**Theme: A city working for everyone: Shared spaces that are perceivable, operable and understandable for all**

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| Aspects of the street that work for you | Aspects of the street that don’t work for you | How to make a shared street more perceivable, operable and understandable for a broader group | Make your ideas possible | Group |
| * *Wide streets with lots of trees* * *Multi crossings like Yonge & Dundas* * *Benches & parks (back from street but still part of it)* * *Spots for rest and refresh* * *Elements where we pay homage - Statues, historical learning, murmur, storytelling - statues, flowers, sculptures) History* * *“love tree” painted* * *benches, garbage cans, accessible public bathrooms* * *Art & graffiti (not so much advertising)* * *Sensory rest (break from noises, smells, touch)* * Tactile elements - (deaf-blind community) Air bursts/ water/ Predictable sounds or vibrations to communicate * *Friendly, non-overwhelming spaces for animals (spaces to pee)* * *Places for people to pee* * *Walkable, uncrowded* * *Less commerce focused and more experience focused* * Curb! Changes in texture | * *Crowded, bumping into people, not enough space for pedestrians, cluttered, congestion* * *Construction (noise, impeding movement) -* *communication* * Lack of access for wheelchairs (bike lane between parking & sidewalk) * No indicators of change from foot to vehicular traffic (re: visual impairment) * *Car dominated* * Poor *communication & signage* * *Unpredictability & change in the environment leading to risky behaviour* * Stressful high simulation environment that encourages “ everybody out for himself” thinking * Anonymity, lack of accountability * Garbage cans with flap that close on your hand * *Intense smells* * Lack of places for people to meet, converse - Lack of welcome * *Perceivable/ understandable: what is public/ private space? (getting arrested on Dundas square) - Communicate what is standard for that space (parks that close at 7:30)* * *Spaces that are commerce-based &* unwelcoming for low income people * *Policed, unwelcoming private spaces, discriminatory* * *Surveillance* | * *Air columns (feeling barriers)* * *Vibrations that indicate areas to avoid* * *Barriers that are sensory activated* * *Texture changes* * *Tactile markers* * *Multi-sensory zone indicators* * *Predictability (route planning, knowing I can go on this part of the street)* * *AI technology (cross road digital-communication)* * *Signs, kiosks >> interactive/intuitive* * *Responsive traffic lights* | * *AI*  1. *Need for “Incognito mode” > Privacy and security* 2. *Traffic lights / Crosswalks are equipped with an A/V kiosks that pair users to the dynamic street - input addresses / questions* 3. *Avatar / Blinking light - for individuals to follow or haptic vibration or audio that are personalized* | Relink |
| * Mistake crossing? Not too long * *Like the width of the sidewalks in Toronto* * *Bump strip that you can follow (Not in Toronto in Soul) - it’s on the side of the sidewalk, it’s in subway system+streets, Construction can block it* * *Removed the poles!* | * Downtown is not a good experience * No marking, * *Inconsistency of sidewalk materials, bricks, concrete* * *Bumps and curb cuts* * *Difference in standards across GTA (no sidewalks, narrow sidewalks, wide ones)* * *Small signs, to high and not accessible* * New poles without notice near curb cut * *Addresses are hidden, hard to find destinations, need to ask for direction* * *Bus stops are not easy to find* * *Bus drivers take different routes* * *Hard to find the push to walk button on traffic lights* * Aggressive cars * Streetcars in the middle * *For dynamic streets, what if you don’t want the street to change, you are afraid of change, you don’t like to adapt* | * *Put tactile strips down in between empty areas* * *Put beacons down - locations on street (better than GPS)* * *Find addresses, bus stops, orientation* * *A city that accommodates you* * *Bus stops for you, crosswalks where you are* * *A way to report obstructions, expect a restriction, notification sign* * *Better tactile strip (slippery when wet?, low tech, there is no standard for strips)* * *Contrast strip on stairs* * *Audio tone for crossing* * *Crossing lights* * *Storefront computer vision for wayfinding* * Bust stop narrative descriptions / use stop numbers * *Have audio signals at every intersection of a streetcar stop* * *Locator tones* * *Having internet connection everywhere (cost?* | * App that you can use to cross - auditory input guide pedestrians * Traffic signals that would detect person crossing and change when person has crossed * Tactile strips, sound system/ laser tone connected to smartphone, app in multiple language (challenge is that can’t trust app to guide, maybe physical beacons are better) * Robots to help cross street | Boulevard |

**Themes: Co-Existing- Managing conflicting needs in shared spaces (Group Harmony)**

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| When needs conflict with other users | Aspects of street that lead to conflicts | Addressing conflicts in shared spaces | Make your ideas possible |
| -Crossing intersections safely in absence of audible signals  -In conflict with cars and cyclists when accessing intersections  -Gold medal transit user - conflict between transit and private vehicles  -Inter-pedestrian conflict - conflicting speeds of walkers  -Safety of pedestrians conflicts with flexibility of movement - concrete barrier next to sidewalk -deliveries/drop-off conflict with cyclists, pedestrians and traffic  -Street sports and cars/ bikes in conflict  -Street festivals and cars/other traffic  -Tourists and local pedestrians  -Construction vs. sidewalk usage - noise, construction traffic, road damage and debris. | -Sidewalk is meant to serve multiple uses - users have to self-organize  -Infrastructure encroaching on sidewalk space - bike racks, trees, signs, ramps, patios, bus shelters, construction, garbage  -Infrastructure is permanent - not effective for changes in city needs.  -Traffic lights do not support effective flow of traffic- invest in audible signals  -Inadequate drop off/pick-up  -Lack of common knowledge on how street should be used | -Strictly allocate street usage - slow/fast walkers, garbage,patios, cyclists, cars.  -Express pedestrian lanes - “one way pedestrian street”  - mandatory training program to walk on busy streets - “walker’s license” - Awareness campaign- “how to be a good pedestrians”  - Move non-curb critical uses ( e.g bike racks) to alleyways  - Public shaming to discourage bad behavior (e.g horn when you double park)  - Barriers (dynamic) to open and close streets (centralized control of deliveries, freight)  - More perspective management of the curb  - Dynamic fires  -Coordinated construction planning  -Better management of intersections ( e.g more turn signals)  - Pedestrian overpass/underpass. | **Physically:**  - Elevators/ramps to walkways  - Cyclist specific signals  - Dynamic pavement  - Audible  - Barriers up/down  - Trip wires  -Accessibility lanes  - Staggered steps  -Tactile forms within surfaces- “ pedestrian lanes” through an intersection  **Digitally**  -Better real-time adaptive signal changes  - Adaptable/removable turn signals  -Contextual signal optimization ( e.g train coming) and communication  - Video projection as deterrent to violation  -Awareness of pedestrian and cyclist flow  - Incentives/points for pedestrians waiting on flashing hand  - Sign above intersection that quantifies impact of blocking intersection (including cumulative count)  **Data**  -volume flows ( traffic/pedestrian)  - light turning  -Navigation apps  - Accidents, fatalities  -Historical vs. real-time vs. predictive  - Navigation app knowledge of sudden blockages  **Regulatory**  -Dynamic fines for pedestrians  - Intersection use fee |

**Theme: Lost & Found - Wayfinding and orientation in dynamic spaces (Side Thoughts and Sweet Streets)**

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| Navigating Streets/Neighbourhoods | Getting lost | Navigating a dynamic space | Make your ideas possible | Group |
| **-**Signage  -Google Maps/Earth  -Buildings/Landmark greenspace  -Lights  -Description/directions/Ask  -Curbs  -Subway system  - Pictures/Images  - Sounds  - Neighbourhood (Culture etc)  - Maps  -Events (CNE, Concerts etc). | - Signage (confusing, placement language)  - No global standard?  -Construction/detours  - Landmark changes  - One way streets  -Inconsistent street names (merging streets)  -Redundancy naming of streets  - Changes (Names of subway station - streets)  -Difficult to re-navigate or find way ( U-turns, no lefts etc)  - Lighting  -Public transit ( lack of orientation signage, directions, street sides, names - Xpress)  -Elevator broken/specific entrances for differently abled.  -Crowds are disorienting (Space)  -Situational circumstances (safety, day/night/tourists). | -Visual/Auditory/Haptic Live maps and indicators  - Navigating by association - consistencies, placement i.e benches on north side, food on south).  - Observation  - Signage - dynamic ( cultural/symbols  -Successful models- managing expectations of people to remove fear and anxiety  - How street communicates - sensors and notifications through tech device | **Consistency:**  -Landmarks, signage  -Placement  -Personalization  - Air movement- sensory engagement.  - Same texture for North/South side streets and same texture for East/West streets.  - Icon/pictograph indicators  - Referencing natural behavior  - Landmarks/buildings - built in indicators  **Interveners**  -Orientation  -Mobility  - Instruction  -Guiding  -Differently  -Able bodied persons  -TTC, Streets | **Side Thoughts** |
| Signs - visuals, sounds  - Tactile feedback/kinesthetic  -Smells  -Maps  -GPS  - Google maps/street view  -TTC website - station description  -lights  - landmarks  -Blindsquare-uses beacons  -asking people  -follow people  - blocks of colours  - numbering landmarks/ columns  -TAI’s - tactile strips  - Senses - tech support  - predictability - landmarks, cues, consistency | **Finding this building** - GPS, maps fails- poor routing, directing  Solution: rely on people for directions..  - Wander away - not paying attention, losing track, situation based teaching→ landmarks  Solution: listen to announcements  **Union Station**  Noise, low vision relies on hearing and sound.  **-**Sidewalks are directional indicators - wayfinding tool.  -Poor signage/identification | -Moveable landmark - predictable (shape, size, color, texture, sound)  - teachable, locatable, wayfinding  - people  - safe/ rest spaces - predictable, guaranteed/never changing/fixed, used for orienting yourself.  - Dynamic streets with lights - could there be a pole(s) to creating defining landmarks  - could there be an area that is never changing with dynamic streets - one part always sidewalk area. | **Dynamic Street Hexagon**   * Tactile variable surface * Painted live like on highway * Reflector glass beads embedded * Austrian Braille Trail * Sustainable materials - not just eco friendly - Be friendly) * Turning something bad into something good ( i.e plastic) * Braille display - refreshable * Module is dynamic - interchangeable * textures/dots/domes/lines/more light interchange with pole with more wayfinding details. | **Sweet Streets** |

**Prototype Description (Group: Relink)**

To create multisensory interfaces located near intersections and various other locations to provide support to help pedestrians better navigate space safely with other modes of moving through the space. The interface will be AI (artificial intelligence) based to help provide information on surroundings as well as help different user style interaction (braille, ASL, closed caption, facial recognition, etc. )

**Feedback:**

How can these ideas be applied for other users of the space, such as bicycles, motorized vehicles, etc.

This solution may not be accessible for people who are not accustomed to technology

Although it was questioned how you customize the interface for different needs, people mentioned that such solution leads to independence for people with different needs including elderly and children.

It is accessible for many people and if it can promote consistency if integrated with the modular redesign of smart tiles.

People were concerned about cost, sustainability of such solution and maintenance particularly with weather consideration

Also, points made about privacy and ethics (data recognition and facial recognition)

**Revised prototype:**

This is for pedestrians use only, and should visually stand out and provide multi-modes of interaction and provide different languages. It should run on solar power and doesn’t depend on pedestrians data and stats.

**Prototype Description ( Group: Harmony)**

Our intersection is designed to reduce vehicle volume, congestion, and blockage, and optimize for pedestrian and cyclists throughout. We achieve this with the following features:

1. Dynamic pricing to drive through the intersection (cars only).
2. Staggered bicycle (yellow) and car (blue) stops to promote cyclists safety.
3. Signage to indicate to vehicles cost of blocking intersection (promote good behavior)
4. Tactile crosswalk boundaries (pipe-cleaner)
5. Adaptive signals that change based on real time demand and contextual data (e.g extend a walking sign so pedestrians can catch an incoming train)
6. Audible signals for the visually impaired.

**Feedback :**

-People with developmental delays, processing issues, reading barriers, language barriers, financial barriers

-Not as much for visual issues other than auditory signal

-All abilities are not treated equally

-This idea empowers cyclists

-Being thoughtful of others/environment - costing people minutes

- Can be anxiety producing

-A lot of signage/reading

- No tactile/visual/auditory indication of difference between sidewalk/bike path/roadway

- Are walkways/bike paths and roads all on same level? Curb?

**Revised Idea:**

Pricing dynamic for each vehicle based on transportation alternatives and income and origin

Increased physical/tactile separation of boundaries

Consolidate signs into one dynamic sign that communicates the most important /necessary messages at a particular time

Note: colors not representative of actual implementation

**Prototype Description (Group: Side Thought)**

This prototype focuses on designing streets that allow for easy navigation by pedestrians. The focus is to incorporate a coded navigation system with texture, color, vibration and smell and capitalize on landmarks to amplify navigation. The streets will be color coded according to cardinal directions, for example all North streets will be the same color, and all South streets will be a different color etc. Technology will be used to provide wayfinding on buildings facing pedestrians. In addition,

**Feedback:**

This idea would enable people who are not familiar with a space for example people with physical or visual disabilities, but exclude those in a rush. The idea considers many groups, aesthetically pleasing features and clear way finding. There are so many ways to navigate, it might get confusing (sensory overload), cluttered -not necessarily maximizing space, many require education - not clear how you figure out where to go.

**Revised Idea:**

Guiding principles of mobility in each section. Vehicle access every two blocks ( behind building)

Breezeways through buildings - connection to sustainability services with four city blocks - micro communities. Encourage wayfinding as an activity, experience, social, cultural connection.

**Prototype Description (Group: Boulevard)**

Guided walk. A tactile strip to guide pedestrians when crossing the street. This guided walk provides store information, addresses, street names, audio feedback. It includes a mobile app integration. Mobile app provides info about features at an intersection - users can control setting to receive more or less details about the features (e.g. restaurants on right and description of the menu) partnership with restaurants and stores to install beacons in indoor spaces. The tactile strips provides a language that you can learn. The audio feedback and the strips tell you that you are arriving at a new street/intersection. Audio feedback can count down distance from the destination (steps)

**Feedback:**

The tactile strip may cause problems for people who have balance issues. The audio feedback is not recognizable for deaf and people who can’t speak may have difficulty elaborating, however, it supports people using canes, people with low vision, blind, and anyone who needs accommodation. It is a low cost solution that enhances wayfinding and helps with safe crossing. Questions around the app, who sets it up, why the voice activation has to be done through the app, how it can be applied in all streets and people can become dependent on it

**Revised idea:**

App should incorporate different languages (ASL + other languages + text) to personalize info to individual (consult deaf community and deaf blind)

A vibration input to indicate when to cross (at the end of street/ auditory)

Yellow strip for people who can’t see

A strip that is removable

**Prototype Description (Group: Sweet Streets)**

Dynamic street/ road - Hexagons embedded with hole in the middle and retractable braille trail. If it is a walking area - IOT can be put in place or retracted via technology. The hole in the middle can be filled with trees, lights, poles or moveable landmarks. Moveable landmark is embedded with sound beacon and technology which when a button is pushed it will give location details to pedestrians, and can be moved or reprogrammed

**Feedback:**

Could be confusing or disorienting for some people. People who can express themselves through the space, people who use beacons could be empowered by this idea. One of the advantages of this idea is the use of landmarks to find out where you are in space, provides info on what’s around to orient you. It is utilitarian and incorporates art and playfulness. However, it can be confusing because shaped in a hexagon and people can get lost and what’s the point of having a landmark if it’s moveable

**Revised Idea:**

A combination of hexagons and lights can create a tactile wayfinding using the tiles that is responsive and flexible.