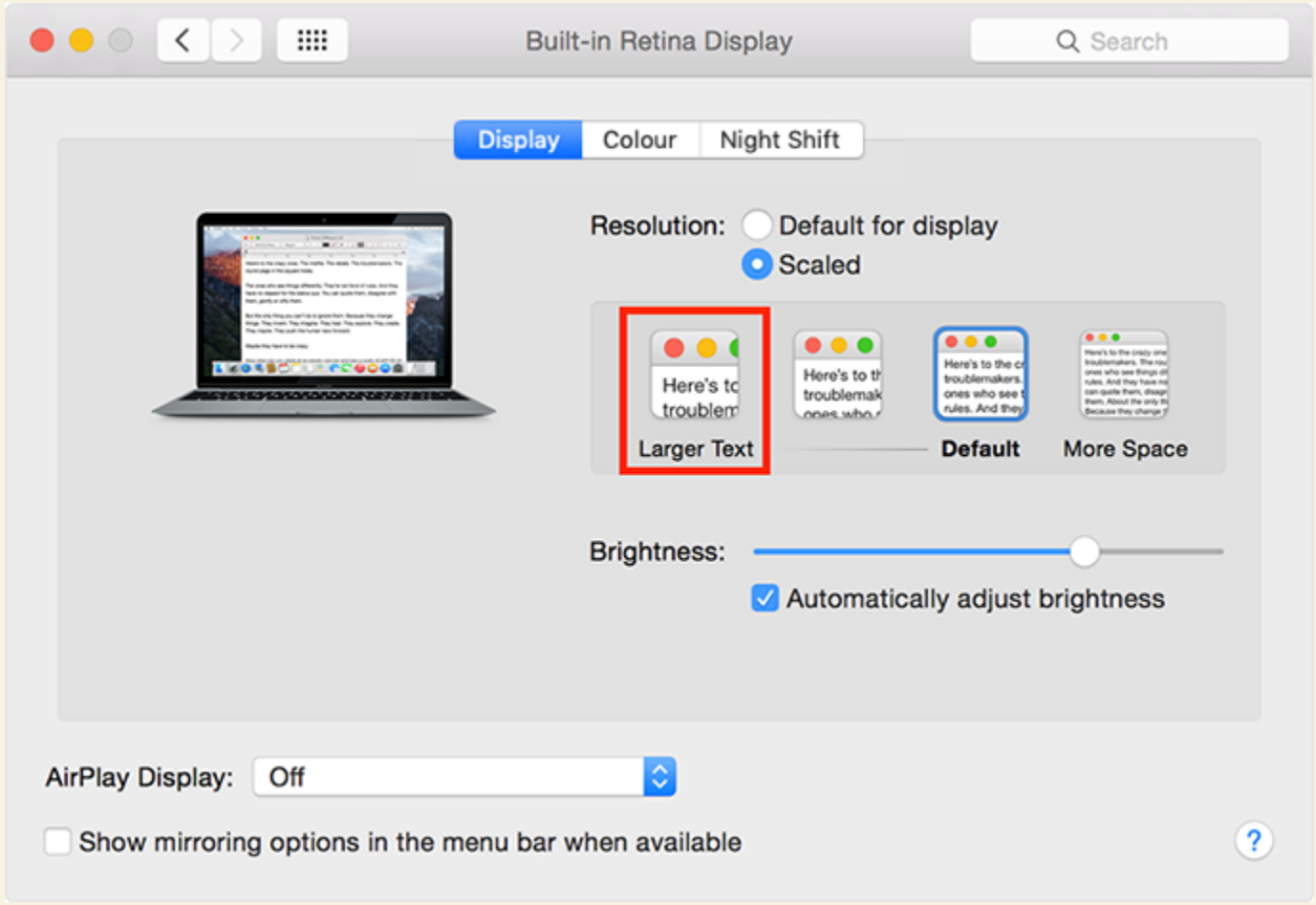
- Speak slowly and clearly.
- Be concise. Please keep remarks to 30 seconds or less.
- Identify yourself.
- If referencing a slide, describe what is being referenced.

Zoom Etiquette

- Everyone is muted upon entry.
- Use Zoom’s raise hand feature if you would like to speak.
- Before you speak, you must unmute yourself.
- You can use the Chat feature to communicate with the meeting host if you have a question or comment.

Enlarging Text on Zoom





Windows: Settings > Ease of Access

Mac: System Preferences > Display

Please Link your Audio

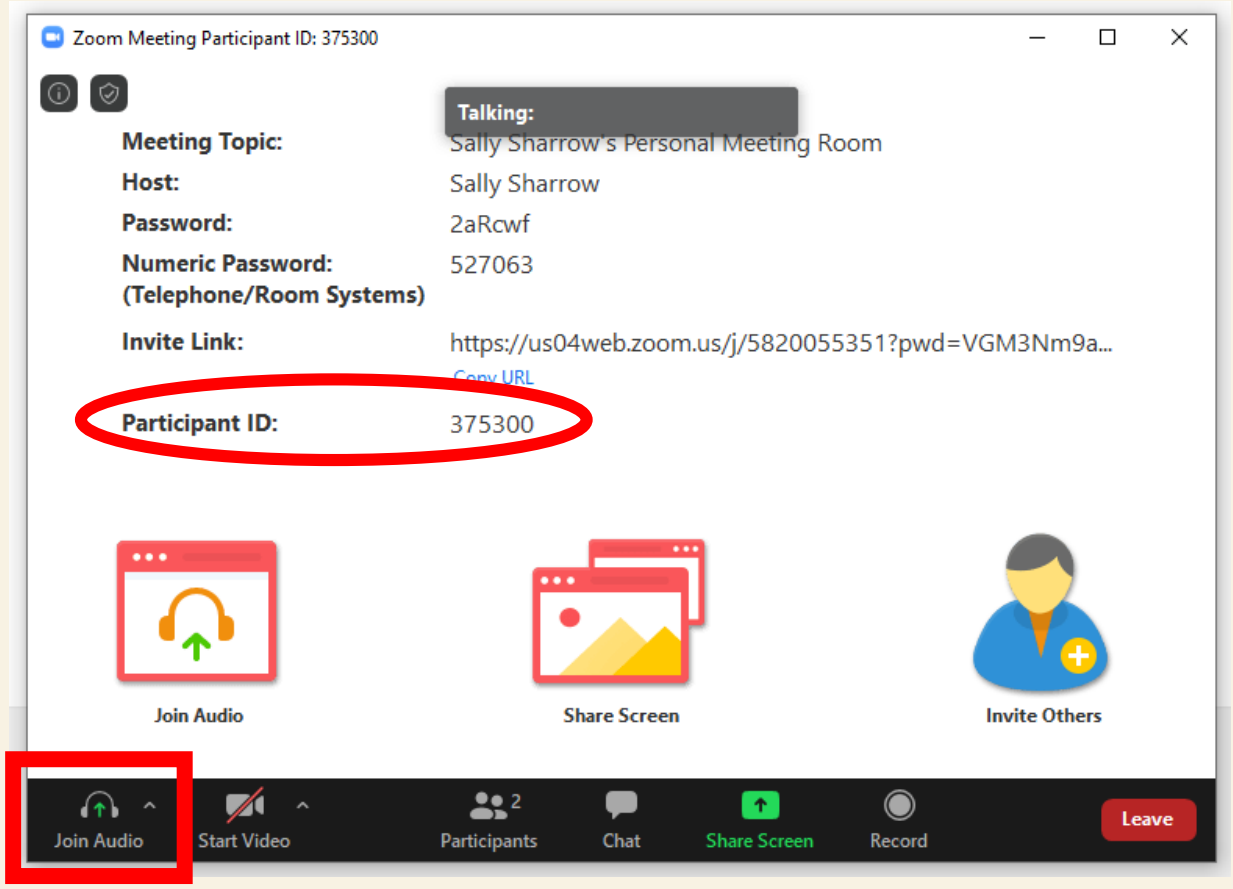
If you're listening in by **phone**, please link your phone to your computer.

Find your Participant ID on your home screen. If screenshare has started, you can find this in the audio settings.

Once you have your Participant ID, press #Participant ID#

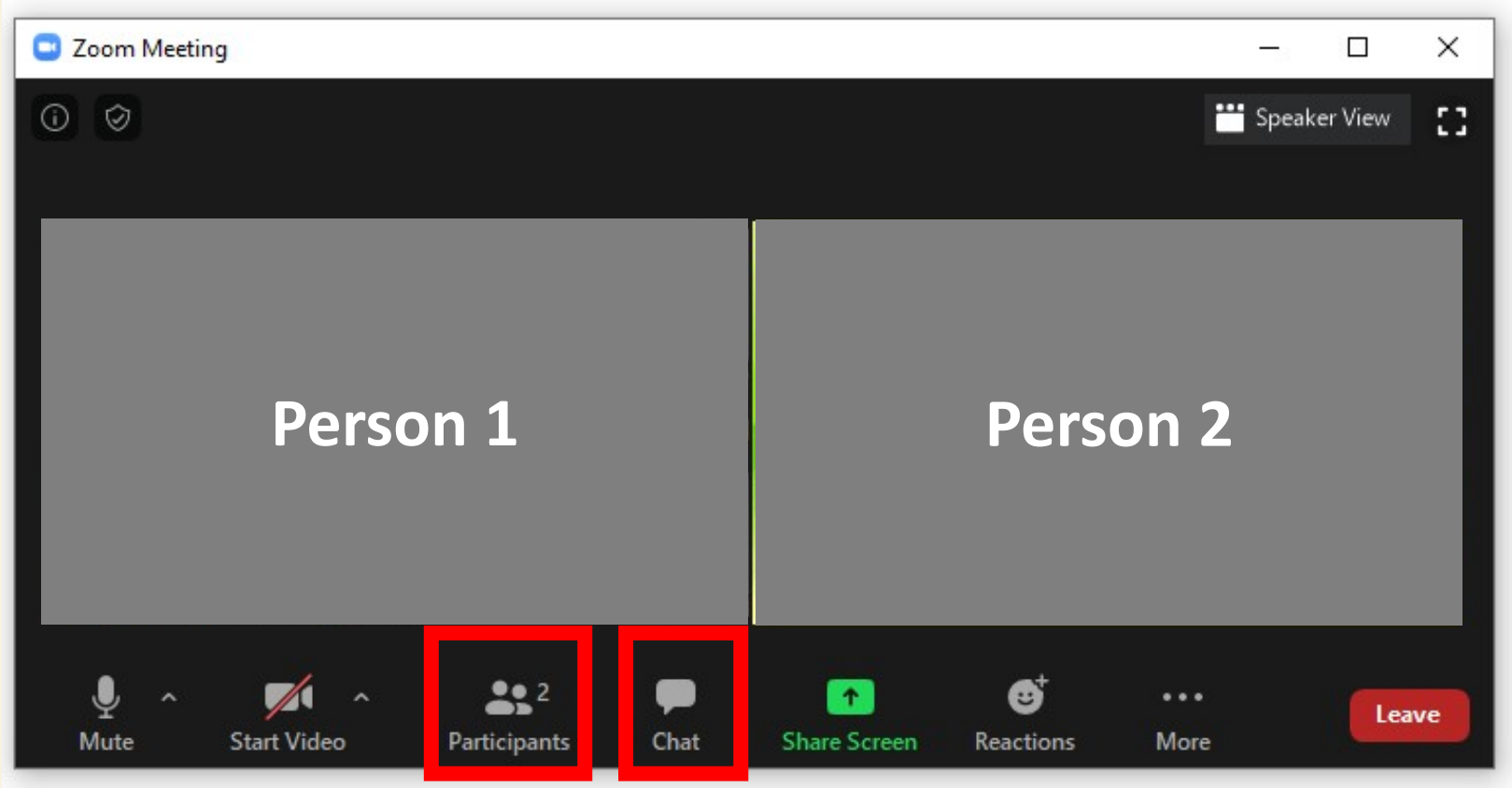
In this example, you'd press:
375300

Access Audio Settings



Find the Chat and Participants Windows

Click on the Chat or Participant icons to open the option in a new window.

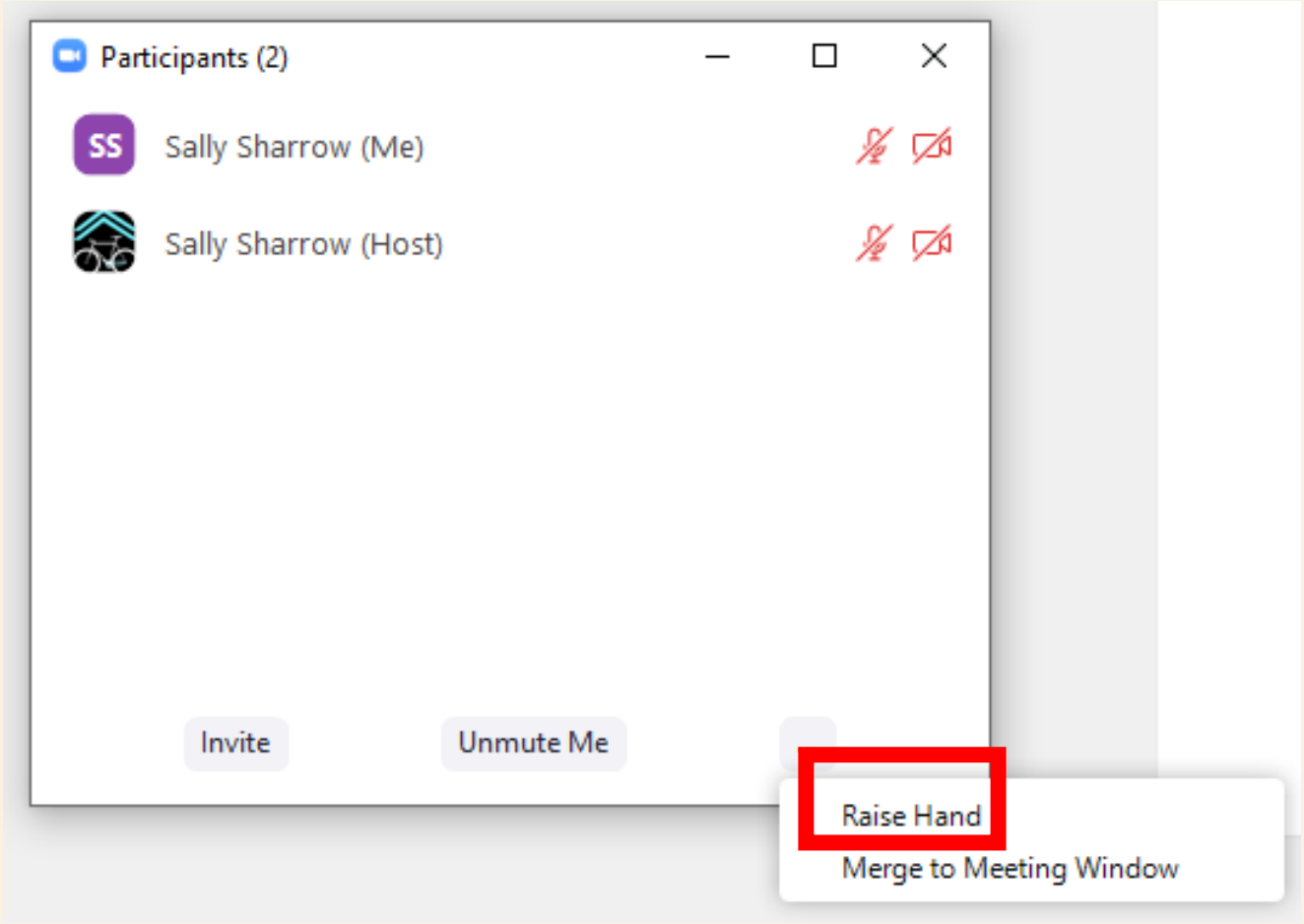


- See names of other participants
- Raise your hand

Chat with the meeting host

Raising Your Hand

- Raising your hand lets the host know you would like to speak.
- To raise your hand using your phone, dial *9
- To raise your hand on your computer, use the keyboard shortcut ALT + Y.



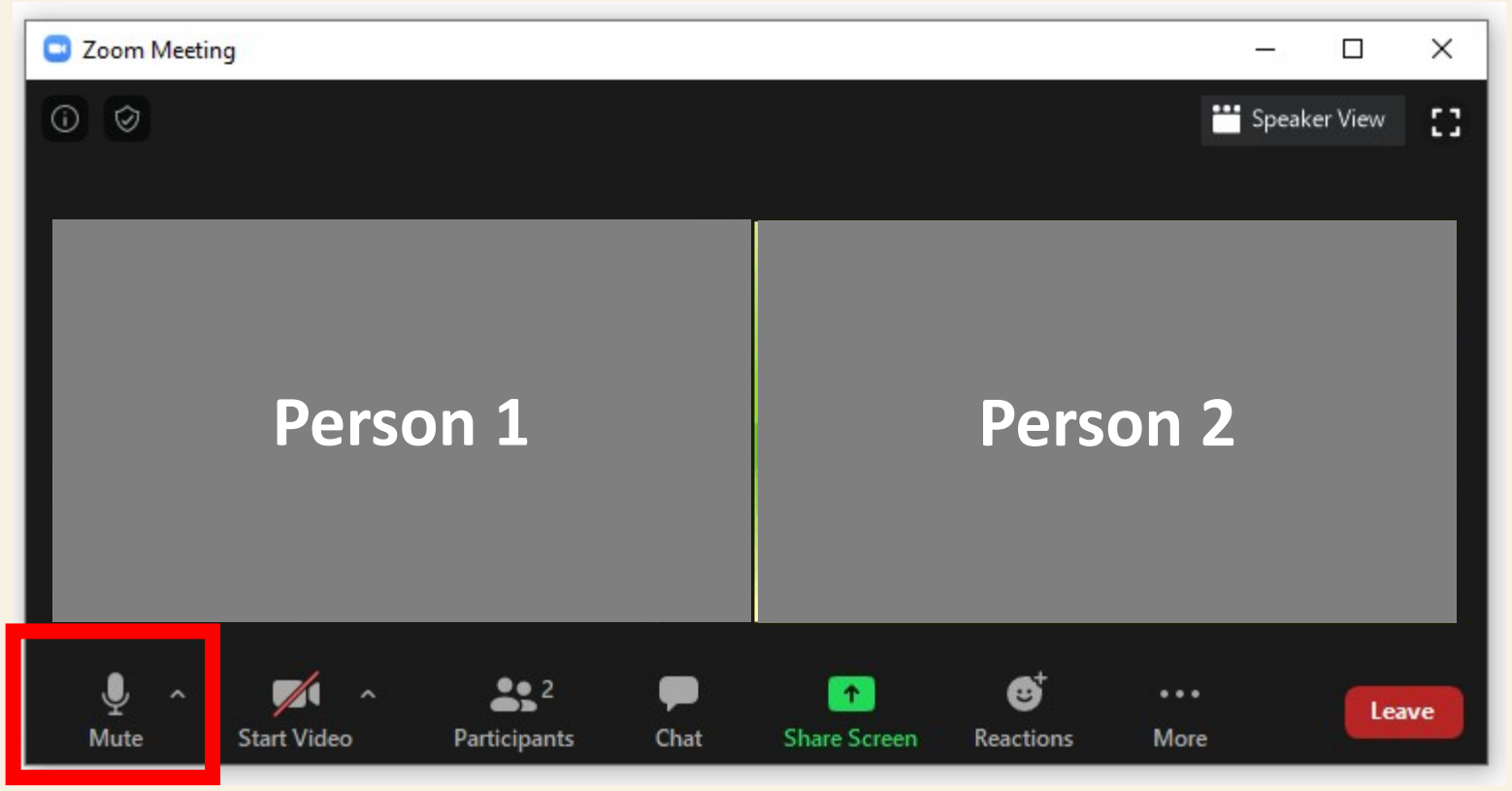
Raise your hand **if you have a vision disability or have experienced vision loss.**

- On the phone, dial *9
- On the computer, type ALT + Y

The meeting host will make a note of this on your name within the Zoom platform.

Mute On/Off

To mute or unmute yourself, dial *6 on your phone or use the keyboard shortcut ALT + A on your computer.



Mute or unmute

Introductions

Introductions

- Montgomery County Department of Transportation
  - Matt Johnson, Project Manager
  - Hannah Henn
  - Darcy Buckley

- Toole Design
  - Jim Elliott, Project Manager
  - Kan Ray
  - Katie Heuser
  - Marybeth Cleveland, COMS

- Montgomery County Department of Health & Human Services
  - Betsy Luecking
  - Shawn Brennan

Project Introduction

Project Introduction

- Scope
  - MCDOT received a grant from the Metropolitan Washington Council of Governments (COG) to undertake a study of how the County and other jurisdictions can improve wayfinding and safety for people with vision disabilities.
  - The project will result in a toolkit of treatments for how to better serve people with vision disabilities and also a 30% design for a pilot project in Silver Spring.
  - The project must be complete by June 2021.

Project Context

- MCDOT was inspired to apply for this grant based on feedback from the Commission on People with Disabilities and other County residents related to the installation of floating bus stops in Silver Spring.
- The County has also adopted Vision Zero, which is an effort to reduce injuries and fatalities on our roadways to zero by 2030. People with disabilities are among the most vulnerable users of our roads, and special care must be taken to design in ways that improve safety and mobility for them.
- The County is also committed to reducing greenhouse gas emissions, and creating alternatives to travel by car is a key part of that.

People with Vision Disabilities

Types of vision loss

Approximately 85% of those considered legally blind have some vision

Legal blindness:

- Visual acuity is 20/200 or less in the better eye with best correction, or
- Visual field is restricted to 20° or less

Aira vision sim app simulates varies types of visual disabilities while using the phone's camera

A person wearing a black backpack walking away. She is on a wide sidewalk in an urban area. She uses a white cane in her left hand and a support cane in her right hand. (Photo credit: Toole Design)

Overall acuity loss

Image is a faded unfocused photo. The bottom part of the frame shows a white sand color and a large reddish rectangle. A smaller black rectangle is found to the left of the reddish rectangle. Dark vertical lines are found scattered throughout the photo, some short and some tall. A blurry white triangle is located on the left and one on the right. (Source: FHWA)

Peripheral vision loss

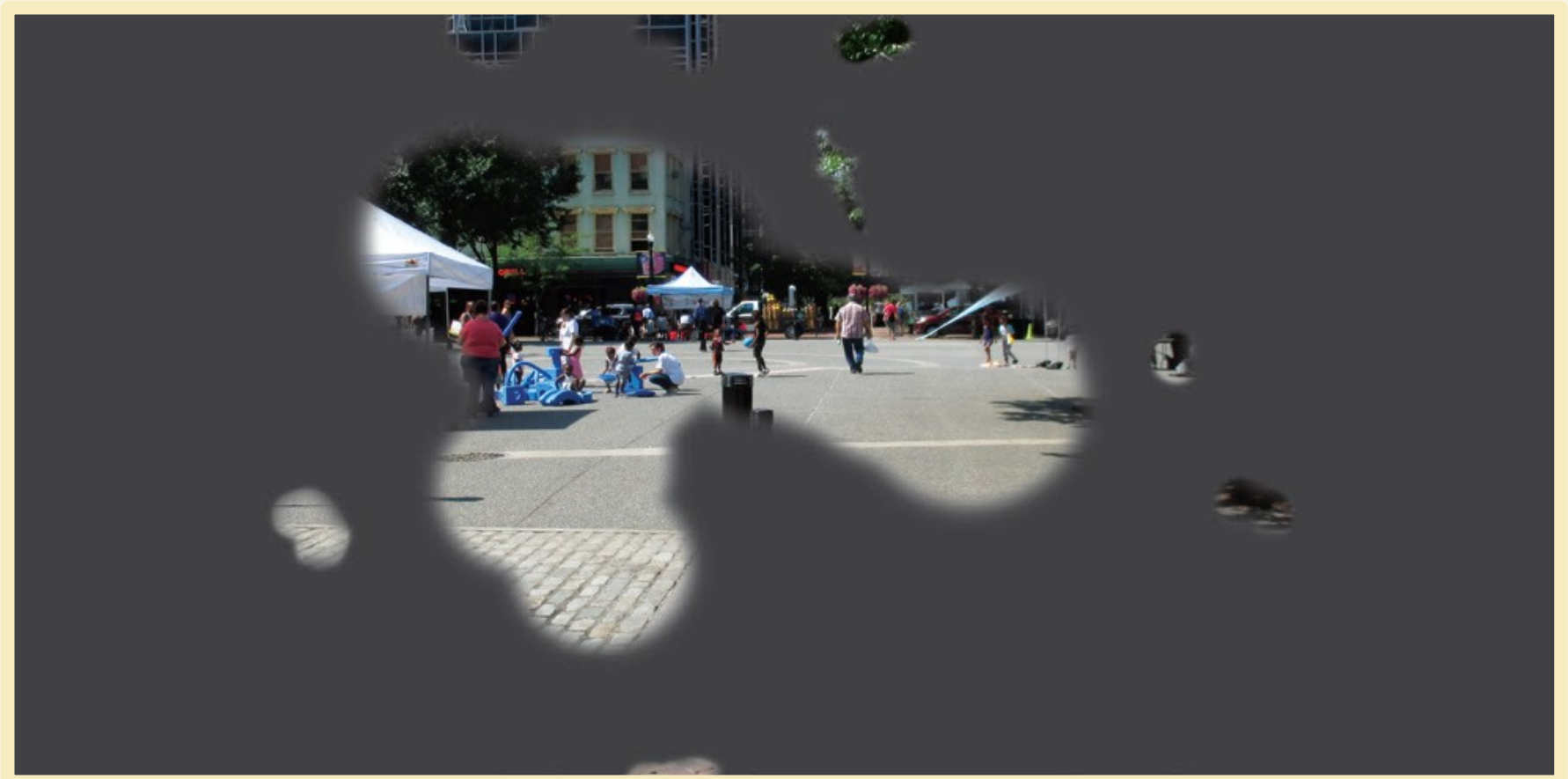


Image is a dark grey opaque rectangle with an abstract shape opening in the middle. Through the opening are people gathering in the distance. A small white and blue tent canopy is in the distance. (Source: FHWA)

Central vision loss

Image is a blur of colors including white, reddish brown, black, and a sand color. The photo has a dark circular obstruction in the center. (Source: FHWA)

Color Blindness

Image of a courtyard with colors dimmed. People stand and sit in the center, around tent style canopies. Various waist high pillars are found throughout the courtyard. Tall buildings are in the background and trees flank the courtyard. (Source: FHWA)

Total vision loss

Image is a dark grey opaque rectangle

“Normal” Vision

Photo of a courtyard. People stand and sit in the center, around blue and white tent style canopies. Various waist high pillars are found throughout the courtyard. Tall buildings are in the background and trees flank the courtyard. (Source: FHWA)

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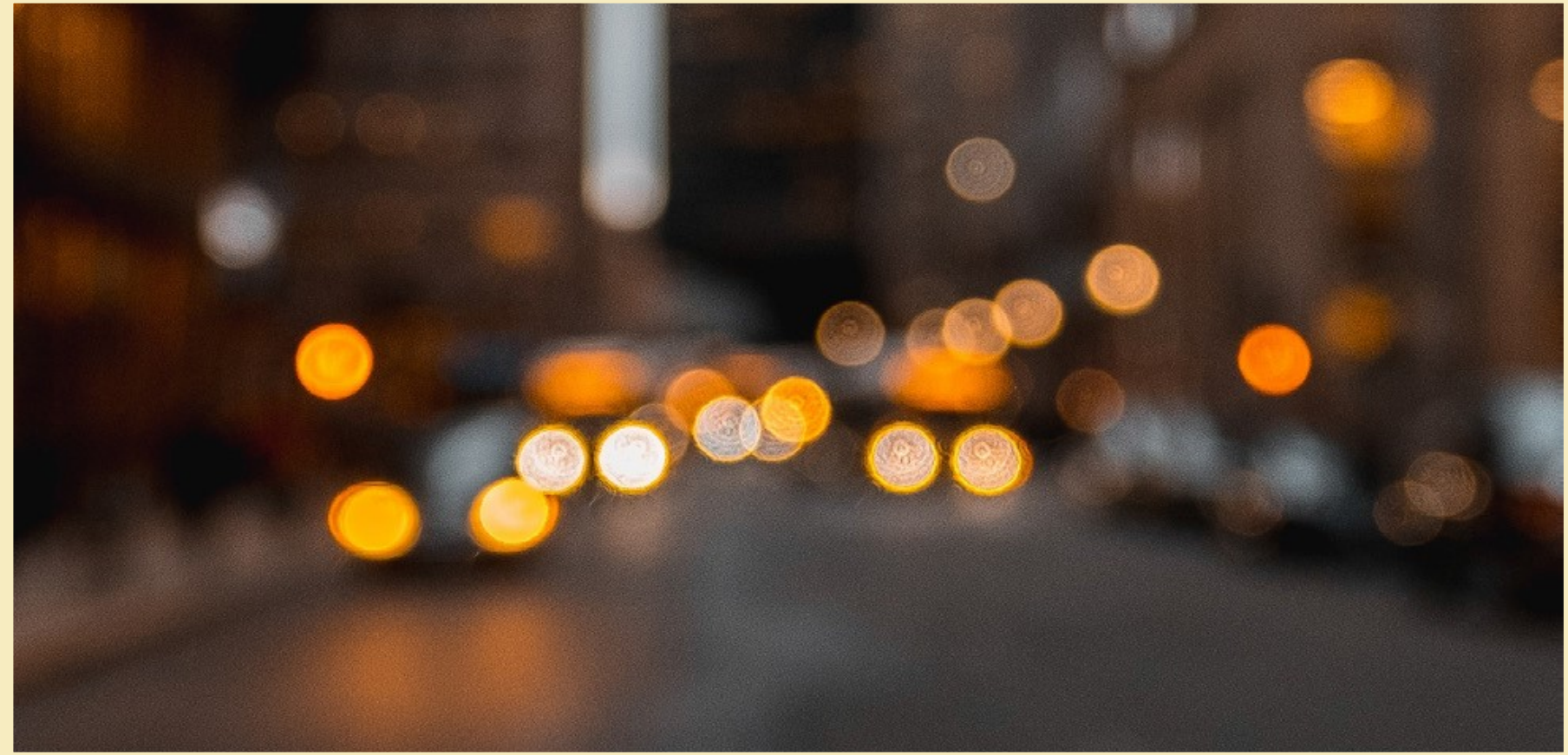
Night Blindness



Dark photo with several orange circles scattered throughout. (Source: FHWA)

Pedestrians with low vision

- May have difficulty with depth perception
  - Judging location of vehicles or obstacles in the path
  - Judging approaching speed of vehicles

- May have reduced contrast sensitivity
  - Distinguishing hole from shadow
  - Not seeing colors or color contrast accurately

- May have more difficulty in low light situations or in bright light

- May have difficulty reading or locating signs and signals

How Pedestrians Travel

- Different people travel differently — this is not determined
  by the type of vision loss

- Factors include:
  - training vs. no training
  - different characteristics such as stamina, age, health, other disabilities
  - different goals
  - different personalities
  - different household dynamics

Orientation and Mobility (O&M)

- Specific to people with a visual disability
- Getting around safely and independently is for anyone at any age
- Some people who experience vision loss receive O&M training, but not everyone knows what O&M training is or has access to training

‘MOBILITY’ includes

- Using visual skills and visual aids
  - Monocular, visor, sun filters, etc.
- Using human guide technique
- Using a white cane (also called a long cane)
- Using a guide dog
- Using technology
  - OrCam, phone apps, Miniguide, Sunu
- Crossing streets
- Using public transportation

Using Visual Skills

Visual scanning for environmental clues

- A handrail can indicate a set of stairs
- People gathered near a corner might indicate a bus stop
- Yellow surface on the street corner might be a ramp
- Dark edge of the grassline against the lightly colored sidewalk highlights the walking path
- A line of newspaper stands can indicate the close proximity of a metro station
- The large dark area could be the metro station entrance

Photo of a dark-haired woman wearing an electronic visual aid on her forehead covering the top part of her eyes. Her hand rests at her chin. (Source: Inquirer.net)

The Human Guide

- A technique used to gain assistance when navigating
- The person being guided can offer directions, but will receive assistance going around objects and locating steps
- The person being guided may need additional assistance with orientation

Photo of a woman linking arms with another woman as they walk down an urban sidewalk. (Source: Devon Live)

The cane as a tool to:

- Locate Obstacles
- Locate Landmarks
- Locate Surface changes
- Be identified by drivers and other pedestrians

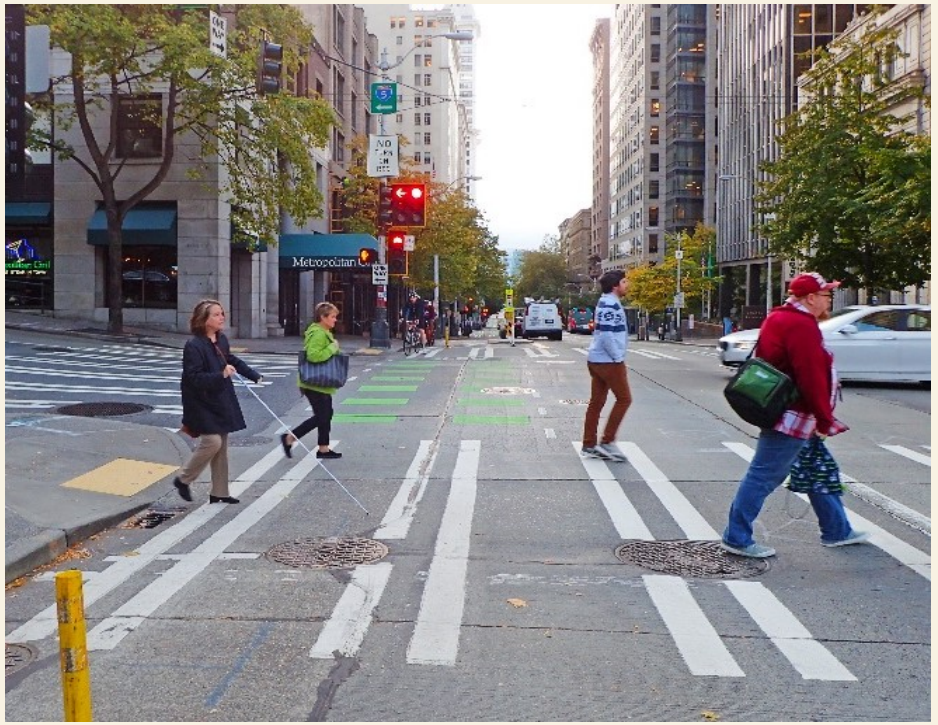
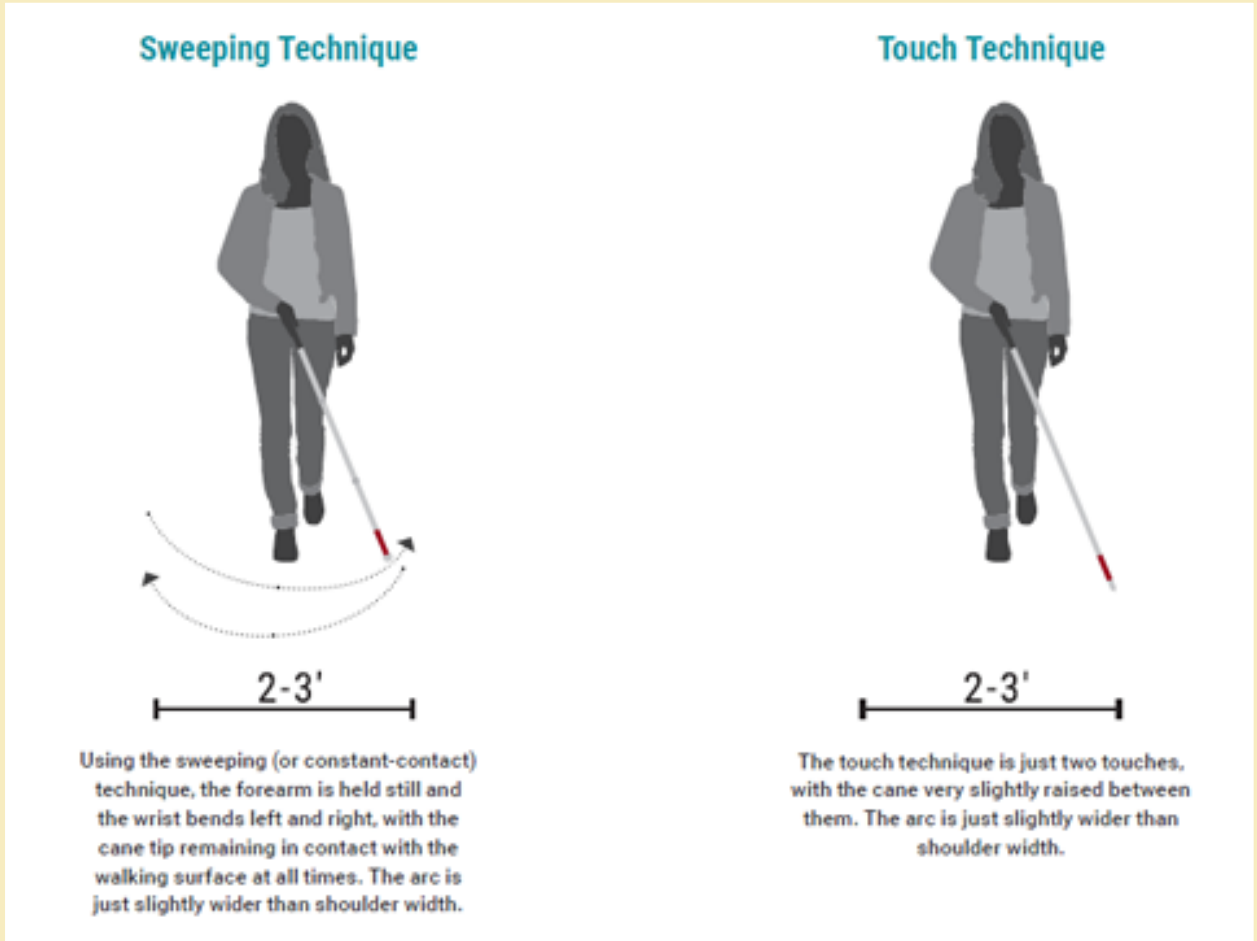


Photo of people crossing in the crosswalk on a busy downtown street. One of the people has a vision disability and is using a cane.(Source: Toole Design)

Cane Techniques and Tips



Graphic illustrating common cane techniques (Source: FHWA)

Different types of cane tips. From left to right: marshmallow tip, ball tip, pencil tip, metal glide tip (Source: APH Technology Products)

The dog is used as a tool to:

- Avoid obstacles
- Locate landmarks the handler trains the dog to find
- Alert the handler by stopping at curbs, stairs, ramps
- Go around pedestrians

A man with a guide dog walking past a bus shelter. (Source: Toole Design)

Skills needed to cross a street

- Identify the location of the street
- Interpret the traffic (using visual info and sounds)
- Determine the type of traffic control
- Locate the crosswalk button (if there is one)
- Line up
- Determine when it is safe to cross
- Initiate crossing
- Staying aligned when crossing (know how to recover from veering)
- Identify when you have reached the other side of the street

Ways to identify a street corner

- Use clues, time and distance and generalize
- An increase in traffic sounds ahead-difficult for someone with a hearing impairment to localize
- sidewalk widens(where the two sidewalks converge)
- adjacent building line disappears
- a curb or slope, detectable warning surface
- locator sound of APS

Lining up to cross

- Use of the parallel traffic sounds
- Use of visual information
  - Crosswalk lines
  - Other pedestrians
- Tactile cues
  - Curb, ramp, grass — but never line up with the ramp!
- APS tactile arrow

A large red brick sidewalk and a light-colored ramp with yellow detectable warning surface. The ramp points into the direction of the intersection, the crosswalks flank the ramp. (Source: Marybeth Cleveland, COMS)

Staying aligned during crossing

- Use sounds of the moving traffic parallel to crosswalk
- Use the locator sounds of the APS on the other side (if there is one and it is audible)
- Visual info: Crosswalk lines, traffic, pedestrians

Crosswalk across several lanes of traffic. Multiple cars line up on the far side of the crosswalk. A construction site and tall buildings are found in the distance. (Source: Marybeth Cleveland, COMS)

Concentration Required

Mobility skills take a lot of concentration and skill.

But what about orientation?

It is an added level of required concentration.

Orientation

- Asks the questions:
  - Where am I?
  - Where am I going?
  - How will I get there?
- We are all familiar with a GPS, but do you use that *everywhere* you go?
- Different types of travelers may use different types of cues in their environment

Are we there yet?

- **Visual cues:**
  brightly painted mailbox or a large potted plant
- **Tactile cues:**
  a bench, fence, handrail, or large potted plant by the mailbox can be detected with a cane
- **Auditory cues:**
  The neighbor’s barking dog can say “you are almost home!”
  Traffic level changes (increase or decrease)

Are we there yet?

- **Olfactory:**
  The strong smell of coffee is hard to miss, so it helps if you live near a Starbucks!

- **Memory:**
  Little or No visual info means memorizing all the landmarks and turns

- **Technology:**
  Phone apps (Aira, Be My Eyes, BlindSquare), GPS (Victor Reader Trek),Beacons, Some APS offer street names

Generalize the environment

- Making an educated guess with common characteristics
- When you locate a handrail, what does that mean?
  - This is a predictability that we all rely on.
- When moving around, we look for and use predictability and commonalities

Locating an unfamiliar bus stop

- Plan ahead
- Use apps and electronic travel aids
- Make an educated guess by generalizing:
  - Bus stops are often 10-20 feet from a corner
  - They may have a landing pad (a piece of extended concrete)
  - They may have a shelter
  - They may have a bus stop pole - not usually round, but can look like a no parking sign

Challenges People with Vision Disabilities Face when Navigating

People with vision disabilities face challenges navigating…

- Sidewalks
- Intersections and crossings
- Separated bike lanes and floating bus stops
- Other public spaces

We’d like feedback on the challenges you face in each area.

What do you find challenging about navigating sidewalks?

What do you find challenging about navigating intersections and crossings?

What do you find challenging about navigating bike lanes?

What do you find challenging about navigating other public spaces?

Principles and Tools to Help People with Vision Disabilities Navigate

Principles

- **Safety**—Street design advances the County's Vison Zero goals of eliminating serious and fatal 2030, with a particular focus on vulnerable road users
- **Compliance**—Street design complies with all accessibility laws and standards.

Principles (cont.)

- **Inclusiveness**—Design is developed through an inclusive planning process and seeks to address diverse user needs.
- **Consistency and Predictability**—Design is consistent and predictable. A person with a vision disability should be able to navigate a street they've never been to before.
- **Maintenance**—All street and sidewalk elements are well-maintained, including elements intended to help pedestrians with vision disabilities navigate.

Is anything missing from this list of principles that you think is important?

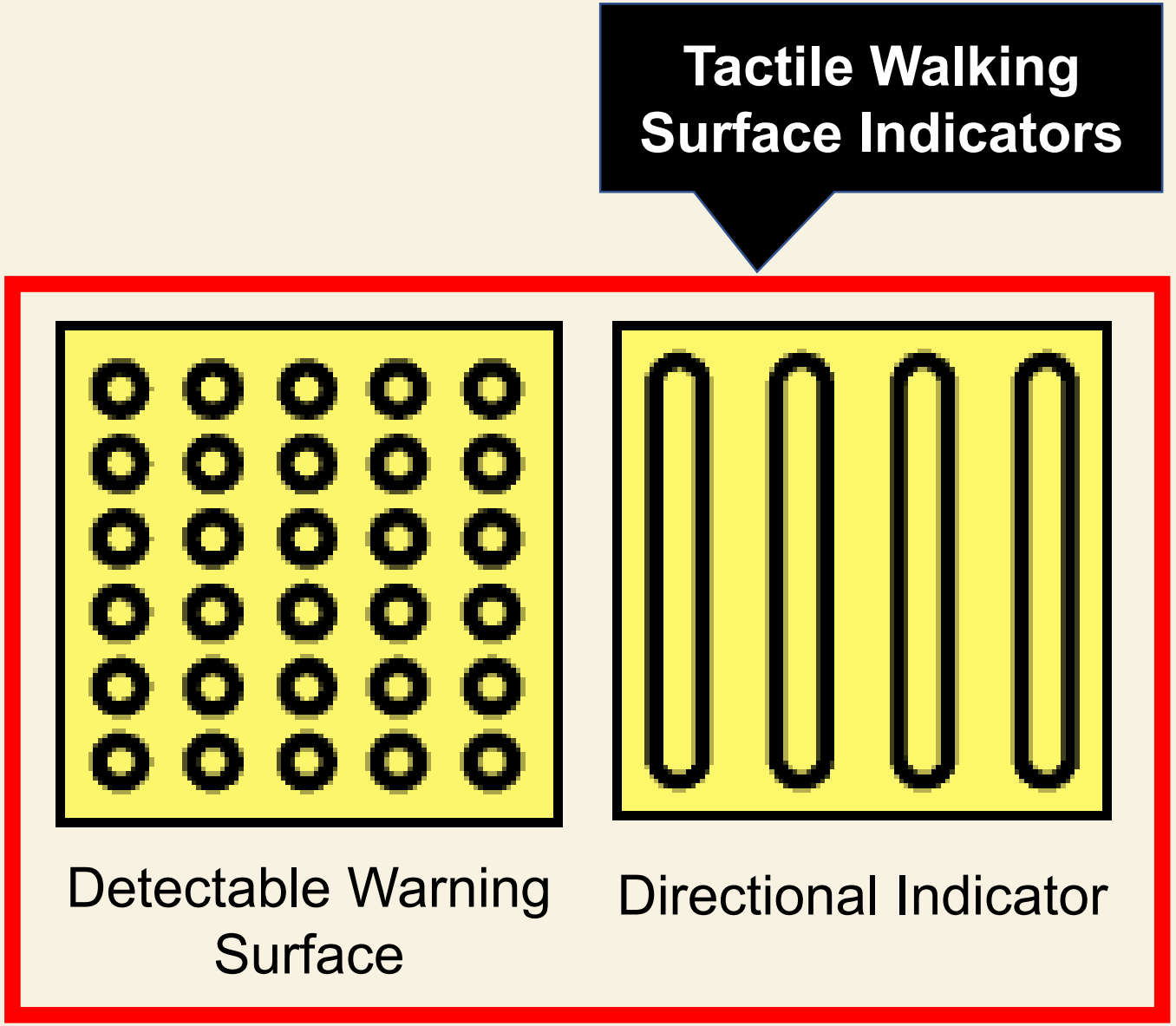
Planning Tools

- Involving people with vision disabilities in street planning and design processes
- Before/after evaluation of innovative street designs

Charlie Crawford and MCDOT staff discussing the design a floating bus stop in downtown silver spring. Charlie is standing on the bus island and there is a separated bike lane in the background. (Photo Credit: MCDOT)

Tactile Tools

- Tactile walking surface indicators
- Detectable edges and delineators
- Contrasting surface textures and slopes



Visual and Aural Tools

- Contrasting colors
- Lighting
- Audible beacons and cues

Accessible Pedestrian Signal
(Source: Toole Design)

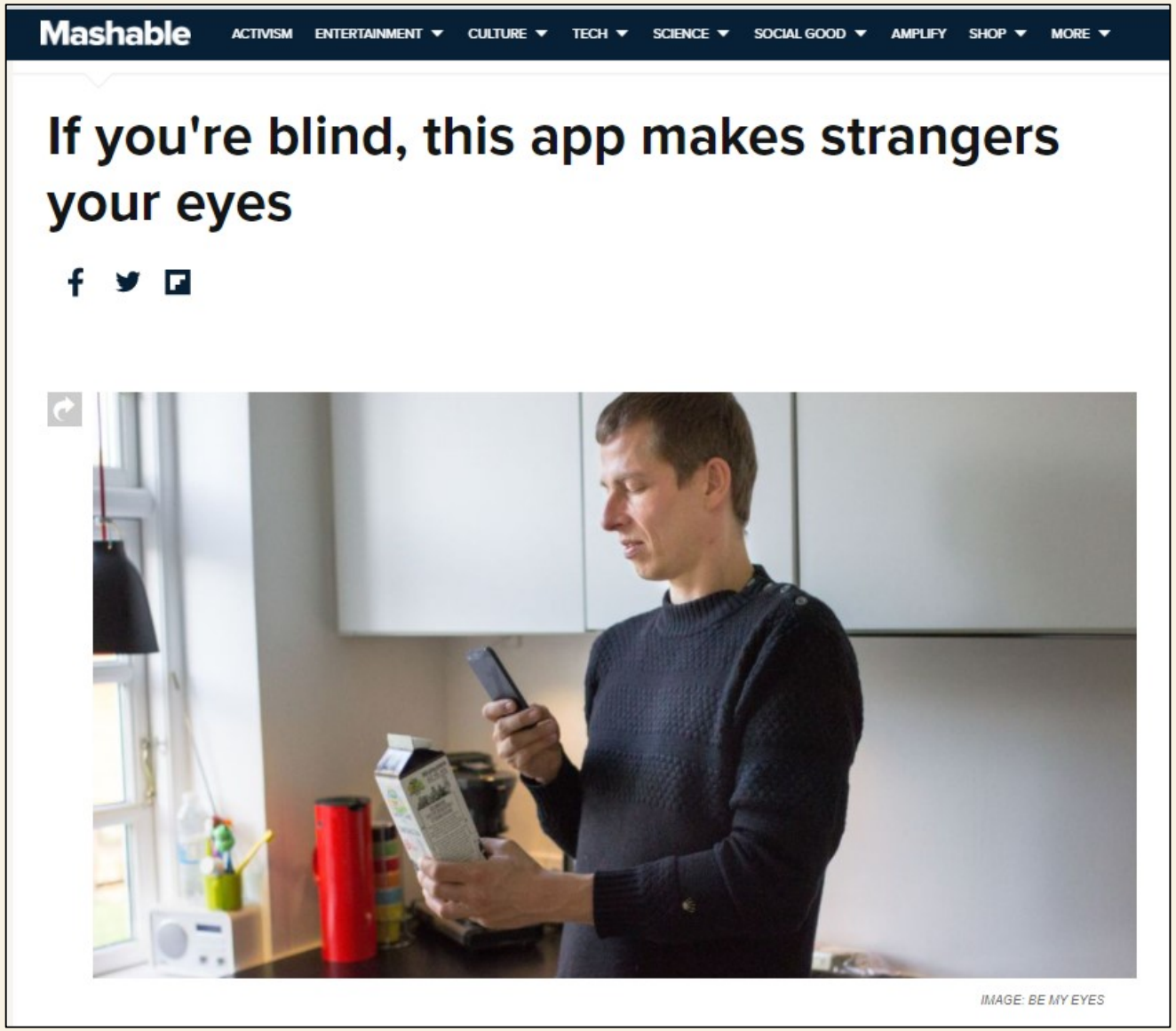
Intersection Tools

- Directional curb ramps
- High-visibility crosswalks
- Accessible pedestrian signals

Curb ramp that is aligned with the crosswalk and includes a raised curb on one side of the ramp. (Source: Toole Design)

Other Tools

- Accessible signage
- Phone apps
- OrCam
- Miniguide
- Sunu



Screen clip from an article on the website Mashable about the Be My Eyes app.

Is anything missing from this list of tools that you think is important?

How do you think people with the County could do a better job of engaging people with vision disabilities in street planning and design projects?

Next Steps

- Survey
- Attend Jan. 13 Commission on People with Disabilities meeting for additional feedback
- Develop draft toolkit and share with stakeholders
- Determine pilot location
- Conduct interviews for 30% pilot
- Report will be done by June. Report is a first step.

Question & Answer

Contact

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Thank You!