Teaching Infrastructure from a Social Justice Standpoint

Summer Gray

Welcome! For the past two years, I have been developing this topic into a course for undergraduate students in the Environmental Studies Program at the University of California, Santa Barbara. The course, titled "The Built World: Infrastructure, Power, and the Environmental Change," emphasizes infrastructure as an assemblage of materials, values, and desires. Introduced in early 2018 to a group of 23 students, the course has been offered twice and will be offered a third time in 2020, each time undergoing revision to draw on the latest global events and most recent studies and source materials.

Objective

Teaching infrastructure from a social justice standpoint allows us to see how systems of value are embedded in each and every part of the built environment, from planning and implementation to construction and repair. These values shape both landscapes of privilege and landscapes of risk. Understanding how these systems operate across space and time is vital to engaging with projects of environmental and climate justice.

As I continue to grow this course, I hope that it will provide a window into an invisible world of choices, limitations, and possibilities that confront us all, especially in the context of climate disruption. When we start to view our roads, highways, water supply systems, electric grids, oil pipelines, wind farms, seawalls, broadband, border walls, and other socio-technical "stuff" as the outcome of value systems, the world begins to look and feel different. We can then ask whether these systems serve to maintain political authority and reinforce social inequity, or whether they challenge existing structures of power.

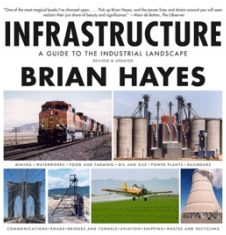
Materials

I use a variety of sources, texts, articles, chapters, creative narratives, and films from all over the world to illustrate concepts and theories, starting with histories of extraction, colonization, and development. I then introduce and analyze case studies to illustrate the frictions and divergent perspectives inherent in the production and maintenance of infrastructure.

Case studies include: the contentious development of the Sardar Sarovar Dam in India; the controversial breach of the levees in New Orleans during Hurricane Katrina; the highly criticized creation of barrier walls in Palestine; the unfathomable damage to Puerto Rico following Hurricane Maria; the invasion of informal settlements in Brazil; and the inequity of broadband and digital storage in the United States.

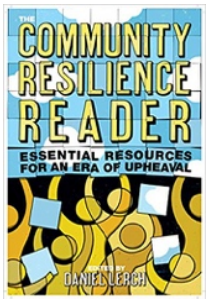
With the coming crisis of climate change, we also look at pathways for repair and transformation and work together to imagine creative alternatives that can help build ecologically sustainable and just futures.

TEXTS



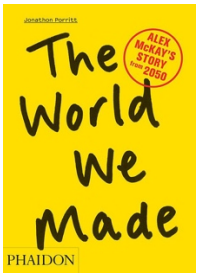
Infrastructure: A Guide to the Industrial Landscape, by Brian Hayes (2014)

Beacause many of the students who take this course come from interdisciplinary fields, it is necessary to provide them with a basic knowledge of how things work. To address this I have used chapters from *Infrastructure: A Guide to the Industrial Landscape* by Brian Hayes. It is designed as a field guide to the built environment, and is presented in beautiful detail. Some of the students find it tedious, while others really enjoy the detail and depth.



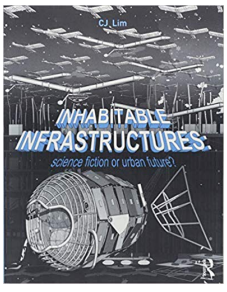
The Community Resilience Reader: Essential Resources for an Era of Upheaval (2017), edited by Daniel Lerch

This edited volume complements the Hayes text nicely by focusing on the built environment and inequality. The authors provide a variety of perspectives on building community resilience, each focusing on a specific element of the built environment. Topics including energy, economy, water systems, food systems, and waste systems.



The World We Made: Alex McKay's Story from 2050 (2013)
by Johnathon Porritt

I really like to throw in chapters from this text because they are imaginative and hopeful. The book is a meditation on what the future might look like if we address the climate crisis immediately. While it leans on the side of technological enthusiasm, it makes for great class discussion and debates.



Inhabitable Infrastructures: Science Fiction or Urban Future? (2017)
by C.J. Lim

I recently discovered this book, so haven't had a chance to test it in the classroom yet. I think it looks like a good alternative or juxtaposition to *The World We Made* (above). Written from a urban design perspective, it "explores the potential of climate change-related multi-use infrastructures that address the fundamental human requirements to protect, to provide and to participate."

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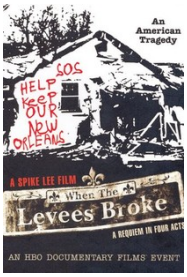
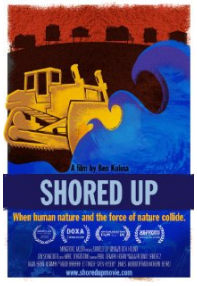
FILMS

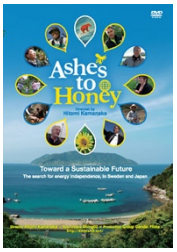
Drowned Out (2002), directed by Franny Armstrong
“In central India, an enormous dam project leaves villagers with scant options: relocate from the riverside to the slums, move to less hospitable land far away or remain and drown. Luharia Sonkaria, the medicine man of the village, guides viewers through the peaceful protests and lengthy court case that surrounded the fight against the government. In addition, the film looks at who benefits most from the dam, and what has happened to those displaced by decades of industrial development.”



When the Levees Broke Part III (2006), directed by Spike Lee
“Residents of New Orleans discuss how they were impacted by the devastation of Hurricane Katrina, and how the city is rising from the ashes.”
Especially the following segments: Investigating the Levee Failure; Levee Failure Responsibility; Changing Coastal Geography; Exploiting Louisiana; New Orleans Land Grab; Plans to Rebuild; Patching a Broken; and Learning from Dutch Levees.



Shored Up (2013), directed by Ben Kalina
“Shored Up is a documentary that asks tough questions about our coastal communities and our relationship to the land. What will a rising sea do to our homes, our businesses, and the survival of our communities? Can we afford to pile enough sand on our shores to keep the ocean at bay? In Long Beach Island, New Jersey and the Outer Banks of North Carolina, surfers, politicians, scientists and residents are racing to answer these questions.”



Ashes to Honey (2010), directed by Hitomi Kamanaka

"The documentary covers the long struggle of the residents of Iwaijima island in the Inland Sea of Japan to prevent the construction of a nuclear power plant across the bay. It compares the situation to Sweden, where models of sustainable energy are being explored."

SAMPLE SCHEDULE

Week 1: Introduction
- "Do Artifacts Have Politics?" (Winner)
- "The Ethnography of Infrastructure" (Star)
- "Preface" (Hayes)
- "Community Resilience and the Built Environment" (Lerch)

Week 2: Historical Perspectives: Infrastructure and Empire
- "Instituting the Development Project" (McMichael)
- "Infrastructure, the Colonial Sublime, and Indirect Rule" (Larkin)
- "Planning" (Escobar)
- "Out of Earth" (Hayes)
- "Resources" (Shiva)

Week 3: Case Study: The Sardar Sarovar Project
- *Drowned Out* (2002), directed by Franny Armstrong
- "Temples of Doom: The Human Consequences of Dams" (McCully)
- "The Domestication of Water: Filtering Nature Through Technology" (Macauley)
- "The Greater Common Good" (Roy)
- "Introduction" (Anand)
- "Waterworks" (Hayes)
- "Building Community Resilience at the Water's Edge' (Wodder)

Week 4: Urbanization and the Anthropocene
- "Global Warming in an Unequal World: A Case for Environmental Colonialism" (Agarwal and Narain)
- "The Agency of Assemblages and the North American Blackout" (Bennet)
- "Lively Infrastructure" (Amin)
- "Power Grid" (Hayes)
- "Oil and Gas" (Hayes)
- "Energy Democracy" (Fairchild and Weinrub)

Week 5: Infrastructures of Security, Access, and Mobility
- "Network-Centric Violence, Critical Infrastructure and the Urbanization of Security" (Coward)
- "Assembling the Fabric of Life: When Settler Colonialism Becomes Development" (Salamanca)
- "Transborder Infrastructure" (Hirsh)
- "Fortified Enclaves: The New Urban Segregation" (Caldeira)
- "You and What Army?" in *This Changes Everything: Capitalism Versus the Climate* (Klein)
- "On the Road" (Hayes)

Week 6: Midterm and Review

Week 7: Infrastructural Crisis and Neoliberal Restructuring
- *When the Levees Broke, Part III* (2006), directed by Spike Lee
- "The Commons: Infrastructures For Troubling Times" (Berlin)
- "Introduction" *Crisis Cities* (Gotham, Fox and Greenberg)

Week 8: Infrastructures of Adaptation
- *Shored Up* (2013), directed by Ben Kalina
- "Living on the Edge," *The Rising Sea* (Pilkey and Young)
- "When a Seawall is Visible" (Shuhei)
- "Aquatecture: Designing Water Adaptable Architecture" (van Horn)
- "Infrastructuring Amphibious Space" (Morita)

Week 9: Sustainable Infrastructure and Alternatives
- *Ashes to Honey* (2010), directed by Hitomi Kamanaka
- "Introduction" and "Dreaming Green: Engineering the Eco-City' in *Fantasy Islands* (Sze)
- "Imaginaries of Hope: The Utopianism of Degrowth" (Kallis, Giorgos and Hug)
- Selected chapters from Jonathon Porritt's (2013) *The World We Made: Alex McKay's Story from 2050.*
- "Six Foundations for Building Community Resilience" (Lerch)

Week 10: Group Presentations

Week 11: Final Exams

ASSIGNMENTS

Early on, I invite students to write a short "ethnographic exercise" on a hidden infrastructure of their choice, describing how it becomes visible upon breakdown and how it embodies systems of value. In the past, students have chosen a range of surprising subjects including a favorite sidewalk, frequently used beach stairs, and the internet. This has proven to be a useful way to foster a personal connection to infrastructure, or what anthropologist Susan Leigh Star calls "the boring things." By encouraging students to see taken-for-granted systems in their own lives, they start to see the world of infrastructure in less abstract terms.

For example:

Ethnographic Exercise #1
"Reading" Infrastructure

For this exercise, I want you to look around at your environment and identify a taken-for-granted system that can be read as infrastructure. Now spend some time studying it. Describe what you chose and why. In doing this, address one or more of the following questions:
How is it embedded?
How is it linked with conventions of practice?
What standards does it embody?
What base is it installed on?
How does it become visible upon breakdown?

Hint: Susan Leigh Star's article will be helpful to you, especially pages 381-382.

Write your observations and reflections in the space of 1-2 double spaced pages. You may include an image or diagram (in addition to your written observations), but this is not required.

Ethnographic Exercise #2

"Reading" Infrastructure (Part 2 - Planning)

For this exercise, return to your chosen infrastructure (or if you must, switch to a different object of study), and think about how it is part of a tradition of planning. You might ask, what kind of order did the planners of this infrastructure seek to create? What kind of society? What needs did they aim to meet in a given community? And, at a more fundamental level, *whose* needs were considered?

In addressing these questions, consider Arturo Escobar's argument, that planning has historically served as a tool for justifying the disassembling and reassembling of societies throughout the world to meet the needs of the industrialized, modern world. In his words: "planning redefines social and economic life in accordance with criteria of rationality, efficiency and morality, which are consonant with the history and needs of capitalist, industrial society, but not those of the Third World" (Escobar 1991, 148).

Write your observations and reflections in the space of 1-2 double spaced pages. You may include an image or diagram (in addition to your written observations), but this is not required.

I also assign a take-home midterm and a final. Below are long essay and short essay prompts:

LONG ESSAY:
How does infrastructure and the built environment serve to maintain political authority and reinforce social inequality? In what ways are these infrastructural assemblages mutable?

Instructions:
In an essay of no fewer than **4 double-spaced pages**, address the prompt by *juxtaposing* **TWO CASES** from the readings. This requires you to do a close reading of your chosen cases, place them side-by-side to develop your own analysis, and to integrate key issues that emerge.

Your options are listed below. Place a ✓ next to your choices and attach this coversheet to your essay.

- ☐ Land Occupations and Informal Settlements in **Brazil** (Ash Amin)
- ☐ Infrastructure, the Colonial Sublime, and Indirect Rule in **Nigeria** (Brian Larkin)
- ☐ Water and the Infrastructures of Citizenship in **Mumbai** (Nikhil Anand)
- ☐ Settler Colonialism in the **Palestinian** Built Environment (Omar Salamanca)

Reference SPECIFIC examples from the readings in your essay.
You may draw on material from previous weeks to help define your terms and support your analysis (for example Langdon Winner, Jane Bennett, Philip McMichael), but you MUST draw extensively from the readings.

Guiding Questions:

When structuring your essay, consider the following questions to help frame your analysis (you are not required to address all of these in your essay, they are simply here to help guide you in reading your cases):

How do histories of colonization, development, and ideas about progress operate in these cases? Who is affected? Are there structural or environmental factors that should be considered? What political configurations exist, authoritarian or otherwise? What kinds of resistance do you find? Can they challenge existing structures of power? Do you think that there is hope for the future in these places? What common themes emerge across your cases?

SHORT ESSAYS:

You have one week to complete FOUR short essay responses based on prompts A-D. Each essay should be at least **300 words**, double-spaced, 12-pt Times New Roman font with 1" margins that follows MLA guidelines. Each question is worth 25 points, based on the following criteria:

Item	Points	Description
Analysis	10	Connects and explains the significance of selected cases and examples as they relate to the prompt.
Use of concepts from readings	5	Draws on concepts from the readings and lectures to support analysis. Not a summary of the reading. Avoids using block quotes.
Image from textbook (Hayes)	5	Relevance of selected image from the textbook. Scan or use a smart phone to capture the image and include in short essay response. Also include a caption with the page number, for example: (Hayes 2014, pxx). Be sure to use your own words to describe how the image relates to your analysis.
MLA format	5	Follows MLA formatting guidelines (8th edition). No title pages, abstracts, or unnecessary padding of margins. Include a Works Cited **for each short essay question**. Resources for MLA format: MLA Formatting and Style Guide @ Purdue OWL; MLA Citation Guide @ Columbia College.

A: What social and technical issues emerge through the control and management of water?

Draw on following:

- TWO of the case studies
- At least ONE reading
- ONE image from Hayes

B: If you were invited to design a healthier, more sustainable food system, where would you focus your attention? Why?

Draw on following:

- At least ONE scene from *Our Daily Bread* (2005)
- ONE image from Hayes
-

C: How does oil and gas infrastructure intersect with social and economic injustice? Compare this to a renewable alternative.

Draw on following:

- TWO of the case studies
- At least ONE reading
- ONE image from Hayes

D: What impact do you think bringing energy resources under public or community ownership would have on people and the environment? Provide some examples.

- TWO of the case studies
- At least ONE reading
- ONE image from Hayes

Other assignments for the course are more creative and center around group projects in which students investigate problems and research alternatives. I also mix in role-playing exercises.

For example, one class created a role play based on the nationwide Amazon HQ2 bidding war:

Small Group Project: A Collective Case Study

City Futures: amazon on a Stick?

Abstract

What can a bidding war teach us about cities? With the future location of Amazon's next headquarters (HQ2) "up for grab" – and with it the promise of $50 billion in investment and 50,000 high-paying technology jobs – who stands to win? By focusing on two communities faced with the lure of economic development, this case offers a glimpse into the conflicting thoughts and desires of those who hold claim to what David Harvey (2008) describes as "the right to the city." Three key issues in the study of the built environment emerge: conflicting paradigms of development thought; rising demands for community resilience; and prospects for the democratization of urbanization.

Prompt

Your city government wishes to convince Amazon to build its next headquarters in your hometown. A proposal is being made, largely invisible to the public. As your leaders prepare to present this proposal to Amazon, parts of the document are leaked. A community forum is set up to voice concerns.

ENVS 193SE: The Built World — Group Vision Projects

"A DAY IN THE WORLD OF 2050"

To help you with this activity, I have come up with some ideas and guidelines that I hope will spark your creativity!

STEP ONE. Break into groups of approximately 3 (if your "theme" group is large, this will mean splitting up!).

STEP TWO. Go to this site and read up on the UN's Sustainable Development Goals: https://sustainabledevelopment.un.org/?menu=1300. With your group, select *at least* **THREE goals** that interest you from the options on the site (1-16), **one of which must be GOAL NINE**. Study these goals and discuss their implications among your group.

STEP THREE. Now, in your groups imagine a **SPECIFIC PLACE** (based on a real location). Together, **decide whether or not your place has met your chosen goals in 2050.** Be creative. (Let's hope at least a few groups answer "yes"!)

STEP FOUR. Now, start to brainstorm/construct a vision about life in this place in 2050. Again, be creative!

STEP FIVE. With your group, write an introduction to a day in this world. Give it a title and an image. Be sure to address which goals you have considered in your vision project. Include a memo that lists what aspects of the vision each group member worked on.

STEP SIX. Use a combination of words and visuals to walk us through your world. Share your world with the class in a creative final presentation of **10 minutes** with an additional 5 minutes of Q&A.