

# A Design Challenge for Enhancing Cartographic Research, Education, & Outreach

Robert E. Roth <sup>a,\*</sup>

<sup>a</sup> *Cartography Lab, Department of Geography, University of Wisconsin–Madison – reroth@wisc.edu*

\* Corresponding author

**Keywords:** design challenge, mapping workshop, pedagogy, community-engaged scholarship, cartography

## Abstract:

The University of Wisconsin Cartography Lab (Cart Lab) *Design Challenge* is a day-long mapping workshop that brings together Cartography and Geography students, often in collaboration with campus or community partners, around a curated mapping theme (Moore et al. 2017, Bley et al. 2022). The Design Challenge is now an institution in the University of Wisconsin–Madison Geography Department, first running in 2015 and wrapping its 10<sup>th</sup> annual event this past February 2024. We seek to identify topics that are inclusive of the diverse breadth of expertise and interests in the Geography Department, oscillating between human/critical and environmental/geophysical case studies and between research versus community partners (Table 1). In total, the ten Design Challenges have involved 68 organizers and partners and participation from 198 students from UW–Madison undergraduate and graduate Cartography and Geography programs. Accordingly, there have been numerous contributors and individual experiences across the ten Design Challenges, and in this presentation, I reflect on the strategic role of the Design Challenge for expanding cartographic research, education, and outreach at UW–Madison from my perspective as the Cart Lab Director.

Event	Year	Topic (Poster Advertisement)	Students	Cart Lab Organizers / Additional Partners
1	2015	Mapping the Transnational Hazardous Waste Trade	18	Tanya Andersen, Rafi Arefin, Jaime Martindale, Sarah Moore, Heather Rosenfeld, Robert Roth / Erik Steiner
2	2016	Visualize Spatio-temporal Fossil Data	20	Tanya Andersen, Scott Farley, Simon Goring, Jaime Martindale, Robert Roth, Jack Williams
3	2017	Meaningful Work for Your City	24	Tanya Andersen, Alicia Iverson, Jaime Martindale, Kris Olds, Robert Roth, Shelley Witte / Arturo Ambritz, Mamata Akella, Matthew Baker, Bill Buckingham, Tom Solyst
4	2018	Feminist Cartographies and Recidivism	19	Tanya Andersen, Meghan Kelly, Robert Roth / Catherine D'Ignazio, Angela Jones, Linda Ketcham
5	2019	Transforming Justice	18	Tanya Andersen, Kallista Bley, Kela Caldwell, Meghan Kelly, Jenna Loyd, Robert Roth / Anne Bonds, Kelly Lytle Hernandez, Jenny Plevin
6	2020	Spend the Day in the Newsroom	24	Tanya Andersen, Alicia Iverson, Meghan Kelly, Nick Lally, Jaime Martindale, Robert Roth / Lauren Tierney
7	2021	Layer Tennis with Cart Lab Alumni	10 (online for COVID-19)	Tanya Andersen, Daniel Huffman, Robert Roth / Zihan Song, Kristin Vincent
8	2022	K-5 Geography Curriculum Development	18	Tanya Andersen, Chelsea Nestel, Daniel Huffman, Robert Roth / Margene Anderson, Julie Collins, Lisa Jong
9	2023	Visualizing the Evolution of the Great Plains	26	Joseph Mason, Taylor McDowell, Robert Roth, Jake Steinberg
10	2024	Co-creating a Historical Atlas of Racial Violence in the U.S. 1898-1945	21	Gareth Baldrice-Franklin, Kela Caldwell, Alicia Cowart, Alicia Iverson, Bill Limpisathian, Robert Roth

Table 1. Cart Lab Design Challenge Topics and Partners

We hold the Design Challenge around the fourth week of the Spring UW–Madison semester (roughly late February), as the timing both lands during the coldest temperatures in Madison (USA) and before midterms start around the fifth or sixth week of the semester. Accordingly, we try to have a topic, partners, and organizing team identified by the end of the Fall UW–Madison semester (mid-December) so that we can create a dataset plan over winter break and begin advertising the event at the start of the Spring semester in late January. In the time first advertisement, we distill the

Design Challenge topic down to a short, actionable prompt to focus creative energy and provide a starting dataset for students to explore in preparation for the event. The event itself is hosted over a roughly ten-hour period on a Saturday to prevent conflict with class schedules, although we often invite a speaker related to the Design Challenge topic to our Friday colloquium series to provide context and inspiration for the event. While every Design Challenge is structurally different in some way, we generally begin with introductions and a summary of goals for the day, hold a brainstorm and group formation session in the morning, and then alternate design sprints with group check-ins over meals, concluding with presentations when students share their key bottlenecks and breakthroughs from the day (Table 2).

<b>Morning</b>	
9:30–10:00	Breakfast: Optional
10:00–10:10	Introductions
10:10–10:30	Inspiration Lecture; Overview of the Design Challenge Goals
10:30–11:30	Brainstorm and Group Formation: Facilitated with whiteboards, Post-Its, etc.
11:30–13:00	Design Sprint #1
<b>Afternoon</b>	
13:00–14:00	Lunch Break; Project Check-ins
14:00–15:30	Design Sprint #2
15:30–16:00	Creative Break: The Marshmallow Challenge
16:00–18:00	Design Sprint #3
<b>Evening</b>	
18:00–18:30	Dinner
18:30–20:00	Presentations

Table 2. Cart Lab Design Challenge Schedule at a Glimpse

Over the past ten years, the Design Challenge has evolved to fulfill multiple strategic objectives for the Cart Lab and Geography Department, and my role as the Director the Cart Lab is to try to balance these often competing goals to ensure we supply a *valuable* experience for as many students as possible, generate *value* in ways legible to the university and community, while remaining true to the *values* we hold as a collective in the Cart Lab. First and foremost, this annual event enables students to test their skills and expand their design portfolios, which are important for obtaining gainful employment in cartography and the geospatial industry. Second, the Design Challenge creates an opportunity for new transdisciplinary conversations across subdisciplines within Geography, generating new scholarly insights and opening new research questions for future collaborations. Third, the Design Challenge encourages experimentation with alternative creative design approaches, enabling participants to step back from delivering specific products and instead focus on being more intentional throughout the process. Finally, the Design Challenge often emphasizes community-engaged scholarship and design practices, empowering community partners with maps and spatial arguments around inequities and other important defined needs.

In summary, the Design Challenge has been essential for centering the Cart Lab, and Cartography broadly, in the UW–Madison Department of Geography, which includes relocating the Cart Lab into a centrally-located and newly-remodeled space in time for the 10th annual Design Challenge last February. In this presentation, I summarize how the Design Challenge has evolved to balance the different goals of the event and touch on success stories that could be translated to peer institutions for the enhancement of cartographic research, education, and outreach.

### Acknowledgements

I wish to thank Cart Lab facstaff Tanya Buckingham Andersen, Alicia Cowart, and Bill Limpisathian for co-organizing past Design Challenges, Alicia Iverson, Meghan Kelly, and Chelsea Nestel for contributing unique perspectives to the Design Challenge organization, and the over 250 partners and students that make the Design Challenge a success.

### References

Bley K, K Caldwell, M Kelly, J Loyd, RE Roth, TMB Andersen, A Bonds, J Plevin., D Madison, C Spencer, T Sims, C Archuleta, Z Ellner, T McDowell, C Nestel, E Noterman, N Smith, S Veleznitsky, N Underwood, R Darlington, Y Gao,

A George, L Miller, T Prestby, and J Vongkusolkit. 2022. A Design Challenge for Transforming Justice. *GeoHumanities*. [doi.org/10.1080/2373566X.2021.1986100](https://doi.org/10.1080/2373566X.2021.1986100)

Moore SA, RE Roth, H Rosenfeld, E Nost, K Vincent, R Arefin, and TMA Buckingham. 2018. Undisciplining environmental justice research with visual storytelling. *Geoforum*. 50(8): 1558-1579. [doi:10.1016/j.geoforum.2017.03.003](https://doi.org/10.1016/j.geoforum.2017.03.003)