

Digital Civics (COMPSCI 592C)

# Tools and Applications

Fall 2018



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09/14/2018

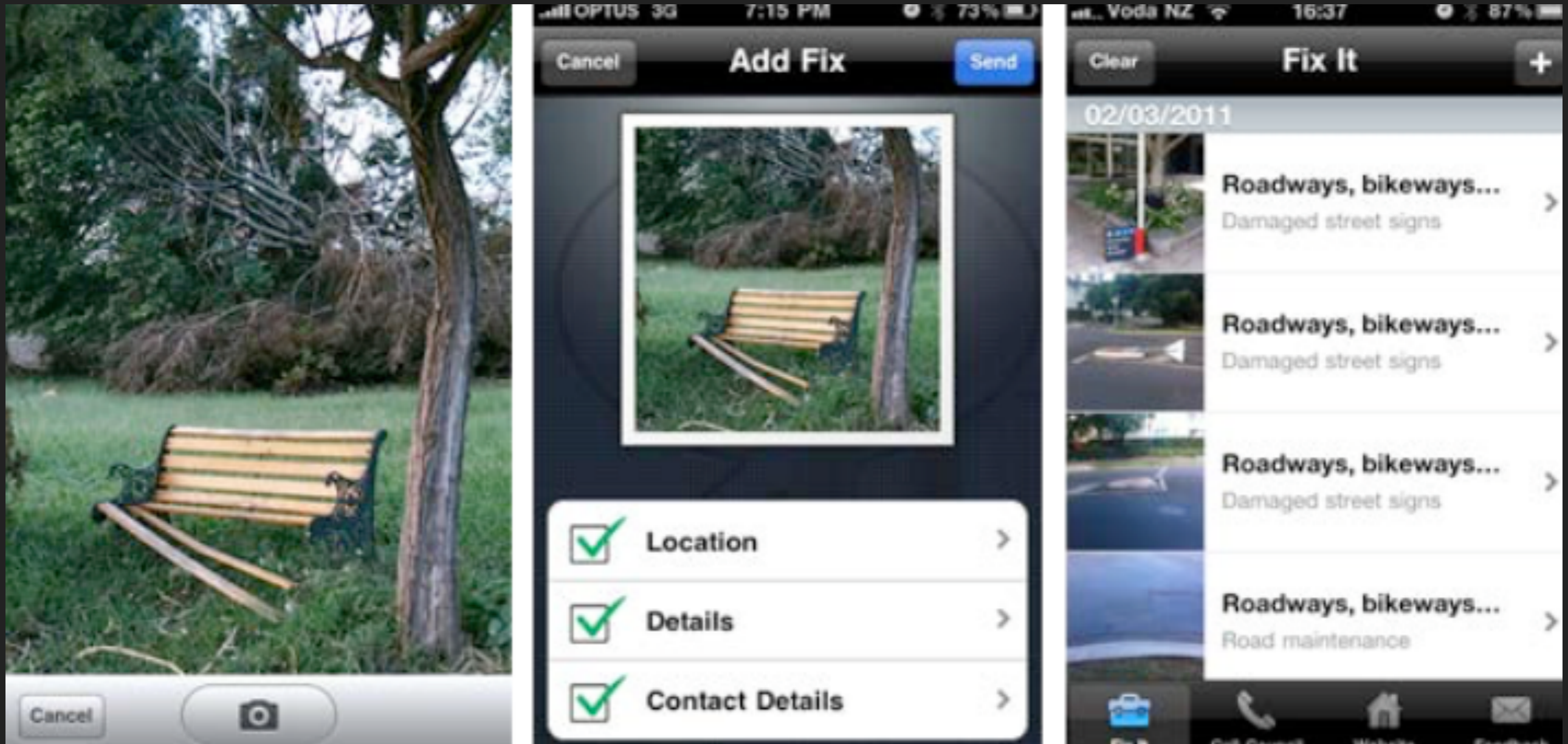
# Objectives

- ▶ Build place-based social capital
- ▶ Increase civic engagement
- ▶ Promote deliberative democracy
- ▶ Support Open Governance
- ▶ Foster inclusion and diversity

# Civic tech includes variety of tools and applications

- ▶ Online surveys
- ▶ Mobile applications
- ▶ Kiosk
- ▶ Online engagement
- ▶ Online and in-person engagement

# Mobile application: fixing the city one photo at a time

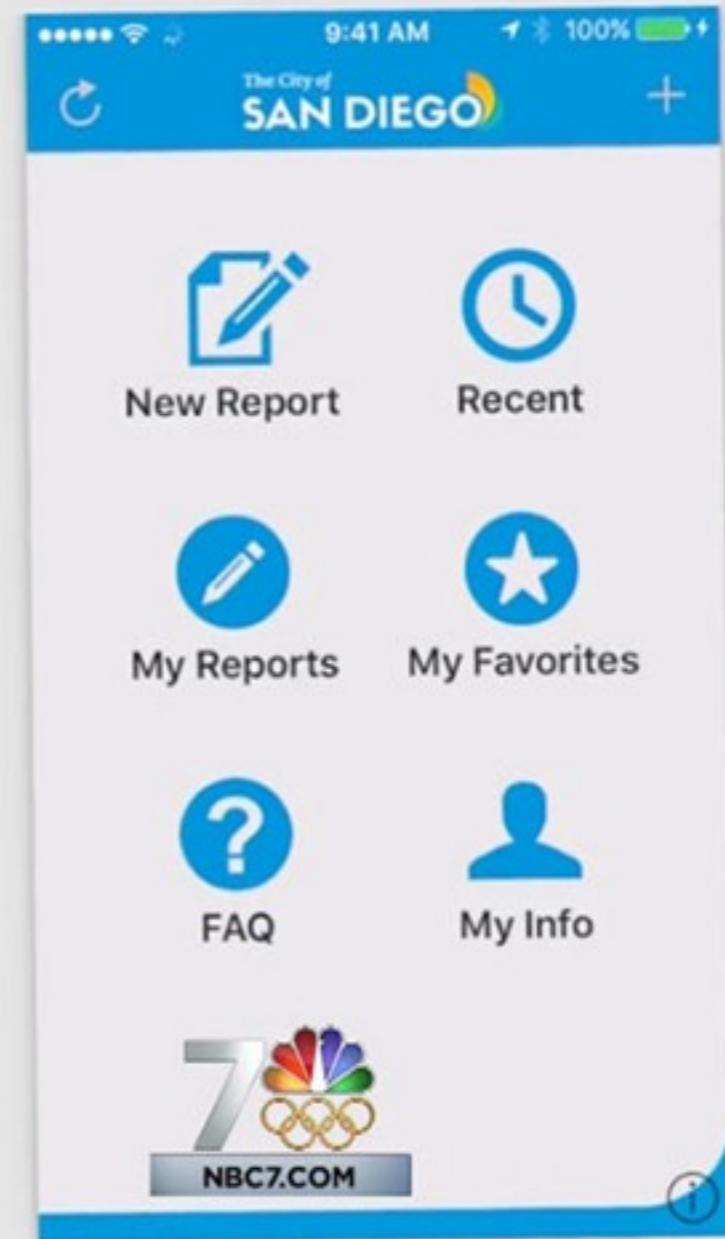


Foth, Marcus et al. "Fixing the city one photo at a time: mobile logging of maintenance requests." *CHI 2011*.

# Mobile application: get it done



**REPORT  
NON-EMERGENCY  
PROBLEMS**



<https://getitdone.force.com/>

# Kiosk: situated voting devices



Taylor, Nick, et al. "empowering communities with situated voting devices." CHI 2012.

# Online survey: Wikisurvey

**Which idea do you think is more important for transportation in Illinois?**

Subsidize bus and rail transit for users

Be consistent in ways that respect both pedestrian and vehicles. For ex, use public funds to shovel sidewalks and not only streets.

I can't decide

33926 votes on 185 ideas

Add your own idea here...

WikiSurvey: M. J. Salganik and K. EC Levy. 2015.

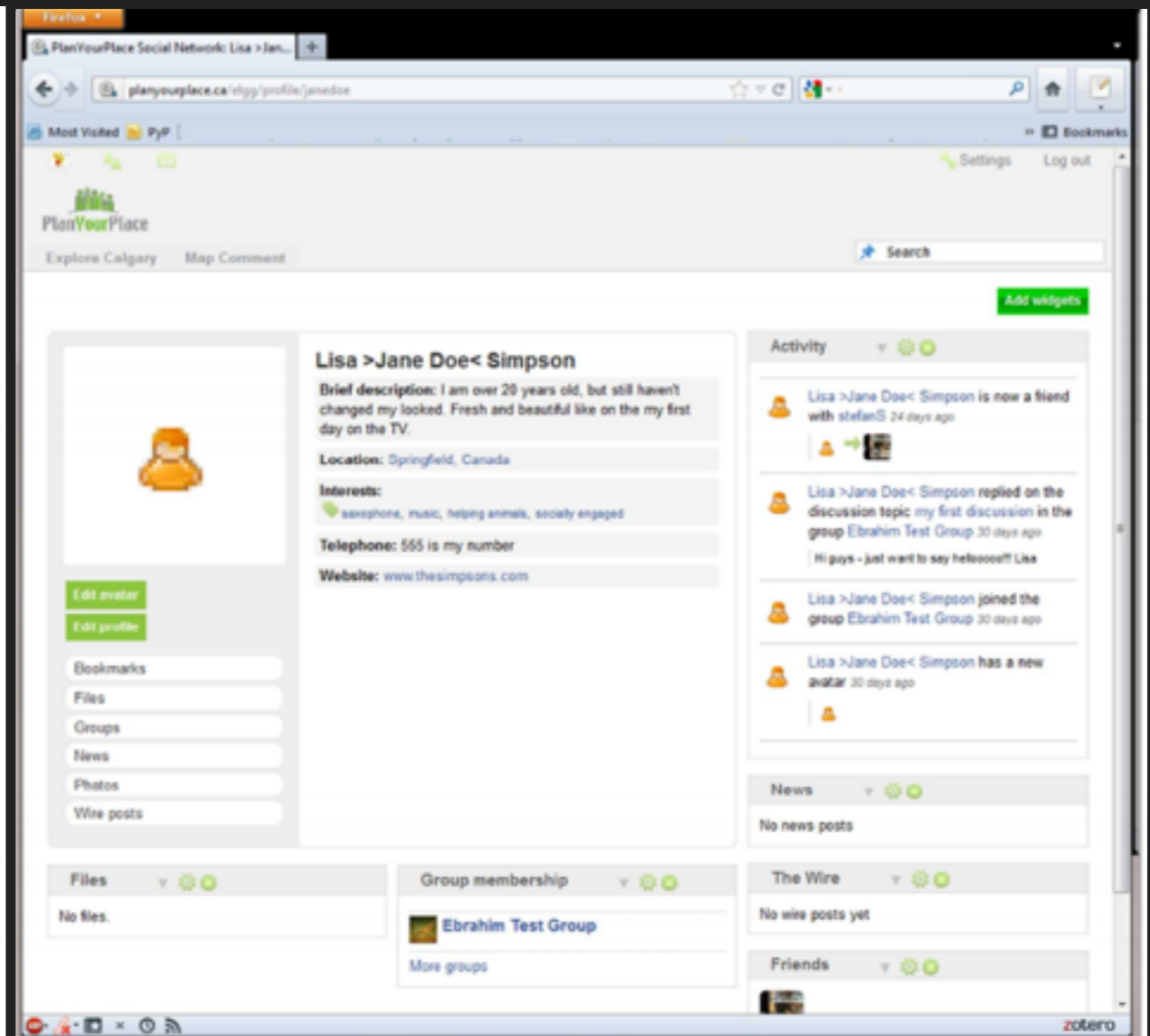
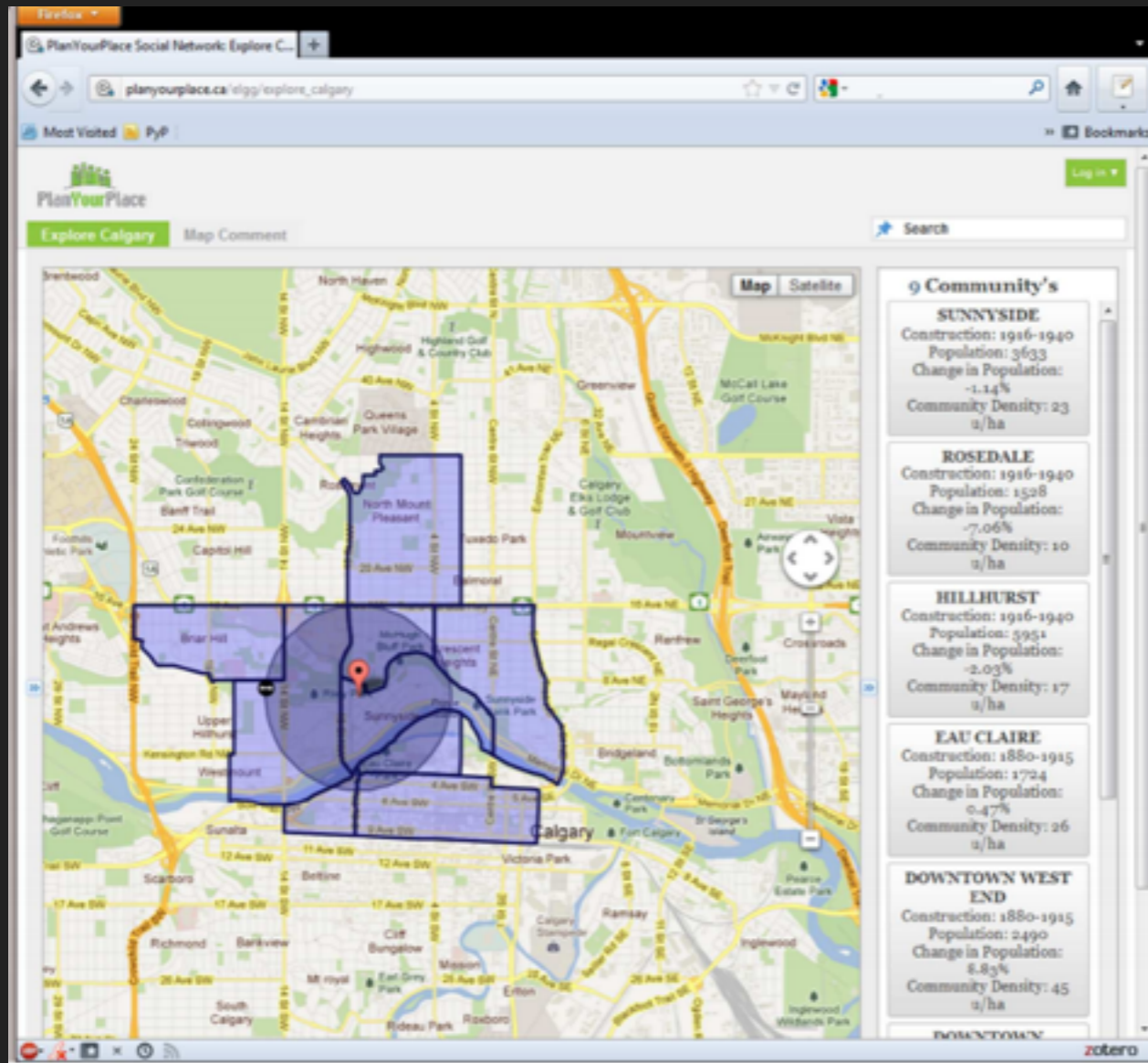
# Augmenting in-person engagement: UD Co-Spaces



**N. Mahyar, K. J. Burke, J. Xiang, S. Meng, K. S. Booth, C. L. Girling, and R. W. Kellett, Interactive Surfaces and Spaces (ISS), 2016**



# Online engagement: plan your place



S. Steiniger, M. E. Poorazizi, C. AM Bliss-Taylor, E. Mohammadi, and A.JS Hunter. 2012.

# Online and in-person engagement: Communitycrit

## CommunityCrit allows **the public** to participate in the urban design process.

By offering a quick and easy way to voice opinions, CommunityCrit empowers anyone to help shape the future of their community.

Currently, we are collecting feedback on an effort to expand the 14th Street Promenade in East Village. The intersection of 14th Street, National Avenue, and Commercial Street—referred to as "El Nudillo," or "the knuckle"—is envisioned as a pedestrian destination, a place of social gathering, and a celebration of East Village and its surrounding neighborhoods.

**What do you think El Nudillo should be?** Please click below to contribute your voice!

[GET STARTED](#)



# Modes of engagement through civic tech

- ▶ Providing access to information
- ▶ Gathering input
- ▶ Voting
- ▶ Feedback and deliberation
- ▶ Public decision making

# UD Co-Spaces: A Table-Centred Multi-Display Environment for Public Engagement in Urban Design Charrettes

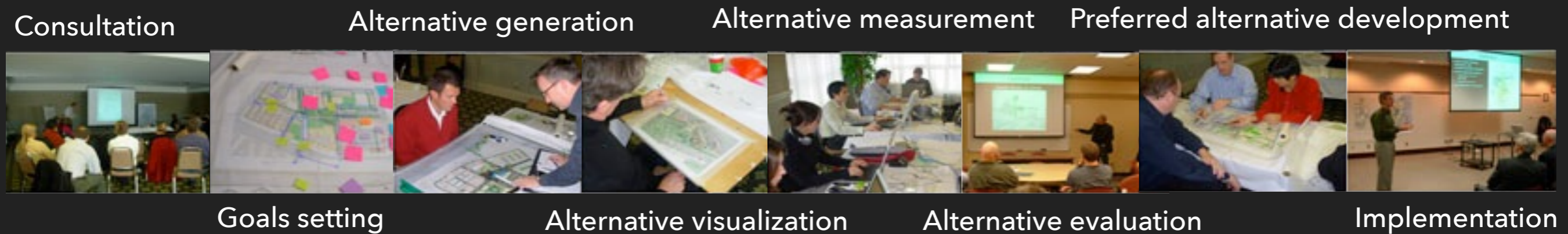


**N. Mahyar, K. J. Burke, J. Xiang, S. Meng, K. S. Booth, C. L. Girling, and R. W. Kellett, Interactive Surfaces and Spaces (ISS), 2016**

**[Honorable Mention Award], ISS 2016**

**[Outstanding Paper Award], CELA 2017**

# Urban design processes



lack of tool support

Girling, C., Kellett, R., and Johnstone, S., 2006

# Problem: lack of tool support during design charrettes

- ▶ Integrating data and **visualizations** of information
- ▶ Employing **interactive** modes to engage people
- ▶ Employing **social** and peer learning

Sheppard, 2012, Moser, 2010, Holden 2008, Davis, 2008, Al-Kodmany 2000

# URP: tangible workbench for urban planning and design



# Design of digital technology to avoid marginalizing people

- ▶ The importance of providing the right information at the right time in understandable formats.

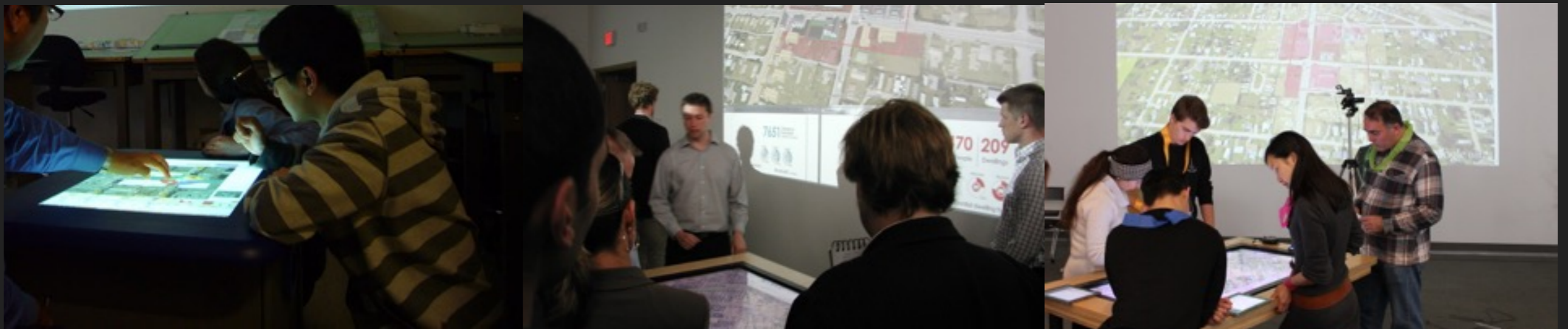


# Research questions

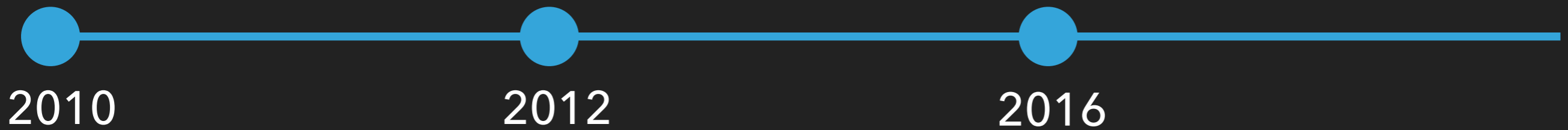
- ▶ How to use collaboration technology & visualization techniques to
  - ▶ engage diverse stakeholders,
  - ▶ foster collaboration and co-creation,
  - ▶ increase understanding of impacts of choices?

# 6 years human-centered design and development process

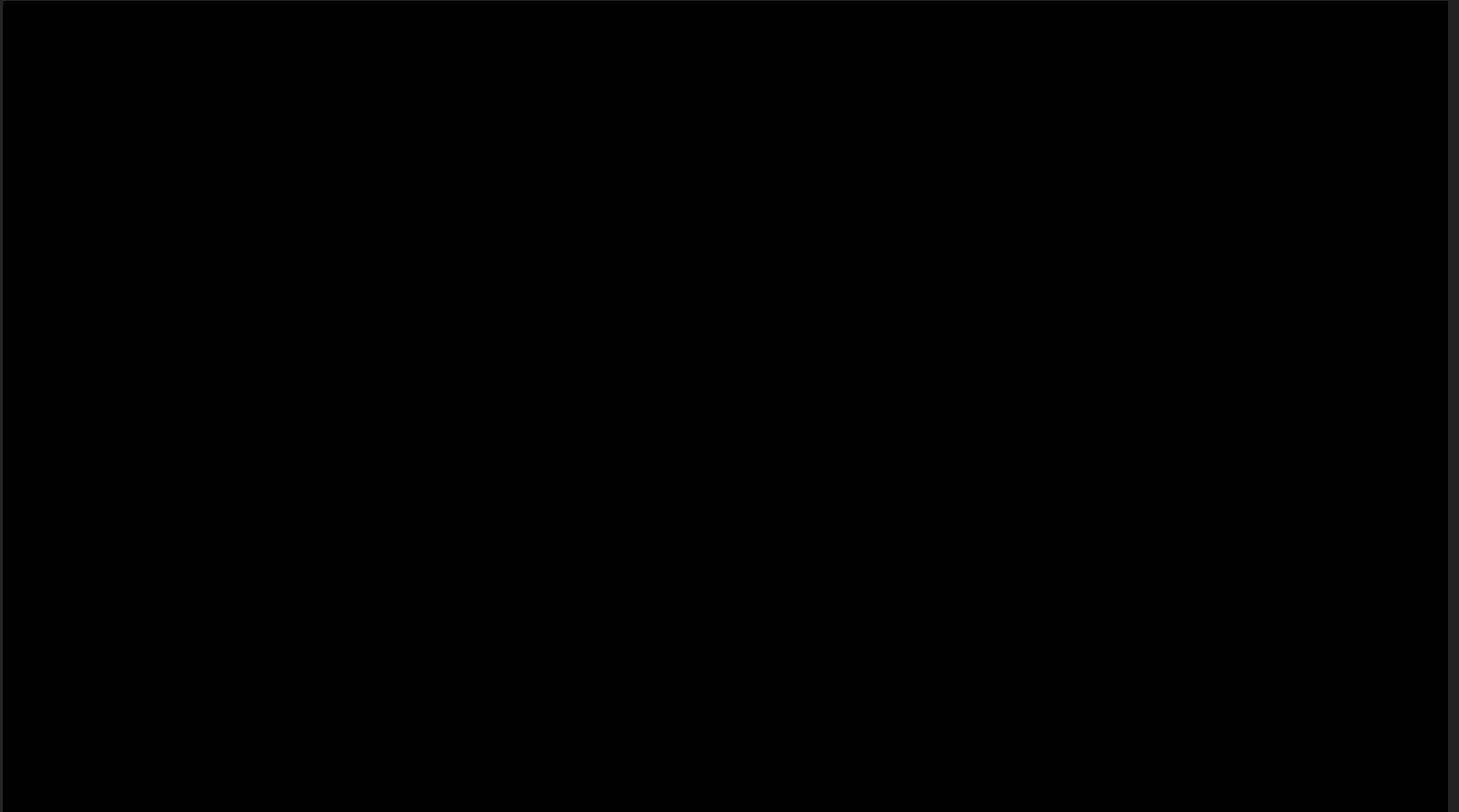
This was a long-term interdisciplinary project that started before I arrived at UBC.



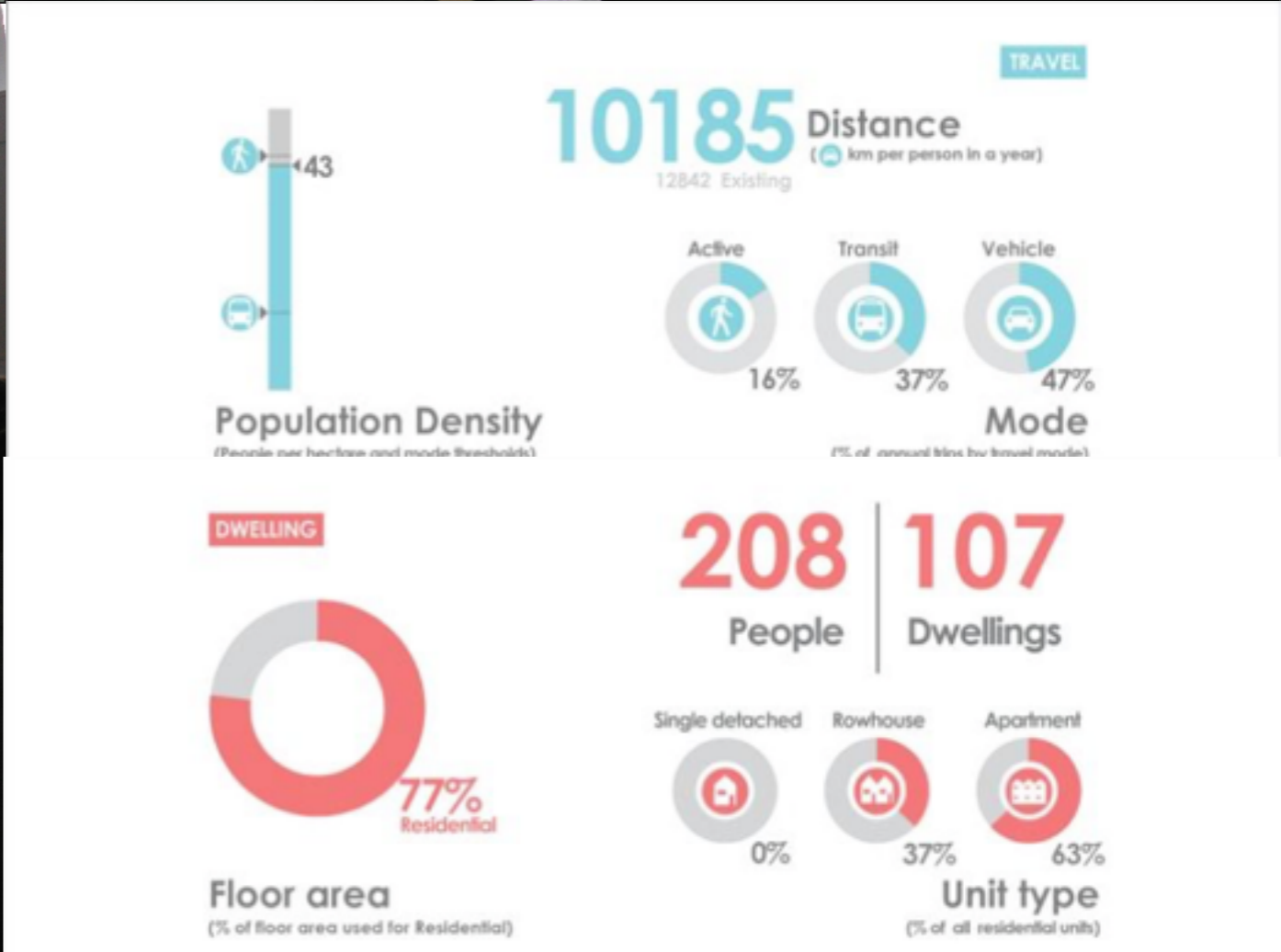
1st version: tabletop tool    2nd version: +wall display    3rd version: +handheld



# UD Co-Spaces (Urban Design Collaborative Spaces)



- ▶ Lack of engagement with metrics on the wall
- ▶ Lack of interactivity and customization to engage ppl
- ▶ Lack of personal spaces
- ▶ Difficulty interacting in parallel with the 3D view



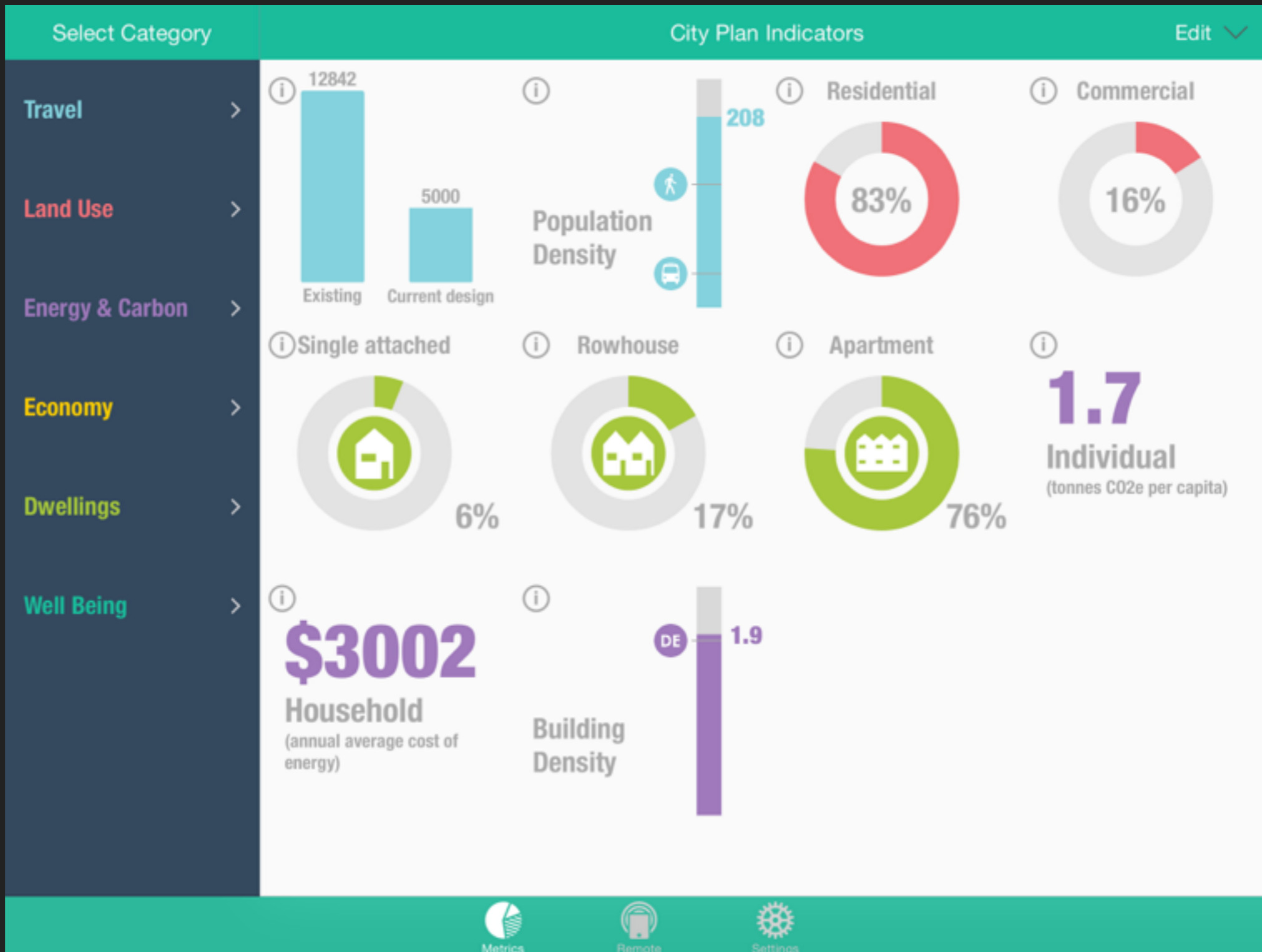
# Method

- ▶ Analysis of version 2 deployment in the wild
- ▶ Interview with urban planners & facilitators
- ▶ Design & development of version 3
- ▶ Heuristic evaluation with 3 urban planners
- ▶ Formal evaluation (comparative study)

# System design & considerations

- ▶ Adding personal spaces
- ▶ Increasing interaction with wall display
- ▶ Building interactive visualizations
- ▶ Providing accessible and understandable information

# Visualization dashboard



# Comparative study





# Design context

- ▶ Design a neighborhood center within a hypothetical existing single family neighborhood in the suburbs of Vancouver.
- ▶ Main Goal:
  - ▶ Increasing the walkability of the neighborhood

# Study procedure

- ▶ 40 participants (groups of 5-6, 17 male, 23 female)
- ▶ Total time: 140 min (~45 min for design activity)
- ▶ Pre & post survey
- ▶ Focus group
- ▶ Video recorded sessions

## Findings: Tabletop surface increased equity of participation



“Having this tabletop got every stakeholder involved so they can make changes themselves, see those changes right away, [which] promotes collaboration”

# Multi-display environment catalyzed discussions



"I definitely really liked how everything was synced, specially with regards to 3D, iPad and table itself"

# Visualization dashboard increased analytical ability



“Having indicators in real time definitely altered how we approached the project, we could see the larger impact ... it was almost like stepping out and saying, okay, what did we actually do and what is the impact.”

## Main contributions

- ▶ UD Co-Spaces was superior than paper-based
  - ▶ Engaging collaborative environment
  - ▶ Alternative generation and measurement
  - ▶ Making information and visualization accessible

## Contributions beyond urban design domain

- ▶ Potential of touch-based interactions
  - ▶ Increase interactions, engagement & learning
  - ▶ Transition novices to experts

# How can we scale it up to engage a broader range of stakeholders?





# CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities



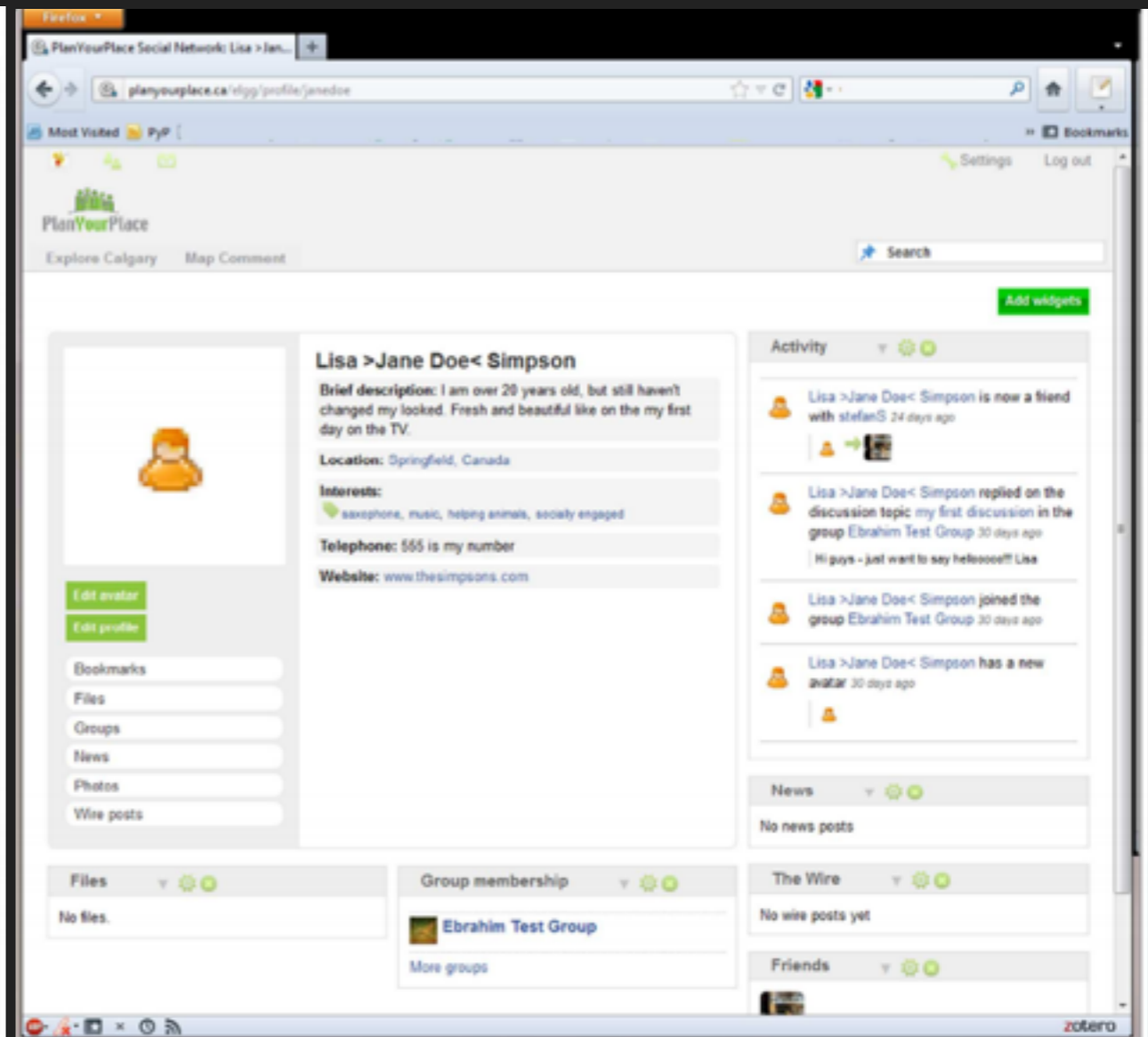
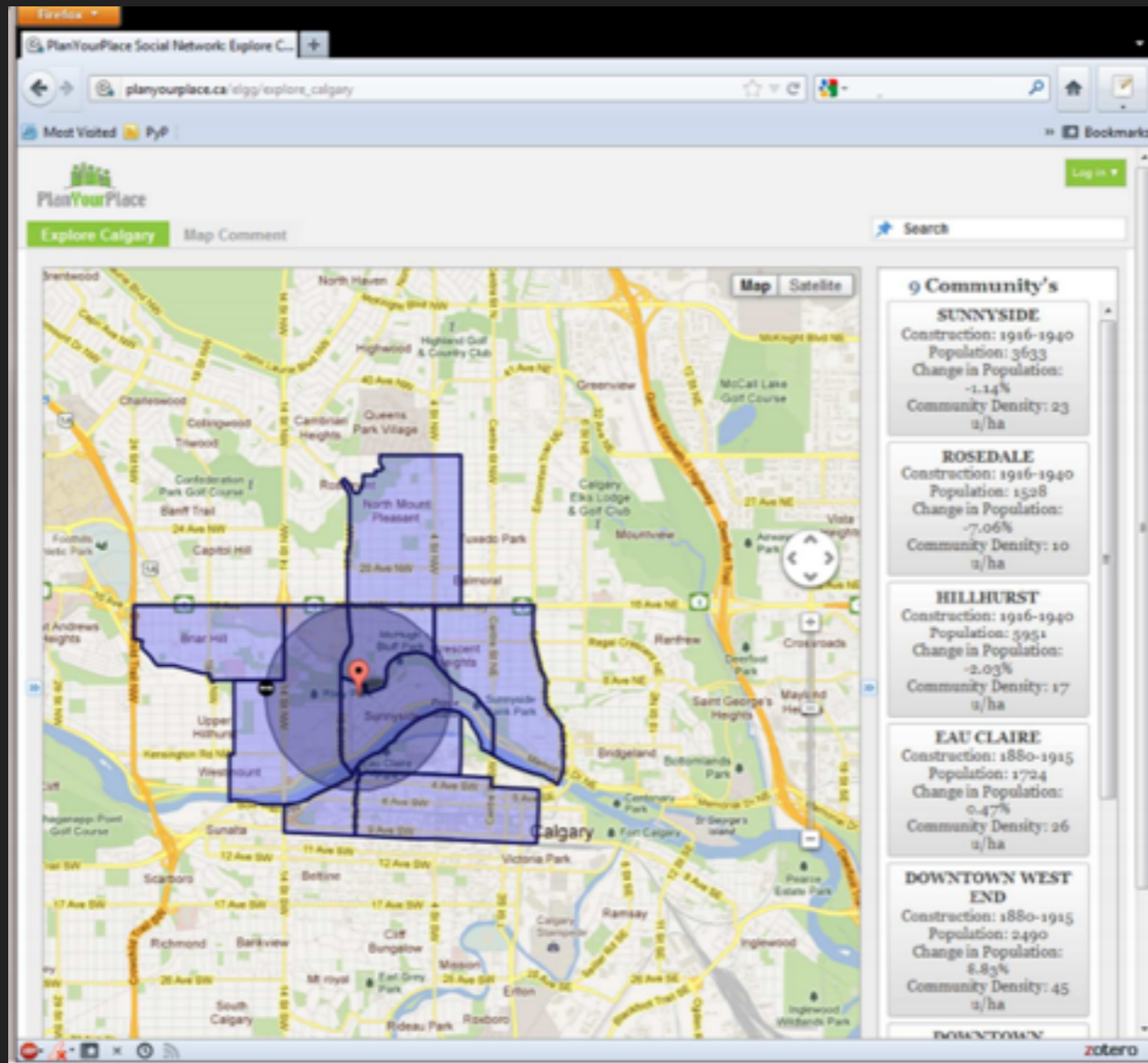
**Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow, ACM Human Factors in Computing Systems (CHI 2018).**

# Face to face methods have many limitations

- ▶ Engaging representative stakeholders
- ▶ Hearing out people's comments
- ▶ Recording/disseminating comments



# Urban design tools require time investment and expertise



S. Steiniger, M. E. Poorazizi, C. AM Bliss-Taylor, E. Mohammadi, and A.JS Hunter. 2012.

# Online civic technologies often limited to opinion polling

**Which idea do you think is more important for transportation in Illinois?**

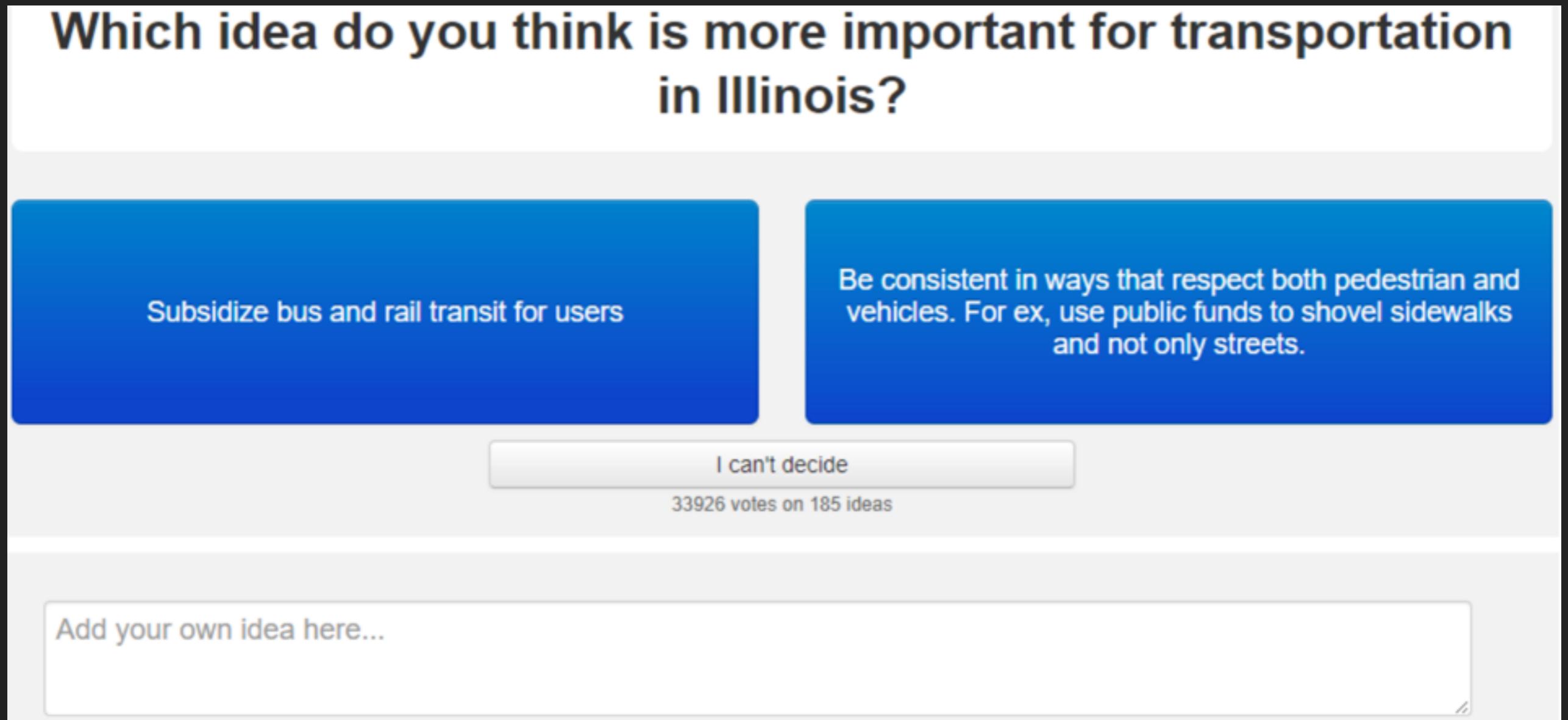
Subsidize bus and rail transit for users

Be consistent in ways that respect both pedestrian and vehicles. For ex, use public funds to shovel sidewalks and not only streets.

I can't decide

33926 votes on 185 ideas

Add your own idea here...

The image shows a screenshot of a WikiSurvey poll. At the top, the question is "Which idea do you think is more important for transportation in Illinois?". Below the question are two blue buttons representing different ideas. The left button says "Subsidize bus and rail transit for users". The right button says "Be consistent in ways that respect both pedestrian and vehicles. For ex, use public funds to shovel sidewalks and not only streets.". Below these two buttons is a white button that says "I can't decide". Underneath the "I can't decide" button, it says "33926 votes on 185 ideas". At the bottom of the poll interface is a text input field with the placeholder text "Add your own idea here...".

WikiSurvey: M. J. Salganik and K. EC Levy. 2015.

# Research question

- ▶ How can we create a system for activities beyond opinion polling that
  - ▶ captures quality feedback
  - ▶ in a short amount of time?

# System design & considerations

- ▶ Providing a quick & flexible workflow
- ▶ Designing understandable questions
- ▶ Providing social interactions
- ▶ Sending people directly into quick activities

<http://cc.ucsd.edu>

## CommunityCrit allows **the public** to participate in the urban design process.

By offering a quick and easy way to voice opinions, CommunityCrit empowers anyone to help shape the future of their community.

Currently, we are collecting feedback on an effort to expand the 14th Street Promenade in East Village. The intersection of 14th Street, National Avenue, and Commercial Street—referred to as "El Nudillo," or "the knuckle"—is envisioned as a pedestrian destination, a place of social gathering, and a celebration of East Village and its surrounding neighborhoods.

**What do you think El Nudillo should be?** Please click below to contribute your voice!

**GET STARTED**



# Design case: El Nudillo a key intersection in San Diego

## Background Info on El Nudillo

The 14th Street Promenade, which was approved by the city in 2016, will be a pedestrian-friendly "green street" extending from City College in the north to the intersection of 14th Street and National Avenue in the south. It will feature widened sidewalks, outdoor furniture, and art, in order to promote social gathering and a unique neighborhood feel. The overarching goal for the 14th Street Promenade is to help create a more sustainable, walkable downtown.

We are now engaging the public and local experts to develop the intersection of 14th Street, National Avenue, and Commercial Street, which marks the end of the 14th Street Promenade. This intersection—known as **El Nudillo**, or "the knuckle"—is envisioned as a pedestrian destination, a place of social gathering, and a celebration of East Village and its surrounding neighborhoods.





# 1) Pick an idea

## Do An Activity

Please select an option below to begin contributing.

### Ideas You Have Worked On

Build a tower  Public Art

### Pick an Idea to Work On

Here are three random ideas that were submitted by community members. Select one to complete five activities related to that idea. You are always free to skip activities, and you can switch to a different idea by coming back to this page at any time.

1 2 3 4 5

Gateway Promenade Real

### Have an idea?

Add your own idea for the future of El Nudillo.

[SUBMIT A NEW IDEA](#)

### All done?

Please take this short survey so we can improve the experience of CommunityCrit for other community members.

[GO TO EXIT SURVEY](#)

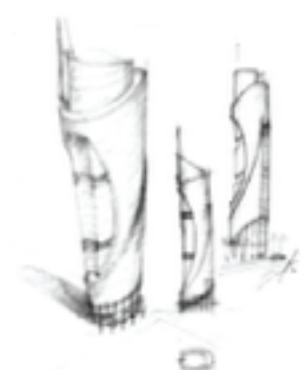
1

# 2) Do or skip activities

## Idea: Build a tower

Submitted by a workshop participant.

Build a tower in the center of El Nudillo. Sketches of tower concepts as shown.



### Question 1/5

How could this idea be improved by taking the following submission into consideration?

### Submission

14th Street Promenade Workshop  
The height limits of East Village/downtown (440 feet) and Barrio Logan (40 feet) converge here. Height should be treated in a sensitive manner.  
— This design guideline was submitted by a project organizer.

Please enter your response here.

[Skip >](#) [SUBMIT](#)

2

## 3) Submit a new idea

[← BACK TO DO AN ACTIVITY](#) [SHOW EL NUDILLO OVERVIEW](#)

**Submit A New Idea**

What would you like to see or do at El Nudillo, the intersection of 14th Street and National Avenue, by yourself or with family and friends?

Please enter your response here.

Give your idea a name.

Name your idea.

Upload a main image (optional)

Choose File No file chosen

**SUBMIT**

**3**

## 4) View my/all contributions

### Ideas

Click on an idea to look at the contributions your fellow community members have made.


**Promenade Real**

It would be brilliant if the entire length of 14th street was closed to motor traffic and was a truly pedestrian promenade. The only exception could be the small Free Ride carts that could transport people up and down the street. This would not only provide a pleasant safe space for people and pets [...]

[DO AN ACTIVITY FOR THIS IDEA](#) 13 36

**Platform connected with bridges**


Instead of making a roundabout we can create a two story triangle platform to avoid a major infrastructure change. It is a platform that works with current traffic, but allows people to walk to get where they need, and creates a green space at the ground level. The three pillars can be lightweight [...]



[DO AN ACTIVITY FOR THIS IDEA](#) 12 32

**Interactive Art**

Love to see interactive rotating art with current cultural subjects. A place for exchanging ideas which helps the community grow together. Sample image from a San Francisco public art piece



[DO AN ACTIVITY FOR THIS IDEA](#) 10

**4**

# Method

- ▶ Partnership with a local planning team
- ▶ Design and development of the tool
- ▶ Deployment in the wild
  - ▶ Interview with community members
  - ▶ Think aloud
  - ▶ Interview with urban planners
  - ▶ Experts' feedback on people's contributions

# Case Study: Park-to-Park Project



Current



Proposed



th St

14th St

National Ave

National Ave

Commercial St

Commercial St

ercial St

Commercial St

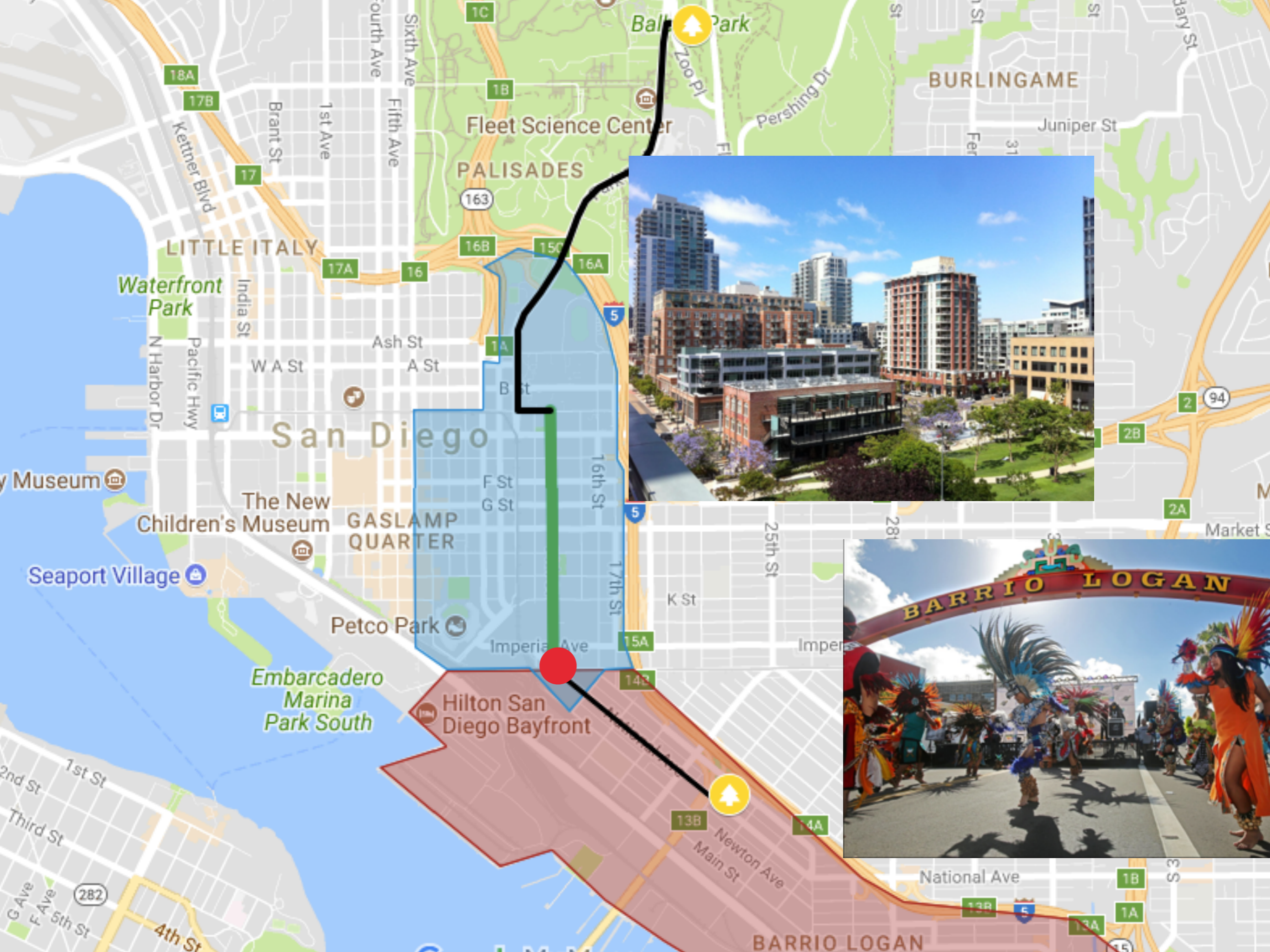
Commercial St

Commercial

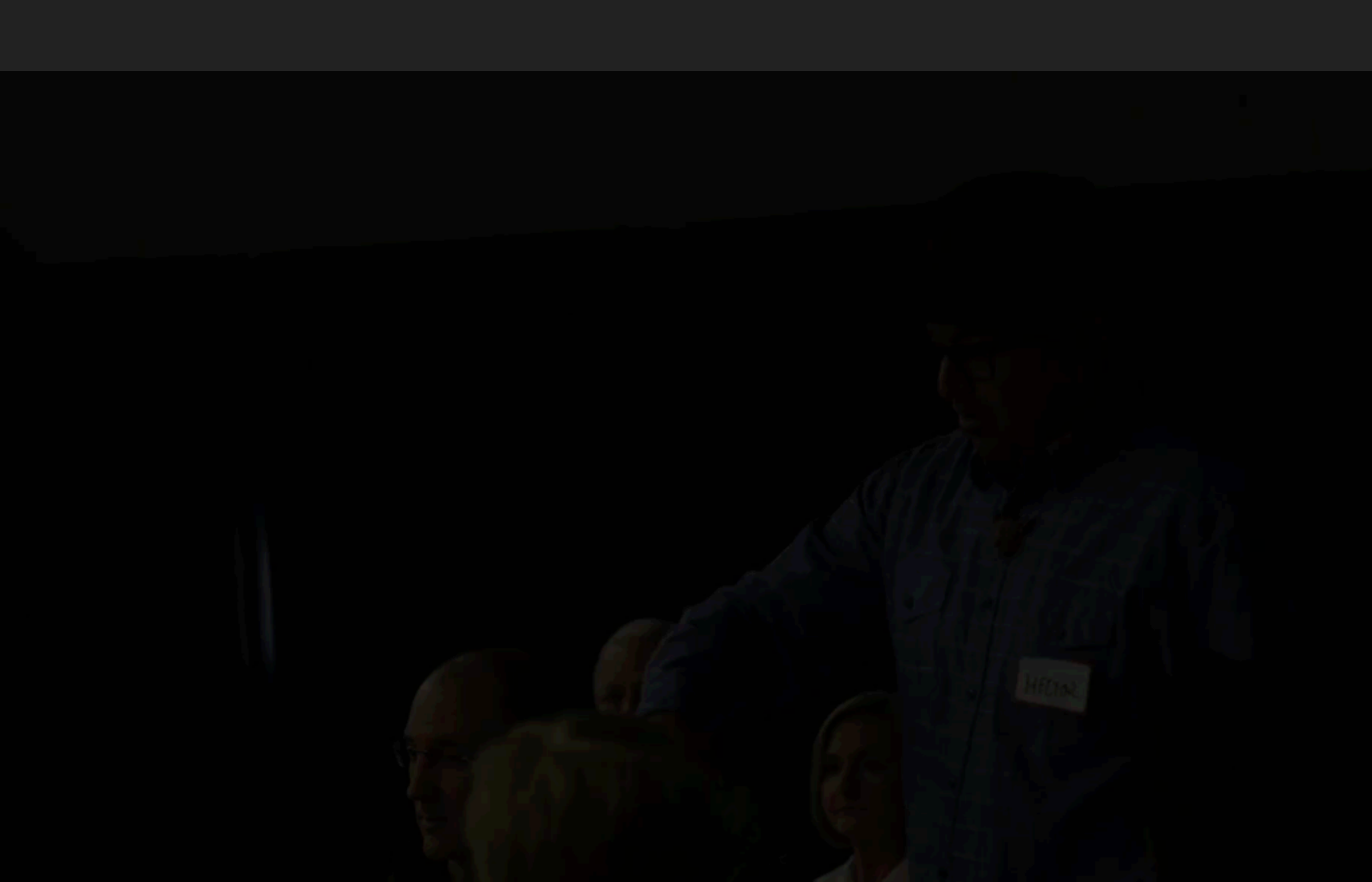
National Ave

Reliable Pipe











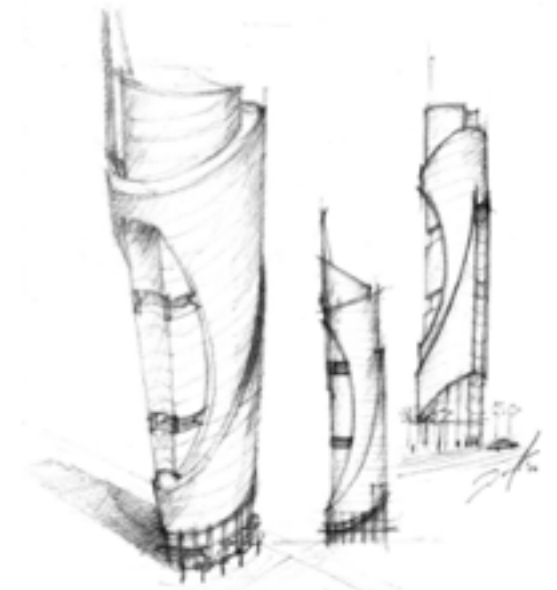
# Workshop participants willingness to use an online tool

- ▶ Willingness (21/21)
- ▶ Technological means (21/21)
- ▶ “We have always been overlooked, so my community would be very interested in an online tool”

# Workshop ideas

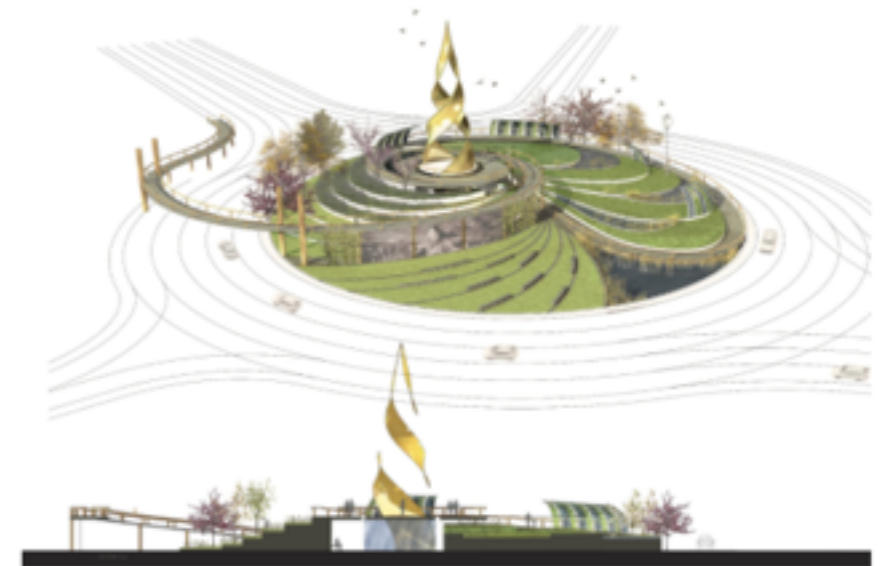
## Build a tower

Build a tower in the center of El Nudillo. Sketches of tower concepts as shown.



## Roundabout

The intersection right now is basically just an empty lot. We could easily make it a roundabout with three crosswalks so that traffic from National Ave and Commercial St can still get around but so people can also use the open space in the center.



DO AN ACTIVITY FOR THIS IDEA

8 26

# CommunityCrit ideas

## Promenade Real

It would be brilliant if the entire length of 14th street was closed to motor traffic and was a truly pedestrian promenade. The only exception could be the small Free Ride carts that could transport people up and down the street. This would not only provide a pleasant safe space for people and pets [...]

## EL Parquecito

a densely landscaped small urban park. NO Large sculpture or gateway 'ART' archway JUST a BIG canopy tree and pervious ground cover with native grasses to soften



DO AN ACTIVITY FOR THIS IDEA

8 22

## Empowered community members to provide input

“I don’t have time to go to workshops so it provides opportunity to give feedback”. (P6)

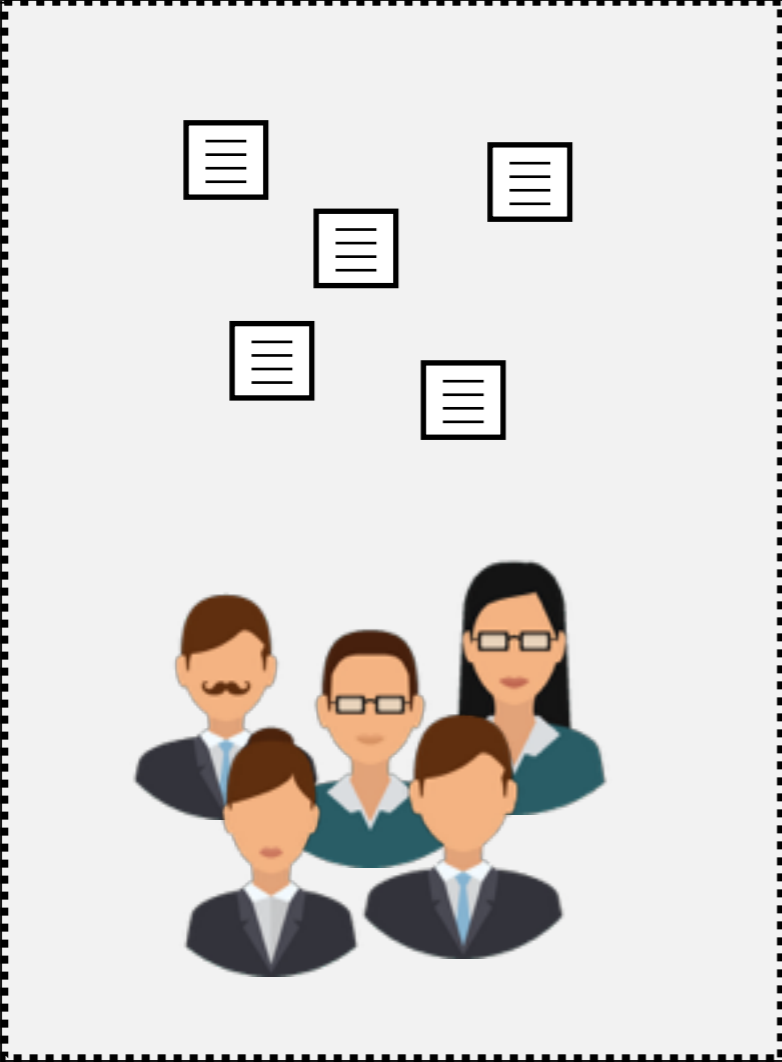
“I liked only having to answer 5 questions. I have conducted lengthy surveys myself and thought them to be excessive to the point of endangering the quality of data collection (respondents get bored, distracted, only want the "reward" etc.)” (P2)

## Urban planners saw value in public outreach

“Provides more tools for community outreach and for people to participate, and will give us a chance to present ideas that came out of CommunityCrit back to the public during the next workshop and facilitating a discussion around them.” (E2)

# Contributions: Scaling & diversifying public participation

Public Workshop



CommunityCrit



# Remaining problems and ideas for your projects

- ▶ In class activity: team formation

# Project daedlines

- ▶ Week 2: team formation and project ideation
- ▶ Week 3: project ideation
- ▶ Week4: project pitches
- ▶ Week 6: no lecture-project discussion and feedback
- ▶ Week 7: feedback on early project prototypes
- ▶ Week 9: feedback on project prototypes



# Remaining problems

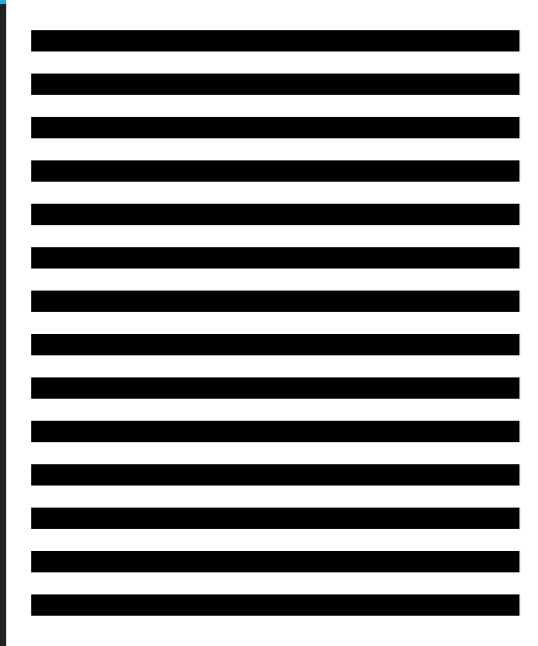
1. Increasing civic engagement
2. Making sense of people's input
3. Organizing opinions and points of conflicts
4. Fostering inclusion and diversity

# 1. Increasing civic engagement

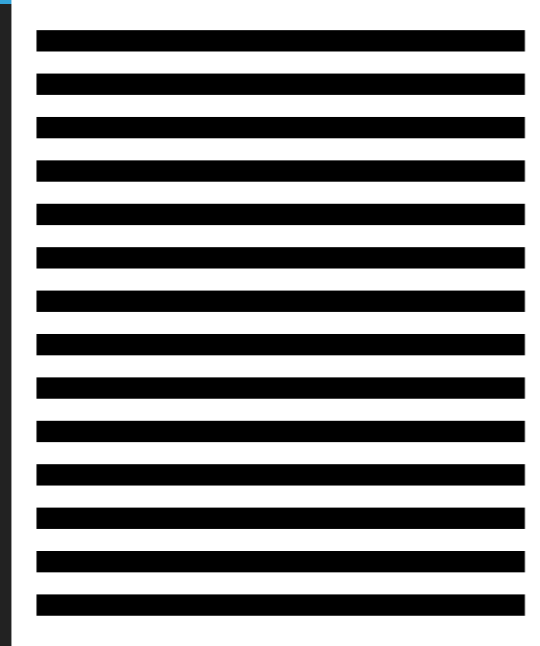
- ▶ Personalizing tasks
  - ▶ Send people to tasks biased on their interests
- ▶ Communicating outcomes in an engaging manner
  - ▶ Visual storytelling
  - ▶ Meaningful visual encoding

# Sources and original plans are lengthy

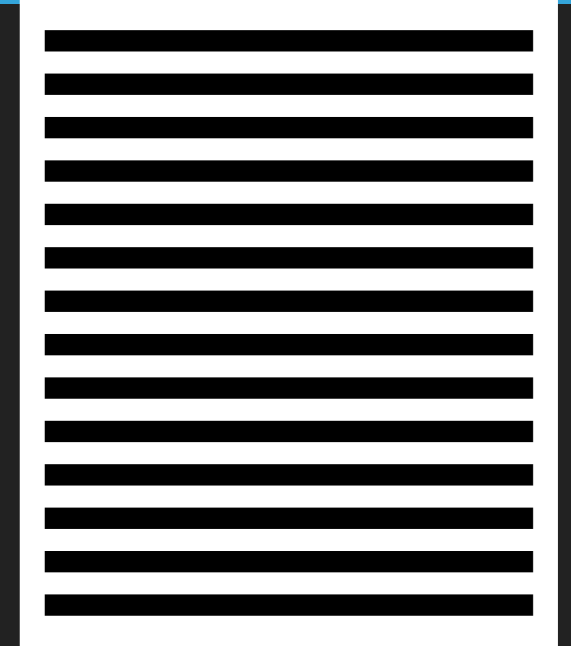
Master Plan



Community Plan



Design Guidelines



# Personalizing tasks based on peoples' interests



Scenario: Betty a single mother

✓ Role: Resident

Interests

✓ Mobility

Street Character

Topics

Walkability

Parking

Furniture

Excerpts



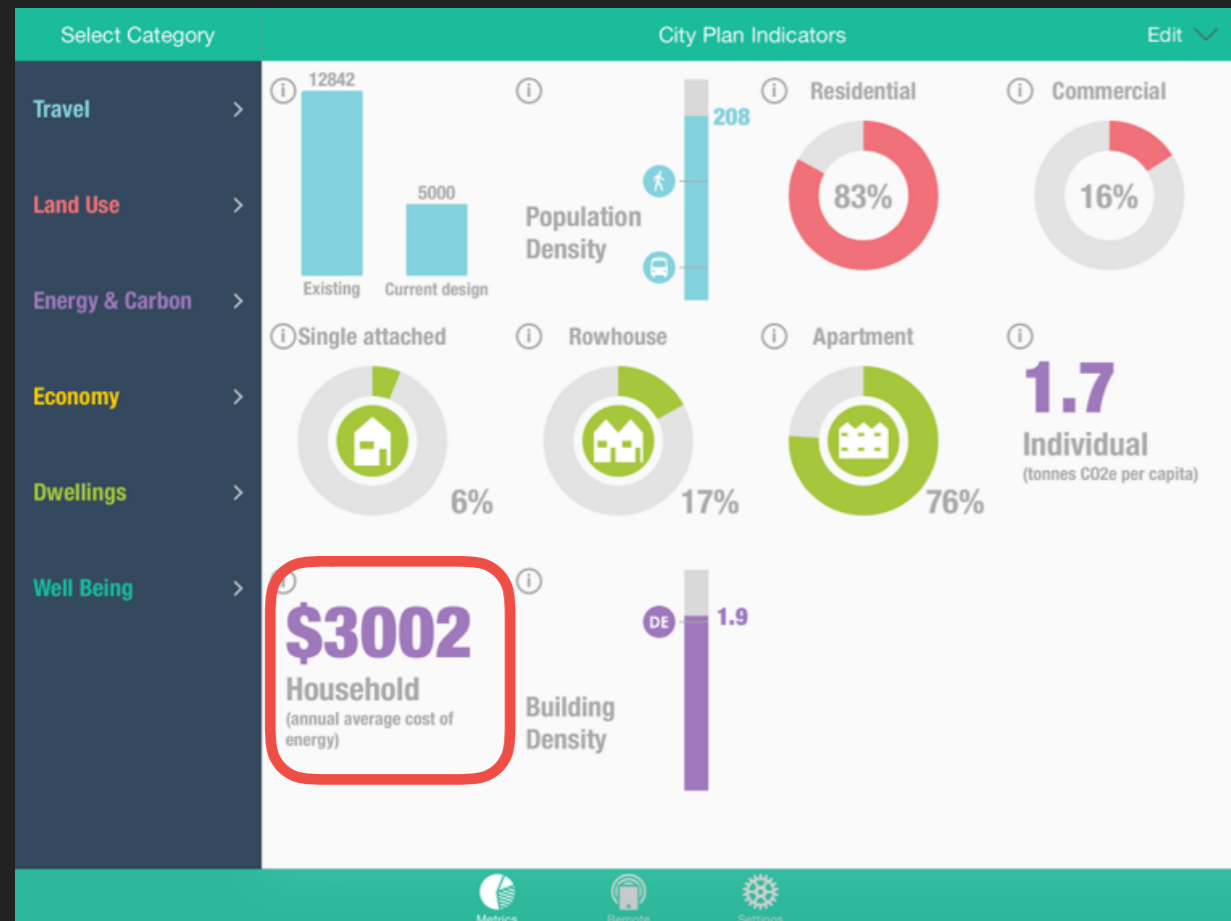
Sources

Master Plan

Community Plan

Design Guidelines

# Visualization design for non-specialist users



Infographics to increase everyday people's engagement

# 2. Making sense of people's input

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## Interactive Art

Love to see interactive rotating art with current cultural subjects. A place for exchanging ideas which helps the community grow together. Sample image from a San Francisco public art piece



DO AN ACTIVITY FOR THIS IDEA

10 34

## Build a tower

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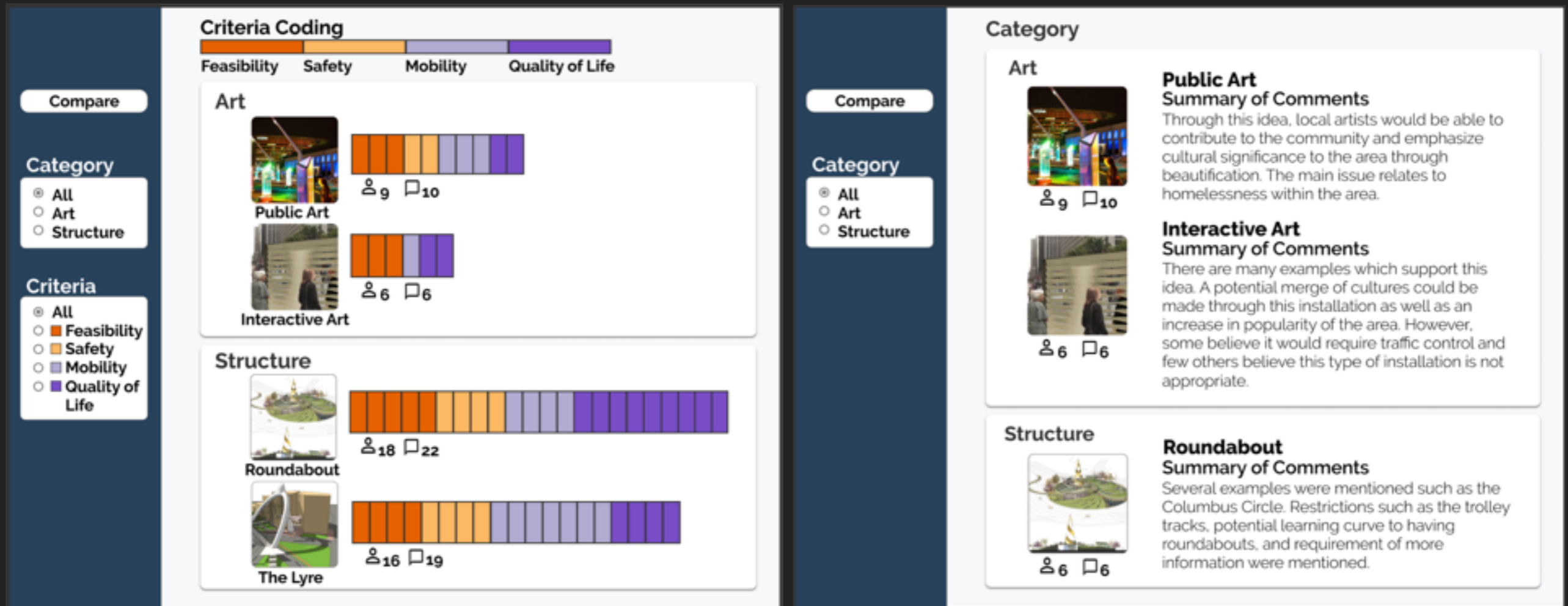
DO AN ACTIVITY FOR THIS IDEA

7 28

## Roundabout



# Visualizing comments, constructing meaningful summaries



### 3. Organizing opinions and points of conflicts

- ▶ How to organize opinions, identify patterns of thought & points of conflicts?



Search ...



THE LATEST



SANDAG Nears Deal to Develop Clairemont Trolley Station Site After Threatening to Seize Property



The Case for Fact-Checkers in a 'Post-Truth World'

# I'm a Young Techie. Here's What San Diego Needs to Do to Keep Me.

## THE GIST

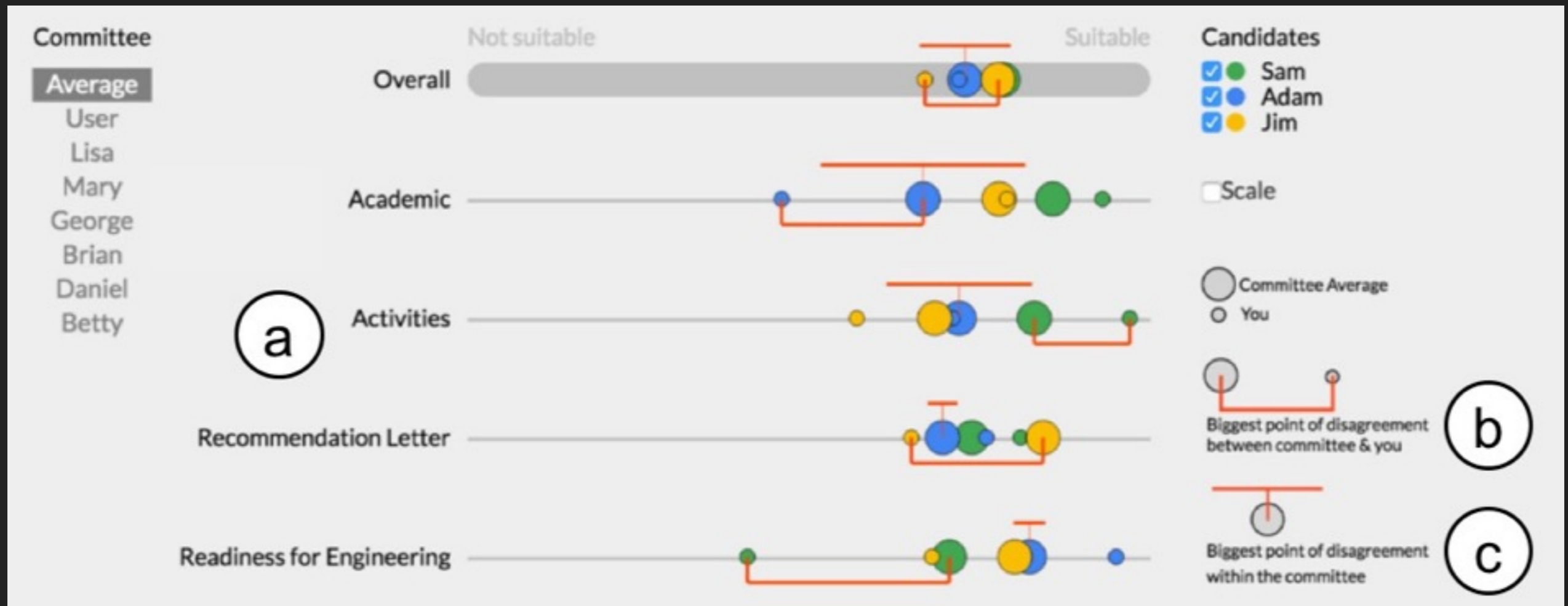
Please don't make me work in Sorrento Valley.



Photo by Sam Hodgson

A view of the San Diego skyline

# ConsensUs: visualizing disagreement in collaborative decision making




Mahyar, Narges, et al. "ConsensUs: Visualizing Points of Disagreement for Multi-Criteria Collaborative Decision Making." *CSCW demo*, 2017.


Disagree Agree

**Give your Opinion**

### Top Cons




Slock.it has a private interest to avoid the DAO to get hacked. Its interests are aligned with the DAO. (read more)  
5/7/2016, 1 comment




Instant withdrawals are a terrible idea.  
5/7/2016, 0 comments

### Top Pros



A pause to review security issues is sensible.  
5/7/2016, 2 comments



I like that The DAO can crowdsource the security audit of its own code  
5/7/2016, 1 comment

# Relevant talks and events

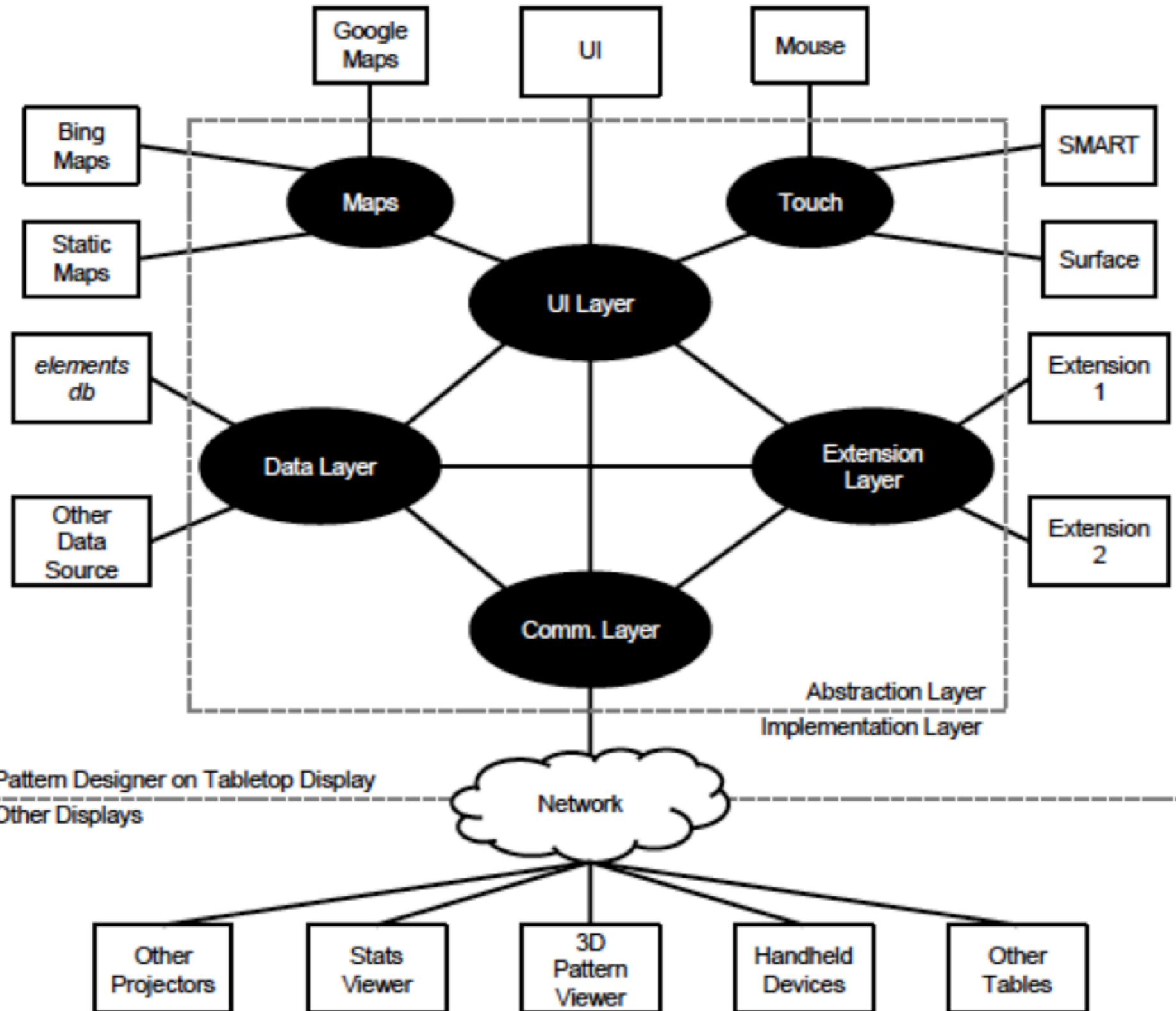
- ▶ Fall Speaker Series to Explore Technological Shifts and Social Change
  - ▶ <https://www.umass.edu/sbs/news/faculty/fall-speaker-series-explore-technological-shifts-and-social-change>
- ▶ MIT Design.a.Hack.a.thon: Sept 15-17th
  - ▶ <https://www.media.mit.edu/events/city-robotics-hackathon/>
- ▶ Using the Crowd Mixer, October noon-2pm
  - ▶ [https://umassamherst.co1.qualtrics.com/jfe/form/SV\\_3seo2iVW3CTrRKB](https://umassamherst.co1.qualtrics.com/jfe/form/SV_3seo2iVW3CTrRKB)

**Back up *Slides***

# UD Co-Spaces: specifications

- ▶ Projectors in Decision Theater (UBC, CIRS building):
  - ▶ Native Resolution: 1920x1200
  - ▶ Aspect ratio: 16:10 (WUXGA)
  - ▶ Image Size: 127- 1524 cm
- ▶ Touch table: PQ labs touch interface
  - ▶ 52" HD TV
  - ▶ Resolution 1920 x1080

# UD Co-Spaces architecture



# UD Co-Spaces development

- ▶ Software uses a layered approach that introduces abstractions for the 2D and 3D displays and for the case database.
- ▶ RabbitMQ provides a bulletin-board-style messaging layer to broadcast and listeners associated with each federated component provide asynchronous responses.
- ▶ Bindings were written to support PQ Labs multi-touch surfaces for the 2D tabletop, Google Earth for 3D rendering, Google Map, and elementsDB.



# CommunityCrit development

- ▶ Responsive and mobile-friendly using Laravel framework
- ▶ Backend: PHP with a MySQL database
- ▶ Front-end: HTML, CSS and Javascript

# CommunityCrit workflow

