

UD CO-SPACES: A TABLE-CENTERED MULTI-DISPLAY FOR PUBLIC ENGAGEMENT IN URBAN DESIGN CHARRETTEES



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WHAT ARE DESIGN CHARRETTES?

- ▶ A common method for engaging the public in urban design
- ▶ Intensive multi-day processes
- ▶ A team of professionals and a diverse set of stakeholders create a development plan



WHY DESIGN CHARRETTEs ARE IMPORTANT?

- ▶ Diversity of viewpoints
- ▶ Discourse among stakeholders
- ▶ Buy-in for final solutions

(Lennertz et al. 2006, Brody et al. 2003, Innes & Booher 2004)

WHY DESIGN CHARRETTES ARE HARD?

**“AN IMPOSSIBLE PROBLEM IN
AN ABSURDLY SHORT TIME”**

Condon, 2007

HOW DESIGN CHARRETTES ARE CARRIED OUT TODAY?

- ▶ Paper-based
 - ▶ Engaging, collaborative
 - ▶ No feedback on indicators
- ▶ Geographic info system
 - ▶ Expert intensive
 - ▶ Non-collaborative



WHAT ARE THE CHALLENGES FOR DESIGNING TOOL SUPPORT?

- ▶ Integrating data and visualizations of information
- ▶ Employing interactive modes to engage people
- ▶ Providing understandable yet credible information
- ▶ Employing social and peer learning

(Sheppard, 2012; Moser, 2010; Holden 2008; Davis, 2008)

MAIN GOALS

- ▶ Engaging diverse stakeholders
- ▶ Fostering collaboration and co-creation
- ▶ Understanding consequences of their choices

DEFINITIONS

- ▶ Indicators (sustainability metrics):
 - ▶ e.g. population density, percentage of walking trips
- ▶ Case: has information such as footprint, height, volume
 - ▶ e.g. buildings, streets, or parks.
- ▶ Task: Designing a neighborhood for maximum walkability

UD CO-SPACES (URBAN DESIGN COLLABORATIVE SPACES)



UD CO-SPACES: TABLETOP AND HANDHELD DEVICES



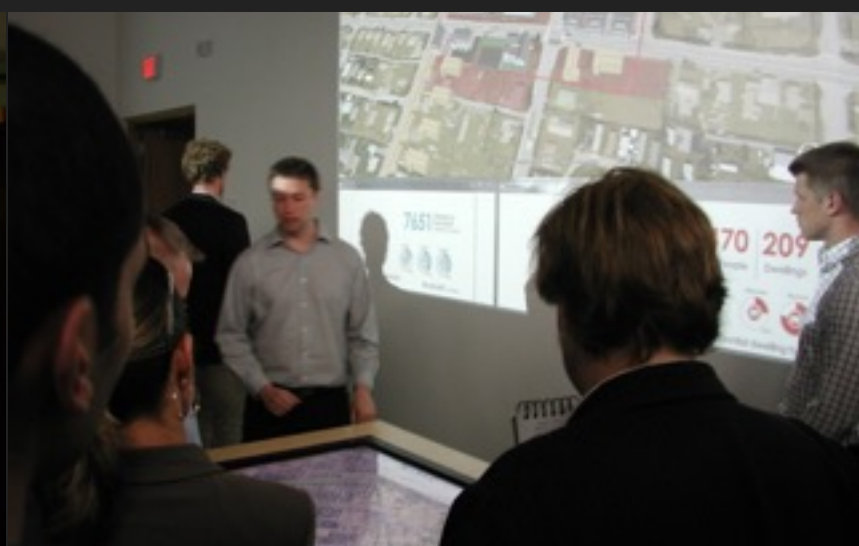
UD CO-SPACES VIDEO



DESIGN, DEVELOPMENT AND DEPLOYMENT PROCESS



2010



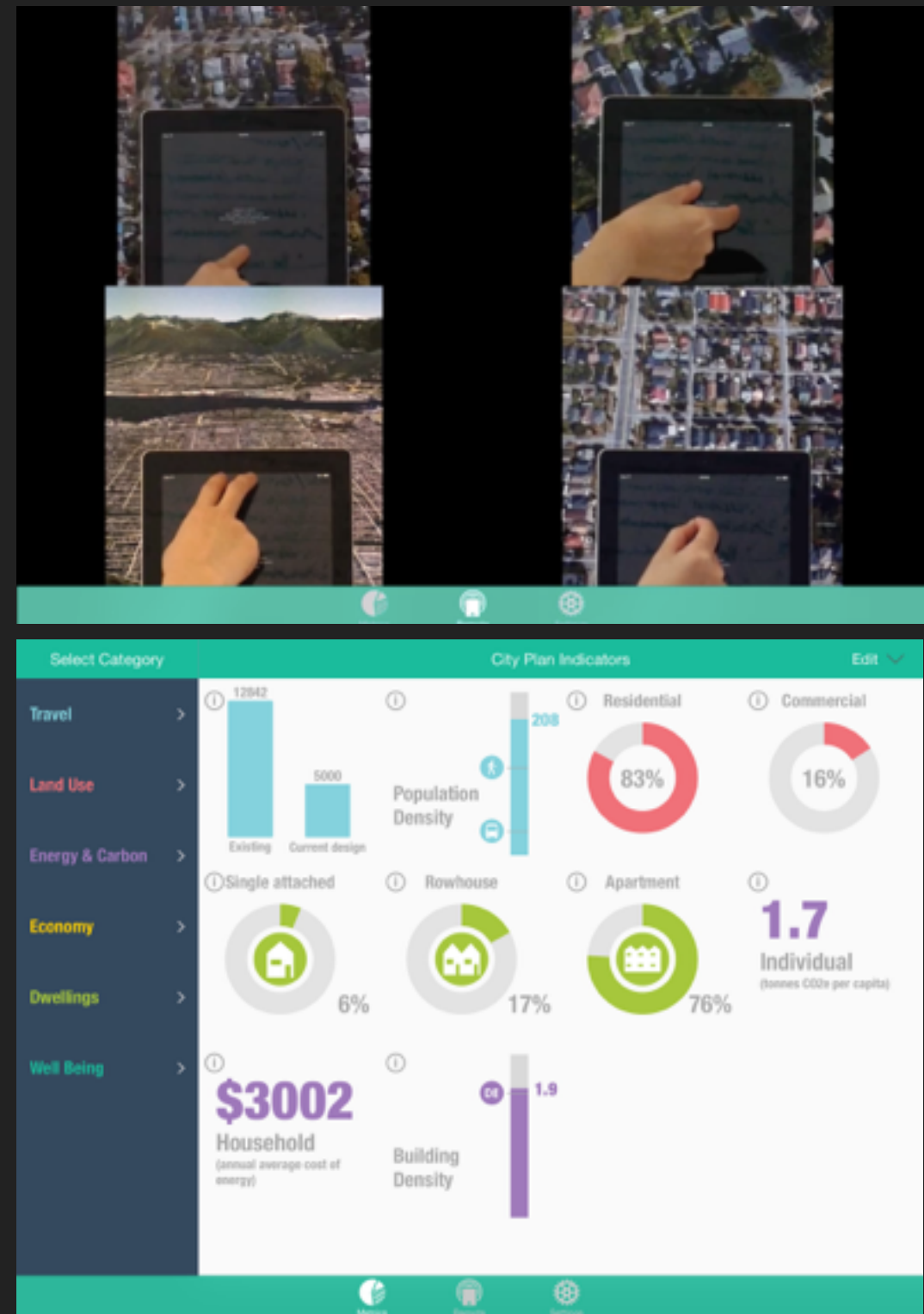
2012



2016

CURRENT VERSION: INTEGRATING INDIVIDUAL DISPLAYS

- ▶ iPad 3D viewer app
 - ▶ Improving interactions with the 3D wall display
- ▶ iPad indicator app
 - ▶ Moving indicators into personal spaces



USER STUDY

- ▶ Lab study with **37 participants** (8 groups of 4-5)
- ▶ University students from various disciplines
- ▶ 2 conditions: paper vs. UD Co-Spaces



WHAT DID WE LEARN?



ROLE: CO-CREATION OF SOLUTIONS



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

DID THE TECHNOLOGY CATALYZE DISCUSSIONS?



"2D and 3D helped with dialogue"

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

DID THEY UNDERSTAND CONSEQUENCES OF THEIR DESIGNS?



“Having [indicators] and having that in real time definitely altered how we approached the project”

SEVEN PRINCIPLES FOR URBAN DESIGN CHARRETTES

- 1) Engagement
- 2) Collaboration
- 3) Interactive visualization
- 4) Accessibility
- 5) Iteration
- 6) Understanding consequences
- 7) Transparency

MAIN CONTRIBUTIONS

- ▶ Urban design charrettes: technology and guidelines

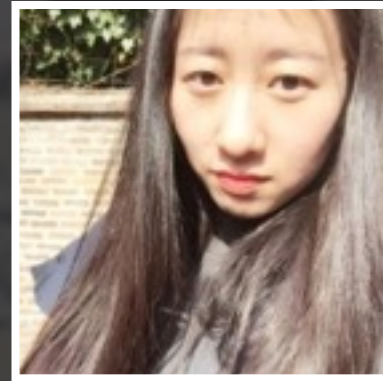
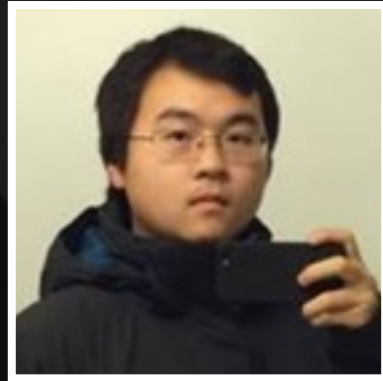
Beyond the urban design domain:

- ▶ The potential of interactive surfaces
 - ▶ Building common ground
 - ▶ Increase interactions and engagement using touch-based interactions
 - ▶ Transiting Novices to experts

WHAT CHALLENGES REMAIN?

Just Scratching the Surface: The long Road to Effective Cross-Surface Interaction





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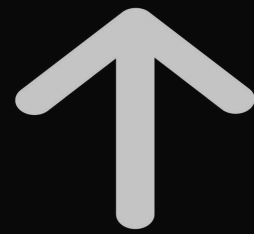
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Slides, paper, and more:

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BACK UP SLIDES

HOW MUCH ENGAGEMENT?



increasing levels of engagement

empower

make or delegate decisions about options

collaborate

participate in generating and testing options

involve

participate in defining options

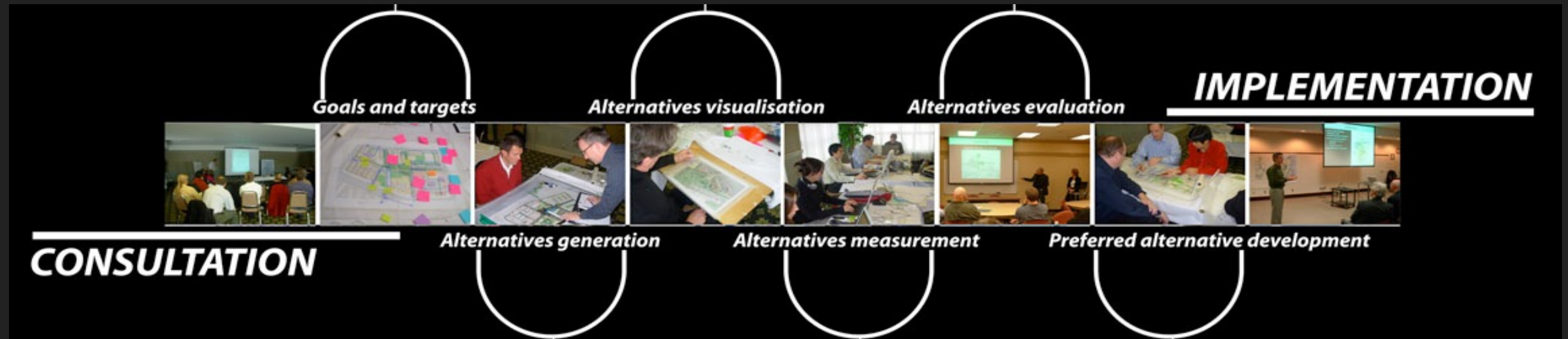
consult

contribute, and learn about others', feedback

inform

share information

WHAT IS THE GAP?



- ▶ There is a gap in tool support for design charrettes
- ▶ Early in the process where influential (and difficult to reverse) directions are considered with relatively little information

USER-CENTERED DESIGN PROCESS

- ▶ 2010: one single display small tabletop
- ▶ 2012: larger tabletop connected to a large wall display
- ▶ 2016: multi-display: table, wall, iPads



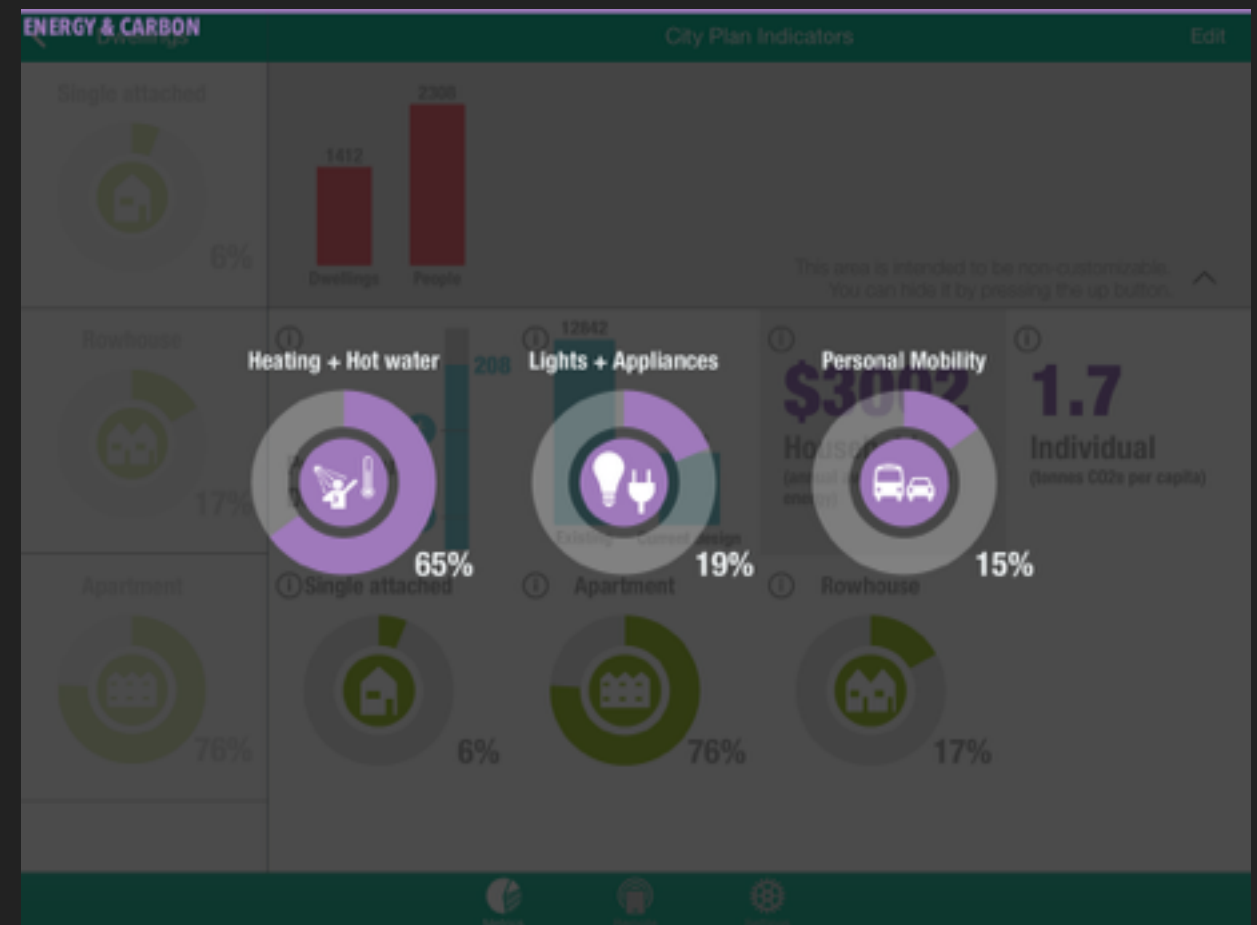
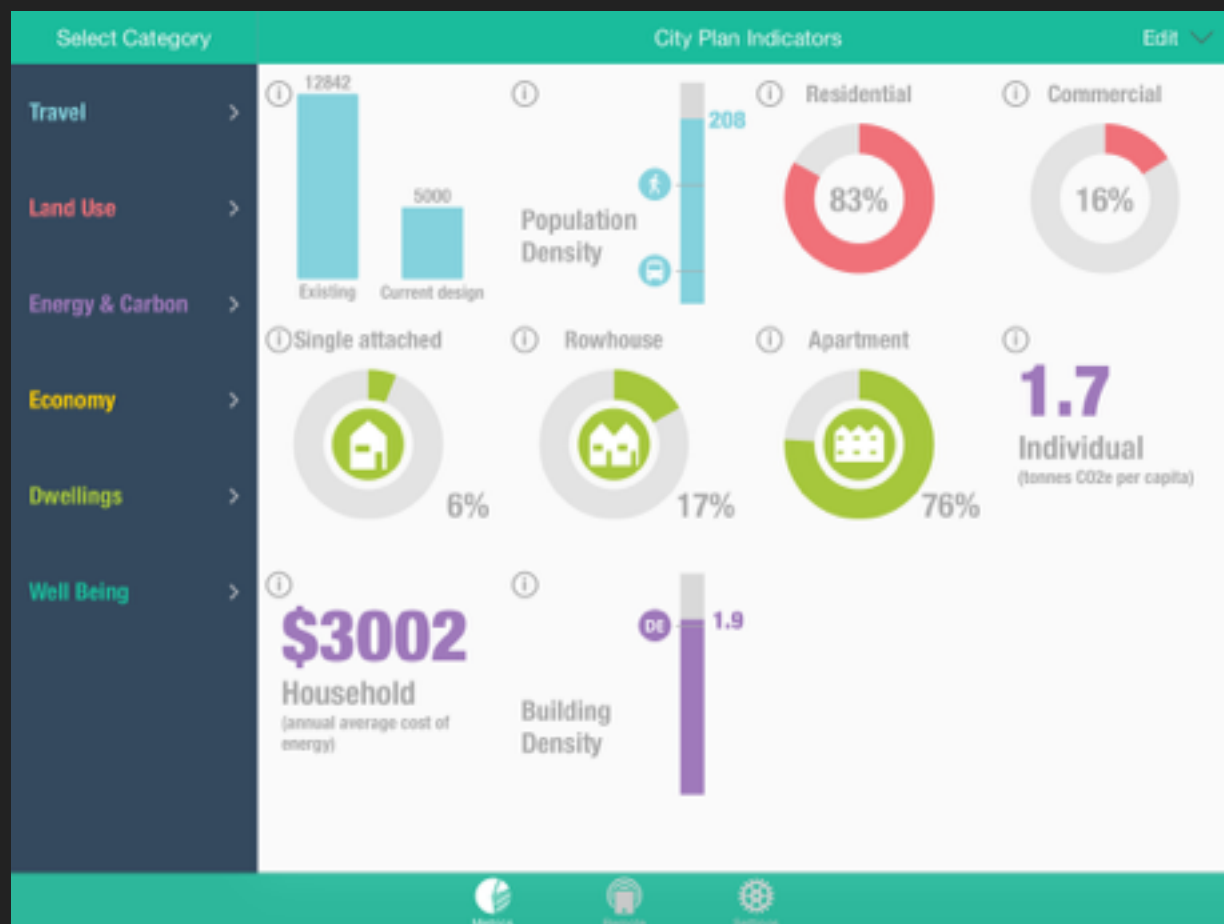
2010

2012

2014

2016

VISUALIZATION DESIGN FOR PUBLIC ENGAGEMENT



- ▶ Infographics & donut charts based on domain experts' suggestions

ROLE: SHARE THEIR THOUGHT PROCESS WITH OTHERS



DID THEY GET SOME APPRECIATION FOR WICKED PROBLEMS?

“There are a lot of details to consider when doing urban planning!”

“The process helped understand city planning and its ramifications”

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