### MCPs:

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adriana Akers</td>
<td>Paul Goodwin</td>
</tr>
<tr>
<td>George Beane</td>
<td>Yafei Han</td>
</tr>
<tr>
<td>Pierre Beaudreau</td>
<td>Dwight Howell</td>
</tr>
<tr>
<td>Kassie Bertumen</td>
<td>Elizabeth Irvin</td>
</tr>
<tr>
<td>Andrew Binet</td>
<td>Josselyn Ivanov</td>
</tr>
<tr>
<td>Katherine Blizzard</td>
<td>Lillian Jacobson</td>
</tr>
<tr>
<td>Yael Borofsky</td>
<td>Ross Karp</td>
</tr>
<tr>
<td>Brian Bowen</td>
<td>Elizabeth Kuwada</td>
</tr>
<tr>
<td>Alexander Brady</td>
<td>Andrew Lai</td>
</tr>
<tr>
<td>Sofia Campos</td>
<td>Ethan Lay-Sleeper</td>
</tr>
<tr>
<td>Michael Castagnola</td>
<td>Lui Lin</td>
</tr>
<tr>
<td>Calilda Cenizal</td>
<td>Babak Manouchehrifar</td>
</tr>
<tr>
<td>Alison Coffey</td>
<td>Karuna Mehta</td>
</tr>
<tr>
<td>Alison Crowley</td>
<td>Sunny Menozzi</td>
</tr>
<tr>
<td>Julie Curti</td>
<td>Catherine Mingoya</td>
</tr>
<tr>
<td>Alice Davis</td>
<td>Katherine Mytty</td>
</tr>
<tr>
<td>Melissa Deas</td>
<td>Carey Anne Nadeau</td>
</tr>
<tr>
<td>Christian Desrosiers</td>
<td>Longrui Peng</td>
</tr>
<tr>
<td>Thierno Diallo</td>
<td>Pablo Posada Marino</td>
</tr>
<tr>
<td>Michael Dowd</td>
<td>Anirudh Rajeshekar</td>
</tr>
<tr>
<td>Raphael Dumas</td>
<td>Smita Rawoot</td>
</tr>
<tr>
<td>Lee Dwyer</td>
<td>Meng Ren</td>
</tr>
<tr>
<td>Evan Easterbrooks-Dick</td>
<td>Alicia Rouault</td>
</tr>
<tr>
<td>Kara Elliott-Ortega</td>
<td>Chloe Schaefer</td>
</tr>
<tr>
<td>Claire Evans</td>
<td>Danya Sherman</td>
</tr>
<tr>
<td>Hector Flores Ramirez</td>
<td>Alexandra Sutherland-Brown</td>
</tr>
<tr>
<td>Allegra Fonda-Bonardi</td>
<td>Christopher Van Alstyne</td>
</tr>
<tr>
<td>Leo Goldberg</td>
<td>Fei Xu</td>
</tr>
<tr>
<td>Mia Goldwasser</td>
<td>Lisa Young</td>
</tr>
</tbody>
</table>

### PhDs:

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eric Chu</td>
</tr>
<tr>
<td>David Lee</td>
</tr>
<tr>
<td>Danya Rumore</td>
</tr>
<tr>
<td>Leah Stokes</td>
</tr>
<tr>
<td>Bruno Verdini Trejo</td>
</tr>
<tr>
<td>Laurie Zapalac</td>
</tr>
</tbody>
</table>

### SMs:

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juan Pablo Duran</td>
</tr>
<tr>
<td>Elisabeth Rutledge</td>
</tr>
<tr>
<td>Ruishan Zheng</td>
</tr>
</tbody>
</table>
Neighborhood Design and Public Life: Lessons from Beijing’s Hutong and Superblocks

Beijing’s hutong, centuries-old neighborhoods composed of narrow streets and courtyard housing, are famous for harboring a tight-knit social fabric and a vibrant public realm. Over the past thirty years, large-scale redevelopment of hutong neighborhoods has occurred, and new neighborhoods in Beijing and in much of China have come primarily in the form of high-rise buildings arranged in superblocks. This model of neighborhood design has been criticized for its energy inefficiency, auto-centric nature, and perceived lack of respect for traditional Chinese urban forms. Less explored to date is the fact that residents of superblock neighborhoods often complain about a lack of community interaction and public life, particularly as compared to hutong neighborhoods.

This thesis examines this phenomenon and asks the following questions: What accounts for the disparity between community interaction in superblock neighborhoods as compared to hutongs? Can urban design and the built environment play a role in fostering community and public life in contemporary Chinese neighborhoods? What lessons can be drawn for urban designers and planners in regards to the impact of neighborhood design on public life?

The thesis begins by reviewing a history of major urban form changes in Beijing’s history with a focus on neighborhood design. A field study undertaken in Beijing in January 2015 provides the primary data for the research, including resident interviews and observations of public space use in a hutong and two superblock neighborhoods. Using this primary data as well as secondary sources related to Chinese neighborhood design, a set of conclusions is drawn regarding how the built environment affects public life and community interaction in Beijing neighborhoods. Finally, a series of design recommendations is presented, focusing on the ways that urban design can support an active public life while meeting the high densities required in rapidly urbanizing contexts.
George Beane
Thesis Advisors: Gabriela Carolini
and Rafi Segal

Hydro-Social Infrastructures:
New Models for Water-Sensitive Urban Development in Mexico City

This thesis will attempt to address the following question: How can urban designers use community water systems to foster the cohesiveness of physical and institutional fabrics within informal settlements? In other words, how and to what extent can the design of water and sanitation infrastructure not only improve basic service provision, but also create new opportunities for community building?

The thesis uses Delegación Iztapalapa, Mexico City (CDMX) as testing ground for the proposal, which is intended as a site-specific exploration of design solutions to low-quality water provision conditions in one informal settlement in CDMX; a new institutional framework for infrastructure provision in informal settlements within the capital; and a broad argument for truly multi-performative infrastructure that moves beyond the current model (i.e. multi-use).
Urban Planning and the Scientific Uncertainties of Sea Level Rise

While climate change has recently gained much needed traction in our societal and political spheres, the science behind climate change continues to be a complex interplay of countless variables, timelines, and scenarios. Despite climate scientists’ best efforts to predict what the future holds in terms of climate change and sea level rise, various limitations and uncertainties inherent in the models themselves challenge our ability to plan appropriately for the future.

As planners and designers adopt various sea level rise thresholds in their policies and designs, the uncertainties of the climate models, and climate itself, are often overlooked. Major planning and design projects and proposals, such as those resulting from the ‘Rebuild by Design’ competition launched by the United States federal government, were found to use different sea level rise thresholds in their approaches.

Such observed variation in projects’ sea level rise preparedness mirrored the uncertainty in the climate models themselves and led to establishing a framework for a more long-term and incremental analysis of the impacts of sea level rise on the built environment.

Using modeling and scripting software (Rhino and Grasshopper) a customizable tool named SEARISE 3D was developed to allow planners and designers to explore the impacts of sea level rise on any portion of any city (using elevation and building infrastructure data). Using metrics generated through the tool, decision-makers can find the optimal long-term sea level rise threshold to begin preparing and designing for. Similarly, planners, designers, and architects can use the tool to visualize flooding scenarios and extract base layers for producing design proposals to respond to a certain sea level rise threshold. SEARISE 3D was made available online for free (under the MIT License) for all to use, improve, and develop further metrics for decision-making in face of our uncertain climate future.
Building Community in San Francisco’s Potrero Hill Neighborhood

Trauma Informed Community Building (TICB) is a new approach to community development that utilizes a “trauma” lens when engaging with communities that have been negatively impacted by concentrations of poverty and crime, social isolation and economic disinvestment. TICB first acknowledges the adverse effects persistent trauma has on individuals and communities and how these effects challenge “traditional” community building strategies. The practice involves a set of intentional strategies at every level of the social-ecological model—individual, interpersonal, community and system—to reduce the amount of chaos and stressors in individuals’ lives, to build social cohesion among neighbors and institutions and to foster community resiliency over time. By implementing these strategies, the authors hypothesize individuals will increase their ‘readiness for change,’ which, in turn, lays the foundation and support for effective program and service delivery and sustainable individual and community change.

They argue these two outcomes are critical when working with “trauma-impacted” communities that are undergoing any kind of major transition and disruptions—i.e., housing redevelopment and/or relocation.

TICB was created by BRIDGE Housing Corporation (BRIDGE), a nonprofit affordable housing developer in the U.S. Pacific Northwest, based off of its six years of community building experience in San Francisco’s Potrero Hill neighborhood, as part of the master redevelopment of Potrero Terrace-Annex public housing under San Francisco’s HOPE SF initiative. In this thesis, I utilize the case study methodology and mixed-method techniques to explore what it means to approach community building with a “trauma” lens. I explore the evolution, implementation and early impacts of TICB at Potrero Terrace-Annex and I assess the value of TICB’s framework as a whole and key lessons learned and challenges. Specifically, I examine the extent to which BRIDGE’s community building activities have positively impacted the social dynamics of the economically- and socially-diverse North and South side Potrero Hill communities, increased public housing residents’ civic participation and capacity, and helped transform systems, namely democratic processes and public education. I conclude with recommendations to inform policy, practice and future research.
The Practice and Politics of Care: Social Service Organizations, Community Resilience and the Redevelopment of Regent Park

In 2005, the Toronto Community Housing Corporation began the ambitious mixed-income redevelopment of Regent Park, Canada’s oldest and largest public housing estate. The community has long been subject to race- and class-based stigmatization, and today is one of the last areas of concentrated poverty in Toronto’s rapidly gentrifying downtown core. A dense and remarkably active hub of non-profit organizations has developed in Regent Park since the 1970s. This thesis investigates the role that social service providers play in enabling community members to navigate and adapt to the drastic social, economic and political changes brought about by redevelopment in a context of welfare state retrenchment and strong government support for gentrification.

Academic literature tends to dismiss social service organizations as dupes of neoliberalism, robbed of any agency of their own and complicit in the punitive oversight of the poor. I show that the reality on the ground is far more complex, and that social service providers have exercised a powerful place-based agency by virtue of their position at the intersection of state, market and community forces. At the heart of this agency sits a praxis of care that is attentive to the complexity of ordinary life and responsible and competent in providing practical and emotional support.

I argue that together, the social service providers in Regent Park form a “landscape of care” that over the course of redevelopment has afforded the community orientation, stability, space, capacity and the means to negotiate social and institutional power structures, thereby enabling not only survival but adaptive resilience in the face of erasure. Care enables creative reformulations of the conditions and possibilities of everyday life on the margins of the post-welfare city, and can thereby be seen as a form of oppositional politics that, though nascent, has powerful counter-hegemonic potential. I conclude by considering how care can serve as an analytical and strategic framework for community-level actors contending with the disruptions wrought by the messy and contingent neoliberal urban political economy.
The Tysons Tunnel Decision: A Case Study of Suboptimal Decision-Making in Major Transit Investments

In 2014, Washington, D.C.’s Metrorail system opened Phase 1 of its new Silver Line, which extends the current system to include significant portions of Fairfax County in Northern Virginia. This extension runs through Tysons Corner – a major regional business district that is notorious as a sprawling and auto-oriented “edge city” – on elevated tracks that are an average of 36 feet off the ground. Fairfax County hopes the Silver Line will help transform Tysons Corner into a true urban downtown that is walkable and transit-oriented. This goal, however, is shadowed by a heated debate that occurred between 2005 and 2008 over the “Tysons Tunnel,” which was a proposal to build the Silver Line underground through Tysons Corner instead of the elevated design that was originally planned and ultimately built. The tunnel was widely popular and proponents believed it would more effectively transform Tysons Corner into a walkable, transit-oriented district, while the elevated design would only harm these goals by dividing the area with bulky infrastructure.

Opponents did not disagree, but believed the tunnel’s added costs would disqualify the entire Silver Line project from federal funding. The ensuing debate pitted Silver Line partners from all levels of government, local businesses, and community members against one another, until the elevated design gained final approval in 2008 due to a series of disputed political reasons. Still, the debate leaves serious questions about the Silver Line’s ability to transform Tysons Corner with its elevated design.

This thesis explores in depth the history of the Tysons Tunnel debate and the perspectives of all major stakeholders in the debate in light of the Silver Line’s current impact on Tysons Corner. It seeks to determine whether the decision against the Tysons Tunnel was optimal given the political and economic constraints at the time, or based on unfounded policies and politics that have produced suboptimal results. This investigation presents strong evidence that flawed federal funding criteria, political clashes between high-level politicians in Virginia, and an uncompetitive contracting process unnecessarily constrained the Tysons Tunnel debate, leading to a suboptimal decision that manifests today in Tysons Corner.
Towards a Transdisciplinary Approach to Rural Electrification Planning for Universal Access in India

Around 30% of India’s roughly 1.2 billion people lack access to electricity, largely in rural areas. National and state rural electrification efforts are predominantly focused on grid extension, but interest in off-grid systems, like solar home systems and micro grids, for rural areas has been growing. Little policy or regulation dictates off-grid electrification and detailed data about customers’ needs are hard to access, making it difficult for planners to determine the best electrification mode for a given area. New planning approaches are needed in the face of these challenges.

Technoeconomic planning methods typically dominate rural electrification planning, yet many obstacles face rural electrification planners that are not technoeconomic. This thesis posits that combining the best aspects of technocratic and communicative planning into a transdisciplinary planning methodology will allow planners in India to incorporate technoeconomic, socioeconomic, sociotechnical, social, political, and regulatory factors that influence rural electrification into a single comprehensive approach to regional rural electrification planning in India.

I propose and demonstrate three elements of this overarching methodology. First, I attempt to elicit planners’ perspectives on rural electrification planning priorities in India through semi-structured interviews (n = 6) and a pilot survey (n = 10). Second, I discuss the importance of understanding consumer electricity needs and demonstrate how electricity demand is both a technoeconomic and non-technoeconomic factor that influences rural electrification. Third, I show how a technoeconomic electrification planning model, called the Reference Electrification Model (REM), can illuminate the consequences of different assumptions about electricity demand on technology decisions for Vaishali District in the state of Bihar.

This research emphasizes the variety of perspectives and dynamics that influence rural electrification planning and reflects on the challenges of developing a truly transdisciplinary rural electrification planning methodology for India.
Climate Control: Smart Thermostats, Demand Response, and Energy Efficiency in Austin, Texas

Energy efficiency and demand response are critical resources for the transition to a cleaner electricity grid. Demand-side management programs can reduce electricity use during peak times when power is scarce and expensive, and they can help to integrate intermittent renewable energy resources by balancing real-time supply and demand for electricity. These programs are more cost-effective than large-scale energy storage technologies and are particularly important in cities and states with strong climate change and energy goals.

Since 2000, Austin Energy has managed a residential demand response program that enables it to reduce air conditioning usage by remotely adjusting thermostat settings at tens of thousands of homes. The utility distributed free thermostats to households that participated in this program; however, by 2012, it determined that only one third of them were working as intended. During the summer of 2013, Austin Energy decided to implement a new program utilizing new technology, Wi-Fi connected “smart” thermostats. Instead of providing free thermostats to reduce peak demand, the utility encouraged residents to bring their own device and receive a one-time $85 enrollment incentive.

This thesis analyzes these two approaches to residential demand response as measured by program enrollment rates and participant performance during demand response events. In addition, it assesses the smart thermostats’ ability to reduce energy consumption (i.e. improve energy efficiency) over the course of the summer. My analysis indicates that smart thermostats were more effective at reducing peak demand than the free thermostats employed in the previous program. However, homes with smart thermostats used more energy for air conditioning over the course of the summer than homes without, indicating limited energy efficiency potential from smart thermostats among the study population.
In the aftermath of Superstorm Sandy, two separate, federally funded programs began purchasing storm-damaged homes from voluntary sellers in the low-lying, working-class communities of Staten Island’s East Shore. New York State’s, offered in three specific, geographically bounded neighborhoods, requires that the land procured be preserved as open space. The City’s acquires any substantially damaged properties, with the goal of redeveloping them as more resilient housing. I began my research by asking why these parallel and sometimes competing programs had been established for the East Shore. What I uncovered was a deeply political, ad-hoc process resulting from a complex series of interactions between and among residents and their elected officials, each lobbying for their own priorities.

While I explore this process in depth, I also pursue additional questions suggested by my findings. I was consistently told that each program’s primary goal was to meet residents’ immediate needs; thus, each was designed to respond to individuals or groups of homeowners, rather address the community as a whole. Yet when they were announced, each was also framed in terms of future land use: with the State’s to create “buffer” areas protecting inland neighborhoods, and the City’s providing an opportunity to rethink the East Shore’s small lots, narrow streets, and insufficient infrastructure, a legacy of its history as a community of summer bungalows. Now that the government has begun to acquire land, however, these future-oriented goals have encountered numerous challenges—from disagreements over the appropriate agency to own and maintain the open space, to a potential loss of one of the few areas of the city providing an affordable homeownership option.

In this context, I examine the post-Sandy planning processes that did take place in New York and their relationship to the acquisition programs, in comparison to similar planning and acquisition processes in New Orleans, LA and Cedar Rapids, IA. Ultimately, and particularly in light of the slow process of disbursing federal aid, I ask whether an engaged, participatory planning process is really a barrier to meeting immediate needs, or whether a properly designed process can yield better outcomes for both the victims of disaster and the neighborhoods they leave behind.
Many youth today grew up with narratives about reaching for the American Dream and working hard to reap the benefits. Yet over 2 million people have been deported under President Obama’s administration and over 2 million people live encaged in the U.S., both world records. Millions of youth, especially youth of color, have undergone criminalization, economic crises, and systemic family separation as a result of the American nightmare. But it takes time to become numb to injustice, and the undocumented and Black youth movements of our time are rising to transform society side by side.

This research identifies “healing” as a new priority arena for organizers in movements today. Healing means “to make sound or whole; to restore to health” and comes from the old English word for whole. Social justice organizing is about human relationships, and if we acknowledge hurt people hurt people and healed people can help heal people, we begin to understand the significance of building power with love through healing our individual and collective humanity. Queer, feminist author and activist Audre Lorde said, “Caring for myself is not self-indulgence. It is self-preservation, and that is an act of political warfare.” Healing is a political act. My research asks, What does healing look and feel like as an explicit part of youth organizing today?

Through my personal organizing and interviews with young organizers, I find consistent definitions and accordance with the significance of healing within organizing. For them, healing is “restoration,” “remembrance,” and “returning to justice”; “mending the wounds without allowing interference or infection from the world;” and the act of making ourselves and each other whole again by organizing based on love. Healing is “working towards freedom with chosen family.”

Contemporary youth-led movements are evolving a new organizing approach by melding different traditions. I see living legacies from organizers like Miss Ella Baker, Paulo Freire, and Saul Alinsky in youth organizing. At times, this appears in the form of honoring Baker’s legacy or aspiring to practice Freire’s pedagogy; other times, their impact is seen in inherited organizational structures. As young organizers implement healing practices central to their movement culture and way of organizing—some more explicitly than others—they struggle to integrate healing work and sustainability into organizational structures. However, this does not deter them from trying, and reminding themselves and each other that, “We on the Freedom Side!”
Gentrification without Displacement

Gentrification is the movement of a moneyed class or the gentry into disinvested urban neighborhoods. This action facilitates displacement of existing residents in the formerly disinvested neighborhoods. This displacement is another step of a long history of marginalization of low-income minority communities. Unites States housing policy has facilitated urban disinvestment and marginalization for the past 80 years. The Station North area of Baltimore presents the current tension between gentrification and displacement. The research presented defines the development ecosystem, gentrification and displacement characteristics, and existing plans for affecting Station North. The research leads to a conclusion that under current conditions displacement cannot be prevented. However, lessons from Station North can be utilized for future inner city development strategy that minimizes displacement. Areas for further research on displacement minimization are presented. Lastly, this is client-based thesis for Ernst Valery Investments (EVI). The research and analysis provide a foundation for EVI’s community wealth building philosophy and offers potential opportunities and pitfalls of EVI strategy.
Transportation Policy Networks as a Strategy for Metropolitan Governance in Mexico City

How does transportation policy inform the institutions of governance? In turn, how do the conditions of these institutions shape transportation planning and implementation at the metropolitan scale? This thesis argues that public transit project implementation in particular has proven to be a semi-successful mechanism to gain and exert political power at multiple scales in the past; therefore, the subsequent expansions of transit service within the Mexico City metropolitan area (MCMA) reflect successive negotiations of political power and influence among the policy network composed of governments, NGOs, and non-profits, moving towards more productive forms of cooperation. The MCMA continues to expand rapidly, putting pressure on infrastructure like public transit, which carries almost two-thirds of daily traffic. Several state-level governmental entities, predominantly the Federal District (DF) and the State of Mexico (Edomex), make up the MCMA; however, urban growth is surpassing their jurisdictional capacities. Unhindered and even instigated by transportation and land use decisions, growth has spilled over from the DF into Edomex, complicating the development, implementation, and enforcement of policies across the two jurisdictions. Using three cases of recent metropolitan-scale transit projects – Linea B, the Tren Suburbano, and the integration of the DF’s and Edomex’s BRT corridors at Indios Verdes – as a lens, this thesis examines how institutions and actors approach the jurisdictional and functional divides between the states, and reexamine how they have done so in the past. These three projects show how the structure and quality of the policy network is associated with positive policy outcomes, not only along operational indicators but also larger measures of accountability and cooperation. Through the creation and reshaping of institutions at multiple scales, transportation policy networks have broadened over time as a strategy of metropolitan governance, auguring a future in which cooperation and competition in fact coexist at this scale not only within the realm of transit but also concerning Mexico City’s overall political dynamics.
Urban Adaptations Observed: The Politics of Governing Climate Resilience in Indian Cities

An increasing number of international policymakers and funders have strongly advocated for programs that integrate and support both climate change adaptation and urban development, arguing that combining these two objectives will help ensure the long-term resilience of cities. This dissertation delves into the cases of Bhubaneswar, Indore, and Surat in India and looks at how urban local governments plan, implement, and advocate for locally grounded, contextually relevant adaptation and development priorities within their jurisdictions given such external mandates and incentives.

My findings highlight two interrelated ways to theorize changing institutional relationships between climate adaptation, development planning, and urban political economy. First, through a process that I call street-level resilience making, I find that adaptation planning, implementation, and governance relies on the experimentation and co-creation of adaptation options between urban sectors and actors.

Secondly, I show that urban adaptation is governed through power in translation, where different urban actors, groups, and communities contest intervening authorities through their ability to translate climate information, adaptation needs, and resilience-building options. In this context, cities are not in fact unidirectional recipients of external aid and support; rather, cities are taking ownership over how external funds get implemented, which urban actors participate in the process, and why certain sectors and populations receive more support than others. However, as cities gain authority over how external adaptation mandates get translated into concrete programs and interventions, this simultaneously creates more opportunities for local authorities to exclude certain populations in decision-making. The pursuit of urban resilience can therefore become a moniker for further co-optation of political power and for entrenching existing urban socioeconomic injustices.

Finally, in response to rising urban inequalities attributed to current and pipeline adaptation interventions, I present a framework for evaluating climate justice from below. This concept takes into account how adaptation is mainstreamed into urban development and its relationship to broader socioeconomic transformations at a global scale. I conclude that the ability to mitigate existing power imbalances rests on the restructuring of governance arrangements available to marginalized communities to advocate for their own interests in the street-level resilience-making process.
Negotiating Neighborhood Priorities: The Politics of Risk & Development in Medellín’s Comuna 8

In a time of increasing concern over the impacts of climate change, environmental degradation, urban insecurity, and rapid urbanization, risk management has come to the forefront of planning agendas in cities across the world. No longer considered solely in environmental terms, key drivers of risk include a range of socio-economic and governance factors, and as such, risk management interventions have become tightly entwined with urban development politics. With many risks distributed unequally and affecting a city’s most marginalized individuals and communities most significantly, understanding how the intersection of risk management and urban development manifests in planning and policy interventions at the neighborhood level proves increasingly important for equitable city planning pursuits.

Using the case study of a Comuna 8, a semi-informal district in Medellín, this thesis explores how community-based groups situated in municipally-defined areas of high environmental risk negotiate their development priorities with city government and development entities. By examining how risk is invoked, re-interpreted or contested by different stakeholders pursing planning at different scales in Medellín, it demonstrates how the political nature of risk discourse and designations allows different stakeholders to justify, challenge, or carry through different development visions for a specific territory. For planners and communities concerned with equitable outcomes in cities facing complex environmental and social risks, this thesis suggests both the need for analytic frameworks that address risk in context of disputed development and improved decision-making structures that recognize the agency of grassroots actors in local development and risk management.
The Economic and Financial Feasibility of Food Innovation Centers

A Food Innovation Center (FIC) is an enclosed commercial space comprising a mix of complementary uses pertaining to locally-operated food growing, production, processing, testing, distribution, and sale. These uses include indoor vertical farms, commercial shared-use kitchens for start-up food businesses, rooftop greenhouses, food halls with local, artisanal vendors, and food-related R&D space, among others. FICs lie at the nexus of the urban agriculture and commercial real estate sectors of the economy. Though there are many variations, certain fundamental values guide the projects: a desire to engage local farmers, manufacturers, and entrepreneurs in the process of creating and sustaining a regional food system.

While literature exists on the demand for locally produced food, there is still a gap in the industry's knowledge about the financing environment, development costs, and overall rate of success that FICs experience.

The research presented in this thesis is intended to provide an overview of existing Food Innovation Centers via data on acquisition, construction, operations, and returns of individual projects. Does the FIC product innovation add value to urban industrial real estate, and is the FIC a feasible model, financially and economically, for industrial development?

Survey analysis of 62 FICs and six in-depth case studies show that FICs are more prominently featured in commercial rather than industrial space and operate on a business model in which a developer owns the property but leases to individual tenants operating one of the FIC business components. Financing largely comes from the philanthropic sector, and some of the most ambitious FICs have partnered with municipalities to identify publicly owned land for a nominal ground lease to the city or below-market acquisition. Commercial investment in FICs focuses more specifically on indoor vertical farms rather than any of the alternative FIC uses, and those FICs that operate primarily as shared-use kitchens typically earn less than $5,000 in annual net operating income. Overall, the FIC product type is still under development, but the highest yield component may be indoor farms, for which the technology supporting the farm systems is still very much in the nascent R&D phase and not yet prepared for commercial diffusion.
Strategies for Equitable Climate Change Adaptation: Lessons from Buyback and Elevation Programs in Rhode Island

As the impacts of climate change become more pronounced, many coastal and riverine communities in the United States will face severe flooding from sea level rise and increased frequency of storms. From a municipal perspective, planners and elected officials will be confronted with questions of what tools and resources are available to help private property owners adapt to climate change impacts, when those tools and resources should be used, and who they should help. This thesis uses qualitative methods to examine how two Rhode Island communities, Cranston and Westerly, have utilized buyback and elevation programs to adapt to future flooding risks. My questions include understanding how federal policies for acquisitions and elevations shape climate adaptation at the local level, how planners prioritize and fund these projects, how different aspects of equity are incorporated into municipal-level decisions, and how local-level efforts with private property owners should move forward.

I identify a merging of hazard mitigation activities with climate adaptation, as existing federal disaster mitigation programs administered by FEMA and HUD shape and constrain adaptation efforts in Cranston and Westerly. Limited levels of federal funding impacts what municipalities will do, leads to incremental adaptation planning efforts, and means that communities need to act quickly to implement programs when funding becomes available after disasters strike. I find that while Westerly and Cranston have prioritized the use of buyback and elevation programs based on spatial-environmental risk, neither community has defined standards for determining climate change risks or incorporating socio-economic equity into their programs. I argue for an approach to adaptation planning that balances justice-oriented distributional and procedural equity at the local-level, and suggest supportive changes at the state and federal level that would facilitate stronger local adaptation planning. In anticipation of increasing demand for help from private property owners in the future, communities should define clear equity standards to ensure that vulnerable populations can adapt and use public participation to help define municipal adaptation priorities.
Innovation Districts: Economic Development, Community Benefits, and the Public Realm

Innovation Districts are emerging across the country as vehicles for economic development, job creation, urban revitalization, and sustainable growth. As they continue to be developed, there is a need to rethink the role of community benefits in supporting economic resiliency within the innovation ecosystem. Public innovation centers have the opportunity to bolster this environment by providing needed community space, fostering exchange within the public realm, and helping to sustain a mix of budding startups and established firms. Innovation space such as incubators, accelerators, coworking spaces, and maker spaces are not foreign to the commercial real estate market. However, when these relatively new product types collide with the idea of public space and community benefits, there is potential to create something unique. In the spirit of a community center, innovation centers offer the broader public access to the rapidly growing innovation ecosystem and startup culture, all while helping to generate new ideas, products, and—potentially—jobs.
communities around the globe have already begun to feel the impacts of climate change. looking forward, the impact will only become more pronounced. as such, an increasing number of municipalities, counties, and states are asking how they can prepare. various non-profits, public entities, and even the private sector are trying to facilitate smart preparedness policies by providing tools that forecast expected changes and provide guidance for vulnerability assessments. many of these tools take the form of map-based visualizations showing downscaled climate data. this thesis explores whether communities are actually able to use this downscaled data to inform decisions and consider policy options that will increase their resilience. i specifically focus on a tool produced by the state of california called cal-adapt. based on interviews with local officials and climate professionals across california, i find that climate tools like cal-adapt do provide value. they deliver information needed by local officials to think through future conditions and lobby for the resources they need. despite this, cal-adapt is not reaching its full potential.
Supportive Housing in the Age of Market Fundamentalism: A Human Rights-Based Approach to the Provision of Supportive Housing for Mentally Ill Homeless People

Despite its cost-effectiveness, supportive housing is grossly underprovided. In this paper, I build a rights-based strategy for supportive housing advocates, specifically structured around meeting the needs of mentally ill homeless people. A rights-based strategy, emanating from constitutional law, is the most robust way to secure this support.

The failure of New York State to provide supportive housing for mentally ill homeless people is a prima facie violation of human rights under domestic law (specifically, NYS constitution Article 17, Section 1) and various international treaties. The government has enforced a property ownership and regulatory regime that interferes with mentally ill citizens’ ability to satisfy their basic needs and therefore must provide a publicly-financed remedy for their condition. This thesis identifies the best legal strategy by which activists can secure this remedy.
Beyond the Resource Curse: Mineral Resources and Development in Guinea-Conakry

Natural resource endowments are no guarantee of socioeconomic development. Many developing countries are rich in natural resources (minerals, oil, gas, hydropower), and yet many of their citizens remain in poverty and their economies have failed to grow; the “paradox of plenty”. Despite its natural resources (bauxite, iron ore, diamond, gold and hydropower), Guinea has been unsuccessful in marshaling and leveraging these resources to produce socioeconomic development. The critical challenge for Guinea, just like many resource-rich countries, is governance failures - decades of military rule, corruption and resource mismanagement after centuries of French colonial rule. This thesis uses secondary sources and data to argue that the resource curse as a phenomenon in resource-rich countries has limitations as it does not offer these countries a path for how their resources could be used to propel social and economic development. To overcome the so-called resource curse, this thesis argues that the key to unlocking economic and social development in mineral-rich Guinea, is investing its resource-generated revenue to develop the country’s infrastructure services. Infrastructures such as roads, telecommunications, water, power, education and health facilities are the foundation for socioeconomic development.

The new hope for Guinea rests in the fact that after more than fifty two years of military and authoritarian rule, the country transitioned to “democracy” for the first time in 2010. This coupled with the emergence of new global players such as China and other emerging countries, with their quests to secure stable natural resources to fuel their industries, comes a new window of opportunity for resource-rich countries such as Guinea to leverage and link its extractive industries to develop key infrastructure services. Guinea could leverage its bauxite and iron ore industries to transition to onsite transformation of these materials, whose transformation is energy-intensive. Guinea could then leverage the demand for power from the onsite transformation to develop its untapped hydropower generation capacity to supply both mines and the rest of the country. However, this will not happen without governance reforms in Guinea’s extractive industries and mining code.
Using the Boston Metro Region as a case study, and a four-step model for the year 2010, I demonstrate a method (Inundation Impact Assessment) for quantifying transport network impacts under six different inundation levels, one-foot to six-feet. The results indicate that inundation has widespread impacts on the ability of persons to complete trips and the performance of both the auto and transit networks.

I then demonstrate how this method can be applied to examine different infrastructure projects in the future, modeling two different demographic scenarios for the year 2030 with two different BRT alignments. The goal is to evaluate potential contribution of BRT to recoup trips lost by the impact of inundation on other transit links.

The methods and approaches used in this work show how such four-step models can be used to plan for inundation events. This method provides significant amounts of data that can be used to assess the value of potential interventions, such as the protection of mobility or the reinforcement of transportation network performance.
Using Automatically Inferred Origins and Destinations to Analyze Spatial Variations in Transit Effectiveness

By inferring individual passengers’ origins, destinations, and transfers using automatically collected transit data, transit providers obtain and analyze larger volumes of information, with more accuracy, and at more frequent intervals than are available through traditional origin-destination (OD) surveys. Automatic OD inference can be an input into the analysis and reporting of agencies’ social goals, such as the provision of equal service regardless of race, national origin, or ethnicity, which is federally required in the USA by Title VI of the Civil Rights Act of 1964. The methodology prescribed in the Title VI regulation, however, has relied on transit supply metrics and has not adapted to the availability of OD data, and the resulting ability to provide passenger-centric demand metrics.

The goal of this thesis is to demonstrate a preliminary methodology to link automatically inferred OD information from regular transit users to the demographic data of public transit commuters from the US Census’s American Community Survey, and to examine any spatial variation in passenger-centric metrics such as journey time and speed. This study infers origins and destinations in the context of the Massachusetts Bay Transportation Authority (MBTA) network of bus, bus rapid transit, and heavy rail. From a sample month of these data, an example of a passenger-centric analysis is performed by comparing travel times and speeds of trips with origins in areas home to predominantly Black or African American transit commuters to travel times and speeds of trips with origins in areas home to predominantly White transit commuters. Commuters from predominantly Black or African American census tracts are found to have longer travel times and slower speeds relative to commuters from tracts where commuters are predominantly White. Short-term solutions such as increasing reliability of bus departures at terminals and long-term solutions such as faster, more frequent commuter rail service are proposed and evaluated to mitigate these differences.
Juan Pablo Duran  
Thesis Advisor: Balakrishnan Rajagopal  

Political Economy, Public Policy, Power Structures, and Human Rights Violations: The case of Internally Displaced Persons in Colombia between 1993 and 2010

Colombia is the second country with more displaced persons in the world, and one of the worst countries regarding Human Rights violations. Despite the popular believe that these Human Rights violations are due to the internal conflict with guerillas, this thesis found that rather, the largest share of displacement, and human rights violations are due to economic projects.

The imposition of the neoliberal agenda since the nineties made the State weaker. This allowed deeper state capture by paramilitaries, drug-dealers, politicians, international corporations, and national entrepreneurs who grabbed land from poor peasants in order to obtain financial gains.

This thesis also studies how national and international elites were able to take advantage of different waves in the US foreign policy, and the policies of Bretton Woods Institutions in order to create new forms of speculative wealth.

This process has created more than 10 million of hectares of monopolized land, and more than 7 million of victims, the vast majority of them were poor farmers who don’t belonged to any army in conflict.

In this context, research findings suggest that the current peace process will deepen the current Development model. The peace agreement with guerrillas only will be possible under principles of impunity for political and economic elites, legalization of denuded lands based on “property rights” principles, and the imposition of “Free Trade” and “Market Discipline” for Colombia in its relationship with international partners.
This thesis examines the Dudley Street Neighborhood Initiative (DSNI) community land trust, which provides long-term affordable housing to low-income families using a resale-restricted model and promotes community control over development. It seeks to answer the following question: how much and in what ways has DSNI’s land trust stabilized the Dudley neighborhood, specifically with regard to foreclosures, vacant lots, owner occupancy, and housing affordability?

It also attempts to measure the land trust’s impact spatially and quantitatively and isolate it from economic and social changes in the surrounding neighborhood and the broader Boston housing market. Interviews with housing researchers and experts on the Dudley area supplements this quantitative analysis (a relatively rare approach to studying community land trusts). Findings largely support the hypothesis that the DSNI land trust has significantly lower building values and vacancy rates than the surrounding neighborhood, as well as significantly fewer foreclosures during the housing crisis and an increasing owner-occupancy rate. It is not clear whether there is a spillover effect from the land trust onto neighboring properties within the Dudley Triangle; however, the analysis does largely support the land trust’s claims as a model for housing affordability and development without displacement. The conclusion offers implications for DSNI, the community land trust model, and Boston housing policy.
Adaptive reuse and historic rehabilitation have been utilized as a development strategy since the creation of the Federal Historic Preservation Tax Credit in 1976. In many cases, the adaptive reuse of vacant properties has been used as a tool for neighborhood economic development and revitalization. This strategy has increased in popularity since the start of the 21st century, with many states creating additional historic tax incentive programs. Investment in rehabilitation projects using the Federal Historic Tax Credit reached nearly $6 billion in 2014. This thesis examines three residential projects in Massachusetts developed during the 1980s in order to investigate the long-term impacts of adaptive reuse on the surrounding neighborhood. The case studies are the Baker Chocolate Factory in Dorchester, Museum Square in Lawrence, and the Francis Cabot Lowell Mill in Waltham.

Through an in depth analysis of these cases using qualitative and quantitative research methods, this thesis connects aspects of the development process and external influences to positive or negative neighborhood development outcomes. Findings reveal that these case studies have had varied impacts on their surrounding neighborhoods: while the Baker Chocolate Factory development was associated with increased property values and additional investment, the Museum Square project appeared to affect very little change in the adjacent community. From these findings, it appears that residential adaptive reuse is an effective tool for neighborhood social and economic development under the right political and economic conditions, and with strategic decision-making during the development process. Key factors that contributed to the success of the adaptive reuse projects focused on in this thesis include the following: effective use of financial incentives and subsidies, local political support, local resident involvement, CDC and nonprofit involvement, and the presence of broader plans for neighborhood revitalization. The thesis concludes by presenting recommendations for how the strategy of adaptive reuse can be improved to have a more significant, positive long-term impact on the surrounding community.
Following Hurricane Sandy in 2012, federal, state, and local governments initiated a series of disaster relief and recovery programs. These efforts were criticized for their lack of coordination, and fueled the public opinion that not only were coastal cities increasingly at risk for storm events due to climate change, but also that the government is not equipped to adequately respond to or prevent future disasters. The Rebuild by Design urban design competition was the first implemented recommendation of the cabinet-level Hurricane Sandy Rebuilding Task Force, and the main goal for the competition was the procurement of innovative resiliency projects for the areas affected by Hurricane Sandy. Sponsored by the U.S. Department of Housing and Urban Development (HUD), the competition is an unprecedented use of urban design by the federal government, leading to the question of why HUD would turn to an urban design process in the midst of other recovery efforts. Through interviews with designers from the winning design teams, this thesis finds that design thinking, under-examined by the participants, management, and evaluations of the competition, is the underlying theory that explains the benefits of an urban design process in the context of responding to climate change. Design thinking theorizes design as an alternative decision making process that can address complex problems for which there is no correct solution. This leads to the use of design as a method of creative problem solving as well as a catalyst for organizational change. This thesis finds that the competition design teams practice characteristics of design thinking. The resulting design ideas synthesize across regional, social, and economic systems, and offer an improved approach to the current infrastructure practices of flood protection and water mitigation. At the same time, the ability of the design process to fulfill the organizational goals of the competition, such as capacity building for local governments, remains mixed. Finally, this thesis generates recommendations for future iterations of Rebuild by Design as well as cautionary lessons for designers in light of the politics of relying on design as a form of innovation.
Upgrading from Below: a Collective Approach to the Right to the City in the Federal District, Mexico

In 2010, then-Mayor Marcelo Ebrard of Mexico’s Distrito Federal (DF) signed the Mexico City Charter for the Right to the City. Echoing a global movement by activists, academics, citizens, and government officials, a consortium of municipal activist organizations had written the charter over a three-year participatory process. However, like many Right to the City movements and charters globally, Mexico City has struggled to ground the principles of the Charter through policy, financial resources, and programs at the citywide level.

This thesis will suggest an alternative framework for grounding the Right to the City: through local collective action that is connected by transnational networks of civil society actors. Drawing on the experiences of Frente de Renovación Fase 2, a self-built community in the eastern delegation of Iztapalapa, this thesis illustrates how local action is effective in achieving the Right to the City in the short-term, but that long-term gains must be maintained through city-, national-, and global-level networks.
The spatial structure of development is of both theoretical and policy relevance given the feedback or network effects that material wealth or income inequality may have between neighboring spatial units. In order to investigate if development spreads like a contagious phenomenon between municipalities in Southern Mexico, I perform global and local spatial autocorrelation analysis. My analysis finds statistically significant evidence of spatial (positive and negative) autocorrelation clusters in these municipios for variables like GDP per capita and poverty rates, among others. This evidence supports the argument to investigate in more depth the role of space in development policy for this region of Mexico.
Integrating sustainability into arts-focused neighborhood development on contaminated sites in “hot” real estate markets

Cities with industrial legacies are seeking to redevelop former brownfield sites. Some of these same cities are also seeking to promote neighborhood-scale arts-oriented development to spur economic development. In this research, I explore whether and how cities with rapidly intensifying real estate markets and a growing creative economy promote the development of neighborhood scale arts-oriented development projects. Using the case of the ARTFarm for Social Innovation in Somerville, MA, I trace how cities can utilize arts-oriented development projects to create civic spaces that meet the competing long-term interests of multiple stakeholder groups more effectively than attempting to meet contending interests in separate locations. The ARTFarm project provided the City of Somerville with an opportunity to simultaneously pursue brownfield clean up, arts-based development, and environmental sustainability in a mutually reinforcing way.

Based on key informant interviews and data collected during ARTFarm’s early development, I examine the challenges of implementing mutually reinforcing environmental remediation, arts-based, and sustainability policies in an intensifying real estate market. I then chart several preliminary future directions for the ARTFarm site and for the three-way policy integration it seeks to achieve.
Between 2002 and 2014, the Bloomberg administration implemented dozens of neighborhood-scale rezonings to catalyze economic growth and create the conditions for new residential development. With the amount of housing affordable to low- and moderate-income households diminishing every year and a new administration publically committed to addressing the city’s housing challenges, it is an opportune moment to consider the motivation for and impact of the Bloomberg administration’s rezoning program. Though individual rezonings have been subject to extensive scrutiny, little research has been done to assess the technical, social, and political dimensions of the rezoning program as a whole.

This thesis explores the way in which Bloomberg administration rezonings guided growth spatially and how that growth affected access to housing for households at various income levels and of different races. Data on development and demographic change suggest that the rezonings facilitated new housing growth in prime, central neighborhoods at the expense of low- and moderate-income renters.

In low-density areas, the city conducted rezonings that preserved neighborhoods from new development, but, in combination with an influx of immigrants and renter households, contributed to increasing rent burdens and overcrowding. The quantitative analysis demonstrates that, on aggregate, rezonings were associated with residential displacement in and near the city’s core while serving to exclude low-income households in the periphery.

An analysis of the social and political context of the rezonings indicates that while the Department of City Planning was motivated by infrastructural and economic considerations, the interests of non-governmental stakeholders shaped the rezoning program to a significant extent. Homeowner mobilizations produced downzonings particularly in Staten Island, eastern Queens and southern Brooklyn. Meanwhile, development interests spurred rezonings in commercial and industrial areas as well as gentrifying neighborhoods, inducing a sharp increase in housing costs and residential dislocation.

While one portion of the rezoning program embodied the interests of homeowners, another was driven by the demands of the development community, resulting in divergent outcomes that undermined access to housing for New Yorkers of limited means. This thesis suggests changes to New York City’s planning and zoning mechanisms to more effectively realize citywide growth goals while responding to the particular needs of low-income, largely non-white households.
As people and places are beginning to experience climate change impacts such as extreme weather events, increased temperatures and precipitation, and sea level rise—and scientists project unavoidable levels of future change—cities are beginning to take action. Simultaneously, US cities are continuing and expanding their commitment to mitigate carbon emissions, knowing that unless emissions are reduced significantly it may not be possible to adapt to future climate impacts. Because cities, operating under increasing financial constraints, are taking on both mitigation and adaptation and must advance on both fronts in the coming decades to meaningfully reduce climate change impacts, some forward-thinking planners are trying to connect and integrate local mitigation and adaptation planning rather than pursuing them as independent planning processes.

I consider the challenge of integrated climate change planning in the case of Somerville, Massachusetts, where city planners intend to link mitigation and adaptation in developing the city’s first climate change plan. In doing so, I argue that Somerville can advance a more transformative approach to climate action that increases the urgency of mitigation action, and ensures adaptation is advanced through green rather than grey infrastructure strategies. Most important, linking mitigation and adaptation can increase the community development and social equity focus of local climate policy, thereby broadening the range of stakeholders engaged in climate action and increasing political support for projects prescribed by the plan.

My recommendations focus on how Somerville can ensure that its climate change planning fulfills its transformative potential by: 1) filling the current gaps in municipal climate change responsibility; 2) focusing on issues that have direct mitigation and adaptation overlaps; 3) positioning climate action to influence citywide planning; 4) linking mitigation and adaptation under a resilience framework that centers on social equity, community development, and public health and safety; 5) engaging stakeholders that are traditionally involved and new to climate action; and 6) communicating about climate resilience rather than mitigation or adaptation.
This thesis has sought to construct a diagnostic study of small downtown revitalization in Somersworth, New Hampshire, and Berwick, Maine. To develop a holistic understanding of downtown revitalization in Somersworth-Berwick, and other such small towns on the urban fringe, this research was divided into three broad parts: [1] local contextualization of Somersworth-Berwick and empirical studies of small town revitalization, [2] a local market analysis, and [3] a site plan and financial feasibility model. The methods used to complete this research included focused interviews, market analysis, and financial modeling. These methods are coupled with a review of literature and sought to answer what potential market-based downtown revitalization strategies are and how economically and financially viable these might be in the context of Somersworth-Berwick.

While this thesis has fashioned a robust framework specifically in the context of Somersworth-Berwick’s downtown revitalization, its methodological approach and findings are applicable for similar small and fringe communities.

The findings of this thesis highlight that market-based revitalization efforts, such as catalytic real estate development, do hold promise in advancing revitalization efforts yet often require subsidy in the face of weak real estate markets and market failure. As such, broad-based and non-traditional revitalization efforts are key elements to a holistic and effective downtown revitalization plan.
Dwight Howell  
Thesis Advisor: Alan Berger

Army Installations of the Future: Urban + Shrinkage + Landscape

The US Army has set a course to transition to a future force that is adaptive, modern, and at the forefront of change. This strategic vision lacks a refined installation strategy to meet the needs of the future force. In a period of troop reductions, declining budgets, and increased facility vacancy rates the Army is required to shrink its installations.

This thesis explores how to shrink Army installations through change, policy, and design. A set of changes is proposed that focus on eliminating housing, revising security standards, increasing privatization, and growth in Enhanced Use Leasing. Current Army planning strategies based on New Urbanism principles do not address how to shrink installations. Four theories are analyzed to develop a framework for designing the future of Army installations. Parameters are established to test the results of the design. The framework is applied to develop a design proposal for Fort Belvoir, VA.

The framework generated a successful design of Fort Belvoir, VA based on the establish parameters. The framework and design process is transferable to all Army installations in the United States. Army planners can apply the process and framework as a tool to generate solutions to shrink Army installations.
Driving Down Emissions: Finding a Workable Path to Vehicle Miles Traveled Reduction Policy in Massachusetts

Massachusetts is one of the US states at the forefront of carbon emission reduction policy, and has the potential to model success to the rest of the country. The state’s Global Warming Solutions Act (GWSA) passed in 2008, two years before federal climate legislation floundered in the U.S. Senate. This legislation committed the state to reducing carbon emissions 25% below 1990 levels by 2020 and 80% by 2050. However, progress toward these targets has been uneven, particularly when it comes to transportation and land use. Despite aggressive goals, the number of vehicle trips, the number of vehicle miles traveled (VMT), and the carbon emissions from passenger vehicle trips are all projected to increase over the next several decades.

What will it take to get Massachusetts on track to meet its vehicle emission reductions targets? Many of the state’s environmental advocates are uniting behind a potential new policy, a revenue-neutral carbon tax. This policy would levy an additional fee on fossil fuel consumption, but would distribute the revenue back to the state’s residents instead of adding it to the state budget. This thesis explores the political, technical, and equity-based considerations that must be addressed to implement this policy. Through spatial analysis of passenger vehicle driving patterns in the state of Massachusetts, a case study of British Columbia’s successful revenue-neutral carbon tax, and analysis of the current political landscape in Massachusetts, I offer some recommendations about how advocates should proceed in trying to move an ambitious policy proposal forward in a challenging political environment.
Drinking Fountains: The Past and Future of Free Public Water in the United States

Drinking fountains have a rich history as pieces of urban infrastructure. Installed in Renaissance Rome as public art glorifying the Pope, in industrial London as a humanitarian source of cholera-free water, and in prohibition-era America to discourage alcohol consumption, drinking fountains have filled many public functions over many centuries. But today’s drinking fountains, when installed at all, are purely utilitarian: undesigned in terms of both form and strategic urban placement. Shoved between bathrooms and trashcans and probably broken, drinking fountains have fallen on hard times in the public realm. Many Americans express skepticism of public water sources, and millions choose expensive and polluting bottled waters instead, reflecting underlying attitudes about distrust of government and public infrastructure.

There are compelling reasons to rethink and redesign our relationship with drinking fountains. Today, the United States confronts a new set of challenges: neglected urban spaces, obesity and lifestyle-related disease, widespread privatization of public goods, rampant socio-economic inequality, and plastic pollution.

Drinking fountains may be uniquely suited to help confront these problems by cutting down on bottle waste, providing accessible water for homeless and vulnerable populations, reducing consumption of sugar-sweetened beverages, facilitating exercise, and adding interest and beauty to public spaces - but they will only be able to achieve these goals through thoughtful design and good maintenance. In surveys, people were more likely to drinking from outdoor drinking fountains if they believed that they were clean, safe, and beautiful; the importance of appeal in decision-making has been understood by corporations like Coca-Cola and Apple for decades, but has been little-considered in promoting public water.

Drinking fountains, a seemingly insignificant urban element with huge actual potential, are an exemplar of what is possible when societies value public space and the public good. Addressing both the problems in current fountains and in peoples’ perceptions of them could reframe drinking fountains to help address some of today’s most pressing problems.
Drawing Outside the Lines: Community-Driven Design in Unincorporated Communities

Design is both a mode of communication and a collaborative process. It is a powerful tool with which to convey ideas about the built environment and unlock creativity. Yet urban planning has not harnessed design’s potential to engage communities in participatory processes. Urban design has been guarded as an exclusive realm for experts rather than a shared process that utilizes the knowledge of both professionals and community members. Urban planning has long struggled to successfully involve the public in its processes, and this thesis argues that participatory design is the key to meaningful community engagement in planning.

Participatory design is particularly important when planning in marginalized communities. It provides participants with a sense of ownership over their communities and exposes the manifestation of oppression in the built environment. Using Paolo Freire’s idea of “consciencizaciòn,” this thesis tests participatory design’s ability to allow both designers and community members to gain critical consciousness and work towards social change together.

The research for this project focuses on marginalized unincorporated communities that have been systematically excluded from city annexation practices because of their racial and socioeconomic makeup. These communities have been left under the jurisdiction of counties, lacking infrastructure, adequate emergency services, public open spaces, and sufficient political representation. This thesis also explores the impact of participatory design processes on teenagers in unincorporated communities who often bear the brunt of their communities’ oppression, and are rarely consulted in planning decisions.

My research concentrates on a participatory design process I conducted with high school students in a predominantly Latino unincorporated community outside of Santa Rosa, California. This community suffered a tragedy in 2013, when a 13-year-old boy was shot and killed by a Sonoma County Sheriff in a vacant lot along Moorland Avenue. The incident spurred community protests and organizing for change, and led to my involvement with the neighborhood. My work with the Santa Rosa teenagers revealed the importance of design in participatory processes. The physical act of designing unlocked students’ creativity, built their capacity to think spatially and feasibly, and showed them the power of young people’s voices in creating neighborhood change.
In response to a widespread dissatisfaction with an inefficient and highly political system of development permitting and land use decisionmaking, Philadelphia instituted a large-scale reform of its zoning code and planning documents in 2007. These reforms attempted to reconcile a desire for greater administrative clarity and development-friendly adjustments with the necessity to maintain some form of community control over neighborhood futures. The reformers emphasized the importance of broad-based and widely accepted municipal plan for creating a framework within which development could be made beneficial for all. However, the city also formalized a mechanism for community input in variances, through which community groups would weigh in on the merits of granting relief. This thesis hopes to show that reformers did not sufficiently recognize the ways in which neighborhood divisions undermine the smooth operation of a zoning and planning regime.

Formalizing community input in zoning relief lends credence to forces of ideological conflict which take legitimacy away from the plan and politicize the administration of zoning. Findings suggest that the compromises necessary in creating a new plan and zoning regime insured that developers will continue to push against planning restrictions, while communities see zoning as their only tool to fight cultural and ideological battles against development and to dictate their desires for future neighborhood growth. Multiple groups within the same neighborhood fight to assert their own visions, sharpening ideological conflict. Community groups have taken on the difficult administrative task of running a contentious public meeting, but the impact of their efforts on the decisions made by the Zoning Board of Adjustment is uncertain at best. The examination of Philadelphia’s attempt to reconcile community control and administrative clarity and efficiency shows that convincing a reluctant city of the benefits of by-right development is difficult without addressing the strong divisions revealed by new projects with a commitment to ongoing planning and consensus-building efforts.
Shaping an Inclusive Waterfront: Community Engagement in the Redevelopment of San Francisco’s Pier 70

Community engagement in large-scale development projects is a critical step in the real estate development process, needed both to obtain official project approval and to gain feedback to create projects that better provide for and respond to the needs of the community. In San Francisco and other cities with extensive political and community involvement surrounding issues of urban growth, community engagement can be particularly important. Yet the community process can be agonizing, rife with contentious public hearings in which only those who are avidly for or against a project participate. Because of this, developers may dismiss engagement as an unpleasant formality necessary for project approval. However, the community process undertaken at Pier 70, a large waterfront development project in San Francisco, demonstrates that engagement can be an effective tool to build trust, gain project support, and make projects that better serve the community.

The developers of Pier 70, Forest City, have gained remarkable community support for their project, including receiving citywide voter approval for proposed height changes on site. This thesis examines Pier 70 as a case study to explore how developers can help foster trust and effective collaboration through the community engagement process. To do so, it draws from a review of the process and problems of standard community engagement and presents alternative models. It also discusses recent large-scale waterfront projects in other cities, the history of San Francisco’s highly politicized development process, and increasing controversy concerning waterfront development. Analysis suggests that Forest City has led an effective engagement strategy, gaining support and meaningful feedback throughout the process. Case study findings at the scale of the developer, project, neighborhood, and city demonstrate how Forest City has tailored their approach to the specific site to align the project and community process with the needs of the city and community. Forest City has been successful largely due to their ability to act locally, engage broadly and openly, and build trust with the community. Ultimately, this thesis draws lessons from Pier 70’s development process to suggest methods for ensuring that development projects are not only profitable, but also valuable for the community and surrounding urban realm.
Community Involvement in Commuter Rail Improvements: The Case of the Fairmount Line in Boston

This thesis examines a successful community-led initiative to improve service on commuter rail and examines whether this initiative’s focus on commuter rail in particular – as opposed to a focus on other modes of transit – affected the strategies of community members’ participation and actions. It finds that despite the project’s focus on commuter rail and significant community involvement, the focus on commuter rail was largely incidental to the strategies used.

The case study used is the Fairmount Line, a 9.2-mile Massachusetts Bay Transportation Authority commuter rail line that passes through largely low-income, minority neighborhoods entirely within Boston. For most of its history it has seen low levels of service. Starting in the early 2000s, community pressure began to build for more stops and more frequent service. This eventually culminated in the construction of three new stations in city neighborhoods, the lowering of fares to equivalent to subway fares, more frequent service and eventually – by 2020 – a plan for operation of diesel multiple units on the line.

Community action was crucial and significant to moving the project forward. The Fairmount Coalition, an alliance of nonprofits, advocacy organizations, community development corporation and others – played four major roles in the initiative: they drove the effort, employed legal tactics and strategies, maintained pressure and publicity on government agencies, and broadened the scope of the project from its initial narrow focus on transportation.

To justify these major actions, however, community actors largely appealed to social justice, environmental justice and transit equity grounds, reasons that were not specific to commuter rail. The fact that it focused on commuter rail was most relevant when community actors claimed that residents had negative perceptions of commuter rail, bolstering the justice- and equity-based narrative of the effort. Otherwise, the fact that this project focused on commuter rail did not appear to have a significant impact on the project’s strategies or success.
Society’s dependence on fossil fuels, spawned during the industrial revolution of the 19th century, increased the physical isolation between the built environment and its primary sources of energy. Rapid population growth and urbanization following this period gave rise, in the 20th century, to concerns around the impact of humans on the environment. These concerns precipitated an increased focus on renewable energy, and sustainable development models present in contemporary urban planning discourse.

Despite the increased focus on urban sustainability, the rapid expansion of renewable energy capacity and supporting policies, municipal governments in the United States continue to struggle with incorporating renewable energy systems into the built environment. The primary challenges concerning this integration rest in the capacity of municipal government to reinterpret the built environment as a framework for renewable energy, to conduct spatial analysis of the potential capacity in the built environment, and to synthesize that analysis with municipal policies in order to develop more robust and specific targets for renewable energy development.

In response to these challenges, I assess opportunities and barriers for renewable energy development in the built environment, and synthesize established methods of spatial analysis, renewable energy policy, and project development models, to inform the role of municipal government in future planning efforts around renewable energy.

To investigate the potential practical applications of this research, I focus on the city of Burlington, Vermont, which in 2014, earned the status as the first city in the United States to source 100% of its electricity from renewable sources. I question the replicability of the means by which Burlington attained this status, whether further opportunities exist for Burlington to expand its support for renewable energy, and what role the municipal government might assume in this expansion.

I find the means by which Burlington sources its renewable energy only partially replicable, but I also find significant opportunities for Burlington to expand support for renewable energy within its municipal boundaries. I conclude my research by providing my findings to the city, in hopes that they will strengthen the role of municipal government in renewable energy planning.
Transforming Urban Waste Systems in a Digitally Connected World

This dissertation investigates how location tracking technologies can transform municipal solid waste management in smart cities. While waste is often tracked in aggregate as it flows between and through handling facilities, there have been few attempts to follow individual trash items geographically using GPS and web-based mapping. Such data could change the interaction between citizens, local government, and service providers, by revealing inefficiencies or fraud in disposal practices, or building trust between stakeholders and enabling alternative approaches for contracting waste services. The five essays of this dissertation demonstrate various designs, deployments, and evaluations of real-time waste tracking systems, and identify the challenges and opportunities for smart waste systems incorporating these tools.

The first essay presents a system where individuals can electronically tag a trash item, and view its movements in real-time. By surveying volunteers who participated in this experiment, it shows that this information can significantly improve their knowledge of how waste systems operate and where different types end up, but attitude and behavior change is less sustainable.

The second and third essays consider waste tracking in Brazil and Kenya, where many cities rely on informal workers to collect and recycle trash. By carrying smartphones tracking their location, waste pickers can map their own movements, waste generation, and material flow across the city. This allows them to organize more efficient routes, coordinate actions in real-time, and negotiate more favorable partnerships with government and private clients. Planners also benefit from crowdsourced data in informal areas.

The fourth essay demonstrates a method for tracking hazardous electronic waste, such as CRT monitors, when illegally exported from high- to low-income countries. The information gleaned has allowed activist groups to investigate smuggling routes and support public agencies in enforcing international law.

Looking to the future, the fifth essay considers how formal waste collection services could be made transparent, and how this might support crowdsourcing efforts to improve their efficiency and better meet citizen needs. Doing so requires design of both real-time urban dashboards and citizen feedback mobile applications. The result could change how cities benchmark effective municipal services and strive for high quality urban environments.
Public Participation in Shantytown Transformation in China: A Case Study

Public participation is not a familiar concept in China but there is a growing demand from urban planners and policymakers in China to understand and utilize public participation tools. This research seeks to answer: How does the public participate in planning in China? What kind of participation is appropriate in China context? How do policymakers design for participation process in future planning projects?

These questions are approached using qualitative methods such as field investigation, semi-structured interviews and policy document analysis. A case study on the use public participation in Baiwanzhuang to transform a shantytown in Beijing is the main lens for understanding participation in China. This is compared to the example of how participation was used in the Boston Demonstration Disposition program, another housing rehabilitation project.

The author proposes a framework to explore the activities of participation that identifies and analyzes several phases of participation in each example to understand the differences between the two contexts.

This research found that participation varies and that there are no uniform criteria of ideal participation for every context. To identify the appropriate participation, the context, goals and values must be understood. To do this, the author develops and uses a “Context-Value-Participation” model for “appropriate participation”. This research also tries to summarize three main features of the China context - development anxiety, elite governance and weak community. Policymakers in China can apply the “appropriate participation” model to China context when planning for future participation.
The Divine Hand of the State? How Religion Influenced Social Policies for the Poor in Iran

As a paramount concern in development planning, poverty alleviation encompasses a variety of agents and actions, depending on the institutional setting in which it is attempted. Iran is a specific case for its uncommon connection of religion, society, and politics. By conducting a historical analysis, this thesis examines how religion has influenced the ways in which the poor have been helped in Iran since the formation of the (modern) nation-state in the 1870s. It shows that there are four principal agents involved in planned/organized efforts to help the poor: the state, the mosque, the civil society organizations, and, of course, the poor. Findings show that religion has influenced social policies for the poor in Iran in several ways. First, as an organized set of beliefs, religion has invariably cultivated a moral-spiritual discourse to help the needy, for example, by motivating state officials who are in charge of social policies.

Second, as an institution, religion has impacted the associations among the principal agents of poverty alleviation through establishing, mediating, or undermining relationships, for example, between the poor and the state. Third, as an instrument, religion has been sometimes used by the state to serve political or security purposes. The results have been mixed, however. Sometimes religion has positively played a social role, such as attributing social responsibility to the state vis-à-vis the poor after the 1979 revolution. But, religion has also exerted adverse influence on social policies, namely when it is used to serve populist public policies or to discriminate against religious minorities. This study concludes that the ‘sphere of planned help’ in Iran is not purely secular—that is, ‘emancipated’ from ecclesiastical influences. The secularization theory therefore bears inherent limitations to capture the social role of religion in poverty alleviation in Iran. Nor is this sphere merely contractual—that is, the exchange of assistance for legitimacy. In other words, not all of the poverty alleviation associations in Iran could be seen as social contracts. On the contrary, some social policies encountered resistance because the poor did perceive them as a contractual form—as a ‘threat’.
A New Dream: Redefining Homeownership through the Post Foreclosure Eviction Defense Campaign

Just a few years ago photos of streets lined with foreclosure signs and anecdotes about families who had lost their savings were on the front page of every major newspaper. Many of these stories profiled immigrants who had been taken advantage of by predatory lenders. In Boston alone, 81% of all foreclosures in 2008 happened in communities where at least one quarter of the population is foreign born. However, without available data on lending and nativity status, it is difficult to prove that predatory lenders explicitly targeted immigrants. Instead, by looking at concentrations of subprime lending and foreclosure spatially, this thesis explores to what extent and why immigrants in Boston were impacted by the crisis.

In addition, it argues that the harm felt by first generation immigrants is the result of structural racism in homeownership policy perpetually stripping inner-city communities of wealth. Without radically altering our conception of homeownership, communities of color and the evolving populations residing within them will continue to struggle.

Encouragingly, community groups have historically played an important role in advocating for policy reform, and we can continue to look to local partners and activists to understand what changes are needed now. Because of the hard work of a close-knit group of residents, organizers and lawyers, people have been able to stay in their homes. In addition to preventing evictions, this network has reformed law to better protect low-income homeowners, created programs that address the root of historic problems, and advocated for policy change. Collectively their model is referred to as the Post Foreclosure Eviction Defense Campaign, and it serves as a national example of an innovative and participatory approach to foreclosure response and prevention. When creating supportive homeownership policies for immigrants and other marginalized populations, policymakers can learn from their ideology, which divorces housing from market instability, and advocates for a more flexible, community-oriented vision for homeownership.
Preserving the Ethos of Industry at the Carrie Blast Furnaces: The Redevelopment of an Industrial Heritage Site and the Interpretation of Manufacturing Culture

This paper proposes a design for the adaptive reuse of the Carrie Blast Furnace Plant, a National Historic Landmark in Pittsburgh’s Monongahela Valley. The Redevelopment Authority of Allegheny County intends to redevelop this 168-acre former industrial site in the near future. In anticipation of this regionally important redevelopment project, this paper considers the philosophical commitments of historic preservation, weighs economic growth imperatives, explores how the Carrie Furnaces could be made to cultivate public memory of industrialism, and examines competing visions of significance, authenticity, and interpretation of heritage sites, particularly in the context of the 21st century.

Four cases studies of internationally renowned projects demonstrate best practices in the redevelopment of historic ironworks, steelworks, and collieries. The Duisburg-Nord Landscape Park and Zollverein Park in Germany, the Belval: City of Science project in Luxembourg, and Parque Fundidora in Mexico all provide lessons in the preservation and adaptive reuse of derelict, historic industrial infrastructure. Though their contexts differ, these four cases offer a common set of best practices to guide the Carrie Furnaces project.

First, through designs and programs, these projects interpret the stories of industrial heritage sites for contemporary audiences, thereby cultivating public memory. Second, these projects’ adaptive reuse of historic structures and spaces creates new, contemporary relationships between the sites and various public audiences. This, as well as the fact that the designs are inspired by site-specific characteristics and are decidedly of their places and times, imparts authenticity. Third, these projects promote local economic revitalization through mixed-use development that engages broad constituencies. Finally, these projects’ designs use elements that pay homage to the industrial forms, materials, and culture particular to their places.

This paper’s proposed design for the Carrie Furnaces site preserves the site’s “ethos of industry” through a 21st-century manufacturing and tourism program that interprets the Carrie Blast Furnace Plant as a site of historic, vertically-integrated iron and steel production for the contemporary public consciousness. This design concept also promotes multi-sectoral economic growth, reconnects ailing nearby communities to the site, and conserves the material and cultural aesthetics of steel production, labor, and enterprise that made industrial Pittsburgh the center of American heavy manufacturing.
Tiny homes, no larger than a parallel parking spot, are an emerging trend in housing for those uninterested, unwilling or unable to participate in traditional housing markets. Five groups across the United States have harnessed this minimalist movement to provide free or extremely low-cost housing for those experiencing homelessness. This thesis is a comparative case study of two such tiny house villages: Dignity Village in Portland, Oregon, founded in 2004 and Occupy Madison Village in Madison, Wisconsin, founded in 2012. This work explores issues related to zoning, NIMBYism, financing, governance, sanitation and building quality and both celebrates the independence and ingenuity of tiny house villages and makes the case for greater municipal regulation of the structures.
The ever-increasing urban population and a growing middle class are leading to a burgeoning solid waste problem in Indian cities. While legislation has been passed to address the growing waste issue, there has been limited compliance by municipal governments. One of the key changes and challenges resulting from the new legislation is that municipal governments are now responsible for household waste collection. This is both a major expense for municipal governments, but also involves influencing the behaviors of every household in a city. The challenge is there is limited research on how municipal governments enact the changes needed to deliver an effective municipal solid waste management (MSWM) system.

Household waste collection may be more acute in smaller cities. Estimates suggest that a lower percentage of waste is collected in smaller cities than in larger cities. Yet, existing research has a bias towards MSWM systems of mega-cities like Kolkata, Delhi and Mumbai even though 48% of India’s urban population lives in cities with populations fewer than one million people. This leaves a gap in the existing knowledge on cities with populations under one million people.

Ostrom, Schroeder and Wynne, whose framework is used in this research, point out that institutional incentives drive the success or failure of infrastructure. Waste management, while not an obvious infrastructure, serves as a key infrastructure in the city, comprised of both infrastructure and system. The question raised is what role do institutions serve in effective MSWM systems?

The goal of this research is to explore the role of institutions and incentives in household waste collection through the lens of Muzaffarnagar, one of the 497 cities with a population under one million people. In this research, institutions refer to the variety of actors involved in MSWM — the municipal government, the private waste organizations, informal recyclers, private sweepers and the beneficiaries of the MSWM system, the households. The incentives are structured intentionally and unintentionally throughout the system and can be both positive and negative.
Unaffordable Fare: The cost of public transportation for low-income commuters working at three airports

For airport employers, making sure the many low-income people they employ as baggage handlers and retail salespeople, amongst others, can get to work ensures the continued efficient operations of the airport and the prosperity of the regional economy. However high and increasing costs coupled with low-wages make commutes unaffordable and constrain employees’ ability to get to their job. Using casestudies of Chicago Midway International Airport (MDW), Denver International Airport (DEN), and San Diego International Airport (SAN), this research measures the extent to which low-income employees commuting to work at the airport by public transportation can afford their commute in 2011.

The results of this analysis suggest that the cost of commuting on public transportation is beyond the means of a low-income budget. Furthermore, fewer low-income commuters take public transportation as the affordability of public transportation declines, suggesting that affordability contributes to outcomes of spatial mismatch.

These results promote interventions to increase affordability and expand accessibility to public transportation for low-income commuters to the airport. This thesis was awarded a $10,000 Airport Cooperative Research Program Graduate Award, sponsored by the Federal Aviation Administration of the Department of Transportation and the opportunity to publish in the Transportation Research Record. Nadeau also was awarded an MIT William Emerson Grant for student field research in support of her outstanding thesis proposal.
Community Oasis: How does the Dudley Greenhouse Build Social Capital to Revitalize the Dudley Neighborhood and What Lessons May Be Offered for Other Communities Interested in Embarking on Greenhouse Efforts?

This thesis proposes that social capital, as the vehicle for community-building at a community-based scale, can address the strains placed on a neighborhood from revitalization. This strategy can play a vital role in the urban design process of the local neighborhood. My thesis presents a case study of the Dudley Greenhouse in Dudley Square, Boston, Massachusetts, which plays a role in revitalizing the local neighborhood by building social capital in the space. Residents are suffering from unsustainable development, poverty, unemployment, crimes, and investment isolation. After many years of grass-roots efforts, the Dudley neighborhood revitalization is gathering momentum. The Dudley Greenhouse is a result of very deliberate organization and community-building strategies. It builds social capital to support the people in this low-income neighborhood. The structure and relationships in the Dudley neighborhood are rebuilt to reconnect the isolated community with resources of the city and region. Other than simply offering financial benefits and/or services to the low-income people, the Dudley Greenhouse builds up the networks of local residents through a process that supports their common values and contributions in the improvement of the local community.

The reputation of the Dudley Greenhouse is overwhelmingly positive. The users of the greenhouse are excited to describe the progress they have made toward the goals in different stories, and expressing the desire of the continuous participation. Participants are gaining increased food produces and access to them, building community through networking with others in the communal gathering space with multiple links to the outside areas.

All the evidence point to the significance of the combination of physical construction as an incubator and storage, social capital creation as a community revitalization engine, and the mechanism of such non-economic, less costly forms of solutions which can be an important source and addition of power and influence in the urban design process.
Cities are, now more than ever before, the main centers of population and production. The growing demand for limited urban space is increasing urban complexity and magnifying both positive and negative externalities of urban agglomeration: increasing productivity, innovation, and social interaction, but also exacerbating living costs, pollution, inequality, congestion, etc. In order to build sustainable cities and have a net positive balance of urban externalities, we need to better understand the motivations of the different agents competing in the race for urban space. Location choice models can help to shine a light on these motivations by providing insights on agents’ location preferences. They are also the building blocks of more comprehensive urban models and simulations that can help navigate urban complexity. This thesis explores location choice models for homeowner households and firms in Greater Boston. Specific research questions that these models can help answer include: How do residential location preferences vary with life cycles? What industries value clustering the most?

These topics are important given (1) forecasted demographic changes, specifically the aging of the baby-boomers, and (2) the continuing move from a manufacturing-based economy to a service and knowledge-based economy. These changes in population and economy will likely require a change in housing stock in order to better match supply with demand, and changes in the stock of commercial space in order to continue boosting the firms that drive the economy of the region. The thesis also explores the data-related uncertainty of these models (how model estimation changes with different data sources) as well as their temporal transferability (how do preferences change over time). The location choice analysis for households suggests that income has a bigger impact on willingness to pay for location attributes than age of the head of the household or household size. The firm analysis indicates that firms in the professional service and health and education service sector place more value on proximity to jobs in the same industry and density than firms in other sectors. These preferences have strengthened over time. An in-depth analysis, such as the one presented in this thesis, of what city agents look for in a location can, and should, inform planning policies and intervention in order to better match location preferences with opportunities.
Do Bangalore’s private water tankers exhibit “mafia-like” behavior?

While there is an increasing acceptance in academic literature about the importance of informal water delivery in cities around the developing world, public opinion is often divided. Many citizens see informal water vendors as businesses controlled by extortionary “mafias” and call for government regulation. This thesis explores whether government regulation is justified in the case of Bangalore, India where water issues have become increasingly pressing and informal water vendors, also known as the “water mafia,” have grown in number and in influence. In particular, this thesis will explore whether private tankers exhibit any form of anti-competitive behavior by addressing two questions: 1) Do private water tankers earn monopoly prices by charging prices significantly above the costs they incur, and 2) Do private water tankers price discriminate between their customers depending on where they live and their access to other sources of water?

Evidence collected in July-August 2014 and January 2015 indicate that tankers do not operate in an anti-competitive fashion and that government intervention is not justified on these grounds. However, tankers do contribute to declining groundwater levels and government intervention on these grounds ought to be explored.
Does “less government” require “more governance” and if so how can governance be built? This is a central question the thesis examines in analyzing housing policy implementation in Maharashtra, India. Public housing policy production and implementation today is no longer a state led endeavor but a state enabled effort that engages multiple stakeholders: private for-profit firms, civil society agencies, community members, local political actors, technical consultants and public administrators. This multi-agency framework is prone to conflicts due to competing interests and requires high level of coordination and collaboration to enable successful policy implementation and in fact could benefit from cooperative policy making to ensure high level of policy acceptance and legitimacy to begin with.

The case research examines the significance of governance building as a tool for public policy adaptation and implementation in a multi-agency implementation framework. It expands the notion of governance from the binary conception of the community as the “governed” and the government as the “governing” to all the co-governance actors involved in the multi-agency implementation system. The research demonstrates that a governance building process that allows for transparency, efficiency, representation, responsiveness, accountability and equity can support successful policy implementation. To support these values defining the implementation “process” is as important as establishing the “structure”, wherein structure defines the architecture of institutions that support implementation and process defines the mechanism of decision making, the strategy for shaping attitudes and methods of norm creation.
China’s rapid urbanization has led to many big metropolises absorbing their fringe rural lands to expand their urban boundaries. Beijing is such a metropolis and in its urban peripheral, an increasing number of communities have emerged that are comprised of monotonous housing projects. However, after the basic residential living requirements are satisfied, many other problems (including lack of amenities, distance between home and workplace which is particularly concerned with long commute time, traffic congestion, and etc.) exist. New remedy plans are undertaken to mitigate such problems. Huilongguan is a typical, representative case of amenity scarcity and improvement dynamic.

The initial aim of this thesis is to investigate whether planning intervention can be evaluated from a crowdsourcing perspective. Using Huilongguan as a case study, research data are obtained from the Huilongguan Community Forum and Dazhongdianping website.

The addition of amenities, such as transportation, shopping malls and work zones, is examined to discover how their restructuring affects the daily lives of residents.

Posts on the Huilongguan Community Forum are extracted and categorized according to a specific scheme. The distribution of posts is researched to determine the amenities that have drawn the most attention of residents of this community, as well as the reason. Based on an analysis of sequential content, the attitudes and opinions of residents with regard to amenities are collected and compared to show which amenities are the most satisfactory and those that are problematic. Finally, assessments are made to evaluate amenities from the perspective of users.

Using community forum and public reviews is one approach among numerous others to evaluate planning intervention. In general, traditional evaluations investigate the outcome of planning at a certain time. However, since urbanization is a dynamic process, obtaining prolonged and real-time feedback from different interested parties has become a challenge of traditional evaluations. This thesis is an attempt at using crowdsourced data to evaluate planning intervention. Moreover, this tool provides a more transparent and less time-consuming way to analyze first-hand data in order to assess the outcome of planning.
Legacy cities – older, industrial urban areas that have experienced significant population and job loss, resulting in high residential vacancy and diminished service capacity – struggle to document fast-changing conditions of vacant and abandoned properties. Digital tools used to create Volunteered Geographic Information (VGI) can facilitate an inclusive and faster solution to vacant property data collection efforts. This paper presents an evaluation of the partnership models and engagement strategies used in three case studies in Newark, New Jersey, Gary, Indiana and Pittsburgh, Pennsylvania. All three cases co-produced VGI through observational surveys on vacant property with a local government and community residents. This analysis describes challenges and benefits of cross-sector partnerships, highlighting an ideal model for future resident engagement around data production in legacy cities.
Climate change poses serious risks for coastal communities. Municipalities will be on the frontline of preparing for adapting to climate change impacts. Yet, despite scientific consensus that some amount of climate change is now unavoidable, few municipalities other than major metropolitan areas have taken meaningful steps to prepare for the climate change-related threats they face. It has been argued that science-based role-play simulations offer a promising public education and engagement approach through which to enhance the readiness of coastal communities to adapt. While pilot efforts have demonstrated the potential of this approach, this hypothesis had not been empirically tested. This dissertation examines the effectiveness of science-based role-play simulations as a public education and engagement tool for climate change adaptation through drawing on the research findings of the New England Climate Adaptation Project (NECAP).

NECAP was a two-year partnership involving the MIT Science Impact Collaborative, the Consensus Building Institute, the National Estuarine Research Reserve System, and four partner coastal New England municipalities. The project engaged over 500 diverse stakeholders – including elected officials, agency personnel, business owners, and members of the general public – across the four partner municipalities in role-play simulation workshops. During the workshops, participants played a role-play simulation designed for their town based on real-world local climate change projections, and then collectively reflected on the experience during a workshop debriefing. Data were collected through pre- and post-workshop questionnaires administered to all participants, follow-up interviews with 20-30 percent of participants from each workshop, notes taken during the workshops, and ongoing observation in each municipality. Based on this data, this dissertation argues that science-based role-play simulations are effective for enhancing literacy about climate change adaptation; increasing support for and optimism about the prospects of local collective adaptation action; and enhancing capacity to engage in collective risk management. The findings of NECAP also suggest that widespread engagement of decision-makers and community members through role-play simulation workshops can generate help catalyze local adaptation efforts. Based on the findings from NECAP, I put forward a theory of how people learn from role-play exercises, and what this mean for their potential as a public education and engagement tool for science-intensive social and environmental issues.
How do CSR Rating Schemes Influence Corporate Behavior?
Lessons from the Utility Industry

Ninety-three percent of the world’s largest 250 companies report data to voluntary corporate social responsibility (CSR) rating schemes, and over 380 CSR rating schemes exist to assess companies’ corporate actions. While reporting to CSR rating schemes may signal that a company takes responsibility for its environmental, social, and economic impacts, the correlation between responding to CSR rating schemes and taking meaningful action to minimize those impacts is still not entirely clear. This thesis asks, “Does responding to CSR rating schemes encourage corporate sustainability within organizations in the electric utility industry?” I sought to answer this question by conducting in-depth interviews with representatives of six companies in the electric utility sector about their reporting approach to the two most widely used rating schemes, the Carbon Disclosure Project (CDP) and the Dow Jones Sustainability Index (DJSI).

I focused on the electric utility industry to ensure comparability and because this sector is strongly positioned to signal corporate sustainability trends given its current technological transformation, traditional use of fossil fuels, and heavily regulated structure. Based on these interviews I conclude that CSR rating schemes have succeeded in encouraging companies to disclose corporate sustainability data through voluntary mechanisms, but due to the existence of some perverse incentive structures, reporting does not fully motivate increased participation and action on corporate sustainability. Positively, CSR rating schemes lead companies to gather and centralize internal data across business units. In addition, external recognition from high CSR scores drives pride in corporate sustainability efforts and draws the attention of executives. However, CSR reporting lacks value for those utilities without end use customers, does not provide commensurate value for the time required to participate, drives companies to focus primarily on reporting rather than on making substantive changes, and leads to mistrust in the CSR rankings because of the difficulty in understanding scores. Based on these findings, I recommend restructuring CSR rating schemes to provide multiple, issue-based scores to each company; replacing cross-sector assessment with sector-specific assessment; and revising the current assessment approach to include in-depth, on-site evaluations of corporate efforts.
Why Utah’s Water Managers Continue to Prioritize Supply-side Solutions

More than 150 years ago, the Mormon pioneers entered the Salt Lake Valley and immediately set to work digging irrigation ditches and canals to harness what water there was for their farms. Since then, Utah water managers have solved water supply problems by building large infrastructure projects. Today, Utah’s population is growing rapidly, but the water supplies that enable its desert oases are not, and climate change is expected to make matters worse. This increasing tension between growing populations and dwindling water supplies is not unique to Utah. However, while other states in the region have implemented aggressive demand-side measures to conserve water, Utah’s conservation efforts have been relatively minimal. Utah’s history of water engineering, the cultural importance of agriculture, the precedent of federal funding for large water projects, and some of the cheapest water rates in the country make demand-side measures a tough sell for addressing water needs in Utah.

However, supply-side projects are costly for taxpayers and for the environment, take decades to complete, and are based on unreliable forecasts of future water demand and uncertain water sources. It is time for Utahns to look past traditional supply-side solutions and embrace water conservation measures, requiring changes to the dominant water planning mindset. In order to do this, the state could take regulatory action, and both the state and LDS Church can act as water efficiency exemplars. It is also time for Utahns to become more involved in Utah’s water planning and decide for themselves whether to continue attempting to conquer nature or to live within its bounds.
Mobile Culture: The Long-Distance American Passenger Train as Public Realm

This project suggests a new framework for understanding, evaluating, and creating new spaces in the public realm. I propose using the term public realm in contrast to current paradigms for public space planning, design, and management in American cities. The term Public space is not clearly defined and yet conjures a privileging of form and aesthetics over spatial practices, cultural activity, and support for contestation that is fundamental to a democratic society. This framework results from my analysis of seven journeys on long-distance (over 700 mile) train routes I took in December 2014 – January 2015. I experienced and observed that the long-distance train is and in many ways always has been a platform for remarkable behavior, because it facilitates deep connections between strangers, conviviality, imagination, deep reflection, and a kind of immersion in the American landscape.

Research questions: What qualities of the train facilitate these meaningful moments? What can planners, designers and others learn from it that might apply to other public spaces and to cities in general?

In many ways, the long-distance train is an exemplary public realm experience, affording experiences that planners and designers try to create. It is democratic in that it serves people across many different communities, geographies and interest groups. It is diverse in that it appeals to a broad spectrum of people across ages, ethnicities, races, nationalities and genders, and critically, it facilitates connections between these different people. However, it is also a contradictory site. Connections are fleeting, immersion in the landscape is simulated, and its network reinforces spatial and social hierarchies inherited from American imperialism, segregation and industrial capital expansion in the late 19th and early 20th century. In fact, I argue that the train is co-constitutive of modern life in both positive and negative ways.

I propose that we take better advantage of the rich site of long-distance trains by curating a set of cultural activities, programs, and design-based interventions on them. I also propose that translating some of the spatio-temporal principles that make the train a successful space could be used to design and manage better public realm places in cities.
Addressing climate change requires societies to transition towards renewable energy resources. In the United States, most states have passed renewables portfolio standards (RPS), creating goals for electricity’s share of renewables, and instituted net energy metering (NEM) policies, compensating individuals and organizations for supplying distributed energy to the grid. Why have some states, like California, successfully expanded their policies, while others, like Texas, have failed to enact higher RPS targets or a NEM policy? Why have some states, like Ohio and Arizona, weakened their policies, while others, like Kansas and Colorado, have staved off retrenchment attempts?

Typical explanations for policy change include shifts in partisan control, shifts in public opinion, and bureaucratic learning. However, I argue that shifts in the balance of power between supportive and opponent interest groups best accounts for variation across states in repeal efforts’ success. Through policy feedback, policy design structures interest groups’ relative power.

Retrenchment attempts are more likely to succeed when renewable energy opponents are greater in number, profitability or political influence. By contrast, policy expansion is more likely to occur when renewable energy advocates become disproportionately empowered compared to their opponents.

Drawing on comparative case studies, this dissertation uses process-tracing to construct policy histories, examining how policymaking and implementation shaped later rounds of policy revision. The study compares six cases of renewable energy policy change in US states, developed through over 100 semi-structured interviews with politicians, political staff, utilities, bureaucrats, and interest groups. Primary and secondary archival documents on were also gathered and analyzed.

Advocates and opponents use several strategies to try to change policy. Politicians often come to support or oppose policies as a function of their ties to interest groups. Still, public support for policy matters; accordingly, interest groups construct and present public opinion strategically to try to shape politicians’ actions. Finally, how the policy is designed, including its timing and visibility, may condition its capacity to expand or contract over time. In this way, my argument draws from and contributes to policy feedback theory.
Happiness research is on the rise. Everyone from economists to psychologists to United Nations policy makers to the country of Bhutan is investigating how happiness, herein defined as a sense of well-being, might be used as a more meaningful metric to judge collective quality of life. The majority of this new research has been confined to the national or global sphere; despite the work of a few, urban areas and public spaces have largely been omitted from happiness study. This thesis aims to bridge that disconnect and to examine well-being at the small, familiar scale of MIT, asking the questions: ‘How does the physical environment of MIT affect happiness, and can we measure and design for happiness in the campus’ public realm?’; and, ‘How do design and mental health experts think about best practices when designing for well-being, and how do these ideas align with or differ from those of the users of public space?’

To answer these questions, I interviewed over 10 experts in the fields of planning, design, and mental health, and almost 40 students and staff at MIT. The data from those interviews were included as the narration in a film – a 35-minute walk through campus, wherein I explored - as one can only do through video - how it really feels to be in these spaces and how they might be improved. The final result revealed an eclectic campus, seemingly planned with little thought towards the whole, and a student and staff population thrilled with their intellectual environment, but lacking the light, greenery, and collaborative spaces to be healthy in their physical one.
The Price Isn’t Right: Mobility Alternatives and their Plight

When it comes to car size, the conventional wisdom of both auto manufacturers and drivers alike would dictate that smaller cars are designed for and work best in the tight confines of the city. Small cars—and specifically for this study, sub-compact ‘city cars’ such as the Smart Fortwo—do indeed offer distinct advantages in terms of fuel efficiency, parking flexibility, increased visibility, as well as better maneuverability. However, empirical observations in the Boston Metropolitan Region find little—if any—correlation with greater share of such vehicles in downtown settings as opposed to more suburban surroundings. Given the suggested advantages of these small cars, why don’t they proliferate downtown?

This study presents several possibilities, beginning with the likelihood that consumers apply a heavy discount to small vehicles as dictated by larger cultural values that may easily outweigh purely economic benefits. The study measures these economic benefits, employing an accounting-based methodology to calculate true long-term costs of driving, highlighting the compared costs of four car models: those of the Toyota Camry, Smart Fortwo, Smart Fortwo Electric, and the Nissan Leaf. Such a comparison illustrates the difficulty small cars face in expensive downtown settings such as Boston’s; counterintuitively, the greater the number of costs that must be paid for by drivers—parking rates, tolls, congestion fees to name a few—the lower the comparative advantage often becomes for city cars and their like.

On the other hand, if prices could be set to reflect real market conditions, especially in downtown areas where city cars are designed to excel, comparative economic advantages for these small cars grow quickly. This is particularly true for parking—should parking rates be charged in relation to how much space is actually used, city cars in particular could hold significant long term economic advantage over larger options, a potential game-changer for urban mobility.

This research examines two landmark negotiations between the United States and Mexico. The first involves the conflict over the shared hydrocarbon reservoirs in the Gulf of Mexico. The second analyzes the dispute over the shared waters of the Colorado River. For over seventy years, pursuing unilateral development, the U.S. and Mexico alternated between deadlock and confrontation in both cases. However, they were able to buck this trend in 2012, reaching two agreements. For the first time, the two sides have established a binational framework through which to co-develop and jointly manage these transboundary natural resources, as partners. This research explores how the negotiators shaped these agreements, and in what ways they contributed to the resolution of these long-standing disputes. With interviews with over 70 negotiators in the U.S. and Mexico, including every one of the chief negotiators who had decision-making authority at the negotiating table, the dissertation argues that a critical factor in breaking the cycle of disputes to reach agreement was that both sides were able to shift from solely allocating costs to also allocating benefits. The two countries reinterpreted the broader political and economic circumstances surrounding the shared water and energy resources, influenced in part by drastic natural disasters and resource shortages. These events, in turn, modified the countries’ alternatives, drew stakeholders to the negotiations with revised mandates, fostered new back table coalitions, and led to a reframing of beneficial trades that had not been obvious earlier. Changes in political leadership, especially in regard to the interpretation of and response to transboundary challenges, were additional enabling factors making this shift possible. By focusing on the negotiation process and the tension between creating and claiming value, the dissertation attempts to draw prescriptive negotiation and leadership advice that may be useful in other international resource management disputes, particularly between developing and developed countries. As such, it aims to highlight how stakeholders can move beyond hard-bargaining tactics and avoid the ultimatums that accompany the presumption that there are not enough resources to go around, and that one side must win and the other must inevitably lose.
The Role of Social Media in Measuring Human Response to Urban Flash Flooding

This thesis explores the role of social media in urban flooding. The author analyzes the activity of weibos (Chinese tweets) related to Beijing’s “7.21” flash flood in the Sina-weibo system (the most popular social media open platform in China) and characterizes these weibos from the 37 hours following this disaster.

In order to understand the response of the public to urban flash flooding, multiple methods are used, including trend analysis, content analysis for high frequent terms and co-occurrence words, and lexicon-based sentiment analysis. In particular, weibos with geo-location information were extracted to draw different sentiment maps for the city. Sentiment maps show the public emotion (polarity, intensity and type) geographically. Through these analyses, I set out to construct a framework to process massive amount of data generated by social media, and proposed a methodology for converting the data into actionable knowledge.

This work explored extracting emotions from weibos, distilling crowd-wisdom by using filters and algorithms to smooth out the noise in the massive amount of data, and determining that human emotions closely correlated with severe natural disaster. By tracking human emotions, it was possible to track the progress of the disaster, and more importantly whether relief was provided to mitigate the disaster. Moreover, by projecting the emotional polarity, intensity and emotional type onto maps, the visualization can provide reasonably clear and timely picture of when and where the strongest emotions occurred. The methodology developed in this thesis could facilitate innovative approaches in the field of urban disaster planning.
Building Solidarity and Growing a Movement: The Story Behind the People’s Climate March

On September 21, 2014, 400,000 people converged on the streets of Manhattan for the People’s Climate March (PCM), making it the largest climate change demonstration in U.S. history. Under a banner that read “Frontlines of Crisis, Forefront of Change,” the march was led by low-income people of color and indigenous peoples—those most affected by the health, environmental, and economic impacts of climate change and the broader fossil fuel industry. Never before had the social justice implications of climate change been given such prominence at a major U.S. climate protest, where environmental policy themes often dominate. This thesis tells the story of how these unique features of the PCM came to pass, as uncovered through literature research and interviews with core PCM organizers.

By first tracing the history of the “climate movement” since the early 1990s, this research exposes a deep division between two streams of the movement—the mainstream Climate Action (CA) camp, led by privileged white environmentalists, and the more radical and marginalized Climate Justice (CJ) camp, led by frontline communities of color—and reveals how the PCM arose from a timely and intentional planning partnership between the two. By directly addressing historically recurrent issues around trust, leadership, funding, framing, and strategy, the PCM planning team developed a collaborative framework that produced more equitable processes, sustained relationships, and just outcomes. As both arms of the climate movement acknowledge the simultaneous necessity and immense challenge of achieving deeper solidarity, the story of the PCM partnership shows that by engaging in shared work, CA and CJ groups may begin to dismantle the barriers that exist between them, grow the size and diversity of the climate movement, and rightfully lift up the voices of those that have long articulated bold calls for change from the frontlines of the climate crisis.
Historic Maritime Cities as New Places for Entrepreneurs and Innovators: Lessons from Venice, Amsterdam and Boston

Scholars and policymakers cite many important factors to explain why some cities are becoming new locations for entrepreneurship and innovation, but one generally has been overlooked: quality of place and its relationship to new forms of production. In the context of a knowledge-based economy, it appears that the value of urban environments is changing. Jane Jacobs’s proclamation that “new ideas need old buildings” for economic purposes and for use diversity (Jacobs, 1961, 188) gets at part of the story, but was made far before digital technology began to revolutionize the way we work and live. This leads to my research question: Do entrepreneurs associated with new industries prefer to locate in age diverse districts? If so, why? My general hypothesis is that historically diverse urban environments are important to entrepreneurs in 21st century industries because they possess a set of particular qualities that makes them knowledge-intensive and simultaneously provides conditions in which entrepreneurs can self-optimize. Both are newly relevant in a network society (Castells, 1996).

To test this, I focus on understanding the location choices of entrepreneurs participating in information and communication technology (ICT) and the creative industries (CI) in situ in three historic maritime cities: Venice, Amsterdam and Boston. Using Boston (and including Cambridge) as a test case, I develop a statistical model to examine firm locations in relationship to building age diversity. Accounting for centrality, I find that firms established in the last five years are disproportionally choosing districts with higher than average building age diversity and, even more notable, with higher than average counts of commercial and industrial buildings from the 1880-1935 time period.

Data collected from interviews of entrepreneurs and other knowledge holders in all three case cities provides insight on how buildings and districts are utilized, concepts of entrepreneurial performance, and the nature of decision-making in the location choice of early stage firms. I find that biophilic, flexible and sociable qualities of the built environment become highly valued as entrepreneurial ecosystems become even more competitive. Even when producing disruptive technology, entrepreneurs persists as situated and social actors.
Establishing Transit-oriented Development (TOD) on the Ground: Case-based Analysis on Implementing TOD in China

While the study of Transit-Oriented Development (TOD) in China has been under way since the 1990s, effective examples of TOD in practice remain scarce. This research conducted 40 semi-structured interviews to investigate the challenges and barriers to implementing TOD in China. Interviewees included different stakeholders in TOD implementation and were from seven different case cities in China and the U.S. (where TOD originated). The challenges to TOD implementation exist throughout the entire process, from concept understanding and planning methodology to regulation requirements and administrative institution capacity. Misunderstanding and incomplete understanding prevent people from fully adopting the idea of TOD. In planning and design, challenges are in the form of conflicts between current planning regulations and TOD planning techniques, and also due to the inexperience of professionals.

In the real estate market, great challenges come from developers who hesitate to take the risk to introduce the new type of TOD product. How to match the goal of mixed land use with market demand, and how to demonstrate the cost-benefit justification, are two critical challenges from the market that TOD research needs to address. Regarding the public sector, institutional coordination will not become a major barrier once a strong leadership in the municipality is in place; but there are still barriers in the administrative regulations and the relative lack of experience. Facing the challenges, in order to establish a successful TOD on the ground in Chinese cities, this research recommends the following solutions. First, effective TOD training programs need to be carried out both by the government and the education system. Second, starting from formulating national TOD planning and design guidelines, the planning codes should be reviewed and revised to establish the legitimacy of TOD, especially for pedestrian-oriented design and mixed land use. Third, an in-depth analysis of costs and benefits and of financing mechanisms needs to be conducted to reassure real estate developers and also provide sustainable economic solutions for the government.