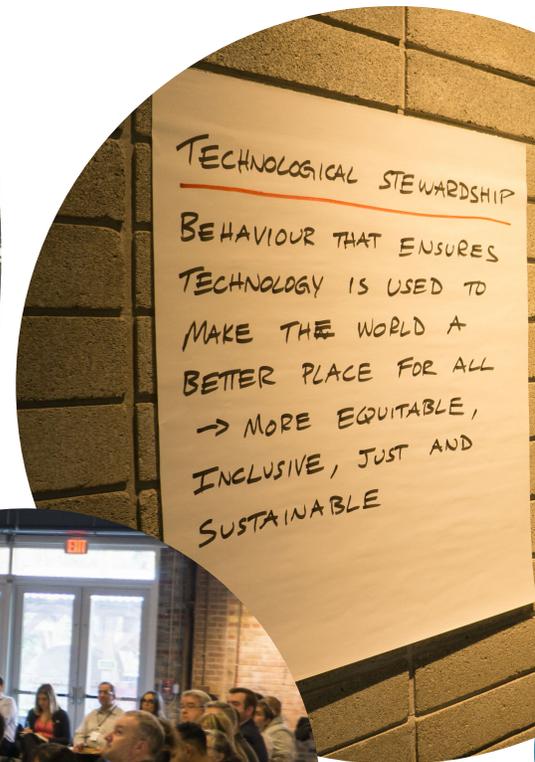


Engineering Change Lab Workshop #15 Harvest

Future Cities & Technological Stewardship

October 28-29, 2019

Evergreen Brickworks • Toronto, Ontario



WORKSHOP GOAL

To explore how the engineering community can better connect with diverse conversations about future cities and promote technological stewardship.

FORMAT

Design & Facilitation

Engineering Change Lab

Workshop #15 of working with the engineering community using a social change lab approach



MaRS Solutions Lab

Deep expertise in social labs and centrally involved in future / smart city efforts in Canada - including as members of Future Cities Canada

Location: Evergreen Brickworks, the historic site of the Don Valley Brickworks that played a storied role in building Toronto and has been transformed into an award-winning public space featuring green design. The space highlights the connections between engineering and city building, and Evergreen is one of the founding partners of Future Cities Canada, a hub for future cities dialogue.

As a **core organizing principle** for the workshop, **five breakout groups were created** to help participants explore connections between engineering and future cities through engaging in specific problems. Key organizations kindly agreed to act as "clients" and bring forward real issues they are currently engaging with as problems.

Although ideally this process would generate useful ideas for the "clients," **the primary intention was to use these specific examples as a method for learning** how to create and practice new ways to broaden engagement, to have conversations, and to collaborate across difference.

PARTICIPATING ORGANIZATIONS

Allenvision Inc. • American Society of Civil Engineers • The Artemis Collective • Business Development Bank of Canada • Canadian Engineering Education Challenge • Canadian Federation of Engineering Students • CareerCycles / OneLife Tools • Chumak & Company LLP • Cisco • City of Toronto • Colleen M. Shannon Professional Corporation • Compute Ontario • Concordia University - Gina Cody School of Engineering & Computer Science • Deloitte • Element AI • Evergreen • Groundswell • GS Group • MaRS Solutions Lab • MASS LBP • Metrolinx • Ontario Association of Certified Engineering Technicians and Technologists • Ontario Ministry of Education • Ontario Society of Professional Engineers • Open North • Professional Engineers Ontario • Ryerson University - Faculty of Engineering and Architectural Science • Sheridan College - Pilon School of Business • Suncor Energy • Tangent Workx Corp. • The McConnell Family Foundation • Thin Air Labs / Inception U • Toronto Community Housing • University of Toronto Faculty of Applied Science & Engineering • University of Waterloo • Waterloo Institute for Social Innovation and Resilience • WSP in Canada • York University - Lassonde School of Engineering

BREAKOUT GROUPS

Active learning was facilitated through engaging with specific problems. Deep appreciation to the volunteer "client" participants who offered these concrete issues for the group to learn through.



GROUP 1:
Developing meaningful civic participation for a city data trust

Problem frame: How might engineering help to create meaningful opportunities for citizen participation and citizen consultation for a semi-public city data management asset?



GROUP 2:
Planning the Transportation Innovation Zones

Problem frame: How might the City of Toronto best leverage the expertise and partnership from engineering, policy, civil society, and business communities to effectively design, deploy, and manage experimentation zones for new transportation technologies in Toronto?



GROUP 3:
Knowledge Mobilization & Academic Training

Problem Frame: How might we break down silos across the engineering, policy, social science, and design academic fields to better prepare/train the next generation of city builders, and impact the city building initiatives in the present?



GROUP 4:
Elevating Opportunities for Engineers to Connect to the Public (National Engineering Month 2.0)

Problem Frame: What are the benefits for the engineering and engineering technician/technology students and professionals that organize National Engineering Month (NEM) events, to see themselves as part of a future cities ecosystem?



GROUP 5:
Retrofitting the built environment of cut-through neighbourhoods through citizen-led solutions

Problem Frame: How might we engage diverse actors to support the development of coherent community-based solutions to retrofit the built environment of cut-through neighborhoods? How do we engage a massive amount of diversity to develop a very coherent solution?

"Grounding the conversation in tangible projects was super effective -- gave things an extra push."

DAY 1 - Context setting

Ideas that set the stage for the discussion.

From our pre-workshop conversations about the connections between engineering and future cities:

"[As someone working in the Future Cities community, I'm] not seeing much engineering engagement...Feels like engineers get reduced to looking at technical things that are tightly framed and that they can get directly paid for."

"We don't see the engineering voice in the strategic level circles we're operating in...don't see engineers in the public service coming forward with a public view – not like scientists."

"Typical of the current state of engineering – we just focus on our pieces and it's not our job to figure out how it all fits together - societal implications, ethical issues, etc..."

Technological stewardship

Behaviour that ensures technology is used to make the world a better place for all – more equitable, inclusive, just, and sustainable.



Necessitates a shift in engineers' dominant understanding of technology

- Artifacts → artifacts that are socially constructed
- Digital → digital but also physical and biological
- Neutral → value laden
- Apolitical → political



Technological stewardship as a bridge between the two communities

SYSTEMS APPROACH

Systems = elements + relationship between elements



Elements = physical objects, digital objects, nature, humans, processes, and more

→ Work together to accomplish a function or purpose

Systems change over time through the collective seemingly small choices of disparate actors



Don't always need big changes -- small, focused interventions can have a large impact eg impact of lots of pollinators on food systems



Day 1 - Mapping the current state

Activity 1: Map the Actors

Who is involved in the initiative? How are they involved? Who is talking to who? Who isn't involved that should be ?



Activity 2: Identify the Opportunity Space

Picking 2-3 actors who would benefit from more engagement. One needed to be an engineer. Also encouraged to consider how to bridge engineers beyond the engineering community. Map the needs/values/influences/barriers of the key actors identified.



Activity 3: Sharpen your framing

Rereading the problem statement and reflecting as a team: has anything been learned that might shift the problem?

Present Back: Presentations of systems maps and personas with key needs/barriers.

Participants shared one word for how they were feeling at the end of Day 1



End of day high-five circle



Curated team working around a real case study with time to do the work together -- beautiful day!

Day 2 - Solutioning

Technological stewardship principles to guide action

Seek purpose direct technological development to maximize positive outcomes for all

Take responsibility consider, anticipate and manage the complex impacts of technology across the entire life cycle

Expand involvement integrate a broad range of non-technical experts and ideas into technological development

Widen approaches explore alternative ways to solve problems

Advance understanding foster dialogue about technology and technological stewardship

Realize diversity ensure technological development contributes to creating equity

Deliberate values consider underlying values and make intentional decisions

Shared action we can only succeed together



Presentations by Inspirational Exemplars

MASSLBP citizen engagement



OpenNorth open data

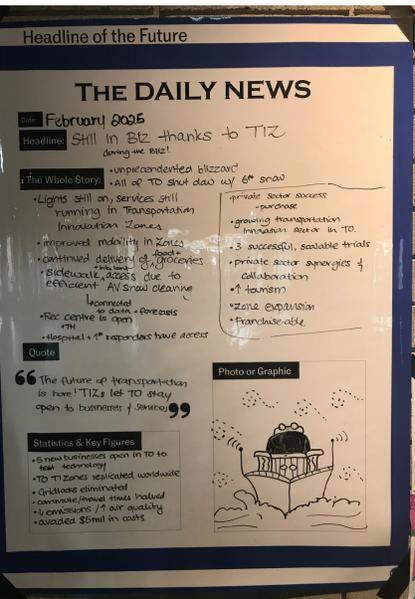


Future World Vision - infrastructure reimagined



IEEE P7000 - Engineering Methodologies for Ethical Life-Cycle Concerns Working Group

Day 2 - Solutioning



Activity 3: Creating the headline of the future. Identifying the "big idea" and illustrating how the ideal outcome would look in a newspaper story.

Activity 4: Designing the strategy that leads to the outcome. Brainstorming prototypes then creating a storyboard that outlines steps toward making the one the group selects a reality.



Present Back: Presentations of big ideas and prototypes



Day 2 - Closing reflections - key themes

What do you feel inspired by?

- the people who committed to be here, who are trying to make strides
- engineers being purpose driven
- people want to solve problems not fight about issues – having platform to do that
- this forum: agents of change working in this context
- exercising the muscle of having conversations across difference - not easy and need to practice
- concept of technological stewardship
- the desire for engineers to have a broader role
- energy and engagement around challenges
- creation of safe space to have difficult conversations with people that have differing views
- the passion in the room
- how the groups converged at the end
- bravery of the 5 “clients” who put out ideas to be tested and were receptive to feedback
- how much work we got done
- the structures that supported the deep critical thinking that happened
- the check out commitments
- willingness of participants to go with the process and trust something useful would result
- the great group and positive experience
- directing thinking towards common purpose from different perspectives
- willingness to sit in uncomfortable conversations
- different worlds I could peek into - tools and resources we heard about
- breadth of knowledge and ideas and questions we had
- visceral sense of community
- that individuals that didn't know each other/representing different interests and organizations could quickly come together to solve a real world issue and appreciate/accept different viewpoints

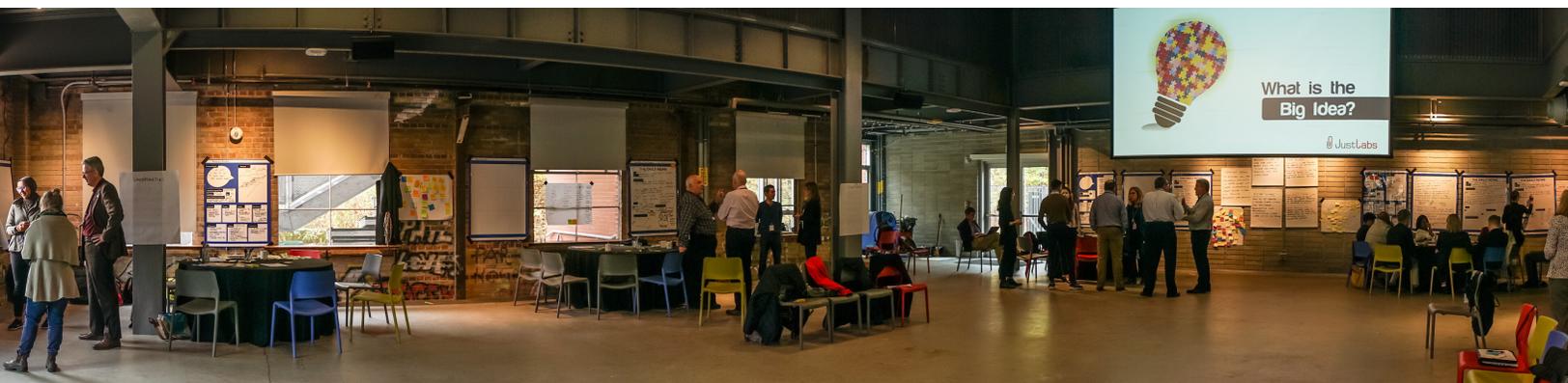


What are you committed to doing?

- keeping on coming to these events
- working to bridge gaps and silos
- sharing the conversations with more working engineers
- keeping in contact with new connections
- exploring tools to communicate about these issues with more people
- keep connecting with people with radically different perspectives
- being part of the new cultural movement and shift
- figuring out how to evolve and support all the work and bring collective learnings back in a usable format
- engaging more deeply and regularly
- continue to think about how to include more diverse perspectives and voices
- bringing citizen voices more front and centre in strategy and vision setting
- navigating boundaries we work in and with
- further investigating all the cool things we were introduced to (IEEE etc)
- life-long learning -- event is a testament to the need for and usefulness of it
- figuring out how to connect all the things that are happening instead of competing
- continue my involvement with the Engineering Change Lab
- make myself more informed on technological change connected to future cities

Key event learnings

- ECL and MaRS Solutions Lab are well aligned
- need to keep having these kinds of connecting conversations to break silos
- need to see engineers as contributors beyond the normal technical confines of their role, and especially as community members
- need to provide participants with additional tools to build the muscles to collaborate across difference
- clearer articulation of the intent to use group projects as a way to practice and learn vs coming up with a specific solution/ideas for other organizations



Thanks to all participants and contributors for making the **Future Cities & Technological Stewardship** workshop a success -- and for helping advance technological stewardship!

If you or your organization is interested in participating in a future workshop, please contact us.

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