URBAN TECHNOLOGY

Cities have always been supported through complex technological infrastructures — from water systems to electricity grids and transportation networks. However, in the last several decades, cities have become increasingly embedded with digital technologies that are dynamically changing, widely deployed, and connected to the Internet in real time.

Urban technology can be categorized across various levels, from **urban screens and surfaces** (billboards and signage) to **networked objects and artifacts** (smart traffic lights, trash cans, sensor-enabled street lights, surveillance cameras), and finally, to **technologies of the body** (mobile phones, tracking devices, biometric feedback devices). Each of these levels is interconnected to form complex sociotechnical urban ecosystems that are embedded with nuanced values and politics.

Our appropriation and use of digital technologies in urban environments has redefined traditional notions of digital and material, public and private, global and local, and individual and community. For example, cities today are constructed from digital, material, and hybrid properties. Walls, buildings, streets, and furniture — all materials that we can touch and feel — are the basis for urban infrastructure. Digital "materials" are primarily constructed of information; while often invisible, they are equally important in shaping our experience of the city. Stories, narratives, photographs, tweets, and videos are all digital materials that help citizens make sense of the city. This joining of digital and material attributes, along with their contextualization through the experience of citizens, allows cities to become meaningful sites of interaction and placemaking.

Urban technologies are embedded with socio-political values. City governments often focus on efficiency and productivity, innovation and economic growth, and safety and security, along with improvements in urban infrastructure. On the other hand, hackers and technologists working for the public good often focus on the privacy of personal information, transparency and access to city data, and democracy and citizen engagement. Yet, it is necessary to consider a much wider set of concerns in order to create quality experiences in urban life.

VALUES IN DESIGN

Both the city government and the hacker/technologist positions are **technologically deterministic**: they imply that technology alone can solve problems and create better urban environments. In reality, technologies are **socially constructed**: people, technologies, and places — and the changing relationships between them — as well as many other cultural, socio-economic, and political factors play an important role in the invention, adoption, use, and appropriation of technologies. Neither perspective is entirely accurate; there is much research being done on the ways in which technologies themselves may have agency, while at the same time being shaped by, and shaping, people's everyday experience in cities.

Through the workshops, we set out to reframe the values that are typically linked with urban technologies by focusing on an alternate set of concepts that we believed would lead to more lively and generative conversations. Values cannot be easily built into urban technologies. A careful consideration of tradeoffs, constraints, and perspectives is necessary in order to design urban environments that integrate digital technologies in a meaningful and enjoyable way that incorporates **quality**, **dignity**, and **respect** for all citizens.

Codesign is a powerful method for enabling diverse stakeholders to come together around the opportunities and challenges surrounding the adoption and use of urban technologies.

CODESIGN

Codesign methods are:

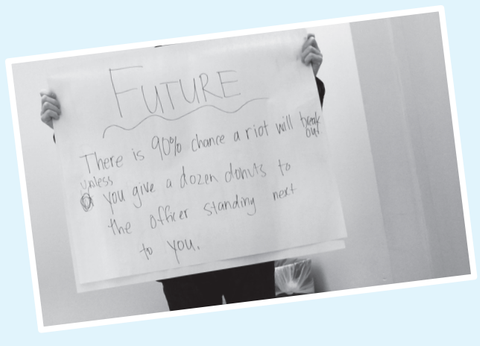
1. **Open, collaborative, and participatory:** The role of designers is not to design, but rather to facilitate and guide the conversation among diverse stakeholders.
2. **Multi-disciplinary and multi-stakeholder:** Codesign provides a platform for people from different sectors, including government, business, activism, and academia, to leverage their multidisciplinary expertise. It is important to include participants from a range of backgrounds and training, such as architecture and urban planning, social sciences and humanities, math and science, engineering and technology, business and law, and art and design, as well as other specialized topics and fields.
3. **Hands-on and action-oriented:** Talking alone is not sufficient for participation. Groups must draw, sketch, visualize, act out, and use other tools to make their abstract ideas visible.
4. **Trust-building and consensus-forming:** Codesign methods can build trust with community members by exposing challenges and tensions between different perspectives, and building consensus and shared meaning through prototyping. While prototypes may be the ultimate result of a codesign process, the collaborative learning and active participation that takes place among group members is often the most valuable outcome. The value of having an open mind and positive attitude throughout the codesign process cannot be underestimated. While it is helpful and even desirable to disagree, all group members must participate and contribute equally in order to drive the process forward.

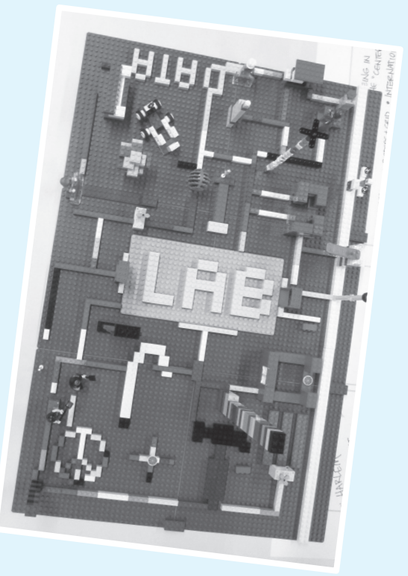
Icons: Ant designed by Paolo Fausone and Cat designed by Valera Nazarov from The Noun Project.

The toolkit is for "designers" including:

- **government officials** charged with making decisions about the future of neighborhoods and urban infrastructures;
- **entrepreneurs** developing the digital platforms, products and services that will enable new ways of experiencing cities;
- **technologists and hackers** developing applications using publicly available data sets;
- **scholars, activists, and artists** who question, critique, and raise awareness of the implications of adopting digital technologies; and, most importantly,
- **citizens of digital cities everywhere.**

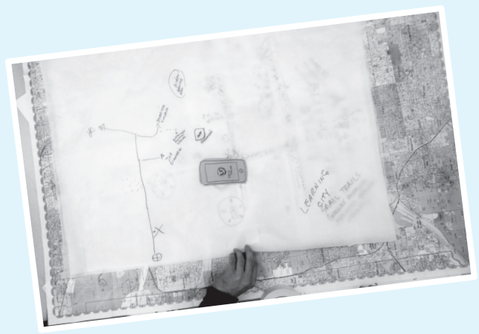
By creating spaces and formats that support and enable citizen engagement, we can re-imagine the possibilities for embedding digital technologies in urban environments for the public good.





Designing Policy Workshop Format

We designed a five-hour workshop to introduce these concepts to stakeholders in different cities. Each workshop included approximately 30 participants, with five to six people per group. Participants included policymakers, business leaders, technologists, activists, and academics. Following initial introductions, the workshop focused on hands-on exercises in which groups moved through a design process from brainstorming to prototyping, as well as the presentation and critique of outcomes. Design artifacts, such as large-format paper with prompts for the various stages of the process, were helpful for structuring the workshops, along with the support of facilitators who guided participants through the activities.



1 Contextualizing the Discussion (20 minutes)

First, we invited people to talk about their own neighborhoods in order to contextualize the discussion in the lived experience of the city. Next, we asked each group to choose a neighborhood to focus their discussion on designing for a specific community. Finally, we asked the groups to draw a map (geographical or metaphorical) of the neighborhood they selected, pointing out important sites of community interaction, such as where people typically hang out.

2 Developing a Shared Understanding (20 minutes)

First, each group received a value card, which was placed on the table. We deliberately avoided the values that are typically associated with urban technology, such as privacy and security or efficiency and innovation. Instead, we substituted values that we thought would spark a more generative and critical discussion, including **romance**, **serenity**, **telepathy**, **serendipity**, **creativity**, **borderless**, and **invisible**. Next, we asked each group to discuss what the value meant to them, and to tell a personal story about the value. Finally, we asked them to discuss the ways in which they might embed the value (or their group's reframing of it) into their city.

3 Brainstorming and Prototyping (2 hours)

In this section, participants used a "design fiction" approach by orienting their discussions towards designing for a future-city scenario — at least 25-30 years into the future. The purpose of the future orientation is to remove the limitations and constraints of our everyday lived experiences in order to encourage creativity and openness to new ideas.

First, each group brainstormed projects, platforms, and services that respond to and build on the ideas around values explored in the previous discussion. In this section, we asked the groups to focus on coming up with as many ideas as possible without judging their feasibility, and making the ideas tangible and visible through sketches, notes, and diagrams. Next, we asked the groups to choose one of their ideas to prototype, and to select one of three formats in which to represent their prototype: interactive scenarios, multi-layered maps or Lego models. Through the creation of the prototype, groups had to think through the complex opportunities and tradeoffs embedded within their ideas and bring their ideas to life.

4 Presenting and Critique (1 hour)

At the end of the workshop, we asked the groups to present their prototypes by acting out or describing their process and ideas. Workshop participants then took part in a facilitated "design critique" conversation in which they provided feedback about the prototypes. The purpose of the critique is not criticism, but rather to help the project move forward towards a shared goal. We guided participants to begin their critique with positive feedback, next discuss limitations and finally, end with alternatives and proposals that might move the project forward.

Acknowledgements

We hope to inspire the world's current and future urban leaders to seek collaborative and participatory codesign approaches to understanding, analyzing, and re-imagining the relationships between complex sociotechnical systems in their cities. We encourage the use of this toolkit in planning discussions and workshops on the future of: technology and infrastructure, health and environment, arts and culture, housing and the built environment, education and training, and other pressing urban issues.

We would like to thank the **Urban Communication Foundation** for their support of this research, as well as the participants and facilitators that contributed to the workshops. In addition, we would like to acknowledge the **Institute of Design at Illinois Institute of Technology**, the **Centre for Social Innovation** and **Emerson College** for providing workshop venues.

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For more information, see **http://designingpolicytoolkit.org**.

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THE DESIGNING POLICY TOOLKIT

The Designing Policy Toolkit is the result of a research project conducted over one year by **Laura Forlano** and **Anijo Mathew**, assistant professors at the **Institute of Design at Illinois Institute of Technology**, and funded by the **Urban Communication Foundation**.

Forlano and Mathew held a series of workshops focused on urban technology in three major metropolitan centers in the United States: Chicago, New York, and Boston. The workshops engaged a range of stakeholders, from policymakers and entrepreneurs to activists and academics, in hands-on activities using open and participatory codesign methods. This toolkit illustrates the ways in which urban technologies are embedded with values, as well as how codesign methods enable diverse stakeholders to come together around the complex sociotechnical questions that are shaping everyday life in cities.