Connected DistributionPlanning Boston for the Future Worker

by Ryan McLaughlin



Bachelor of Science in Architecture Washington University in St. Louis, 2010

Submitted to the Department of Architecture in partial fulfillment of the requirements for the degree of Master of Architecture at the Massachusetts Institute of Technology, February 2016

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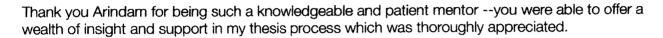
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Abstract

As mobile technology continues to decentralize the workplace and employees are become liberated from their desks, the role of the office building within its urban context entered a state of flux. Accelerated by the burgeoning sharing economy and increased telecommuting, cities must start to incorporate, and even prioritize, productive workplace geographies over large swaths of land.

This thesis sets out to take-on that challenge, and re-imagines the role of the office building within the city by adapting the emerging model of co-working as an urban device. On a regional scale this proposal looks at under-utilized areas within Boston that could be developed with distributed work in mind. On a neighborhood scale, the project speculates on how productive overlaps between a neighborhood co-working space and public amenities such as transportation systems and parks could create a new urban typology that enhances the life of its citizens.

Acknowledgments



Many thanks to Alex, Hashim, and Gabe for helping me refine arguments and narrow my approach in a time where I had many interests.

And most of all, thank you to my parents, family, and girlfriend Charlotte for your love, support, and making it all possible.

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Introduction

A Life of Labor

Labor has become dominant to the human condition. John Locke argued that labor was the source of property; Adam Smith argued it was the source of wealth, and Karl Marx argued labor defines the source of all man's productivity and is the expression of humanity itself. As the economy has shifted after the industrial revolution into the communication and information revolutions, labor has been transformed by technological and management advancements.

A relatively rare typology in the 19th century, the office of more than 10 people quickly became prominent in America and western Europe by the 1920's. Filling the void of theory on the subject, Frederick Taylor developed "management science", a field responsible for transforming large industries by articulating management strategies to provide maximum prosperity for both the employer and the employee --who at the time were mostly factory workers, clerical workers, secretaries, and administrators.

In the last 50 years white-collar work has boomed. The average American has gone from working in industrial or farming environments to the modern office complex. This shift has dramatically affected not only the lifestyle of the average American but also the architecture and urban form that the white-collar offices have created. Swaying from a majority of workplaces occupying the central business district in the 1970's, to the 1980's trends of suburban office complexes in close proximity to highways and with an abundance of greenery. In terms of architectural trends, the office has

seen a transformation from an open-plan in the mid-20th century to a period of valuing private cubicles in the 1980's and 1990's. In the 21st century the common office reverted from the cubicle environment where now over 70% of offices are converted to deep open plans. This shift has partially influenced by the corporate symbolism of the deep open plan -fostering a sense of equality and horizontal nature of the company's physical structure. Critics of the open plan cite studies (2001, 2009) where converting to an open plan office decreases worker satisfaction and productivity, and the open plan is simply a way to pack in as many workers as possible. Despite these criticisms. the large open-plan office remains the most common typology in contemporary work environments.

A state of transition

Through all the fluctuations and trends, what is clear when analyzing the short history of the modern office is that the common workplace is a more complicated, fluctuating model than the home, school, or retail store. This is partially due to the layered and increasingly variable social and family models in America. Women have entered the workforce and as a result there are a rising number of families where both spouses work full-time, bringing in new questions about childcare and hours expected of employees. With an increased talent pool to draw from and international competition, the average American has seen an increase of average office time to 47hours per week. A significant portion of Americans, around 18% of people employed full time, are even working over 60 hours per week. These hours, along with a commute time averaging

25 minutes, could see work take up a majority of life experience.

Work Anywhere

One increasingly popular option is to telecommute into the office for part of the week or full-time. Wi-fi connections are available at home, at cafes, and anywhere with a cellular signal. Despite these capabilities, the central office has not gone away. In 2008 Forrester Research Group predicted that 43% of Americans would telecommute by 2016. The actual number of full-time telecommuting employees, according to workplace analytics, remains at 5% as of 2014. Why the slow adaptation? These numbers suggest that the genius loci of the workplace and face-to-face interactions are indispensable for both companies and workers to foster idea sharing and sense of community or belonging. Workplace theorist Frank Duffy notes that "The value of place is enormous. Places are impregnated with memory, association, and resonance. Places open up unanticipated opportunities and serendipity. They keep life interesting for employees and foster growth for companies." Similar trends can be seen in the rise of online education -despite the cheaper costs and wide-spread availability of online degrees, brick and mortar universities still cannot meet demand for students wanting a traditional classroom.

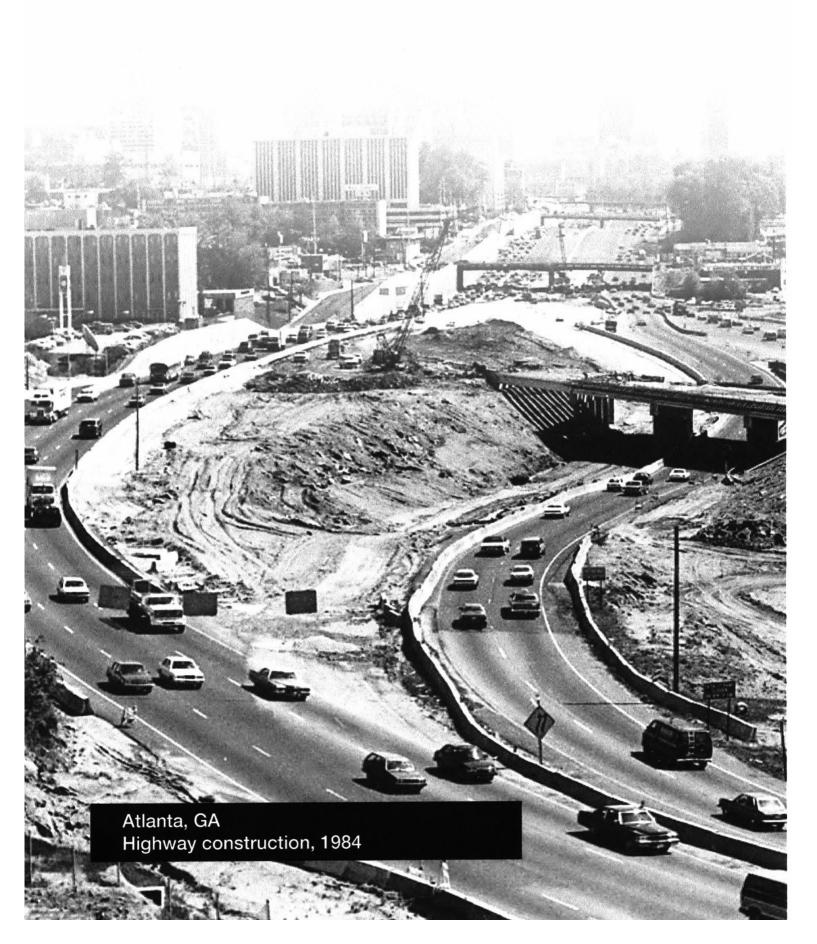
The largest American tech companies – Google, Facebook, Apple—have corroborated this trend. They have discouraged telecommuting and invested heavily into lavish silicon valley corporate campuses. These campuses have expanded into pseudo cities—offering a full host of amenities from free food, nap rooms, sports fields, even onsite hair cuts. The structural message is to offer generous services but also to keep work happening as long as possible. Buses for Google pick employees up in San Fransisco and offer them Wi-Fi and work surfaces during

their commute. Productivity is expected. With the California tech-giants focusing on their suburban campuses, freelancers and the self-employed have seen an increased presence of shared co-working spaces. These private spaces offer a monthly fee of around \$300-600 per user to use the shared desks, espresso machines, meeting spaces. and chance face-to-face interactions that a typical offices. These spaces are for people eager to get work done in pseudo-social settings outside the traditional office. and have been relatively successful. These hypercontemporary spaces, first emerging in 2006 and gaining popularity in 2010, are currently located almost exclusively in urban centers. A presumable reason for these spaces exclusively occupying urban centers is due to the target demographics -knowledge workers- are currently concentrated in small areas. But what happens as economic futures shift and a majority of citizens are knowledge workers that can work anywhere?

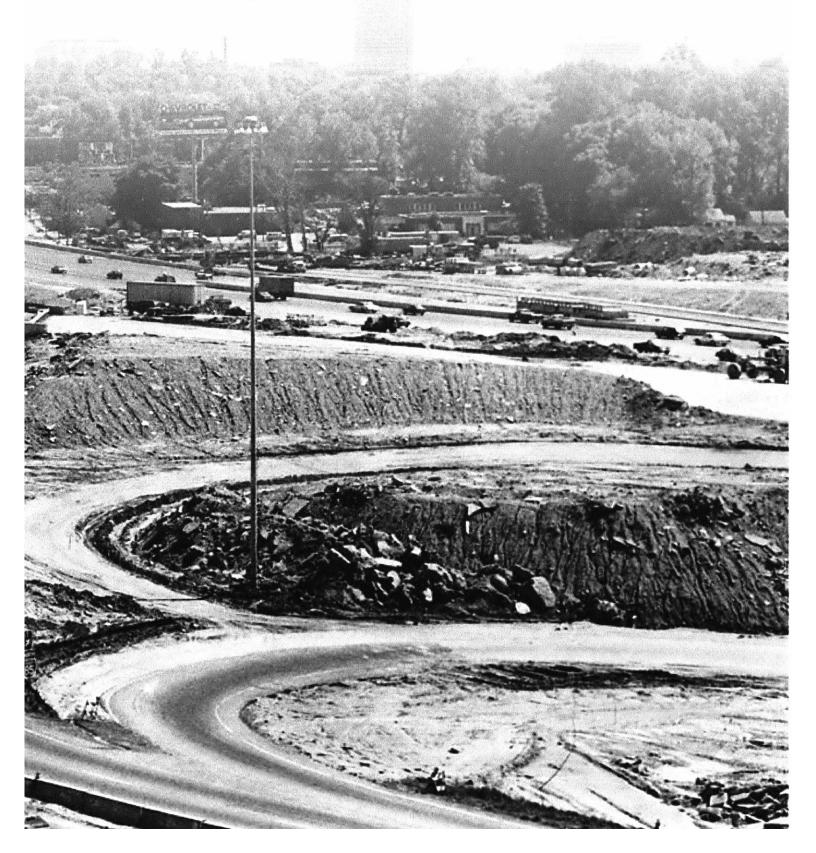
This thesis is looking at the decline of the suburban office complex, the rise of the high-tech corporate campus, as well as the growing number of freelance knowledge workers as a springboard for a new work typology. Can the existing urban housing stock be integrated with a new neighborhood workplace model?

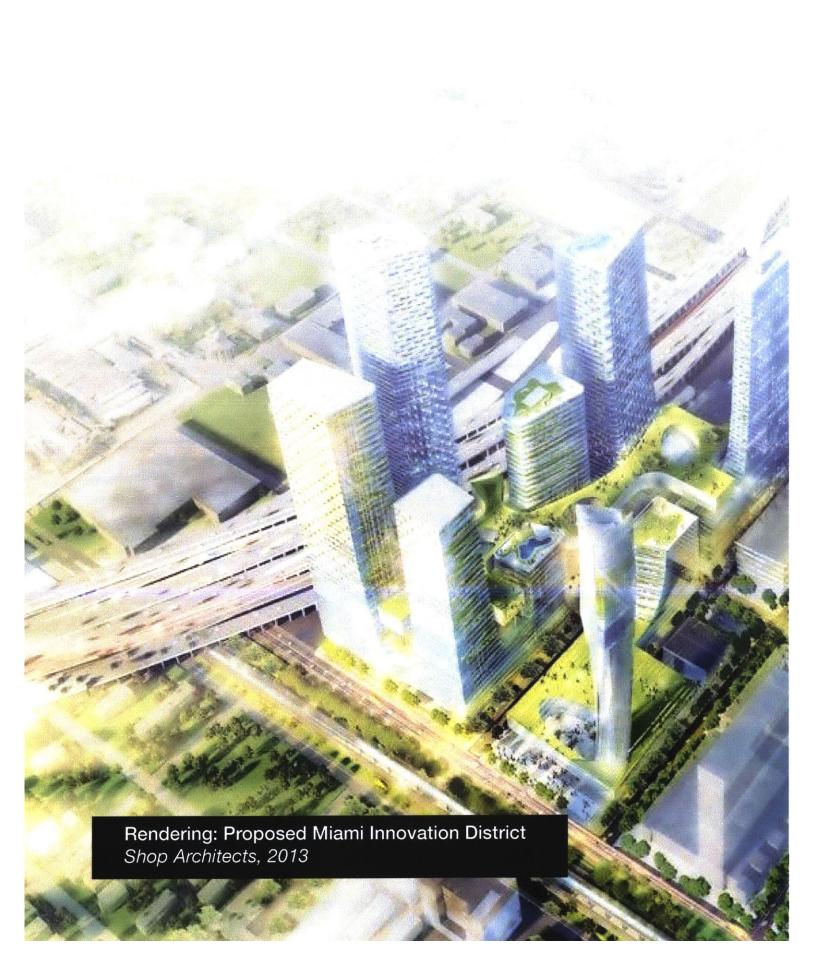
The final proposal is a new typology for shared offices; that of the neighborhood office as a public resource. By situating these office collectives in strategic areas that already contain amenities such as subway T stops and dense housing stocks, the final result could amplify the existing environment to create a new type of community that better fits the contemporary and future worker's needs while, in turn, vitalizing previously struggling neighborhoods.





In the future city, what is the purpose of the skyscraper-dominated CBD?



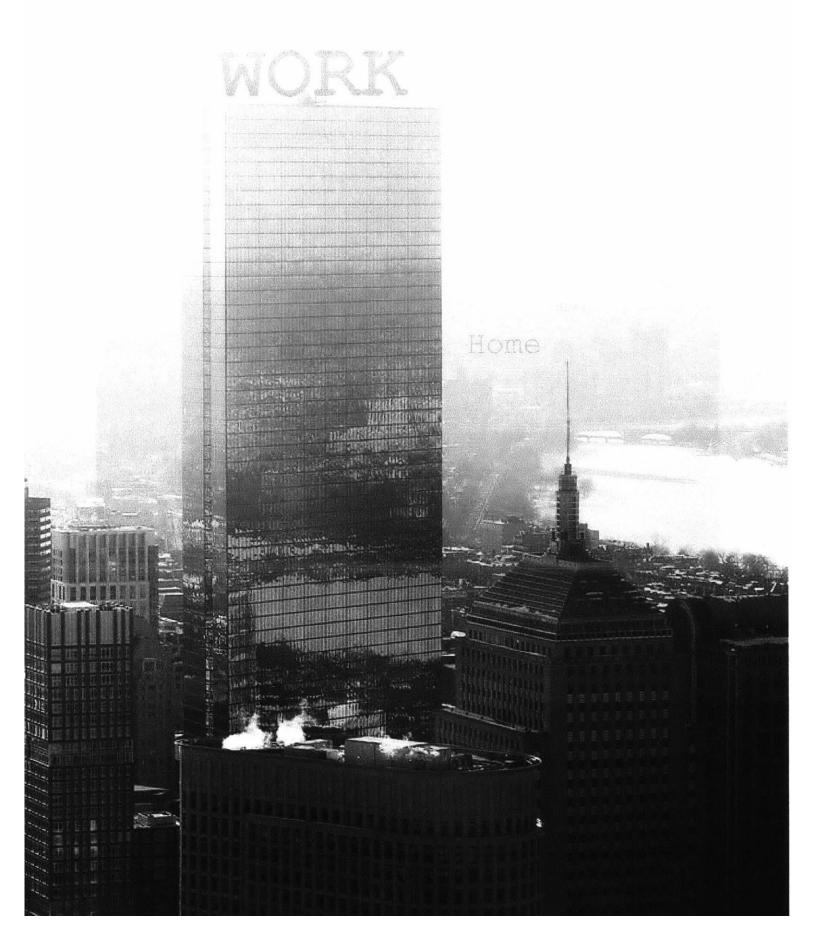


Does it make sense to continue planning and development efforts in creating high-density CBD's or single Innovation Zones?

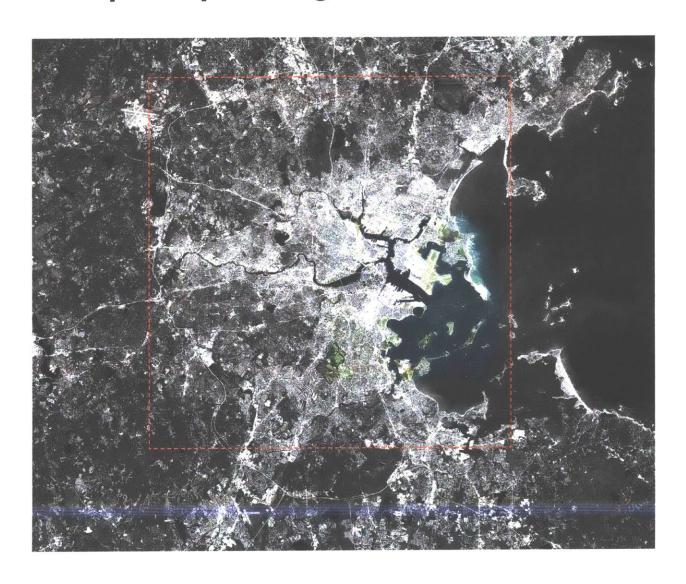


Which has inadvertently encouraged the 30-minute commute for a majority of citizens?





This thesis is proposing a new model for workplace planning in Boston

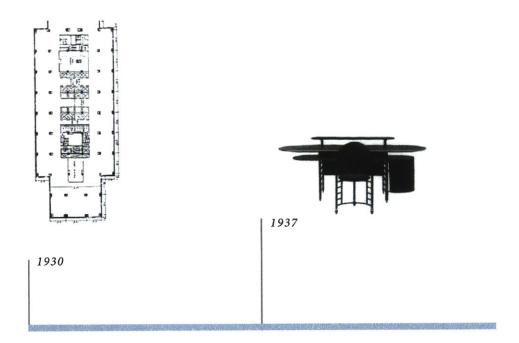


A plan to create distributed zones where any citizen can rent a desk or office And connect these zones with subway transportation and a new ferry system. To simultaniously reclaim the waterfront as a public resource and provide new public workspace, ammenities, and transportation to reinvigorate existing neighborhoods To create a new type of workplace and a new type of city.

Context of the modern office

The Arrival of the Office Typology

The short 80 years that have led to the modern office complex.



Taylorist Urban Complex

Chicago, IL - Home insurance building is considered the first high-rise building, with the goal of creating bright open-plan spaces for workers.

Task Oriented Furniture

Frank Lloyd Wright -Metal Office Furniture Co. - This furniture line is the foundation to the modern workstation

SOM's Influential Years

Shaping the corporate realm.



1957



1958



1961

Ammenity-Rich Corporate Campuses

Connecticut, USA

Optimized to maximize parking, green views, and individual office space, the 1950's saw a boom in suburban office complexes.

Clear Span Construction

SOM - Chicago, USA

The Inland Steel Building uses exterior columns at the edge of the facade, leaving the interior completely free and open-plan.

Autonomous Office

SOM - New York, NY

The Chase Manhattan Bank Building is one of the preemptive examples of American corporate headquarters using airconditioning, flourescent lighting, and open plan.

The Rise of the **Suburban Typology**

Where cheap and efficient is king.



1956



1964



1989

The Rise of Silicon Valley

In 1956, William Shockley moved to Mountain View, California, where he founded Shockley Semiconductor Laboratory. The company soon made the first silicon transistor which quickly dominated the computer industry. As the company grew, soon after Intel and other technology companies moved to the area, creating a center for cutting edge computer science and other STEM fields.

Invention of Cubicle

Robert Propet

The "action office" was a brand new invention advertising extreme flexibility and low-cost for companies

Global Suburban Business Parks

Foster+Partners - UK

One of the first communal business parks outside of central London, Stockley Park was planned with cheaper real estate prices and convenient train and car transportation access.

The Social Context of Work

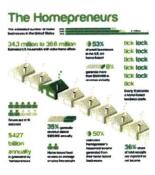
The short 160 years that have led to the modern office complex.



1960-2008



1990'S - 2015



2010-15

Women in the workforce

In 1960, women make up 33% of the total work force in America; 30.5 % of married women work for wages.

In 2008, women comprise 46.5% of the total U.S. labor force. 83% of married women work for wages.

Workplace Childcare

Of the top 100 US Companies, 33 of them provide childcare services on site to its workers as of 2002.

Working from home

In the US, the number of home-based businesses rose from 9m to 18m in the last 10 years. Nearly 1 in 10 privately employed workers in the US now works in a home-based environment,

The Concentration Of Workplace Desirability

Rising inequality in working environments



2004



2006



2012 - CURRENT

The Appeal of the Campus Community

Mountain View, California

2004 marks the opening of Google's community complex, a resurgence of the concept of the corporate headquarters providing a full-service employment center --including free high-end food options and sports fields.

First Shared Workspace

San Francisco, California

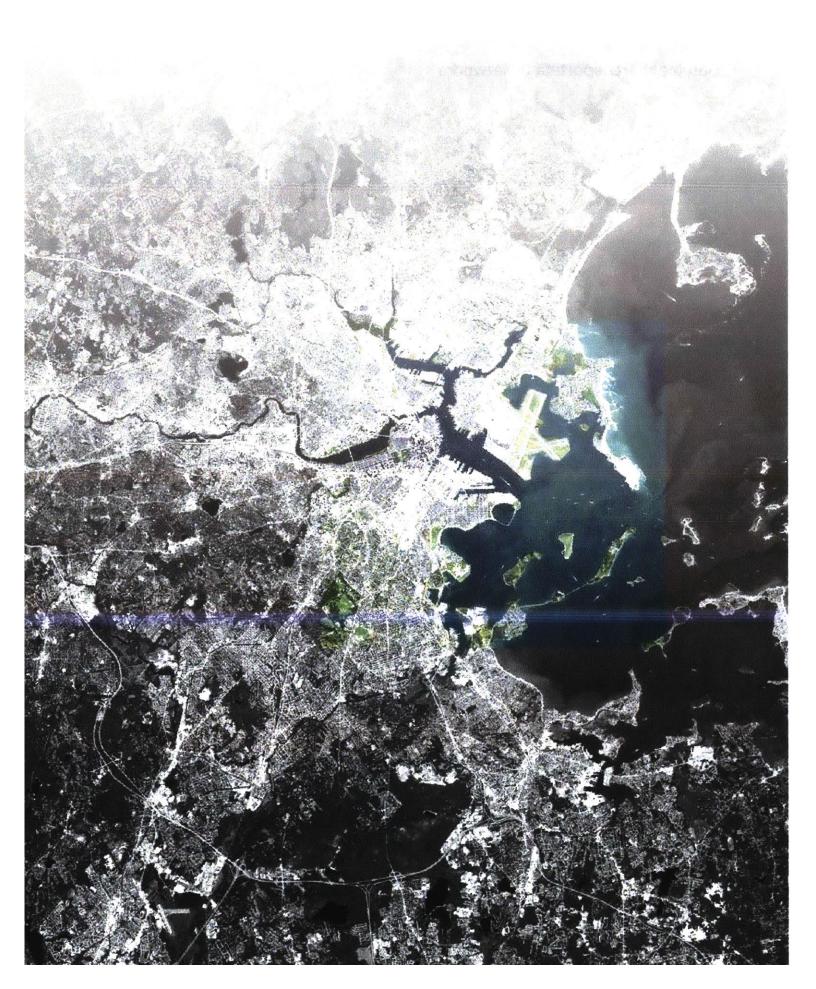
SpiralMuse launches a first recognized coworking space where anybody can pay a monthly subscription to come into the office space.

California Embracing the Suburban

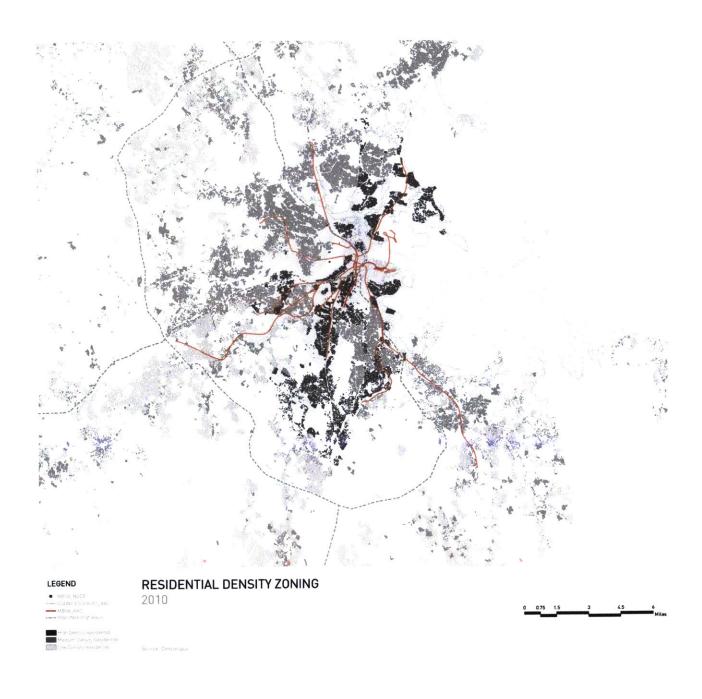
Mountain View, California as well as other suburbs are still cranking out the highest-end office complexes, with Apple and Google both announcing suburban corporate headquarters for 10,000+ employees.

Mapping Boston's Workplace Landscape A study of the metropolitan region

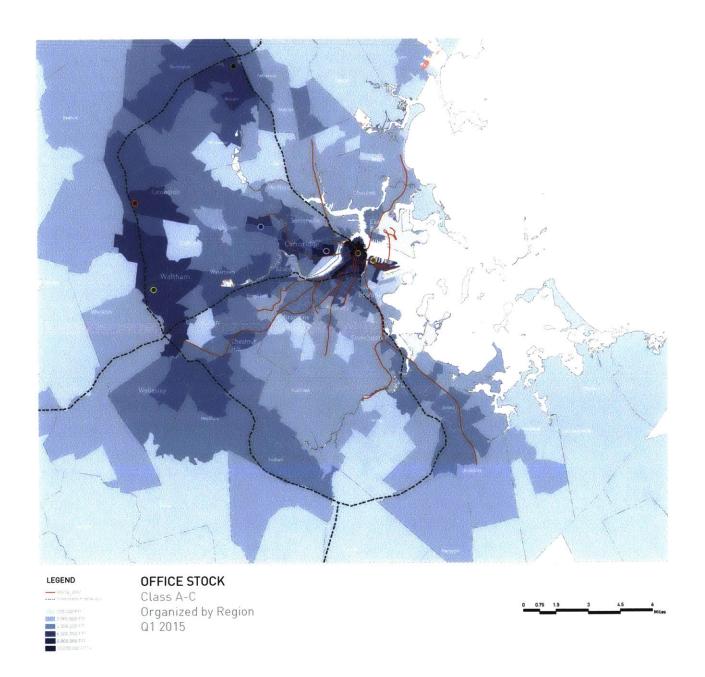
Boston Metro Aerial, 2014



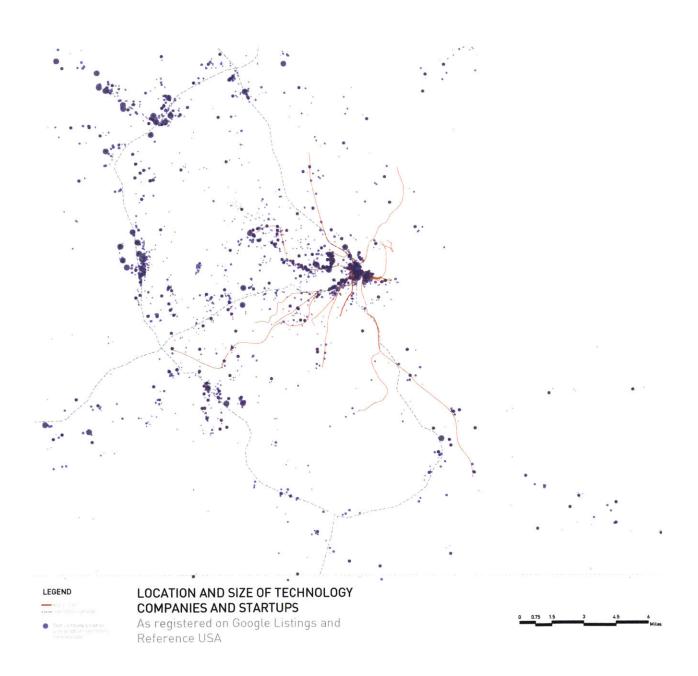


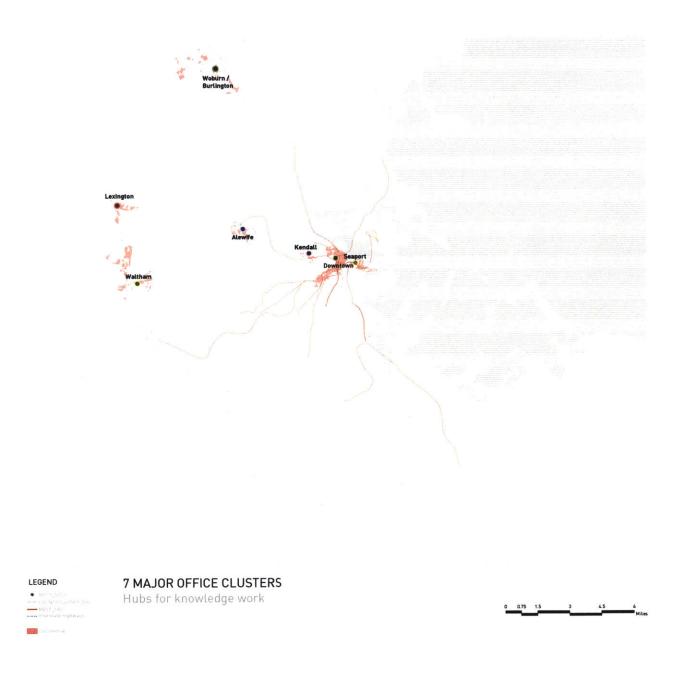


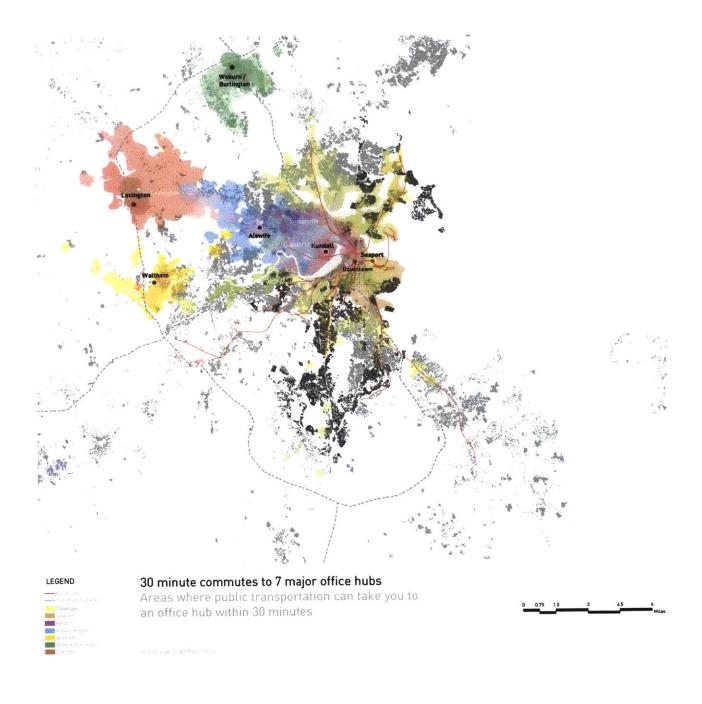
Office Density

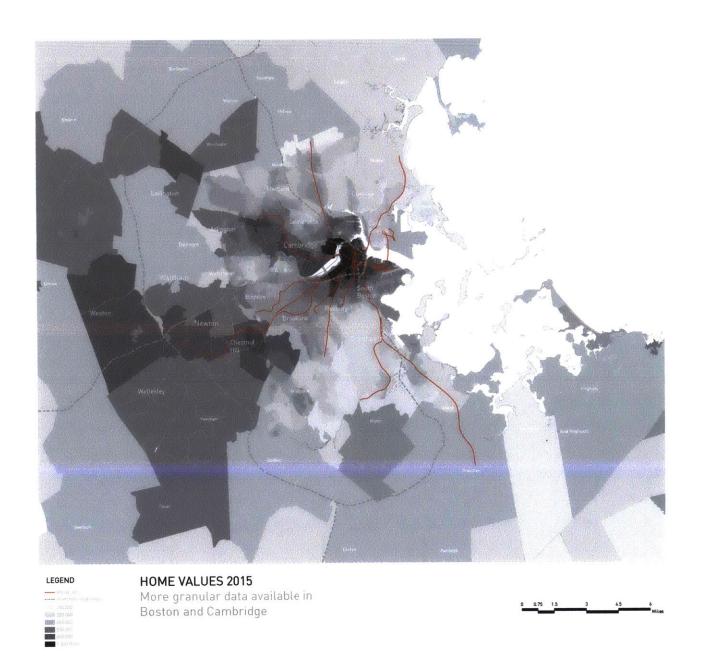


Locations of Knowledge Work





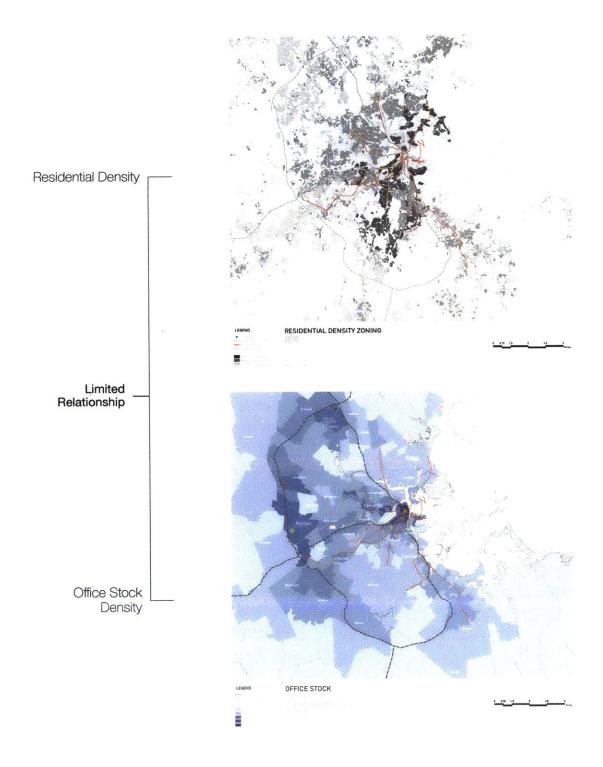






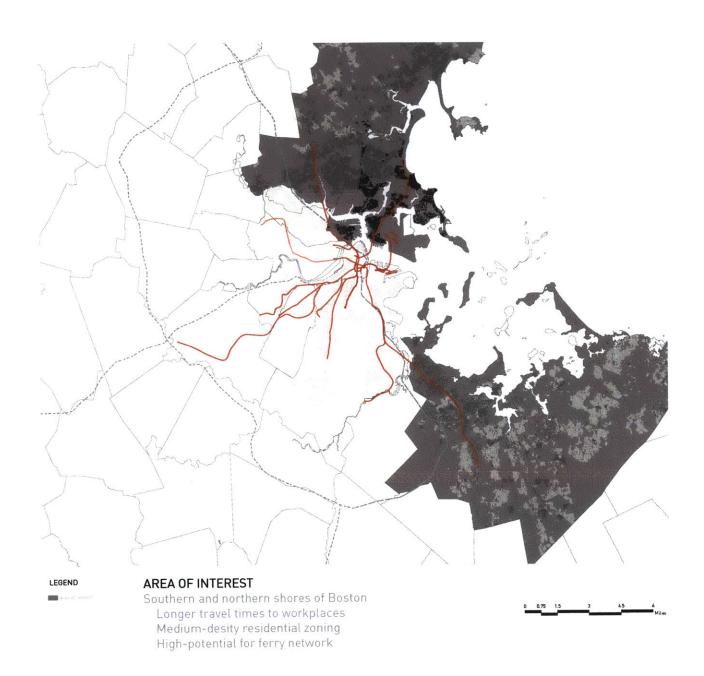
Office Locations vs. Home Values

A possible symbiotic relationship



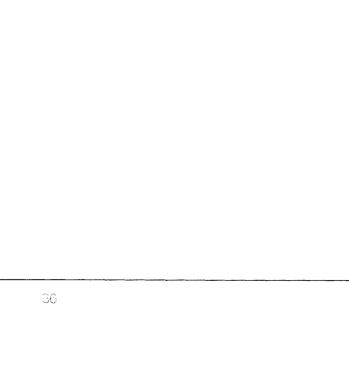
Larger Problem:

Many offices are located close to wealth, but far from the urban housing stock



Project Aim #1:

Develop a framework that takes advantage of under-utilized areas of Boston



Cues From Existing Typologies 3 Urban Paradigms

The Silicon Valley Corporate Campus

Precedent Paradigm #1

Attributes:

- » Owner is sole tenant and developer -typically a high profit tech company
- » Pastoral suburban setting, isolated
- » Ample parking (frequently underground) for car users
- » Free commuter buses from San Francisco (reversecommute), equipped with Wi-Fi and snacks.
- » Free on-site food, daycare, laundry, recreation, massages, group sports activities, nap rooms, etc. --the ultimate luxuries.



Apple Headquarters - Mountain View, CA - Under Construction



Mountain View, California



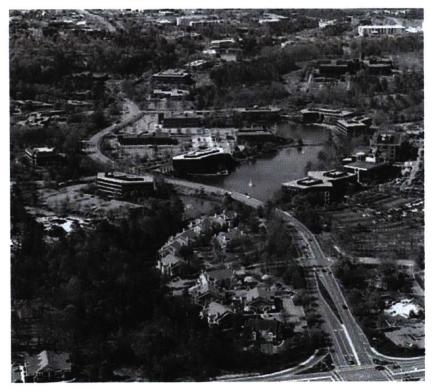
Existing Google Headquarters, Mountain View, CA



Google Headquarters - Mountain View, CA - In Planning

The Suburban Office Complex

Paradigm #2



Waltham, MA

Attributes:

- » Frequently rented to multiple tenants, leased in 1-5 year contracts.
- » Typically 1-to-1 desk to parking spot ratio
- » Affordable Rent
- » Easy access to highway
- » 70% of existing office complexes were built in 1980's and 1990's
- » Limited food or other amenities on-site
- » Drive-to-lunch culture



Waltham, MA



Framingham Office Park



Texus Instruments, Waltham, MA

Urban Co-working

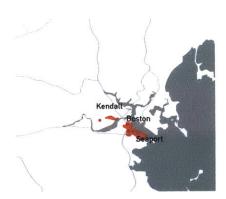
Precedent Paradigm #3

Attributes:

- » Began with public libraries
- » Continued in the 21st century with wireless internet in cafes
- » Now emerging with coworking spaces and desk rental
- » Rely heavily on proximity to density and using the shared urban resources



WeWork Co-Working Space - San Francisco, 2013



Concentrated: Locations of co-working spaces in Boston

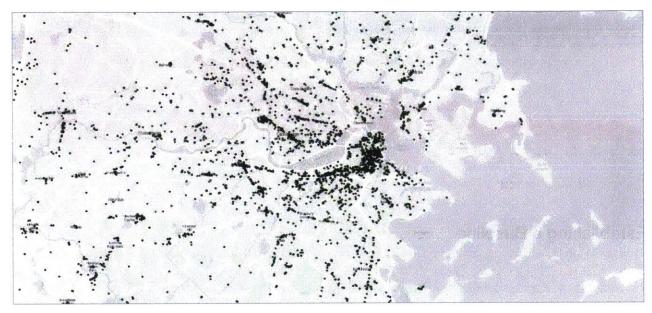


Boston Public Library - 1848-Present

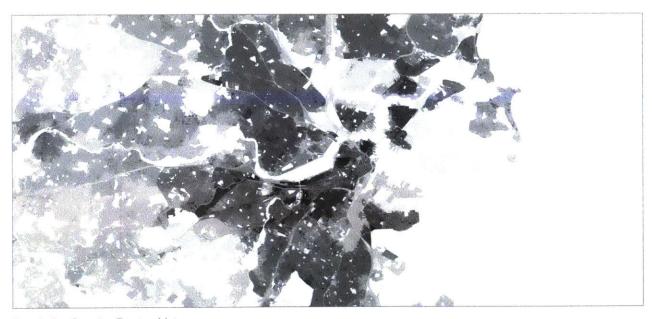


Wireless Internet emerging in cafes, 2006

Investigating the Urban ExternalitiesHow many people does it take to support a restaurant? Any other urban resources that office typologies rely on?



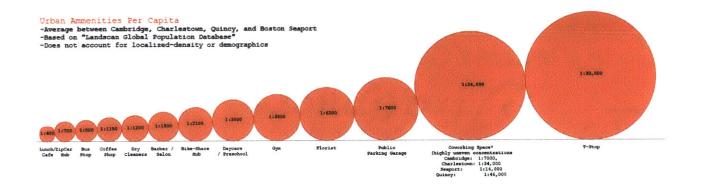
Food and Beverage Locations, Boston Metro Massachusetts Census Data, 2012



Population Density, Boston Metro Massachusetts Census Data, 2010

3,800 People to Support a Gym

Population Density vs. Amenity Density



Establishing a Baseline

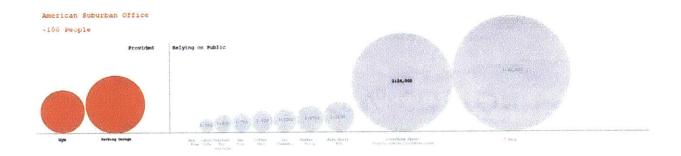
In an effort to establish a numeric baseline for the necessary population density to support a lively urban condition, GIS datasets for 13 urban amenities were analyzed. Population density was based on *Landscan Global Population Database*, accessed September 2015.

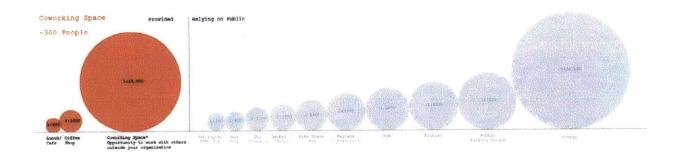
Amenity Type	Average # of people within a 10 minute walk (.4 miles) Landscan Data, Accessed 2015
Lunch/Cafe ZipCar Hub Bus Stop Coffee Shop Dry Cleaners Barber/Salon Bike-Share Hub (Hubway) Daycare/Preschool Gym Florist Public Parking Garage Co-Working Space* T-Stop	400 700 800 1150 1200 1500 2100 3000 3800 6200 7600 24000 30,000

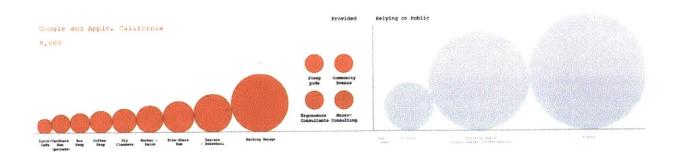
Commercial Density Requirement Chart Custom Data from Yelp (accessed 2015) and Landscan Global Population Database (accessed 2015) for Cambridge, Boston, and Quincy averages.

What amenities does each office typology provide?

A graphic of which amenities are privatized (provided by company), and which are outsourced to the urban fabric.









Rendering: Google Campus, Mountain View, CA BIG and Heatherwick 2015

Privatized Luxury: What if Google's proposed campus was a open to public?

With 8,000 - 12,000 people on each campus, companies such as Google, Facebook, and LinkedIn are building corporate headquarters that function like small towns from 6am-10pm. Amenities include private buses to and from San Francisco, free bike rentals to get around campus itself, free food for any employee, private sports leagues, free laundry service, back massages, barbers, and many more amenities. This has created an environment where companies are using their high-end campuses as recruiting tools, retention tools, as well as a strategy to increase the likelihood an employee will work longer hours. This thesis is taking these concepts and questioning whether a similar planning model could work in the public realm.



Urban Proposal Identifying sites with the most potential impact.



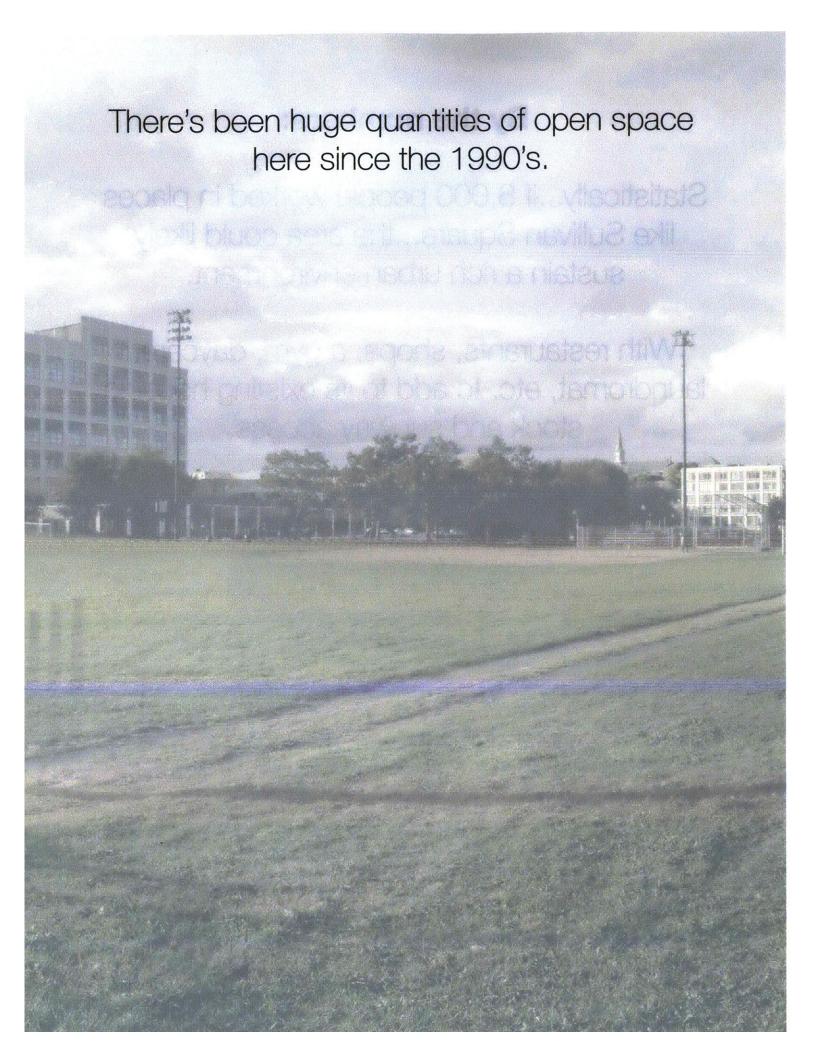
Learning from the corporate mega-campus: Applying the micro-density concepts of private companies into a tool for developing underutilized waterfront areas.

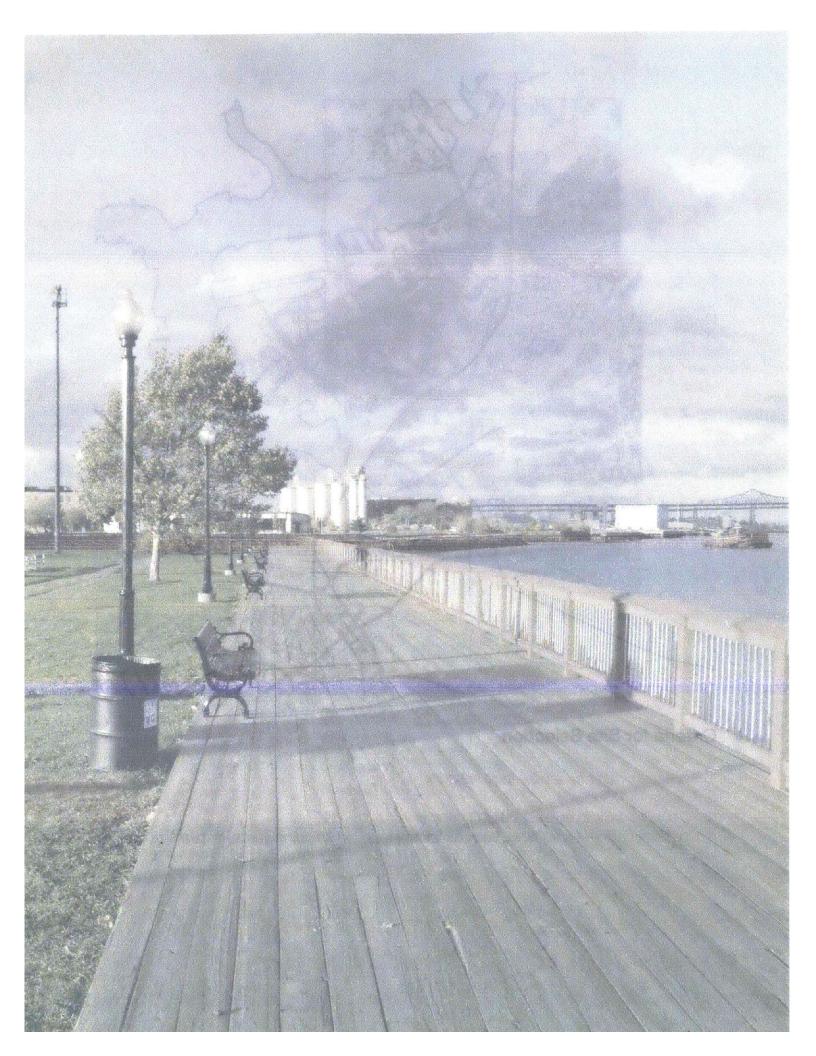
By the numbers:

Statistically...if 8,000 people worked in places like Sullivan Square...the area could likely sustain a rich urban environment.

With restaurants, shops, a gym, daycare, laundromat, etc. to add to its existing housing stock and subway access.









Criteria for Site Selection

- 1) Access to water for a new ferry network
- 2) Access to T/Subway
- 3) 10 minute walk to at least 20,000 people
- 4) Contains under-utilized land, such as vacant lots, old shipping yards, or oversize parking lots.

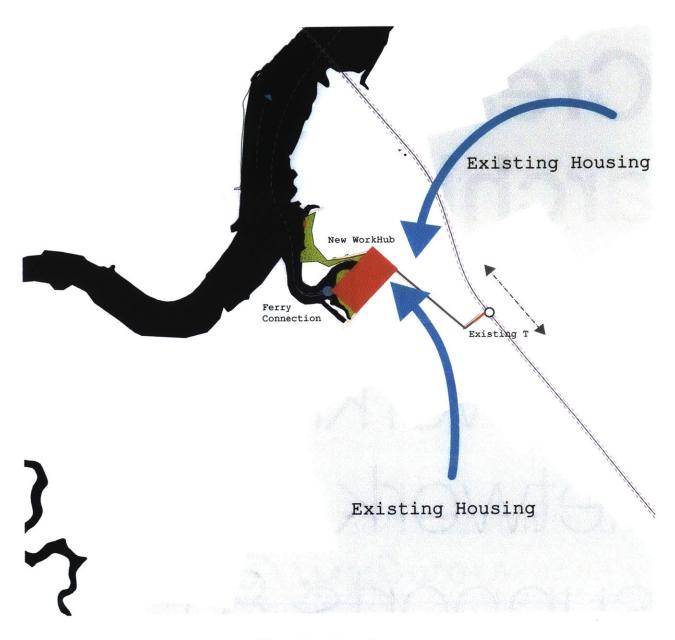


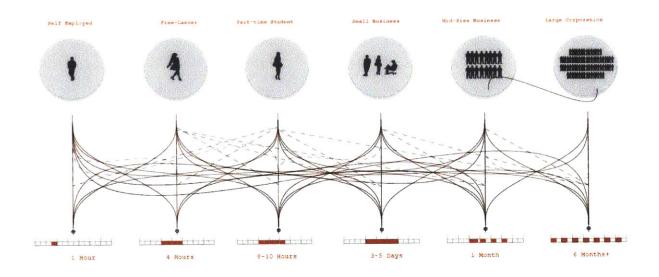
Diagram: A New Workplace Planning Typology

Developing key areas that link existing housing and subway system with a new WorkHub and new Ferry transportation network to increase metropolitan connectivity.

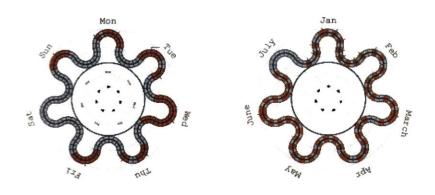
Creating the architecture for a public co-working network that supports 8,000 people.

The Future Worker is Likely to be a Freelancer

...and won't work every day in the same place.

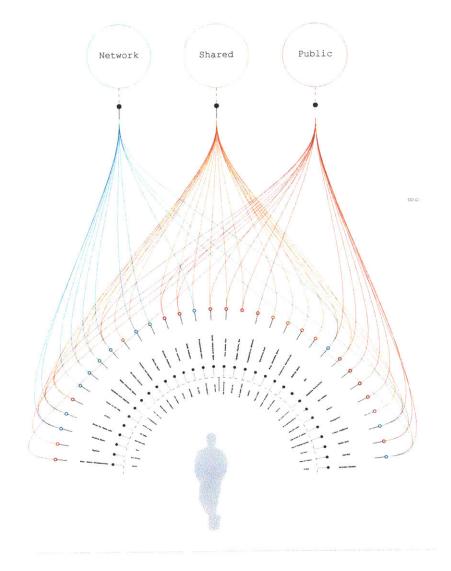


The New Work Week



A Case for Co-Working

Most ammenities lend themselves to being a shared resource.

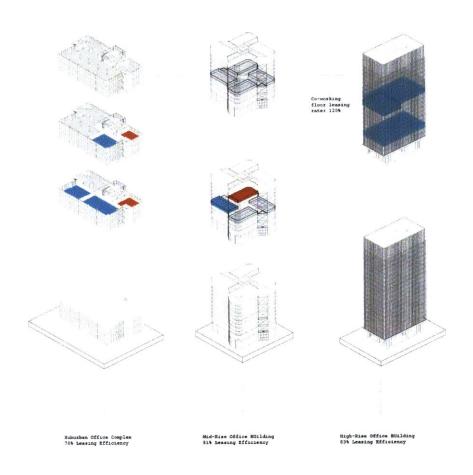


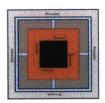
The Future Worker Multiple Projects Multiple Locations

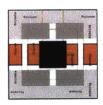
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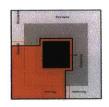
Developer-Based Architectural Models

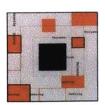
Inadequate depth and flexibility for optimal co-working use







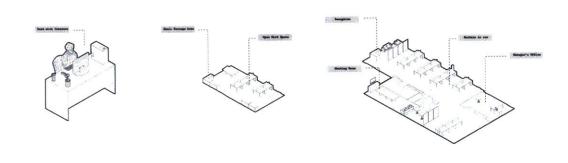


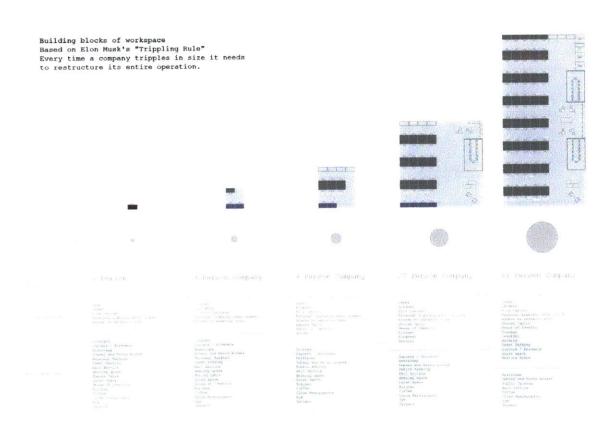


Retro-fitting Existing Structures Into Individual Offices / Coworking

Shared vs. Private Resources

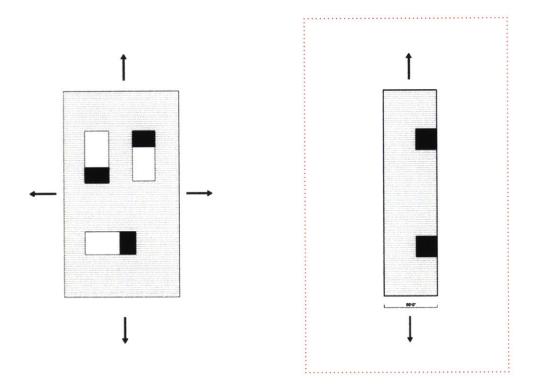
What are the needs of companies at various scales in a co-working environment



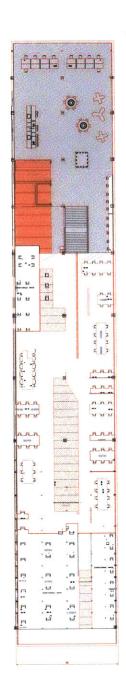


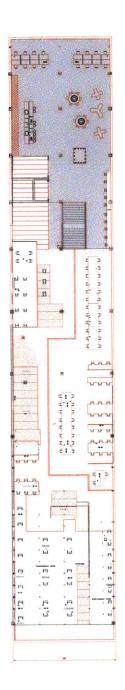
A Case for the Thin Extrusion

Maximizing daylight, maximizing urban flexibility



When the possible scale of a future company is reduced to a single desk for a single worker, how do architects facilitate proper light and view access to all workers democratically? The thin extrusion offers a possible solution by allowing for flexibility in length but keeping width to 50' --making the maximum distance to daylight be 25' for any worker.





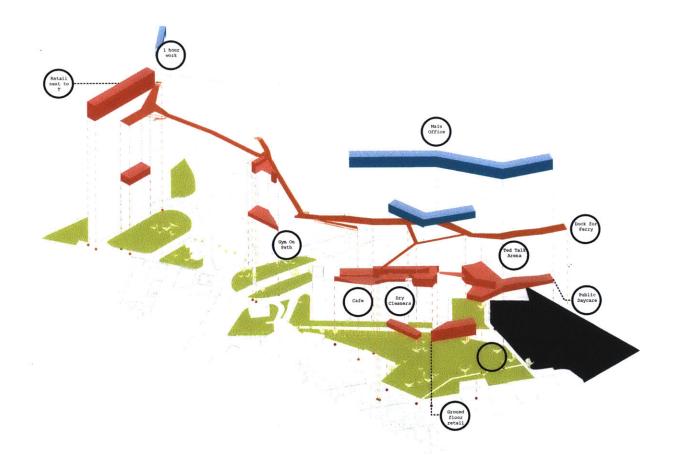
Organizational Flexibility

The thin extrusion can allow multiple futures for growing and shrinking companies while maintaining the autonomy and rights of the individual worker.

Application on an Urban Scale

Situating the Typology Within the City





Program: More than Offices

Besides desks for community-based workers, the site plan connects the T and Ferry stops with a diverse set of urban ammenities to create a dynamic neighborhood condition.

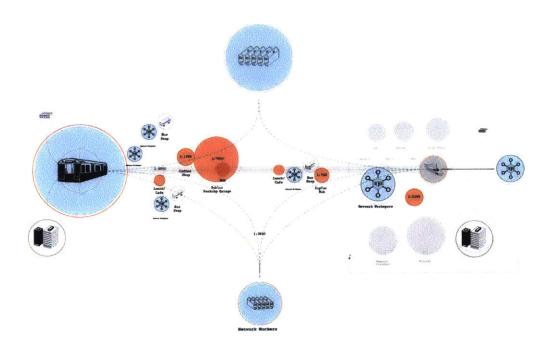


Adaptable: Offices, Retail, Path, and Park

These four components can be woven into existing fabrics and adjusted in length and shape depending on need. The axonometric diagram below shows a weaving path connecting the T stop, open space, waterfront.

Testing Grounds

4 Site Applications



Common Components



Interior - working over the water



Ferry Connection - commute by boat

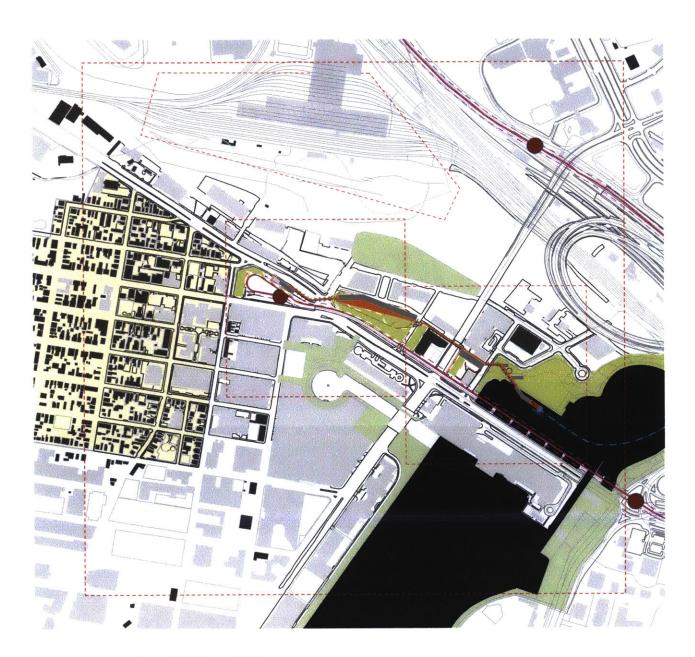
Common Components



Office Connection to Public Park Space, While the office space will require a membership service, the areas around the Collective Office are open to anybody - parks, restaurants and other urban amenities.

Site 1: Lechmere

Type A: Single Neighborhood



Lechmere - Cambridge, MA

- » 2015 Population within 15 minute walk: 22,000
- » Subway Access: Green Line
- » Ferry time: 6 minutes (Downtown) 7 minutes (Sullivan Sq)

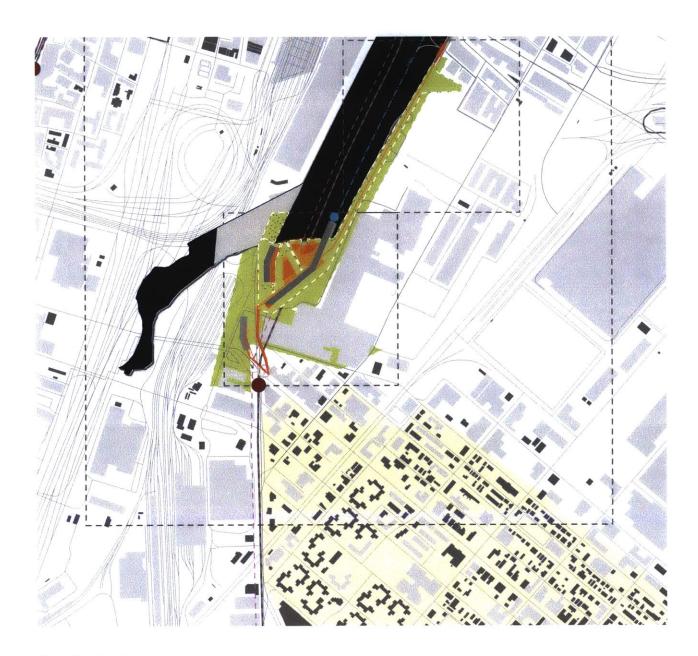
Site 1: **Lechmere**Type A: Single Neighborhood





Site 2: South Boston

Type A: Single Neighborhood

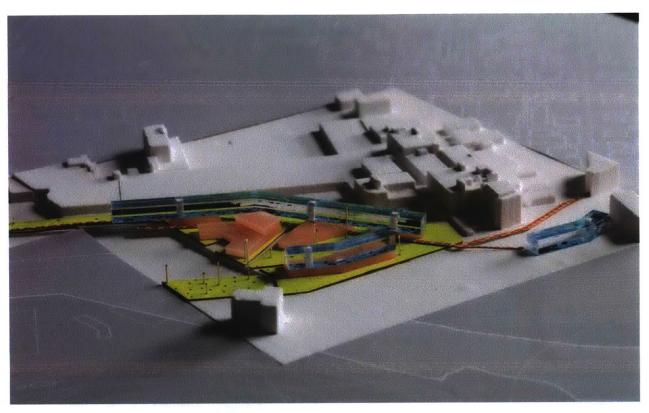


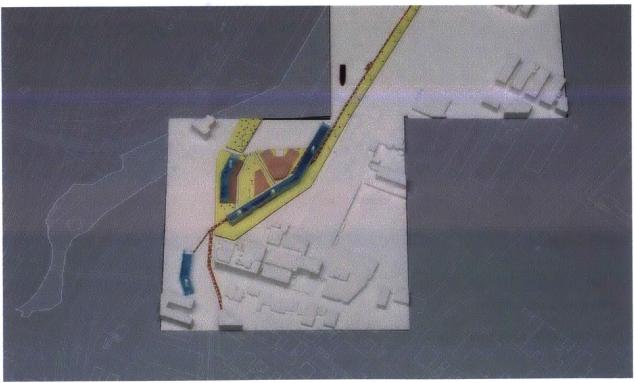
South Boston

- » 2015 Population within 15 minute walk: 34,000
- » Subway Access: Red Line
- » Ferry time: 3 Minutes (Downtown), 10 minutes (North Quincy)

Site 2: South Boston

Type A: Single Neighborhood





Site 3: North Quincy

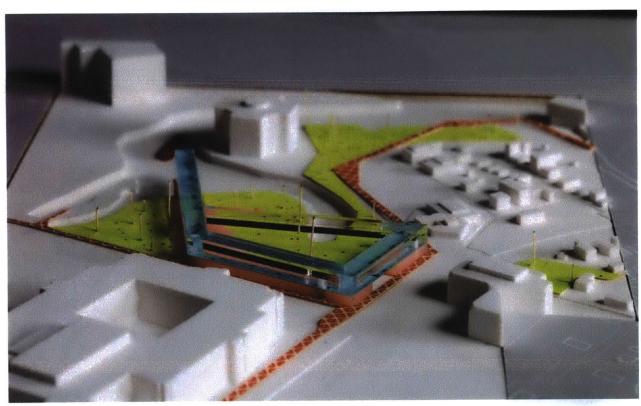
Type B: Dual neighborhood resource

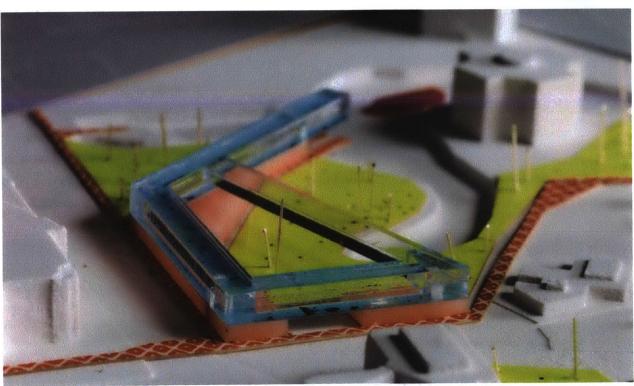


North Quincy - Quincy, MA

- » 2015 Population within 15 minute walk: 37,000
- » Subway Access: Red Line
- » Ferry distance to downtown: 18 Minutes

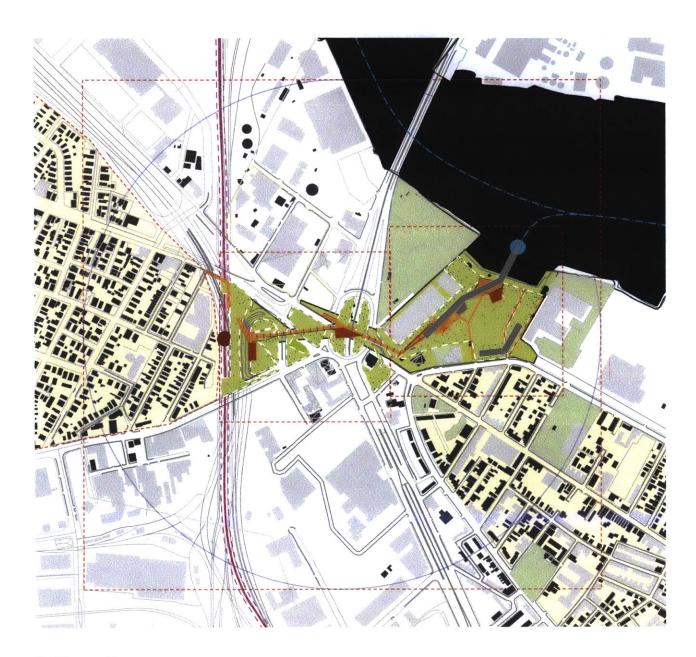
Site 3: **North Quincy**Type B: Dual neighborhood resource





Site 4: Sullivan Square

Type B: Dual Neighborhood Resource



Sullivan Square

- » 2015 Population within 15 minute walk: 42,000
- » Subway Access: Orange Line
- » Ferry distance to downtown: 15 Minutes

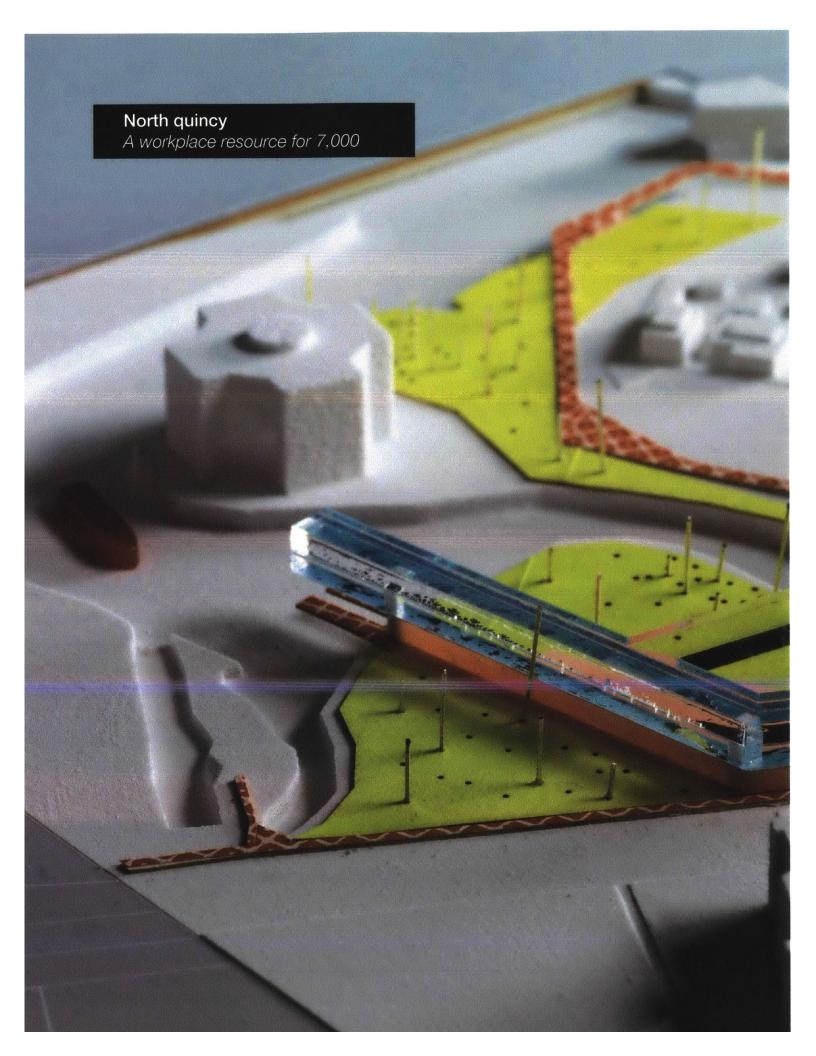
Site 4: Sullivan Square

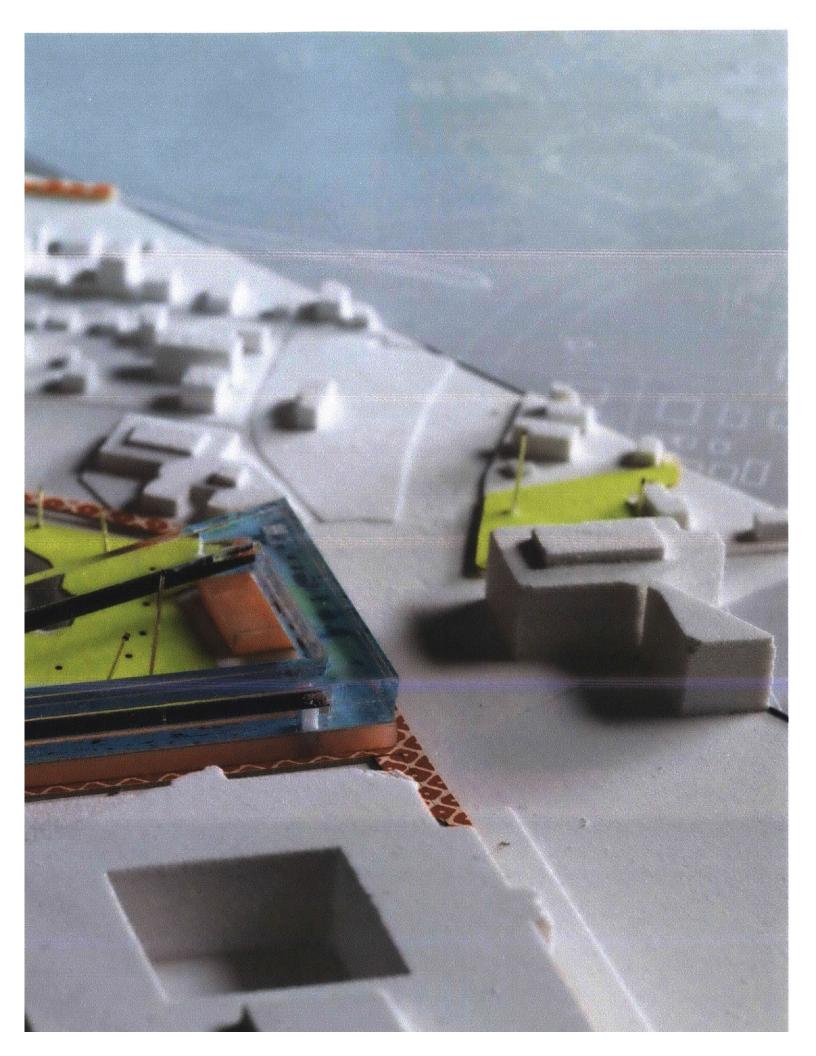
Type B: Dual Neighborhood Resource



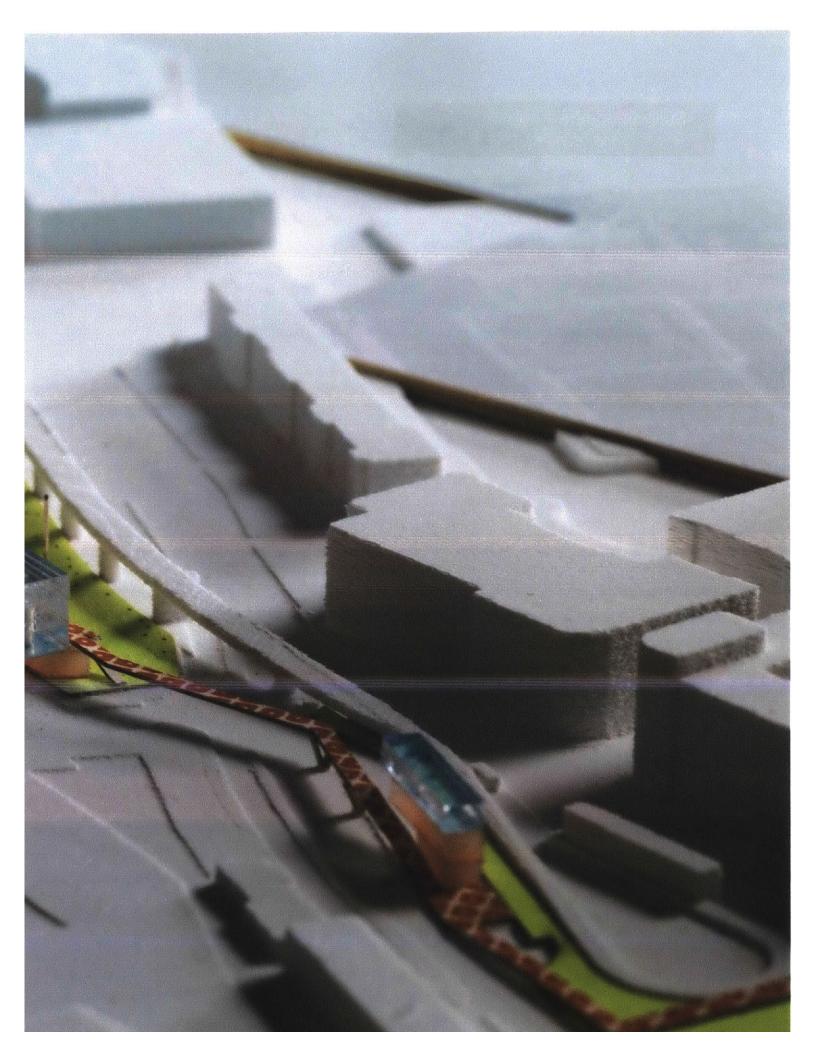


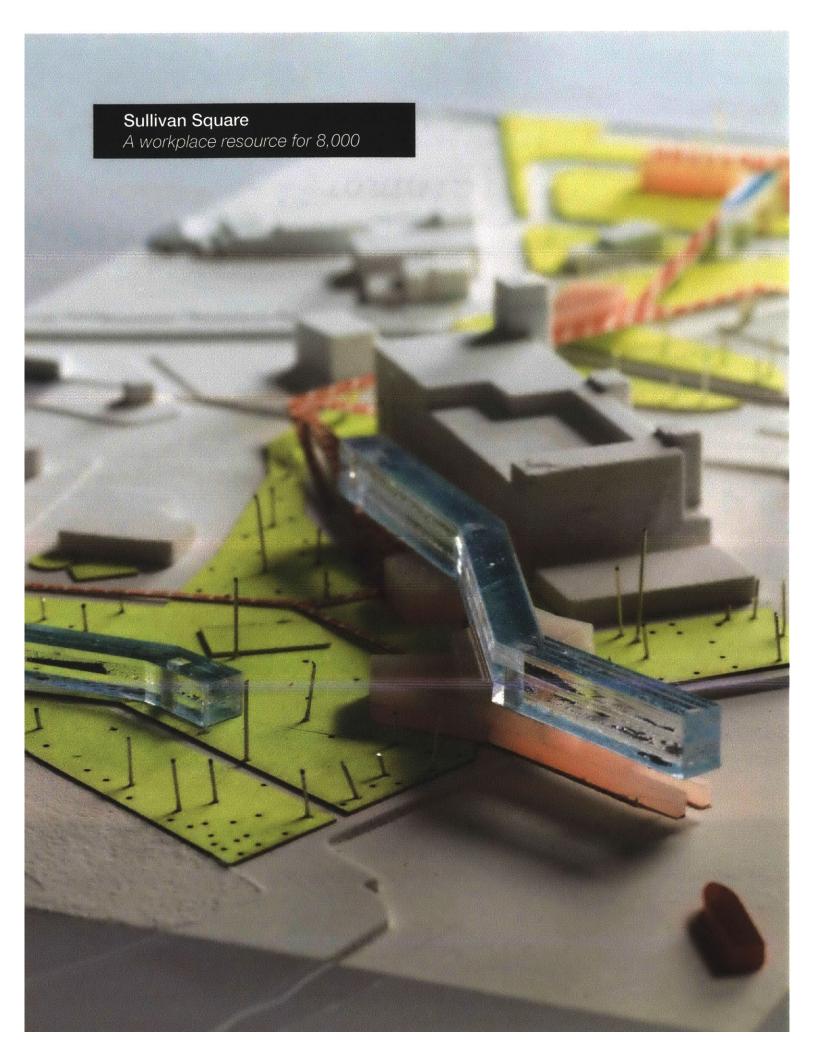


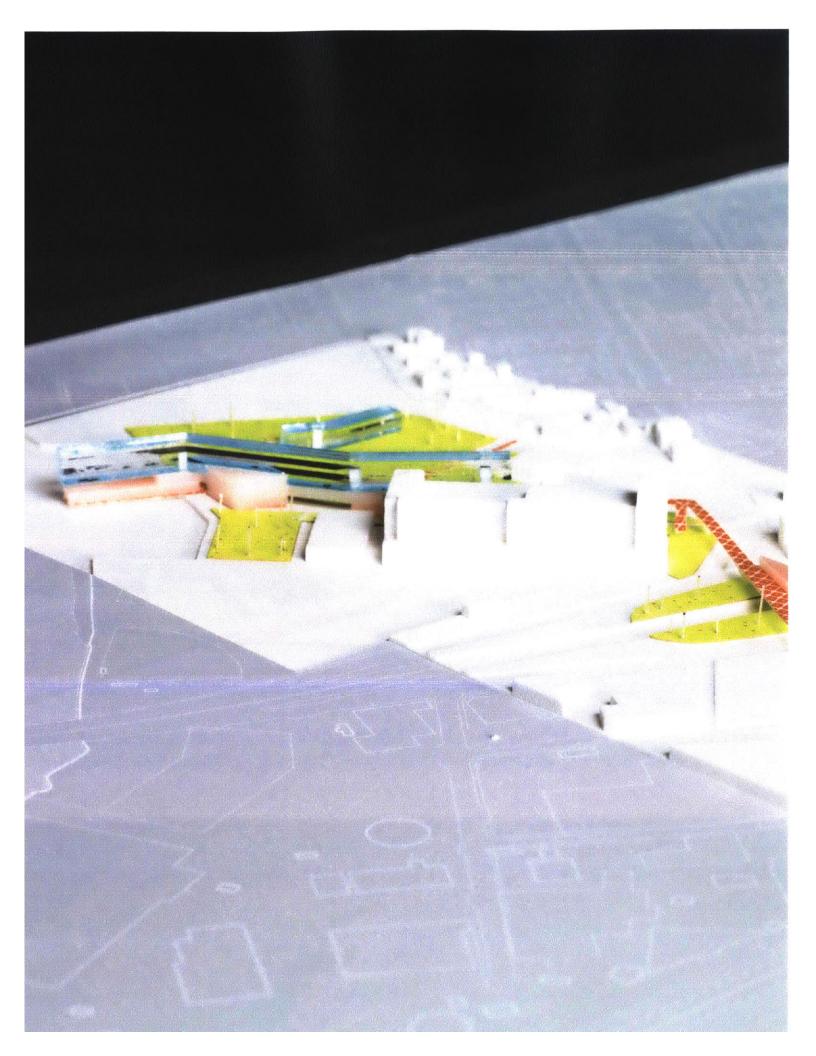




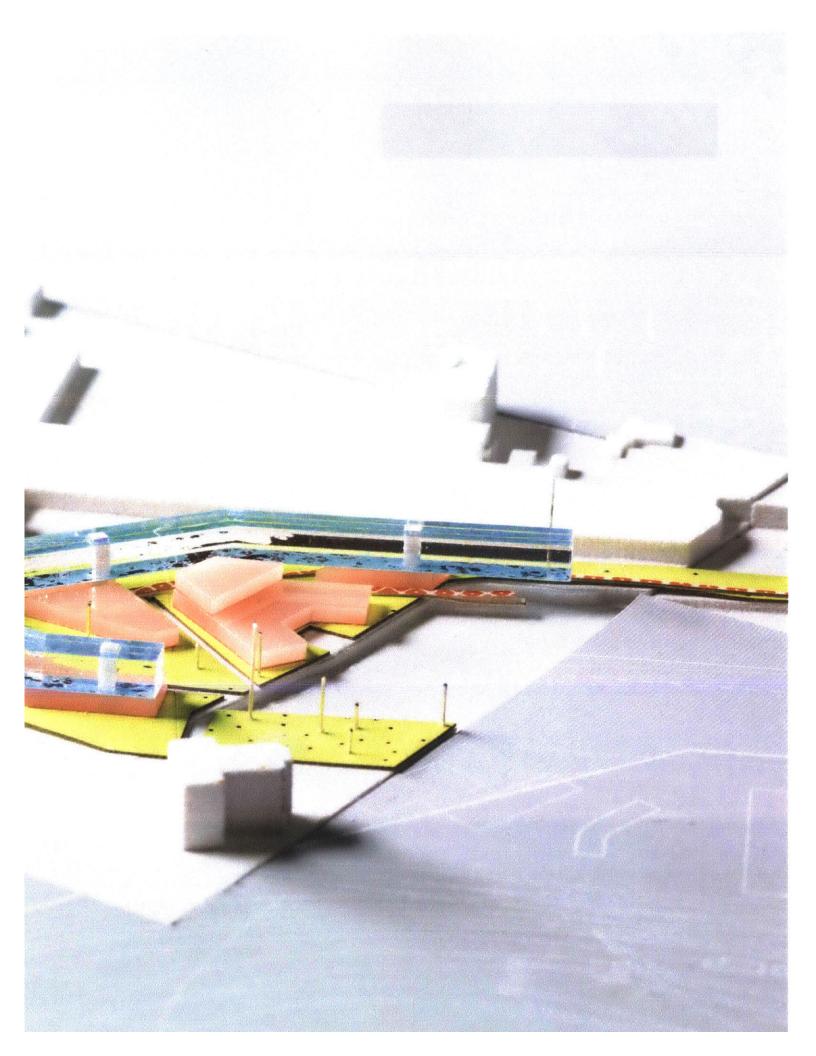












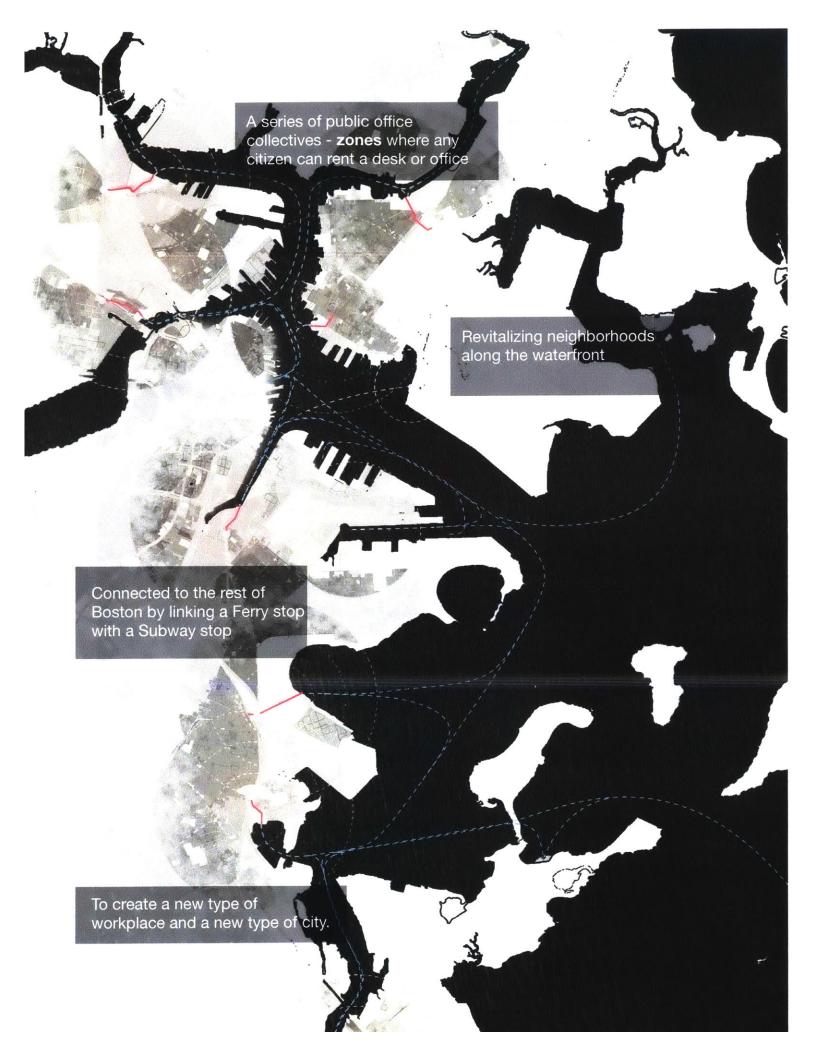
It's time to rethink working in the city



WORK



Planning for a de-centralized future





Full Regional Plan



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