Strategic Plan
Spring 2013

# BROOKLYN TECH TRIANGLE

www.brooklyntechtriangle.com

Brooklyn NavyYard Industrial Park

DWN TWN BRK LYN

The DUMBO IMPROVEMENT DISTRICT

**Strategic Plan**
**Spring 2013**

**Commissioned by**
Brooklyn Navy Yard Development Corporation
Downtown Brooklyn Partnership
DUMBO Business Improvement District

**Prepared by**
**W** X **Y** architecture + urban design

**With Contributing Consultants**
Center for an Urban Future
Control Group
Domingo Gonzalez Associates
Film First Co.
GLEEDS
HR&A Advisors, Inc.
Ken Smith Landscape Architect
Pentagram
Sam Schwartz Engineering
The Marino Organization
Workforce Strategy Center
99 Solutions

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Table of Contents

**The Brooklyn Tech Triangle (DUMBO, Downtown Brooklyn, and the Brooklyn Navy Yard) has become a magnet for the world's pioneering, energetic, and creative entrepreneurs and has emerged as the City's largest cluster of tech activity outside of Manhattan, with nearly 10% of the sector calling this area home.**

Homegrown companies are committed to growing here, and outside firms are looking to become part of the scene. DUMBO is bursting with digital companies. The Brooklyn Navy Yard is teeming with makers, artisans, and firms driven by technology. And Downtown Brooklyn has 57,000 college students—and a supportive business community ready to join the mix.

Over the next two years, the Brooklyn Tech Triangle is expected to grow to support nearly 18,000 direct jobs and 43,000 indirect jobs. The challenge of nurturing this explosion of innovation requires ensuring that the right kind of space is available for tech firms, a dynamic environment is present, and both opportunities and talent are encouraged. However, a lack of appropriate office space and adequate job preparation, among other factors, threatens to stifle this growth and send our companies to invest and hire elsewhere. Led by the Downtown Brooklyn Partnership, the DUMBO Improvement District, and the Brooklyn Navy Yard Development Corporation, the Brooklyn Tech Triangle Strategic Plan seeks to address these challenges by providing a blueprint for nurturing the growth of this sector and ensuring New York can capitalize on the job creation of the industry.

The Brooklyn Tech Triangle has the potential to become a model for the New York City economy and the next generation of tech hubs. Startups are moving out of business parks and into cities where they can draw on a range of resources and inspirations. They are flocking to the Tech Triangle because of its great neighborhoods, amenities, and institutions, and its unique set of work spaces—from the lofts of DUMBO to the light industrial workshops of the Navy Yard to the large offices of Downtown Brooklyn. While the Brooklyn Tech Triangle enjoys unique strengths, there are elements of this plan that can be applied to similar neighborhoods across the City. To do so this effort will require special attention from government, the real estate community, tech firms, and educators.

New York has made generational investments in the Brooklyn Tech Triangle, particularly in: rezoning of the area to support vibrant growth; development of major amenities such as Brooklyn Bridge Park, Barclays Center, and the Cultural District; revitalization of the Brooklyn Navy Yard; and the overall emergence of Brooklyn

*An aerial view of the Brooklyn Tech Triangle, facing northwest, with the Manhattan skyline in the backdrop.*

as a major worldwide brand. Commercial office market expansion driven by the growing innovation economy is the next step to reaping the benefits of these investments—and the demand is out there. We just need to provide the space and tools for such growth to happen.

This Strategic Plan was developed over a six-month period and in consultation with the Brooklyn Tech Triangle Task Force—a civically engaged group of tech leaders, local entrepreneurs, government, the real estate community, tech firms, community representatives and educators who recognize this incredible opportunity for Brooklyn and New York City. It is an action plan for the 21st century and a blueprint that will ensure local residents can find opportunities and tech firms can find the right talent.

The tech sector is incredibly hard to define because it is so intertwined with other industries. Today, tech provides the platform that essentially all industries will depend on to grow. In New York City, the tech sector builds off the strengths of the City such as the financial, marketing and advertising, media, fashion and manufacturing sectors. As Andrew Rasiej, Chairman of NY Tech Meetup, stated, "Tech is not a slice of the pie, it's the whole pan!" Numerous studies and entities have set out to define tech. For example, the New York City Economic Development Corporation described "high tech" as computers and peripherals; consumer products and services; electronics and instrumentation; IT services; media and entertainment; networking and equipment; semiconductors; and software. In contrast, the New York State Department of Labor has used the information sector as a proxy for understanding the tech sector.[1] The Brooklyn Tech Triangle, which plays host to a wide range of tech workers from sophisticated app developers and advanced manufacturing product designers to biotech software developers and film animators, represents an emerging ecosystem of tech workers. As a result, this Strategic Plan doesn't employ a narrow definition for tech but rather embraces the many applications of 21st-century technology and the diversity of job opportunities that are now being created.

While the Brooklyn Tech Triangle brings together a unique diversity of spaces, creative people and institutions, there are many elements of this strategic plan that have implications for City's economy, and in particular, the opportunities in the outer boroughs. The Strategic Plan builds on the input gathered from surveys of local and national tech companies, meetings with over 200 stakeholders, and guidance from an advisory committee of 27 government offices and agencies, as well as a task force of 36 local companies and organizations. The Downtown Brooklyn Partnership, the DUMBO Improvement District, and the Brooklyn Navy Yard Development Corporation have attempted to develop a grassroots plan for responding to these challenges with a unifying vision and specific initiatives. With the support of its partners in government and in the private sector, we have prepared the Brooklyn Tech Triangle Strategic Plan to ensure that the Brooklyn Tech Triangle can accommodate the needs of this new economy.

*1 New York State Department of Labor, seasonally adjusted by NYC OMB, April 2013. The annual growth rate for the information sector was flat for 2012-2013, meaning that the 2012 figure was also approximately 171,000. The information sector includes the publishing, motion picture and sound recording, broadcasting, and telecommunications sectors.*

# EXECUTIVE SUMMARY

*View of Downtown Brooklyn in the evening at the intersection of Flatbush Avenue and Livingston Street.*

New York City is now the second leading tech hub in the nation.[1] To overtake Silicon Valley in the top spot, New York City must plan for the growth of neighborhood-centric tech districts along the Brooklyn-Queens waterfront where the growth of tech-related firms is already being fueled by affordable commercial space, proximity to Brooklyn's sizable tech workforce, vibrant neighborhoods in the outer boroughs, and cutting-edge university research. This emerging "innovation edge" is already well on its way, with the Brooklyn Tech Triangle providing a key spark.

The areas comprising the Brooklyn Tech Triangle—DUMBO, Downtown Brooklyn, and the Navy Yard—have been leaders in this economic growth. DUMBO is home to hundreds of tech and creative companies within a 10-block radius and has become a dense cluster of digital startups. In Downtown Brooklyn, over $5.2 billion has been invested over the last decade or so to create 1.5 million square feet of retail space, 332,000 square feet of office space, and 12.8 million square feet of development. With the tenant wait list at over 100, the Brooklyn Navy Yard is in the midst of its largest expansion since WWII with $1 billion of public and private investment. Jobs at the Yard have doubled since 2001 and are expected to double again in the next five years.

New York City, particularly areas of Brooklyn, is becoming the ecosystem for a thriving new economy with growing tech, creative, and innovation firms. This intersection of companies that utilize digital technology and the Internet as their base infrastructure are breaking old industry rules and laying the groundwork for a new modus operandi for many sectors of the economy. Tech, creative, and innovation firms employ a wide range of workers and produce a diverse set of products and services. This tech ecosystem incorporates companies that build information and communications technology as well as businesses that work off of those systems to develop digital content. Beyond these two arenas, the tech ecosystem relies upon a dense web of support businesses and collaborative sectors.

The Brooklyn Tech Triangle is now home to approximately 10% of all tech firms citywide, the largest concentration—by far—outside of Manhattan. It also boasts several of the City's most successful tech firms (such as Wireless Generation, Etsy, and MakerBot), one of the most vibrant hubs of mobile app developers in the world, and many of the City's hottest startups. In fact, at the 2013 SXSW Interactive Festival, two of the keynote speakers hailed from the Brooklyn Tech Triangle: Tina Roth Eisenberg (Swissmiss) of Creative Mornings and Bre Pettis of MakerBot. Perhaps, more than any other area in the City, the Tech Triangle is at the heart of a dynamic new movement of companies

1 *"New Tech City," Center for an Urban Future, May 2012.*

### The Brooklyn Tech Triangle Today

**523**
innovation firms identified with:

**20%**
started in the last 16 months

**9,628**
tech workers

**23,000**
supporting jobs

**1.7M**
square feet of space occupied

### Expected Growth of Current Brooklyn Tech Triangle Firms by 2015

**48%**
expect to at least double in employment

**$5.9B**
economic impact on the Brooklyn economy

**17,960**
tech workers

**43,000**
supporting jobs

Up to **1.4M**
sf of additional space needed to accommodate this homegrown expansion

*Urbanomics Survey, April 2012.*

### Potential Growth of Brooklyn Tech Triangle by 2015

Up to
**22,200**
total direct tech jobs

**2.6–3.9M**
sf of space occupied by tech firms

**0.9–2.2M**
sf of new space for tech

Tech Triangle will capture
**10–15%**
of NYC's total tech employment

*Brooklyn Tech Triangle Strategic Plan research, HR&A Advisors, May 2013.*

that is fusing technology, design, and manufacturing. Something special is happening here.

The best news is that the Brooklyn Tech Triangle is still very much in its initial ascent. Firms want to locate here and the businesses that are here want to expand. In the coming months and years, there will continue to be tremendous potential to build on the already-strong foundation and enlarge the area's tech cluster—an outcome that, if achieved, would bring a large number of new jobs, provide opportunities to put Brooklynites to work, and further diversify the City's economy. The live-work model of the Tech Triangle could set a precedent for economic development along the Brooklyn-Queens waterfront from Sunset Park to Long Island City.

However, the future development of this new model for the tech industry is not a foregone conclusion. Without careful consideration and nurturing, the City could miss out on a golden opportunity. Without the right kind of affordable commercial space, well-trained workforce, and dynamic environment in which tech companies want to grow, Brooklyn and the City could lose out on the potential creation of tens of thousands of jobs in the coming years. A failure to fully realize the Tech Triangle's considerable potential could also negatively impact the City's overall tech sector, which in the years ahead will need additional commercial space—at prices that these types of companies can afford—to meet the enormous demand for office space that is projected for tech companies starting in, expanding, and moving to New York.

**The Partnership for NYC Jobs Blueprint found that "in 2011, there were twice as many graduates from local universities and colleges in the humanities as in STEM majors, while the job demand is heavily weighted toward technology and math skills." The Blueprint proposes Launch NYC 2020 Jobs Challenge—A Partnership between Employers & Educators.**

### Growth in the Tech Triangle

There are two main reasons to suggest that, under the right conditions, potential for growth in the Tech Triangle is enormous. Nearly 50% of the companies based in the Tech Triangle expect to at least double their employment in the next few years. Major companies like Etsy, Huge, MakerBot, and West Elm have all committed to growing in the area if space is available. NYU is developing a new applied sciences campus—the Center for Urban Science and Progress (CUSP)—and an Innovation District in Downtown Brooklyn that will serve as a catalyst for entrepreneurial ventures and an anchor for established tech companies. CUNY's City Tech is building a massive facility to house labs. Meanwhile at the Navy Yard, a billion-dollar expansion is underway, slated to include a new media campus, a high-tech lab, and over a million square feet of new space of production tech firms.

In addition, more tech companies from outside of Brooklyn are showing great interest in moving to the area in the years ahead. Much of this stems from the continued strength of New York City's tech sector. The lion's share of tech companies in the City today are hiring, new startups are being formed every week and a growing number of tech companies from other cities are either relocating to New York or establishing offices here. Indeed, 83% of the Manhattan-based tech companies that were surveyed for this report said they expected to add employees during the next year. And in our survey of tech firms outside of New York City, 80% said they would consider relocating to the Big Apple or setting up an office here in the near future.[2] All this suggests that the City's tech sector will be much larger in five years—and right now is the time to organize space for this growth.

While the Tech Triangle will benefit from the overall growth of the City's tech sector, it will also likely attract companies that are no longer able to find affordable space in Midtown South, the Manhattan submarket that is home to the City's largest single cluster of tech companies. Midtown South currently has the lowest vacancy rates in the City and with rents skyrocketing—rental prices in Union Square are now hovering over $60 per square foot—a number of tech firms located there will be forced to find new offices when their leases come due in the next year or two.

The Tech Triangle boasts an array of competitive advantages. For one, tech companies value talent, and a significant share of the City's tech workforce lives in Brooklyn, many in close proximity to the neighborhoods of the Tech Triangle. Tech companies are often attracted to neighborhoods where there is already a cluster of tech and creative businesses and a robust

Downtown Brooklyn has

**12**
universities

**57,000**
college students

**BK Tech HS**

**New tech-focused programs coming:**

NYU Media and Games Network (MAGNET)
NYU Center for Urban Science and Progress (CUSP)

Top factors for firms outside NYC to relocate:
(Percentage of all firms surveyed)

1. Proximity to clients: **75%**
2. Existing place to live and work: **65%**
3. Has many venture capital firms & other investors: **60%**
4. It is home to many designers & other creative people: **55%**
5. Talented local workforce: **50%**

In our survey of Manhattan-based tech companies:

**43%**
of respondents said they anticipated having to move out of their space at the end of their lease

**73%**
indicated that they would look beyond their current neighborhoods for new spaces

*Brooklyn Tech Triangle Strategic Plan survey, Center for an Urban Future, November 2012–February 2013.*

2 *Brooklyn Tech Triangle Strategic Plan survey, Center for an Urban Future, November 2012–February 2013.*

community of meet-ups and sector-related events; with more than 500 tech, design, and other innovation firms already in the area, the Tech Triangle offers this in spades. Rents in the Tech Triangle are between 30% and 50% cheaper than in Union Square, the Flatiron District, and the Meatpacking District, an important differential in an industry where even the largest firms prefer to pay more for talent than real estate. In addition, most companies that relocate to the Tech Triangle from other locations are eligible to receive a $3,000 tax credit per employee for 12 years.

On top of all this, the Brooklyn Tech Triangle has some of the best transit connectivity in the City, more college students than even Cambridge, MA, a strong creative sector that is anchored by a myriad of cultural institutions, including the Brooklyn Academy of Music (BAM) and St. Ann's Warehouse, and space that can be used for production at and around the Navy Yard.

Most important factors for tech firms when deciding to relocate:

**Transit connectivity**
(87%)

**Cost of rent**
(68%)

**Availability of space**
(68%)

Our survey shows that

the Tech Triangle is well-positioned to capture a significant share of the City's future tech growth:

**74%**
of the Manhattan-based tech companies and

**75%**
of firms outside of NYC said

they would consider
**Brooklyn**

*Brooklyn Tech Triangle Strategic Plan survey, Center for an Urban Future, November 2012–February 2013.*

*Once a parking lot, Pearl Street Triangle in DUMBO is now a public plaza equipped with seating and public WiFi.*

## Challenges and Key Components of the Plan

The Brooklyn Tech Triangle's ability—in terms of its real estate capacity, cultural dynamism, and profile—to attract a critical density of the world's best tech firms has emerged from major initiatives undertaken over the last ten years. Borne out of the efforts of the "Group of 35" Report, commissioned by Senator Charles Schumer and former Treasury Secretary Robert Rubin in 2001, the Special Downtown Brooklyn District created new zoning for the Downtown area that supported the creation of new commercial space and more Downtown residents. In DUMBO, building owners transformed warehouses into lofty, flexible spaces, supporting an existing arts community. This brought digital pioneers like Huge and Big Spaceship to DUMBO as early as 1999, sparking today's thriving innovation economy. Moreover, the development of Brooklyn Bridge Park has given DUMBO and the rest of the Tech Triangle a new world-class park that helped to create the vibrant tech and creative scene. The funding of infrastructure at the Brooklyn Navy Yard has established a nationally renowned center for advanced manufacturing and creative industries that is generating thousands of jobs.

More recently, incubators and classrooms have been added to the area, including the NYU-Poly Incubator at 20 Jay Street; the soon-to-open "Made in New York" Media Center (featuring Independent Filmmaker Project and General Assembly), also at 20 Jay Street; and the NYU Center for Urban Science and Progress at 370 Jay Street. The BAM Cultural District—notably anchored by the Brooklyn Academy of Music, Theatre for a New Audience, MoCADA, BRIC Arts | Media | Bklyn, Mark Morris Dance Group, and over 40 arts and cultural groups—has been established within the Tech Triangle as a cutting-edge cultural scene. At the same time, Barclays Center is drawing thousands of people to Downtown Brooklyn for entertainment and sporting events, and is the first in a series of developments associated with the Atlantic Yards. Downtown Brooklyn has recently seen a rise in its number of residents establishing a true live-work environment, due to the growth of new housing, businesses, and cultural centers in the area. Brooklyn has long been the space where pioneers test and build homegrown ventures. Artists have historically gravitated to the borough and helped set the stage for the emergence of Brooklyn as the global headquarters for design and creativity. Public investments have ensured that this organic growth and native Brooklyn industries maintain the capacity for success.

This Plan is intended to build on the solid foundation laid in the greater Downtown Brooklyn area over the last few decades and generational investments made by the Bloomberg administration and our local city, state and federal elected officials. It calls for a reenergization of the government toolkit for attracting and supporting tech companies; incentives for property owners to build commercial space; support for quality of life through placemaking, retail strategies and transportation enhancements; and a collaborative solution to ensure a viable local workforce meets the needs of these companies. If fully implemented, up to 3.9 million square feet of space in the Tech Triangle could be occupied by the tech and creative economy.[3]

These building blocks have helped to facilitate the emergence of the Brooklyn Tech Triangle, but the area is now at a major crossroad. The Brooklyn Tech Triangle can truly emerge as a tech cluster and model for New York's tech industry, but there are a number of actions profiled in this report which need to be taken to ensure that the growth of companies and the production of jobs happen here.

There are five key challenges to which the Brooklyn Tech Triangle Strategic Plan counters with five plan components.

The five key challenges are:

*3 Brooklyn Tech Triangle Strategic Plan research, HR&A Advisors, 2013.*
*4 NYCEDC, NYC Commercial Real Estate Competitiveness Study, June 2013.*
*5 Ibid.*
*6 Brooklyn Tech Triangle Strategic Plan research, HR&A Advisors, 2013.*

**1. We are running out of appropriate commercial space for tech.**

The Tech Triangle's stock of office space does not meet projected demand for the tech sector. The problem is most acute in DUMBO, which boasts one of the largest tech clusters in the City but has a limited number of commercial buildings and a vacancy rate that is near zero. When new space is brought online, it is rapidly leased (as in the case of 231 Front Street and 20 Jay Street). With a waiting list of over 100 companies, the Navy Yard has had significantly more applications from design firms and advanced manufacturing companies than it can accommodate. In DUMBO and near the Navy Yard, vacant or underutilized buildings and developments exist; however, due to commercial rents, lack of financing for commercial development, and speculation of future residential rezoning, landlords are not incentivized to unlock these spaces for the industry. Despite the presence of a considerable number of commercial buildings in Downtown Brooklyn, longer-term leases have tied up much of the current space for the next five years. The existing space has not had appeal to the tech and creative industries. These companies seek office space with short leases that accommodate quick growth, pet- and bike-friendly buildings, and open plan spaces for flexible tech office culture and room to grow.

More broadly, the City is expecting High-Growth Industries to demand 20 million square feet over the next 12 years.[4] These startup and medium-sized firms are generally looking for rents below $40 per square foot.[5] Vacancy is relatively low in the Tech Triangle and based on anticipated lease rollovers by 2019, there will be limited amount of commercial space available.[6]

This is the right moment in time for the Brooklyn Tech Triangle as well as outer borough live-work communities, particularly along the Brooklyn-Queens waterfront to convert underutilized buildings into affordable commercial space in order to capture startups emerging from existing and new institutions such as NYU-Poly, City Tech, Cornell Technion, and NYU Center for Urban Science and Progress.

**2. The Tech Triangle could be—but isn't yet—a new model integrating talent from local communities and universities with high-growth industries.**

Talent is critical for generating a tech cluster. Too many companies in the Tech Triangle struggle to find workers that have the skills they need, with some firms going months before they are able to fill empty positions. It is hard to believe that there can be vacancies next to 12 universities with 57,000 students. Both tech firms and universities need to work harder to provide the right kind of training and to enable new startups. A range of initiatives must be undertaken to provide better access to local residents for high-barrier jobs, particularly in digital media, and low-barrier jobs in production tech—building on the success of the Brooklyn Navy Yard Employment Center.

**3. It needs to be easier to get around the Tech Triangle.**

While the Tech Triangle has great public transit connections to other parts of the City and Brooklyn, much of the Tech Triangle was designed for vehicular traffic, and there are too few logical walking and biking corridors within the Tech Triangle. There is a huge demand for gaining access into the Navy Yard by public transportation, and many people working in the Tech Triangle area are looking for transportation options from the Williamsburg and Greenpoint areas.

**4. Some parts of the Tech Triangle need an upgraded energy and vibe.**

The Brooklyn Tech Triangle has a long list of assets but it is also burdened by outdated public spaces and neglected pedestrian corridors along the busy streets of Downtown Brooklyn and around and below the Brooklyn-Queens Expressway and bridge infrastructure. These spaces lack the creative energy and urban dynamism that has attracted techies to neighborhoods such as DUMBO, Union Square, Flatiron, the Meatpacking District, and Chelsea. Certain areas in the Tech Triangle are primed for similarly activated corridors; re-imagining street access to MetroTech and bringing upper floors along Fulton Mall back to life could be the first steps. Making sure that there is activity at the street level—with food and entertainment options and dynamic event spaces—is a critical concern.

**5. The "tech" in Tech Triangle should be apparent to all.**

The Tech Triangle should be a dynamic, engaging place for all users and littered with forward-looking infrastructure technology and demonstration projects. These programs and benefits need to be better marketed. Our survey of Manhattan-based tech companies suggests that people aren't aware of the benefits of setting up business within the Tech Triangle. Most respondents were unaware of Downtown Brooklyn's great public transit links, and only four of the 53 respondents were aware of the REAP tax credit that companies are eligible for if they relocate from Manhattan to Brooklyn.

## 5 Components

# 1

## SPACE FOR TECH TO GROW

**We are running out of appropriate commercial space for tech.**

There is 23.3 million square feet of office space within the Tech Triangle area, but the vast majority of it is either occupied, unavailable, or unappealing to tech and creative firms. In some cases, buildings require refurbishment and management changes to provide features, amenities, or flexible leases that appeal to tech firms.

- Activate underutilized commercial spaces along Flushing Avenue, on the east side of DUMBO, in the Watchtower Properties, in Empire Stores, on upper floors along Fulton Street, and more.
- Create a Special Innovation District to encourage landlords to bring additional space to the market and spur local 80/20 residential construction.
- Create tools to bridge the gap between startups and credit-worthy lessees, and incentives to create or refurbish space for the innovation economy.

# 2

## A NEW TECH ECOSYSTEM

**The Tech Triangle could be—but isn't yet—a new model integrating talent from local communities and universities with high-growth industries.**

Brooklyn's greatest assets are its people, but tech firms struggle to find the right talent. Let's connect Brooklyn's educational institutions together with the tech sector to create jobs for all.

- Launch a coder training program in Downtown Brooklyn.
- Encourage collaboration, curriculum alignment, internships, and adjunct teaching by building relationships between local firms and universities.
- Create an innovation training hub to address emerging job opportunities in partnership with CUNY.
- Advance the NYU CUSP campus at 370 Jay Street.

3

## CONNECTIONS ACROSS THE TECH TRIANGLE

**It needs to be easier to get around the Tech Triangle.**

The Tech Triangle needs to be simple to bike or walk across. The Navy Yard should be easily accessible by public transportation. It is critical to ensure that the points of the Tech Triangle are well-integrated for shaping the new tech ecosystem.

- Expand bus routes and create ferry stops at Jay Street and in the Navy Yard.
- Activate the Adams Street entrance to the A/C and add an entrance to the F stop at York Street.
- Create new bike lanes on key corridors like Jay Street and Cadman Plaza East.
- Explore a 21st century "trolley service" to move people throughout the Triangle.

4

## DYNAMIC PLACES FOR TECH

**Some parts of the Tech Triangle need an upgraded energy and vibe.**

Today's innovators thrive on collaborative and inspirational environments. Companies want to locate in places where the local vibe will entice talent and encourage employee retention. This Plan sets out a vision for a vibrant environment to match the thriving startup scene.

- Reimagine spaces within MetroTech, Columbus Park, Cadman Plaza, and areas below the BQE as 24/7 activity areas for events, great food, and interaction.
- Add lighting, park improvements, and streetscape projects along major streets such as Jay Street, York Street, Flushing Avenue, Flatbush Avenue, and Adams Street.
- Attract additional food, beverage, and entertainment options to the area.

5

## TECH TRIANGLE INTERFACE

**The "tech" in Tech Triangle should be apparent to all.**

This area presents a tremendous opportunity to be branded as tech-forward and to become a testing ground for new technologies.

- Dramatically expand public WiFi throughout the district.
- Increase fiber availability in tech buildings by assisting with "last mile" work and increasing data.
- Create digital navigation touch-points integrated for utilization on mobile devices.
- Give startups the chance to test their products locally and encourage innovations from our academic and business communities to be piloted in the Tech Triangle.

*View of the Manhattan Bridge in DUMBO.*

*BLDG 92 at the Navy Yard.*

*Willoughby Plaza in Downtown Brooklyn.*

# INTRODUCTION


ROOSEVELT ISLAND
LONG ISLAND CITY
HUNTERS POINT
GREENPOINT
WILLIAMSBURG
DUMBO
BROOKLYN NAVY YARD
DOWNTOWN BROOKLYN
COBBLE HILL
CARROLL GARDENS
GOWANUS
RED HOOK
SUNSET PARK

### Tech Growth in New York City

In offices, converted warehouses, and industrial spaces across New York City, a flurry of activity is occurring. Tech programmers alongside designers are working with hands-on builders and engineers who are mentoring new students and young entrepreneurs. Together these futurist makers are dreaming up and creating technologies that change the way people live, work, and play.

New York's tech industry represents a new type of tech, related to a larger transition in a number of economic sectors. New technologies are driving the growth of many of the City's traditional industries including advertising, entertainment, media, finance, fashion, health, and design. These adaptations have led to explosions of industry-specific companies, including AdTech, FashionTech, and Digital Media. Modern manufacturing powered by small-scale, affordable, technologies such as 3-D printing and molding equipment supports many of these traditional industries. In this way, the tech success focuses on clustering, collaborating, and connecting.

The transition towards applied technologies means that complementary sectors benefit from enhanced operations and new products created with tech companies—further compounding the positive impacts of inter-industry tech collaborations. This transition also means that the tech ecosystem enables a new type of firm and worker. Many of the burgeoning technologies today empower small business processes and products to have corporation-scale impact. Brooklyn Tech Triangle firms allow small-scale entrepreneurs access to top-of-the-line production technologies and marketing capacities. Applied technologies also enable a broader range of workers to be involved in the tech ecosystem. The types of tech being developed today require not only programmers and engineers, but also designers, builders, technicians, social media specialists, and more. These new companies seek different types of workers with diverse skill sets.

This should be a special moment for the outer boroughs. Most preferences and needs of the tech industry tie into the assets of New York's outer boroughs:

- Loft-like, open-plan office space with lots of light and flexible building management.
- Rents under $40 per square foot in Class B and C buildings.
- Live-work-play areas filled with social amenities and close to the homes of tech workers.

The Tech Triangle concept, and the initiatives this Strategic Plan puts forward, has applicability for other neighborhoods and old industrial buildings from Sunset Park to Long Island City to Port Morris.

In particular, the Tech Triangle can be the forerunner to a Brooklyn-Queens Innovation Corridor. The

## The Tech Impact in NYC

**#1**
Tech sector has the most leasing activity of all sectors in 2012

Increase from
**9%**
leasing activity in NYC by square feet in 2002

to
**25%**
leasing activity in 2012

**41%**
expected increase in demand from 2012 to 2025

*NYC EDC, NYC Commercial Real Estate Competitiveness Study, June 2013*


New York has recently surpassed Boston as the second most important tech hub in the nation. "Of the tech startups founded in New York since 2007, 15 have raised more than $50 million in investments, 27 have investments of at least $25 million and 81 have raised at least $10 million."[1] New York's growing tech industry is good for the City and for residents. Large companies moving to New York bring jobs, and a healthy tech community generates startups that create opportunities for even more workers. "The NYC Economic Development Corporation reveals that there were 90,273 people working at 7,147 "high-tech" companies in 2010, a 30% gain in employment from 2005."[2]

*Brooklyn-Queens Waterfront: A Focus for Innovation*

1 *"New Tech City," Center for an Urban Future, May 2012, p.6.*
2 *Ibid.*

*A kaleidoscopic water tower, created by artist Tom Fruin, represents one of the many public art displays in DUMBO.*

Brooklyn-Queens waterfront historically was a center of industrial innovation and a creator of hundreds of thousands of local jobs for residents. With its mix of warehouses and loft buildings, this length of waterfront offers a tremendous amount of space that fits the tech sector and innovation economy profile. Unfortunately, today's zoning has facilitated the proliferation of low-employment, high-return uses like short-term storage and speculative pricing for conversions to as-of-right hotels or special permits. These uses are substantially restricting the growth of the tech sector and innovation economy that gravitates toward waterfront industrial buildings with good-bones and affordable rents. With the right set of incentives, land-use policies, and transportation approaches, this edge can be transformed into the new engine of New York City's economy and can become the next generation of workspaces.

**"The vast majority of new 'tech' companies being established today aren't building new technologies but applying them in creative ways to offer new products and services. 'Technology has shifted from the development of technology to the application of technology,' says Larry Lenihan, a managing director at FirstMark Capital."[3]**

*3 "New Tech City," Center for an Urban Future, May 2012, p. 6.*

*Empire Stores in Brooklyn Bridge Park, DUMBO.*

*Pearl Street Triangle, DUMBO.*

*Albee Square on the Fulton Mall, Downtown Brooklyn.*

*MetroTech Commons, Downtown Brooklyn.*

### Brooklyn Tech Triangle Site Area

Throughout the country, tech firms in the last five years have been moving into cities, away from suburban business parks and into urban hubs where there are clusters of talent and amenities. In particular, the Tech Triangle has seen a surge in demand for three central reasons:

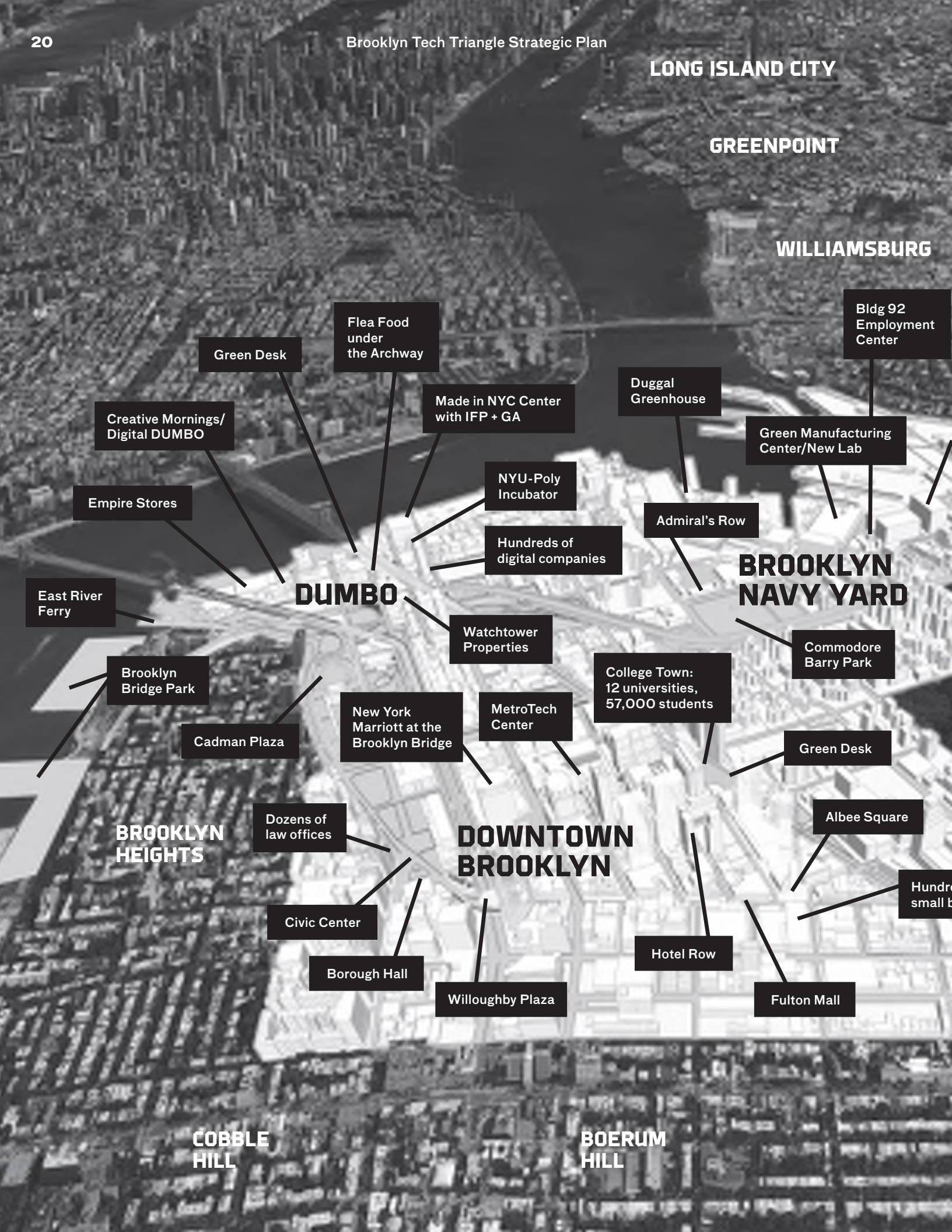
- The Tech Triangle has a dynamic combination of great neighborhoods, interesting workspaces, and a lively cultural and arts scene.
- There is a developing ecosystem between tech, universities, advance manufacturing, as well as artisans and retailers that is creating talent, products, and platforms for marketing products and services.
- The three points of the Tech Triangle—DUMBO, Downtown Brooklyn, and the Navy Yard—provide a diversity of spaces and places that support a great assortment of companies and offer a variety of commercial office products.

The Tech Triangle sits between the inlet of the East River and Wallabout Bay, where the Navy Yard is located. Both the Brooklyn and Manhattan Bridges span across the East River from the Tech Triangle. The Tech Triangle is incredibly well-connected to other areas of Brooklyn and Manhattan by two bridges, 13 subway lines, the Brooklyn-Queens Expressway (BQE), the Long Island Railroad, and 15 bus lines.

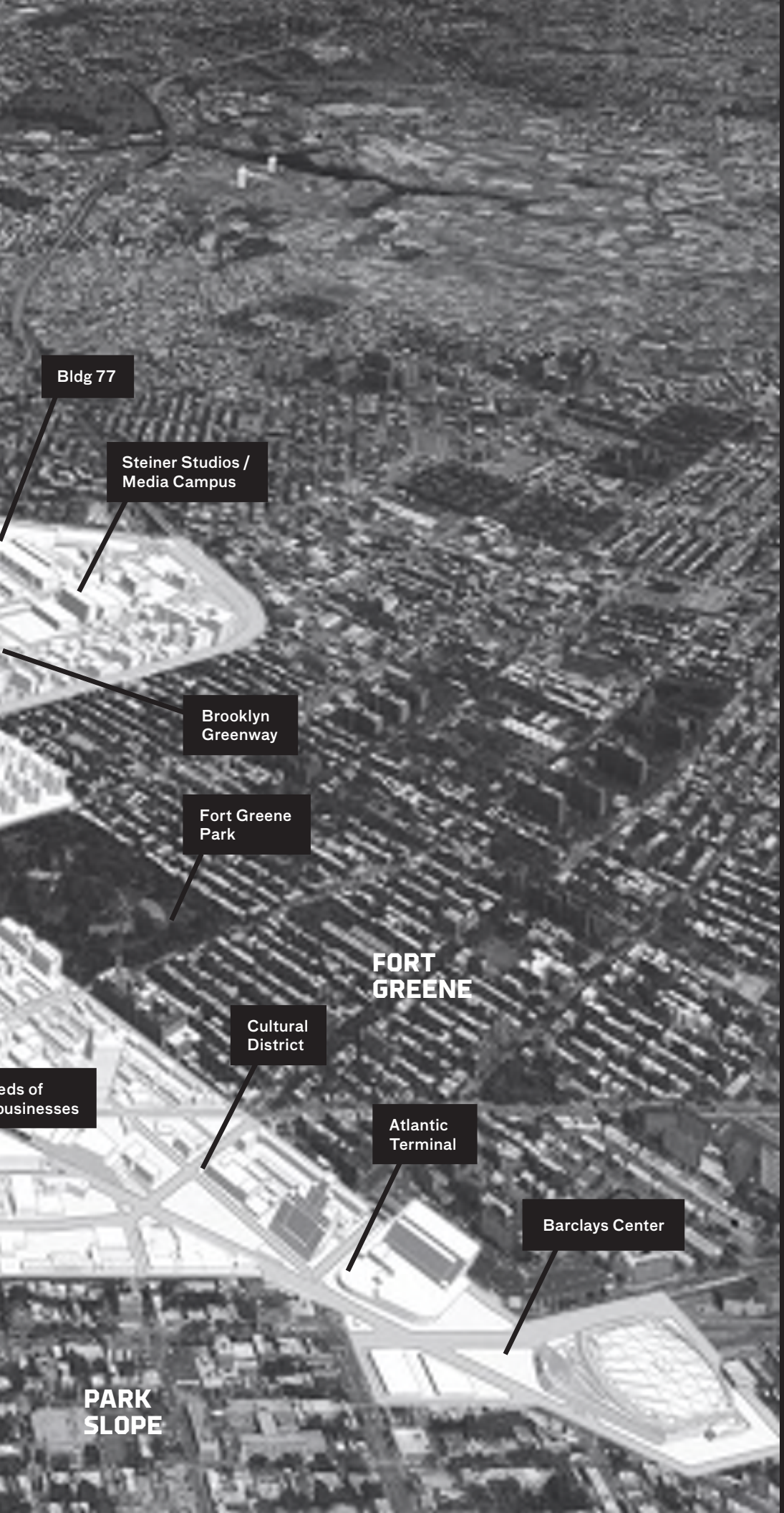
A large part of the Tech Triangle is physically defined and characterized by the bridges and the BQE that cut across the area, creating some constraints on walking and cycling connectivity across the Tech Triangle. But at the same time, this infrastructure has produced a series of unique and dynamic public spaces, such as Cadman Plaza and Brooklyn Bridge Park. These parks and plazas, as well as the historic warehouse and commercial buildings, give the Tech Triangle its unique physical identity.

Brooklyn has been described as the borough of neighborhoods by historian Kenneth Jackson, and the Tech Triangle is adjacent to many of these historic areas, including Vinegar Hill, Fort Greene, Brooklyn Heights, Boerum Hill, and Cobble Hill. The neighborhoods each have a distinct sense of place and tie together a strong live-work community that provides the Tech Triangle with a vibrant social life. Organizations such as the Brooklyn Academy of Music anchor a new cultural district, and the recently opened Barclays Center arena draws internationally renowned artists to perform in the Tech Triangle.

Given the close proximity of the points within the Tech Triangle and Brooklyn's historic neighborhoods, a booming culture of cycling has emerged. With the City's new bike share program and improving bicycle lanes, the streets are filled with people cycling between meetings, from home to work, and over the bridges.


LONG ISLAND CITY
GREENPOINT
WILLIAMSBURG
Bldg 92 Employment Center
Flea Food under the Archway
Green Desk
Duggal Greenhouse
Made in NYC Center with IFP + GA
Creative Mornings/ Digital DUMBO
Green Manufacturing Center/New Lab
NYU-Poly Incubator
Empire Stores
Admiral's Row
Hundreds of digital companies
BROOKLYN NAVY YARD
DUMBO
East River Ferry
Watchtower Properties
Commodore Barry Park
Brooklyn Bridge Park
College Town: 12 universities, 57,000 students
New York Marriott at the Brooklyn Bridge
MetroTech Center
Cadman Plaza
Green Desk
Albee Square
Dozens of law offices
BROOKLYN HEIGHTS
DOWNTOWN BROOKLYN
Civic Center
Hotel Row
Borough Hall
Willoughby Plaza
Fulton Mall
COBBLE HILL
BOERUM HILL

**Tech Triangle**
**Existing Assets**



**"Startups like being near other startups. But mostly startups like being in inexpensive places with fast Internet and easy access, that don't drain their resources and aren't located in areas that make it hard for them to hire."**
**– John Borthwick, CEO, Betaworks**

**"One thing we really enjoy about being in the Navy Yard is that it is a creative community, a community with people that make things. There are a lot of opportunities for working together with people that you happen to realize are your neighbors."**
**– Caleb Crye, CEO, Crye Precision**

**"Etsy was started in 2005. Going from where we were then, which was about 40 people, to surpassing 500 this year, [the issue] is just finding enough contiguous space to hold all the people that we are hiring."**
**– Chad Dickerson, CEO, Etsy**

**"Over the last four to five years, our clients really want to come here. Brooklyn is a cultural center point."**
**– Mike Lebowitz, CEO, Big Spaceship**

### The Tech in the Brooklyn Tech Triangle

The Brooklyn Tech Triangle is home to a remarkable mix of tech companies, from self-funded startups with fewer than five employees to fast-growing firms that have raised $100 million in venture funding and high-flyers that have been acquired by the likes of Facebook and News Corporation. Just as there is no dominant subfield in New York City's tech sector, the companies based in the Tech Triangle literally cover the waterfront and span the tech gamut: there are e-commerce sites and online dating platforms, as well as firms working on big data, energy-tech, health-tech, edu-tech, and 3-D printing.

Building on the area's creative edge, the Tech Triangle boasts one of the world's largest concentrations of digital creative agencies. There are literally dozens of companies in the area that design apps, websites, and digital ads—including Huge, Big Spaceship, Small Planet, Pontiflex, Freeverse, Domani Studios, Carrot Creative, One Hundred Robots, Oak Studios, TENDIGI, Social Bomb, and BBMG. The Tech Triangle also has digital music firms, fashion-tech companies, and gaming companies, like Freeverse and Tiny Mantis. Not surprisingly, the Tech Triangle's most well-known tech company, Etsy, combines art, design, and technology. An e-commerce site that provides a platform for people to sell their art, photography, jewelry, and crafts, Etsy has been valued at more than $700 million.[4]

Within the Navy Yard, advanced manufacturing utilizing a new wave of prototyping technology, has supported the growth of innovative firms such as Crye Precision, whose products include protective military equipment. Meanwhile, in Downtown Brooklyn, a local business that mixes technology and manufacturing is MakerBot, a 100-employee firm focused on 3-D printing whose founder was one of the breakout stars of South by Southwest 2013.

*4 Owen Thomas, Business Insider, "Here's Why Etsy Is Worth Almost $700 Million," May 9, 2012.*


*Creative New York Week Panel, DUMBO.*

*Brooklyn Ballet performs at Albee Square, Downtown Brooklyn.*

*NYU-Poly Incubator, DUMBO.*

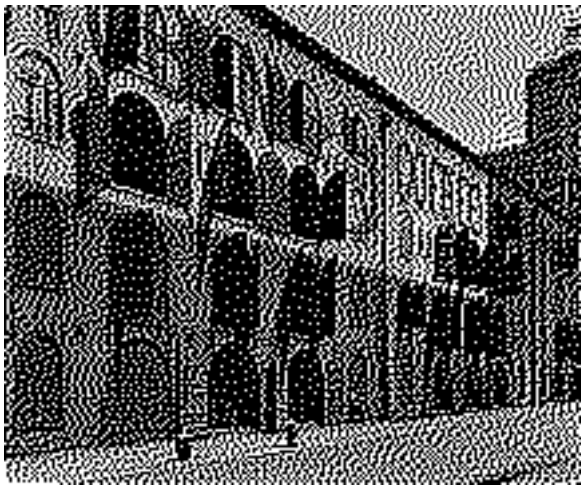
*MakerBot offices at MetroTech Center, Downtown Brooklyn.*

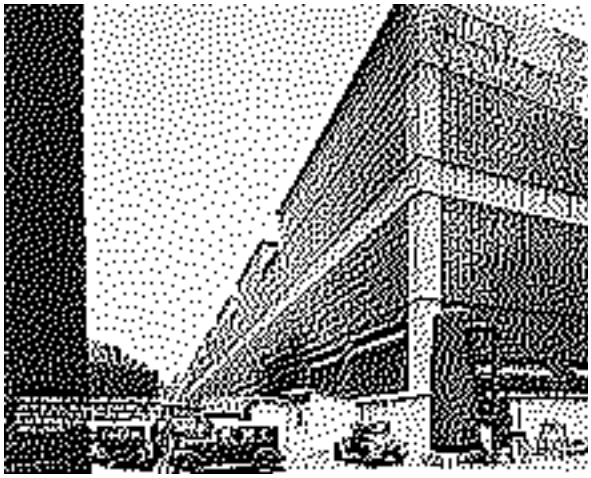
*Etsy offices, DUMBO.*

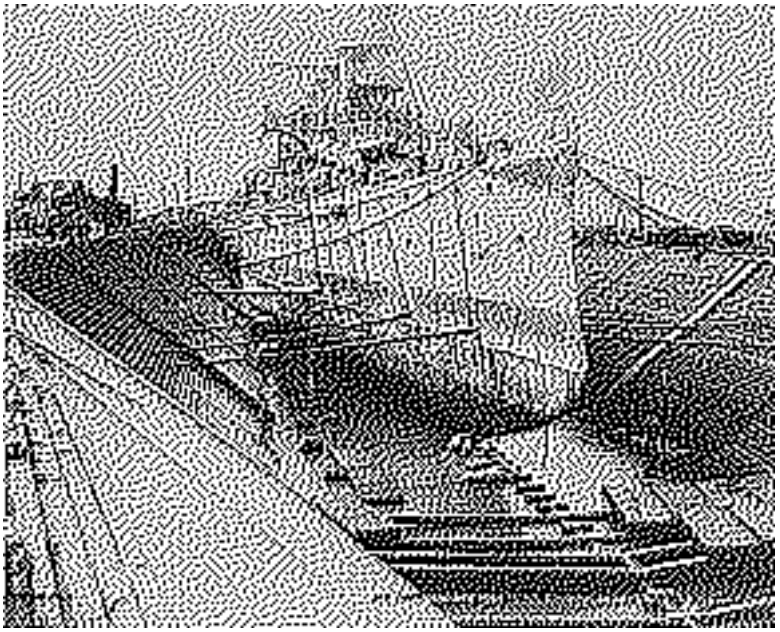
*Duggal Visual Solutions, Brooklyn Navy Yard.*

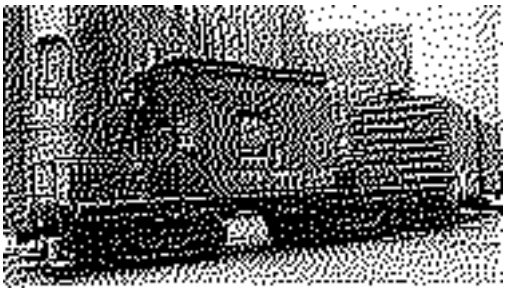
*Pearl Street Triangle, DUMBO.*

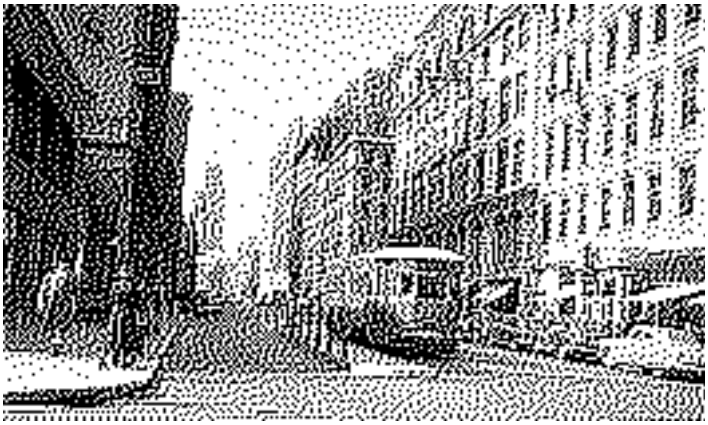
*Smart Planet, DUMBO.*

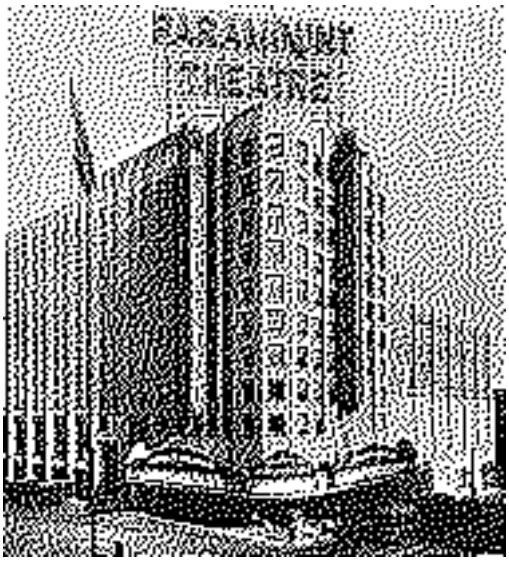











PARAMOUNT
THEATRE

### The Tech Triangle History of Innovation

Each of the Tech Triangle points has a development history that tells the story of urban industrial and commercial change and provides a unique setting for reinvention by today's tech sector. The areas represent three distinct models for accommodating a variety of tech firm types yet interweave to create fertile ground for diversified growth.

#### DUMBO

DUMBO has always been defined by its position as the base for the two bridges crossing from Brooklyn to Lower Manhattan. Until the 1890s, the area was home to Fulton Landing, named for a ferry stop that had connected the area to Manhattan until the Brooklyn Bridge opened. The area has long been a manufacturing zone for a range of products, including Brillo soap pads, coffee, and corrugated cardboard—which was patented in DUMBO by Robert Gair—as well as cutting-edge production and shipping techniques in the 19th century. Since the deindustrialization of the 1970s, artists began moving into the area and taking over the loft spaces. By the 1990s, the area had undergone a renaissance, with many of the warehouse and factory buildings being converted to apartments, condominiums, as well as retail and office spaces. DUMBO is a solidly live-work neighborhood that has effectively employed arts as a catalyst for change. Today, DUMBO functions as a neighborhood incubator, with dozens of monthly meet-ups such as Creative Mornings; and social events such as Flea Food under the Archway and Digital DUMBO. The neighborhood is also home to a number of co-working spaces and traditional incubators that ensure access to the neighborhood for freelancers and companies of all sizes including StudioMates, DUMBO Startup Lab, The Green Desk, NYU-Poly Incubator and the soon-to-open IFP "Made in New York" Media Center featuring General Assembly classrooms. Furthermore, Brooklyn Bridge Park has transformed the area into a world-class waterfront destination.

#### Brooklyn Navy Yard

The Brooklyn Navy Yard is bounded on the landside by Navy Street; and Flushing and Kent Avenues. One of the nation's premier naval ship building facilities, the Yard employed 70,000 people around the clock at its height during World War II. In 1966, the Navy Yard was decommissioned, and it struggled through 20 years of failed attempts at revitalization. At its nadir, the Navy Yard housed as few as 30 businesses and 1,000 jobs. The Brooklyn Navy Yard Development Corporation (BNYDC) was established in the mid-1980s to right the ship. A new leasing strategy of attracting small niche manufacturing businesses was implemented to fill empty buildings, and by 1998 vacancy at the Navy Yard was less than 5%. Over the last ten years, public investment in basic infrastructure led by the City, but with increasing support from the State and Federal governments, has leveraged over $750 million in private investment. More than 330 companies are in the Navy Yard, including clean and green tech, entertainment and media, arts and culture, high-end design with rapidly emerging advanced and additive manufacturing, and food production. The number of employees at the Brooklyn Navy Yard has grown from 3,600 in 2001 to 6,400 today, with 50% of all employees being Brooklyn residents and 35% hailing from communities adjacent to the Navy Yard; employment is expected to double in the next five years. The Employment Center at the Navy Yard also has a record of local hiring and will place 250 local residents in jobs this year. Among its recent placements, 25% are New York City Housing Authority residents and 15% are veterans, further driving the area's live-work concept.

#### Downtown Brooklyn

Downtown Brooklyn grew into the borough's capital due to the Port of New York's proliferation in the mid-19th century with many warehouses and factories. Today, those warehouses and factories have been changed into a variety of other uses including housing, and the area is now home to 17 million square feet of commercial office space that forms the backbone of Brooklyn's commercial office market. Historically known as the borough's shopping destination, Fulton Mall attracts 150,000 shoppers to the area each day. The area has also become a center for research and technical universities. Today, Downtown Brooklyn plays host to 12 higher education institutions and has a student population of more than 57,000. This neighborhood has transitioned into an education hub, with important training programs for the new economy at City Tech and emerging programs such as NYU Media and Game Network and NYU Center for Urban Science and Progress. The area is also well-known for the Cultural District, which is anchored by BAM and over 40 arts and cultural organizations, along with Barclays Center, attracting three million patrons annually.

*The TechTriangle has a storied history of building, transporting, and production.*

*Brooklyn-based artist David Ellis transforms the Pearl Street Triangle into a mural.*

# COMPONENTS OF THE TECH TRIANGLE PLAN

COMPONENT

# SPACE FOR TECH TO GROW

The New York City economy is strong, vibrant, and evolving. While healthcare remains the City's largest employer and financial services its engine of economic output, high-tech and creative industries are growing rapidly, changing the dynamics of the economy. New York City is only second to Silicon Valley in terms of size and rate of growth of its technology cluster.[1]

**The Partnership for New York City estimates that over the past decade the financial services industry grew by 2.4% annually while high-tech and creative industries averaged a 5.3% and 4.1% annual growth rate, respectively. The rapid growth of tech and creative businesses has enabled New York City to command 13% of national market share for economic output in the creative sector alone.[2]**

The rapidly evolving tech and creative industry is spread throughout the City with clusters in Midtown South, which has been renamed Silicon Alley; near the High Line along 9th Avenue; and in the Brooklyn Tech Triangle. These centers of tech and creation are the future of the New York City economy. The Tech Triangle—with its three distinct nodes of Downtown Brooklyn, the Brooklyn Navy Yard, and DUMBO—is uniquely positioned to grow as a hub of New York City's tech and creative industries.

Urbanomics' 2012 Economic Impact Study estimated that approximately 9,600 individuals worked in the Brooklyn tech and creative industries in 2012, occupying 1.7 million square feet of space in the Tech Triangle, approximately 7% of the 25 million square feet in total supply. The study found that based on projections, existing Tech Triangle tech companies are expected to grow to nearly 18,000 individuals and occupy 3.1 million square feet of space. The New York City Economic Development Corporation (NYCEDC) anticipates that High-Growth Industries, of which tech is a significant component, could demand 20 million square feet of space by 2025 citywide. [3]

The fast moving, constantly evolving tech industry does not fit neatly into the Department of Labor North American Industry Classification Codes (NAICS), and as a result there are a range of studies that attempt to quantify the size of the tech industry in New York City. Depending on how one defines "tech and creative," in 2012 the industries employed between 101,000[4] and 171,000 individuals[5] in New York City (an average of 136,000). Translated, Urbanomics' estimated

1 *Partnership for New York, NYC Jobs Blueprint 2013, page 5.*
2 *Ibid., page 11.*
3 *NYCEDC, NYC Commercial Real Estate Competitiveness Study, June 2013. High Growth Industries include Healthcare, Technology, Business Services, Education, Non-profit, Advertising, and Research and Development.*
4 *In the Center For Urban Future's "New Tech City Report," NYCEDC estimated 90,273 workers in the "high-tech" industry in 2010. This represented a 30% growth over 2005. Assuming the same annual growth rate, tech employment in 2012 could conservatively be ~101,000. NYCEDC defines "high-tech" as including tech-related occupations from the following industries: advertising, public relations, and related services; audio and video equipment manufacturing, business support services, communications equipment manufacturing, computer/electronic component manufacturing, computer systems design, and related services, data management services, e-publishing, internet services, machinery manufacturing, navigational/measuring/electromedical, and control instruments manufacturing, other telecommunications, retailers, software production, and telecommunications carriers.*
5 *New York State Department of Labor, seasonally adjusted by NYC Office of Management and Budget, April 2013. The annual growth rate for the information sector was flat for 2012-2013, meaning that the 2012 figure was also approximately 171,000. This figure refers to employment in the information sector, which is being used as a proxy for an order-of-magnitude estimate of the tech sector. The information sector includes the publishing, motion picture, and sound recording, broadcasting, and telecommunications sectors.*

## Potential BTT Tech Occupancy

| | BTT's Share of NYC Tech Employment (a) | BTT Total Tech Employment (b) | BTT Net New Tech Employment (c) | BTT Net New Space Demand (d) | BTT Total Tech Space Occupancy (e) |
|---|---|---|---|---|---|
| **2012 Urbanomics Estimate** | 7% | 9,600 | | | 1,700,000 sf |
| | 10.0% | 14,800 | 5,200 | 900,000 sf | 2,600,000 sf |
| **2015 Targets** | 12.5% | 18,500 | 8,900 | 1,600,000 sf | 3,300,000 sf |
| | 15.0% | 22,200 | 12,600 | 2,200,000 sf | 3,900,000 sf |

*Figure 1.*

9,600 tech employees in the Triangle represented between 7% of total New York City tech employment (based on an average of 136,000 tech employees). Assuming the current growth rates continue, between 121,000[6] and 176,000 individuals[7] could work in New York City's tech sector by 2015 (an average of 148,000).

HR&A projected potential future demand scenarios for tech space, ranging from net new demand of 900,000 to 2.2 million square feet in the Tech Triangle by 2015. Based on these scenarios, as shown in Figure 1, it is plausible that the Brooklyn tech sector could represent 10% to 15% of total New York City tech employment by 2015, occupying a total of 2.6 million to 3.9 million total square feet within the Triangle if the initiatives described in this plan are implemented.

Tech and creative businesses prefer to cluster near companies providing similar services to capitalize on agglomeration effects, as is the case for most other industries. A shortage of space that is available to tech companies is the single greatest challenge threatening the continued growth of the Brooklyn Tech Triangle. Companies want to grow here and relocate here, and although there is presently very little attractive space on the market, there are millions of square feet of space that would be perfect for these tenants sitting underutilized throughout the area. Landlords facing rehabilitation costs to bring their spaces to market and a residential market that would yield three times the sales price choose instead to keep buildings empty or collect revenues from storage, waiting to take these buildings residential in the future. Moreover, tech tenants typically lack the credit required by landlords and banks for construction loans.

- **Challenge 1: There's a shortage of space that meets tech firms' needs within the current real estate supply.**
- **Challenge 2: The rapidly evolving business structure of most tech companies prevents them from meeting traditional real estate and public incentive expectations.**
- **Challenge 3: Rents payable by tech companies do not justify the cost to construct new commercial space.**
- **Challenge 4: Tech does not recognize that all points of the Tech Triangle can meet their business and real estate needs.**

*(a) BTT's Share of NYC Tech Employment for 2012 is calculated by dividing BTT Total Tech Employment by the average citywide tech sector employment figures. This average is 136,000 for 2012.*
*(b) BTT Total Tech Employment for 2015 is calculated by multiplying the BTT's Share of NYC Tech Employment by the average citywide tech sector employment. This average is 148,000 for 2015.*
*(c) BTT Net New Tech Employment is calculated by subtracting 2012 BTT Total Tech Employment from the 2015 figure.*
*(d) BTT Net New Space Demand is calculated by multiplying BTT Net New Tech Employment by 175 square feet per employee, which reflects 2012 occupancy levels.*
*(e) BTT Total Tech Space Occupancy for 2015 is calculated by adding the 2012 figure to BTT Net New Space Demand.*

*6 To derive a projection of ~121,000, HR&A applied a 6% annual growth rate to the 101,000 (2012) estimate for the high-tech industry as described in the footnote above. This assumes that the 30% total growth over the five-year period between the 2005 and 2010 figures, as estimated by NYC EDC, would continue from 2013 to 2015.*

*7 To derive a projection of ~176,000, HR&A applied a 1% annual growth rate to the 171,000 (2012) estimate for the information sector. The annual growth rate for the information sector was flat for 2012-2013. HR&A assumed a 1% growth rate as it is anticipated the tech industry is growing.*

Challenge 1A

**There's a shortage of space that meets tech firms' needs within the current real estate supply.**

To ensure that the Tech Triangle captures the potential market demand, the area's supply must increase. Tech firms prefer open-plan collaborative space. They do not believe that multi-tenant office towers can be refigured to meet their preferences to include open-plan layouts and provide ample natural daylight and flexible collaborative spaces. To date landlords have not speculatively created "plug-and-play white boxes," which would require minimal capital investment by tech companies.

Compounding this misconception among tech firms is the fact that while the borough's prominence on the national stage is growing and there is an interest and demand for all things Brooklyn, most Manhattan brokers are still unfamiliar with the borough and typically do not include Brooklyn options on survey tours. Reinforcing the Manhattan brokers' lack of knowledge of Brooklyn is a reduced financial incentive to make deals in Brooklyn, where rents (and therefore lease commissions) can be less than that of Manhattan. As a result, the Tech Triangle is not always presented to tenants as a viable option when they are conducting real estate selection activities.

To improve the Tech Triangle's reach and enable it to capture the potential market demand, a model unit grant program must be established to demonstrate that the current supply can be easily configured to meet the preferences of tech, and stronger marketing initiatives such as leasing and interior design competitions need to be developed to promote and support the continued growth of tech in the Tech Triangle.

Initiative 1A

## Model Unit Development Grant Program

The Model Unit initiative will provide funds to landlords of traditional office buildings to encourage the creation and leasing of model "plug-and-play white box" units for tech tenants, demonstrating reconfiguration possibilities which respond to tech preferences.

Under this program, landlords would apply for funds from the grants manager (possibly the Downtown Brooklyn Partnership), describing the proposed project including construction/fit-out scope, space dimensions, construction cost, and statement of financial need. The grants manager would then approve the project, indicating the level of funding to be provided. The landlord would sign a grant agreement with the grants manager and then undertake the work, funding the capital investment out of pocket. Once construction is complete, the grants manager would conduct a space walkthrough to approve the work and disburse reimbursement funds to the landlord based on paid receipts.

Initiative 1B

## Brooklyn BOLD (Building Office Leasing Downtown) Initiative

The Brooklyn BOLD initiative will cultivate excitement within the brokerage and tech communities for the Tech Triangle's real estate offerings with improved marketing campaigns, leasing competitions, and interior design contests. Focused on building office leasing in Downtown Brooklyn, the events and news items promoting the competitions and contests will create buzz about the Tech Triangle and promote it as a viable real estate option for tech and creative companies. The leasing competition will be similar to initiatives implemented by the New York City Economic Development Corporation in other parts of the City, such as Take the Helm for Lower Manhattan and the Race for Space in Staten Island. One approach would be to create a two-phase competition that will re-imagine our current stock of back office space and transform it into "Office Space of the 21st Century" and then actively recruit companies to occupy these spaces in exchange for free rent. The size of the awards, structure of the competition and selection process could be set by the funding and management organization.

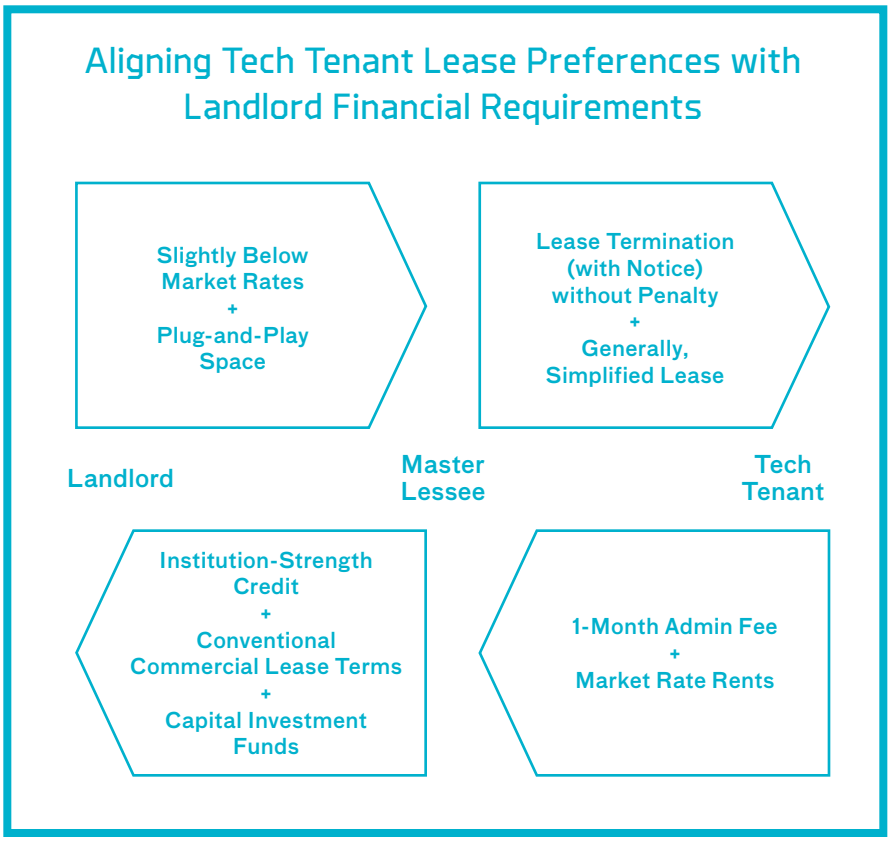
The interior design contest will build upon the Model Unit Development Grant Program by inviting cutting-edge interior design firms to reconfigure existing vacant space into vibrant useable space meeting tech's unique preferences. The winning interior design space could potentially be offered as an award to the leasing competition finalists.

Challenge 1B

**The rapidly evolving business structure of most tech companies prevents them from meeting traditional real estate and public incentive expectations.**

Tech's inherent need for flexibility limits its ability to commit to long-term leases or provide institutional credit. Rather, the nature of tech's typical business structure drives it to commit to shorter-term leases with low credit requirements preferring to occupy "plug-and-play" spaces requiring limited capital investment. However landlords require longer-term leases and creditworthy tenants to meet financing and portfolio requirements. The gap between the two parties creates a misalignment of resources and expectations resulting in obstacles for tech to lease space.

In addition, existing public incentives such as the Relocation and Employment Assistance Program (REAP) and Commercial Expansion Program (CEP) that encourage growing companies to relocate to the outer boroughs are not structured to align with the unique business model of tech, making it difficult for tech firms to take advantage of these incentive programs. Many times these programs are structured to be applied to tax liabilities, something that a number of small and growing tech firms do not have. In addition these incentives require longer-term leases and larger space requirements than tech companies have. Through the Master Lessee Program and Existing Incentive Reforms, requirements of landlord and existing incentives will be adjusted to align with tech's business structure.




**Initiative 1C**

## Master Lessee Program

The Master Lessee Program will align tech tenants' leasing preferences with traditional landlord financing requirements. As new and growing businesses, tech companies typically have limited credit and prefer short-term leases (e.g.,two to three years), while traditional landlords prefer tenants with institutional-quality credit who can commit to longer lease terms (e.g., 10+ years). This initiative would create or designate a creditworthy organization, possibly a subsidiary or affiliate of the Downtown Brooklyn Partnership backed by an institutional lender, to build a pool of potential tech subtenants while also managing a portfolio of up to 200,000 rentable square feet of office space in buildings in MetroTech or along Fulton Mall. Because the Master Lessee is willing to contribute to upfront capital work (e.g., $10 to $25 per rentable square feet), landlords will be expected to offer the Master Lessee rents which are modestly below market to help the Master Lessee amortize capital costs.

The Master Lessee would sign a standard 10-year gross lease with the building landlord and assume the obligation (and risk) of finding a new subtenant if the current subtenant vacates the premises prior to expiration of the Master Lease. The Master Lessee would also provide the Landlord with credit and coverage of turnover costs (vacancy and refurbishment) in addition to upfront capital contributions. The Master Lease would set the terms of the subtenant lease, and subtenants would have to commit to the pre-negotiated terms established by the Master Lease. The Master Lessee would identify and pre-qualify a pool of potential tech subtenants through marketing and outreach. When a space becomes available, the Master Lessee would market the space to its pool and identify an interested subtenant. The subtenant would

then sign the pre-negotiated term sheet, and pay an administrative fee, equivalent to one month's rent, to the Master Lessee. This administrative fee would help cover the Master Lessee's administration and programing costs as well as the rents owed to the Landlord during periods of vacancy. The subtenant would pay the Master Lessee market rents in return for a "plug-and-play white box" and the ability to terminate the lease early with no penalty.

**Initiative 1D**

# Existing Incentives Reform

The policy goals of REAP and CEP are to encourage companies to relocate to the outer boroughs, expanding employment options, and increase tenant occupancy in commercial properties. However, the unique business models and real estate preferences of tech companies make it difficult for them to take advantage of these incentive programs when moving to the outer boroughs.

The following reforms for each program are intended to increase eligibility among tech tenants, as described in more detail below:

### Relocation and Employment Assistance Program (REAP)

- Reduce lease term commitment. Tech tenants prefer short-term leases. A reduction in the minimum lease term requirement from three years to two years would increase eligibility among tech tenants.
- Expand property eligibility. Many buildings receiving the current Industrial and Commercial Abatement Program (ICAP) or its predecessor, the Industrial and Commercial Incentive Program (ICIP), are excluded from REAP even though the property improvements which resulted in ICAP/ICIP awards exceeded the thresholds required by REAP. The City should consider grandfathering these buildings to qualify for REAP.
- Extend eligibility to all tech firms graduating from City-approved incubators, regardless of location. Related to the previous point, tech firms graduating from incubators located in Lower Manhattan or Brooklyn are not eligible for REAP. The City should address this issue by extending eligibility to all businesses graduating from City-approved incubators.
- Reduce time in business requirement. A reduction of the time in business requirement from 24 to 12 consecutive months would help rapidly growing tech startups qualify for REAP.
- Change form of benefit from a tax credit to cash rebate. Because many tech firms do not have tax liability, changing the benefit from a tax credit to a cash rebate, payable for real estate-related costs only, would encourage more relocation to Brooklyn.

### Commercial Expansion Program (CEP)

- Reduce lease term commitment. As noted above, tech tenants prefer short-term leases. A reduction in the minimum lease term requirement from three years to two years (for firms of 1-125 employees) and ten years to five years (for firms 125+ employees) would increase eligibility among tech tenants.
- Expand property eligibility. Tech tenants require modern amenities more typically found in newer buildings. The City should consider expanding CEP eligibility to include properties constructed after January 1, 1999.
- Expand abatement period. For shorter leases (two to five years), the City should consider extending the full abatement period over the entire length of the lease instead of including a phase-out period at the end.
- Expand applicable businesses. Given that retail may serve as an amenity to attract tech tenants, the City should consider expanding the CEP benefit to local retailers.
- Reduce building size threshold. Certain tech firms prefer smaller floor plate buildings, typically less than 25,000 square feet. The City should consider reducing the building eligibility minimum to 5,000 square feet to capture tech companies that prefer smaller buildings.

**Challenge 1C**

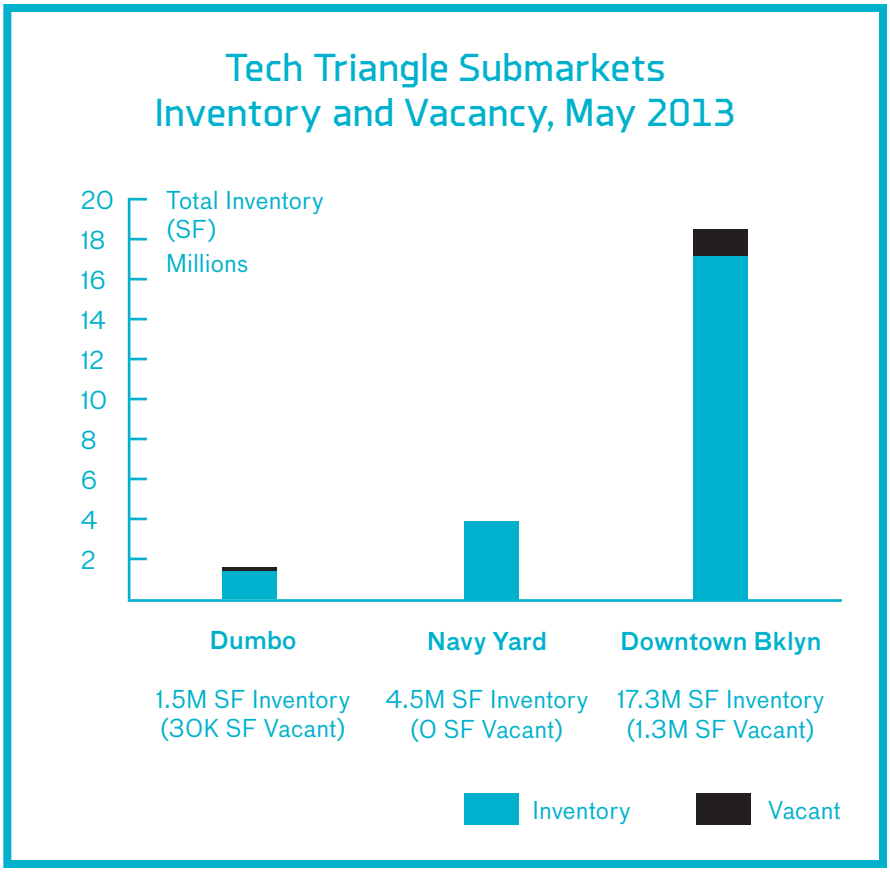
**Rents paid by tech companies do not justify the construction cost of new commercial space.**

Residential development yields three times the revenue of commercial development.

The Tech Triangle currently contains a total of approximately 25 million square feet comprised of approximately 17 million square feet of privately held office and industrial space, approximately 3 million square feet of government-occupied space and approximately 4 million square feet within the Brooklyn Navy Yard. Of the approximately 17 million square feet of privately held commercial space, only 4% is vacant.

Among the submarkets, Downtown Brooklyn represents the largest share of available space, while current space in DUMBO and the Navy Yard is fully leased. Compounding the supply constraints are the limited number of leases rolling in the coming years. The current vacancy represents one of the largest blocks of space available in the next decade, and the next large blocks of space will not become available until 2018. While this limited amount of available space today indicates a healthy office district

in comparison to other similarly sized central business districts, the overall lack of supply and underutilization of space (with respect to use and density of employment) is challenging for both tech companies that want to grow in the area and policy makers who want to incentivize landlords to modernize their portfolio for the new economy. In DUMBO and near the Navy Yard, vacant or underutilized buildings and developments exist; however, due to commercial rents, lack of financing for commercial development, and speculation of future residential rezoning, landlords are not incentivized to unlock these spaces for the industry. Initiatives to incentivize landlords to modernize their space and identify underdeveloped parcels ripe to house new commercial space are critical to the Tech Triangle's success in becoming the top tech hub in the nation.




*CoStar, BNYDC website, May 2013.*

**Initiative 1E**

## Commercial Modernization Incentive Program (CMIP)

Despite the growth of the commercial office market in New York City's outer boroughs, there is increasing discrepancy between the physical space needs of modern businesses (e.g., tech firms requiring open-plan layouts, natural light, and smaller spaces) and the existing configuration of available office supply (e.g., large floor plates with numerous private offices). A new tax incentive program designed to induce improvements in the existing building stock will help accommodate the needs of small- to mid-sized companies between 5,000 and 20,000 square feet, particularly tech firms.

To qualify for CMIP, a landlord would undertake capital improvements equal to or in excess of 20% of current assessed value. Eligible improvements would include the following:

- Demising of floor plates to create smaller units (5,000 square feet or smaller).
- Upgrading of lobbies, elevators, and mechanical equipment.
- Conducting building-wide infrastructure improvements to increase broadband access or obtain environmentally sustainable outcomes.
- Fenestrating and demising ground floor spaces for retail.
- Support storm surge and flood protection measures (e.g., elevating mechanical / electrical systems above Advisory Base Flood Elevations).

The CMIP would result in an exemption in a dollar for dollar tax credit for up to 50% of qualified costs. Rebates would be applied to the property value at the date of completion of the improvements. Property value would be capped at the pre-improvement value for ten years, including a five-year phase-out period.

**Initiative 1F**

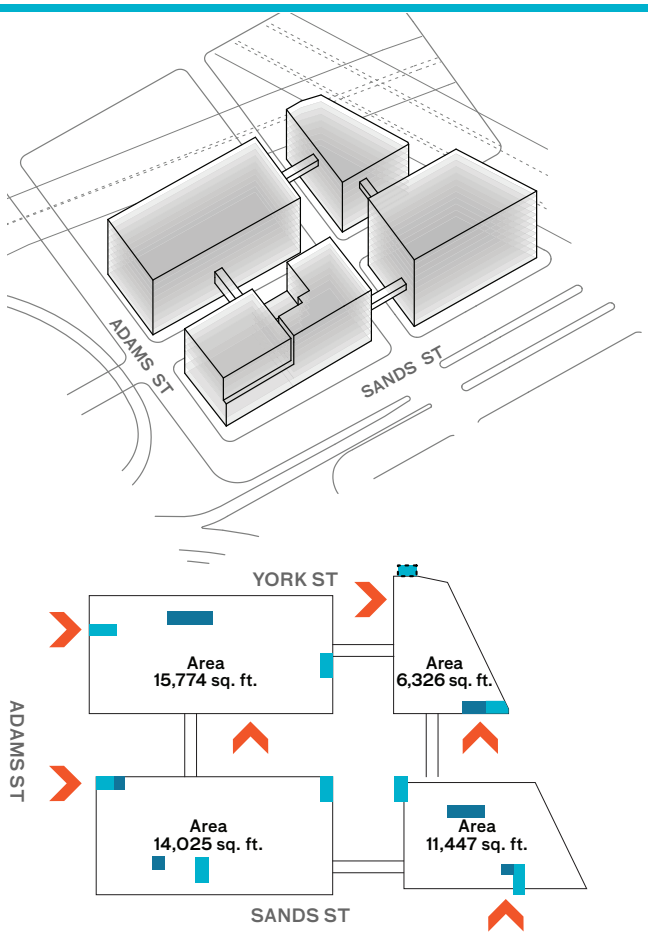
## Target Strategic Sites

There are a number of key sites, including existing warehouse or storage buildings, government-owned sites, and sites of parking lots, which could provide new commercial space. By creating a Special Innovation District with tools to incentivize conversion of existing spaces and new development, these sites present significant opportunity to open up new desirable office space and grow the cluster.

In the case of the Watchtower Properties on Prospect Street, there is significant potential to re-use this warehouse space for tech space. The Brooklyn Landing site is government-owned and currently occupied by NYC Department of Transportation (NYC DOT) vehicles. The City Tech/Concord Village site is currently a parking lot directly adjacent to the C train High

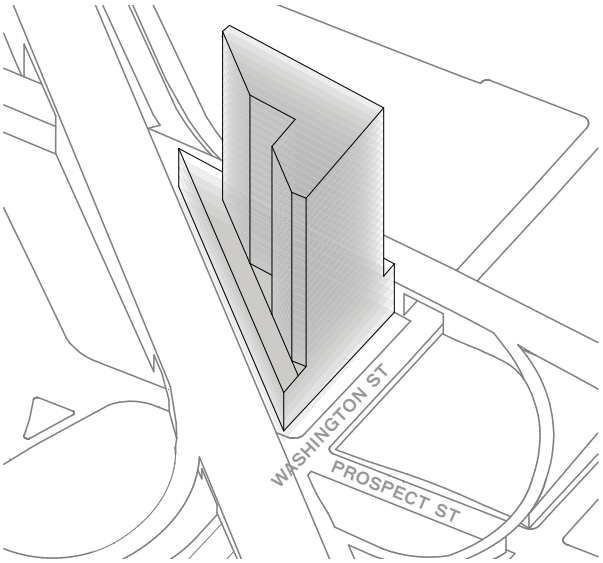
## Case Study 1: Watchtower Properties

The Watchtower Properties, zoned for commercial and manufacturing uses, represent up to 700,000 square feet of space for tech firms. Currently used predominantly for warehousing purposes, the conversion of these buildings for new tech space would provide any obvious stepping stone location for growing DUMBO firms and spaces for new tech arrivals. The activation of these buildings would start to tie Downtown Brooklyn and DUMBO closer together. With their large floorplates, the buildings are not ideal for residential uses and should be considered critical opportunity sites for expanding the supply of commercial space.




## Case Study 2: Brooklyn Landing

The triangular lot at the corner of Prospect Street and Washington Street is currently owned by the Department of Parks and Recreation and is used by the NYC DOT. As a temporary reinvention of this site we propose opening this as a public plaza with a balloon landing location in the center. As a new building site this lot could be rezoned as a contextual R7-1 with 437,000 square feet of developable space. This has potential as a residential dormitory and retail activation at the ground. To the right is a generic zoning massing, which can be further refined to allow a new access route under the Brooklyn Bridge onramp linking on a diagonal to Old Fulton Street.

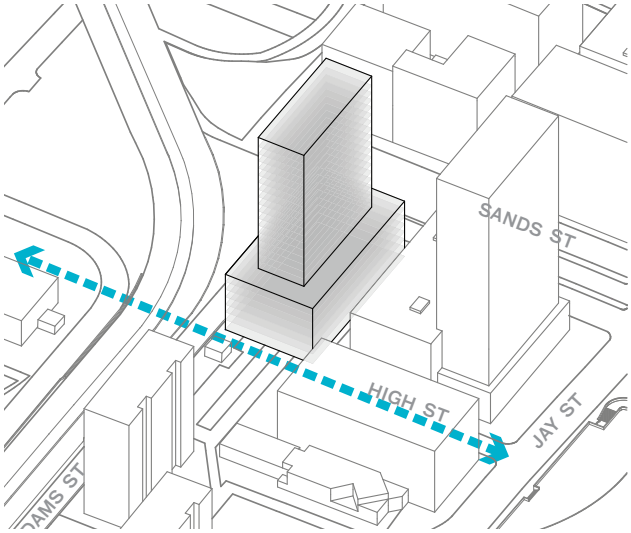


## Case Study 3: High Street City Tech/Concord Village

In the shadow of the Watchtower sites and disconnected in the East-West direction by the Brooklyn Bridge onramp, this key site could help strengthen the linkage between Downtown Brooklyn and DUMBO. Currently an underutilized peninsula space surrounded by Adams, Sands, and Pearl Streets, the site identified is two lots—a three-story building owned by City Tech and a privately run parking lot (not Concord Village parking), which is an extension of the Concord Village property.

If assembled with an easement for connecting High Street across, this would anchor and extend Pearl Street as well as support a necessary East-West connection in the half mile between Prospect Street to the North and Tillary Street to the South. An extended High Street would connect to the existing High Street station (A/C) entrance on the East edge of Adams Street and could be extended further by either an expanded tunnel connection below the Brooklyn Bridge onramp or a stop light and on-grade connection at this location.

If the site area is taken to an extended High Street edge, treating this as an easement between Pearl and Adams Streets (29,126 square feet), the total buildable area would be 100,193 square feet under current R7-1 (3.44 FAR) zoning. If rezoned to a contextual M1-6 (10.0 FAR), matching the existing Watchtower properties to the North and East, this site would have a potential of 291,260 square feet as shown in the massing. A second rezoning option allowing for a greater range of uses would be C6-2 (6.0 FAR) matching sites on the other side of Jay Street with an allowable 174,756 square feet. The site could be extended further to the South (existing Concord Village parking lot) as Concord Village is currently underbuilt.




## Case Study 4: Municipal-Owned Buildings in Downtown Brooklyn

One of the biggest opportunities for new tech space in Downtown Brooklyn is government-owned buildings. With a footprint of over 1.2 million square feet of commercial space surrounding Cadman Plaza, municipal-owned and -occupied buildings such as the Brooklyn Municipal Building at 210 Joralemon Street, 65 Court Street and the US Post Office and Courthouse at 271 Cadman Plaza East could be renovated and repurposed to create a new urban campus for entrepreneurs and startups as well as new retail opportunities to activate the ground level experience. By repurposing these assets, government could avoid having to spend additional money to renovate these aging facilities, while modernizing its footprint in newer, more efficient buildings.

Street entrance/exit. These sites are detailed below. There are other sites that should be considered as well, such as 53 Bridge Street, 29 Jay Street, and 195 Water Street.

**Challenge 1D**

**Tech does not recognize that all points of the Tech Triangle can meet their business and real estate needs.**

There is a fundamental challenge to building commercial space based on current construction costs. Financing of new commercial space, coupled with landlords' preference for creditworthy tenants, serves as a huge impediment to building commercial space. To justify ground-up commercial development, there needs to be rent of at least $50 per square foot; current rents in the Tech Triangle are less than $30 per square foot. As a result, there is no significant ground-up commercial construction within Brooklyn. Similarly, the economics of refurbishing warehouse or storage space into commercial space suitable for tech and creative companies do not stack up; retaining warehouse and storage uses is far more profitable. The challenge of incentivizing construction of new commercial space is complex, and given the speculative prices that can be fetched for residential conversions, the challenge in many cases goes beyond the value of the Commercial Modernization Incentive Program proposed above. For new space to be built in the Tech Triangle, landlords must be incentivized either through mixed-use zoning, air rights transfer, or securing of anchor tenants.

**Initiative 1G**

## Special Innovation District Concepts

The Special Innovation District is intended to create more active space for the innovation economy in existing storage and warehouse buildings. Currently there is a considerable amount of underutilized space, including more than 1.2 million square feet of space just within the five largest self-storage and warehouse buildings between Flushing Avenue and Park Avenue. The Special Innovation District would allow some residential uses to subsidize the conversion of low-employment short-term storage and underutilized industrial buildings into high-employment innovation economy commercial and light industrial space. These uses would also fit with the emergent live-work preferences of tech sector and innovation economy workers. This model could potentially be applied to other targeted areas along the Brooklyn-Queens waterfront. Conceptually, the Special Innovation District would allow:

- The owner of short-term storage or underutilized industrial space to sell their property at a price in keeping with commercial/light-industrial use to a mission-driven nonprofit or a deed-restricted private owner who will convert the space to high-employment commercial/light industrial use. In exchange, the prior owner receives a credit that allows building ground-up 80/20 housing elsewhere in the district.
- The owner to sell or long-term lease a portion of the building to a mission-driven nonprofit, in exchange for the ability to convert the balance of the building to housing. Alternatively, the owner could accept a covenant on a portion of the space for commercial/light industrial space in return for the ability to convert the balance of the building to housing.

**Initiative 1H**

## Creative Financing for Commercial Rehabilitation

There is currently a dearth of financing programs available for the renovation of affordable commercial/light industrial space. By contrast, in the affordable housing world there are numerous financing and tax incentives available. While more creative financing programs need to be developed to meet this need, two existing programs that should be used more broadly is the City's Industrial Development Agency program to finance multi-tenanted commercial/light industrial building upgrades and a new, targeted component of the EB5 federal program, which has been successful in financing buildings in the Brooklyn Navy Yard. The overlap of interests between the need for construction financing and foreign visas to provide talent for tech workers merits further study.

**Initiative 1I**

# Fulton Mall and Downtown Brooklyn Concepts

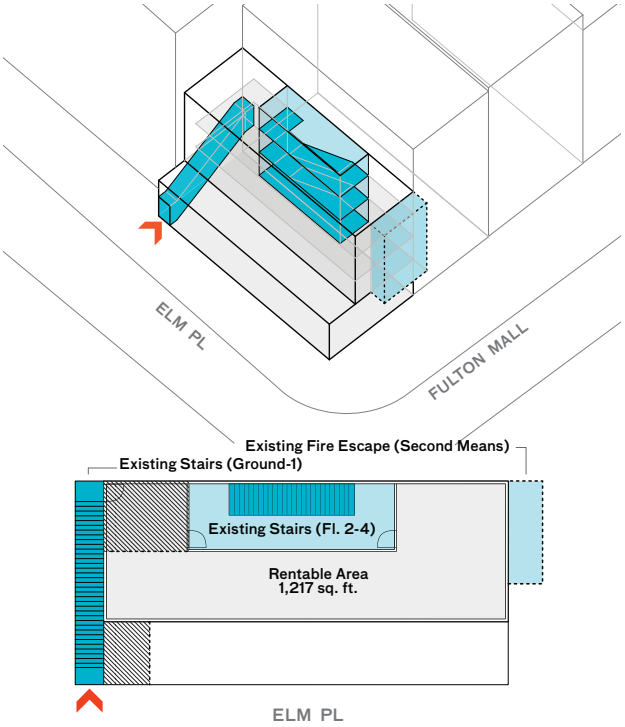
The spaces above retail stores on Fulton Mall are not being used and are often boarded up, which works to the detriment of the Fulton Mall sub-district environment. One way to improve and repurpose upper floor spaces would be to allow the transfer of air rights from Fulton Mall to other sites in the Special Downtown Brooklyn District rezoning area in return for the rehabilitation of the upper floor space. In addition, another approach to generate commercial space in Downtown Brooklyn would be to allow additional FAR for commercial uses only. This would face the challenge of dual cores and ingress/egress issues. Perhaps an examination of antiquated NYC Department of Buildings requirements related to segregated residential and commercial building access is required today as the lines between live and work continue to blur.

## Case Study 5: 472 Fulton Street (+adjacent buildings)

This site could be a pilot project demonstrating the potential for upper floor space transformation along Fulton Street. Compared to other sites that may require more intensive renovation to comply with code and egress requirements, 472 Fulton has one central means of egress that exits onto Elm Place and a secondary fire escape along Fulton Mall. The existing stairs are in poor condition and will require structural and material upgrades along with the floor finishes and new windows. The street entrance will also need to be improved for visibility and appeal for tech tenants.

Other sites along Fulton Street have the potential to connect units along the Fulton Mall edge to create larger floor plates. However, many of these buildings currently use their upper floor as storage space and face the challenge of achieving a second or even first means of egress, as stairs have been removed. Combining multiple upper floor units could address the issue of accessibility along Fulton Street as well as address egress requirements set forth by NYC Department of Buildings. To comply with code requirements, there would need to be two means of egress within 200 feet (300 feet, if there is a sprinkler system). In addition, the means of egress provided would need to be separate from the egress provided by the ground-floor retail tenant.

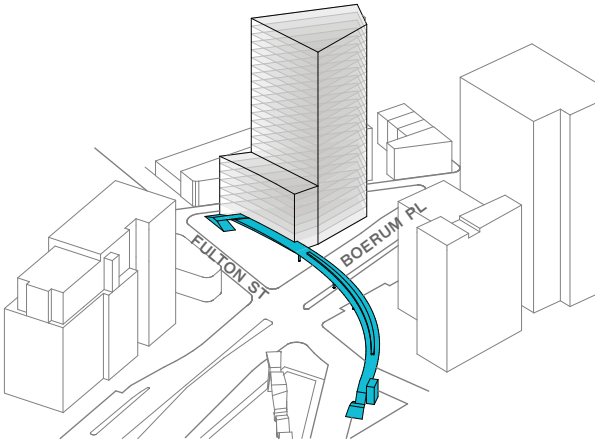
Identifying existing entrances or potential entrances along Fulton Street is rather complex. Entrances located in the center of the block would require coordination with one of two ground-floor tenants to provide access. For example, if 470, 466, and 460 Fulton Street were connected to 472 Fulton Street, these four buildings (150 feet x 75 feet deep) could be thought of as one fire-protected enclosure. Stairs along the parting wall of 472 and 470 could be combined to allow for egress along Elm Place, which is currently challenged by staggered floor levels. The second means of egress would likely need to be located on Fulton Street because the interior buildings are taller than the corner building, thereby rendering the fire escape stairs as insufficient.

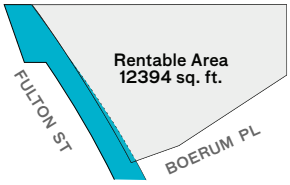


### Case Study 6: 1 Boerum Place

Sitting at the key intersection of Downtown Brooklyn, the 1 Boerum Place site provides a unique opportunity for continuing the development of public space and new retail and office space. Within the Special Downtown Brooklyn Zoning District, this site has a height limit of 250 feet and total allowable square footage of about 221,000.

By connecting with a wide curved pedestrian bridge from the Southeast corner of Columbus Park and setting back the massing with a generous plaza in front, this site has the potential to extend the influence of Willoughby Plaza to the West along Boerum Place and provide new gateway retail at the Northwest end of Fulton mall. The resulting massing is significantly lower than the new towers (at 500+ feet high) along Willoughby Street and could be extended to a contextual 280 feet aligning with the Brooklyn Law School tower to the West.



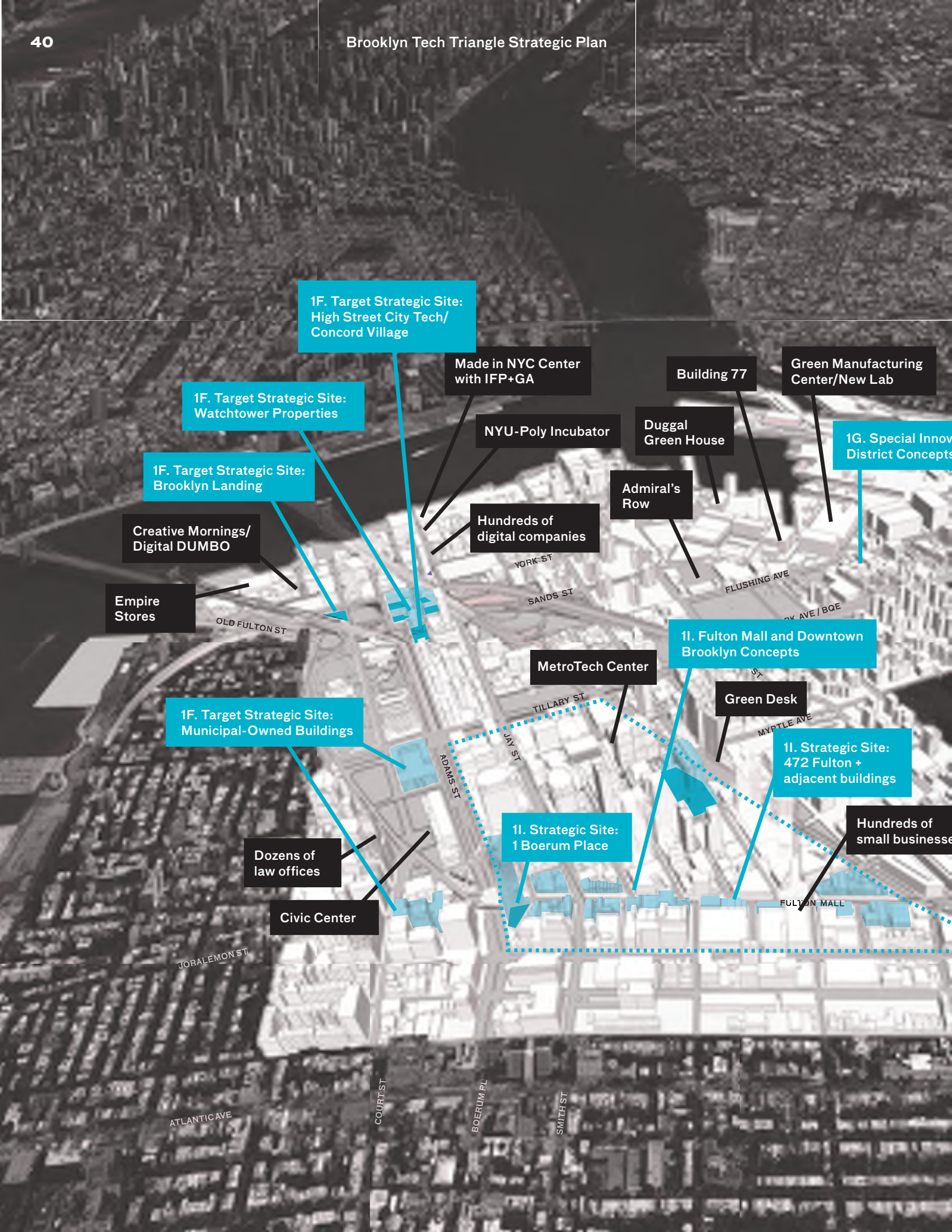

**Initiative 1J**

# Commercial Supply Expansion

Any new commercial building constructed in the Brooklyn Tech Triangle will require one or more anchor tenants to secure construction financing. By relocating the identified anchor tenants from older buildings to new construction in the Tech Triangle, the spaces left behind could be leased to tech firms. Some potential anchors for new buildings include the following:

- Government: Existing government agencies in Downtown Brooklyn occupy close to 3 million square feet of owned and leased property. Using government tenants to anchor new commercial space and reposition existing space is a tried and true method successfully used throughout the City including at World Trade Center I (1970-1973) and World Trade Center II (2010-2013).
- Institutions: A number of education and healthcare institutions are located in Downtown Brooklyn including NYU, Brooklyn Law School, and LIU Brooklyn. Depending on their space and business needs, these and other similar institutions could be targeted as potential anchor tenants of new commercial property.
- Established tech companies: Large tech tenants like Huge and Etsy and established companies such as Google, Amazon, Yahoo, and others outside of the Tech Triangle have the financial strength, space, and business requirements which position them to become an anchor tenant of new commercial property. Should these firms relocate within the Brooklyn Tech Triangle, new tech firms will fill the vacancy and the overall tech cluster in the Brooklyn Tech Triangle will strengthen.

Finally, the City should work with the Downtown Brooklyn Partnership, DUMBO Improvement District, and the Brooklyn Navy Yard Development Corporation to determine whether and how tech space may be facilitated in new commercial or mixed-use public-private development projects. The City could potentially leverage its assets to encourage developers to create tech-focused office space.


1F. Target Strategic Site: High Street City Tech/ Concord Village
Made in NYC Center with IFP+GA
Building 77
Green Manufacturing Center/New Lab
1F. Target Strategic Site: Watchtower Properties
NYU-Poly Incubator
Duggal Green House
1G. Special Innov District Concepts
1F. Target Strategic Site: Brooklyn Landing
Admiral's Row
Creative Mornings/ Digital DUMBO
Hundreds of digital companies
YORK ST
SANDS ST
FLUSHING AVE
Empire Stores
OLD FULTON ST
1I. Fulton Mall and Downtown Brooklyn Concepts
MetroTech Center
Green Desk
TILLARY ST
MYRTLE AVE
1F. Target Strategic Site: Municipal-Owned Buildings
JAY ST
ADAMS ST
1I. Strategic Site: 472 Fulton + adjacent buildings
1I. Strategic Site: 1 Boerum Place
Hundreds of small businesse
Dozens of law offices
Civic Center
FULTON MALL
JORALEMON ST
ATLANTIC AVE
COURT ST
BOERUM PL
SMITH ST


# 1

# SPACE FOR TECH TO GROW

**Initiatives**

1A. Model Unit Development Grant Program
1B. Brooklyn BOLD Initiative
1C. Master Lessee Program
1D. Existing Incentive Reform
1E. Commercial Modernization Incentive Program
1F. Target Strategic Site: Watchtower Properties (on map)
1F. Target Strategic Site: Brooklyn Landing (on map)
1F. Target Strategic Site: High Street City Tech/Concord Village (on map).
1F. Target Strategic Site:Municipal-Owned Buildings in Downtown Brooklyn
1F. Target Strategic Site: Municipal-Owned Buildings (on map)
1G. Special Innovation District Concepts (on map)
1H. Creative Financing for Commercial Rehabilitation
1I. Fulton Mall and Downtown Brooklyn Concepts (on map)
1I. Strategic Site: 472 Fulton +adjacent buildings (on map)
1I. Strategic Site: 1 Boerum Place (on map)
1J. Increase Commercial Supply Expansion

COMPONENT

# A NEW TECH ECOSYSTEM

The rapid growth of digital tech companies and tech-driven manufacturing in the Brooklyn Tech Triangle has prompted an effort to meet the workforce needs of this job-intensive sector and provide quality employment opportunities for local residents. Brooklyn is the fastest growing tech community outside of Silicon Valley, and projections highlight the potential for 14,800 to 22,000 tech workers in the Tech Triangle by 2015.

The goal of creating a tech ecosystem is to build a talent pipeline that addresses the range of skills needed for the tech cluster, from complex coding to entry-level positions, and that attracts firms from around the world through training people from Brooklyn neighborhoods and New York City universities. This ecosystem will dovetail with efforts like P-Tech and K-12 STEM programs and will also create synergies with companies in the area.

The Tech Triangle consists of a diverse and generally well-educated workforce—12 colleges and universities, more than half of the working-age population hold a bachelor's degree or higher, and the public high schools report a 77% graduation rate. However there are pockets of under-skilled, under-credentialed workers as well. For example, 12% of Tech Triangle residents have not attained a high school diploma or the equivalent, and 11% of 16- to 24-year-olds are referred to as "disconnected youth," those who are neither enrolled in school nor working. For these area residents there is a mismatch between thir knowledge and skill sets compared to experience required by employers in the Tech Triangle.

Employment opportunities for the Tech Triangle's workers are diverse. There is a great deal of entrepreneurial work underway in the Tech Triangle with digital marketing and design in DUMBO, science and technology activities in Downtown Brooklyn, and production activities taking place at the Brooklyn Navy Yard. That said, the businesses and associated jobs do not fit the traditional classifications and descriptions due to their entrepreneurial and cross-disciplinary nature, and rapid technological changes. These new and evolving skill gaps, combined with a labor shortage articulated by Tech Triangle businesses, create an opportunity for Tech Triangle postsecondary institutions to meet the area's workforce needs.

There are building blocks and a great deal of good work taking place across the age and skill spectrum to help train and prepare the Tech Triangle residents for technology and creative jobs. Examples of these are BLDG 92 at the Brooklyn Navy Yard which houses the Employment Center and has placed more than 1,500 workers over the past ten years; the K-12 STEM Education Program at NYU-Poly, which is active in 27 Brooklyn elementary, middle, and high schools; the 54 career and technical education programs in Brooklyn High Schools; the Opportunities for a Better Tomorrow programs preparing disconnected youth for technician jobs at Shiel Medical; the Made in New York Production Assistant Program to train 60–70 production assistants each year; Perscolis technology training programs; the New York City Housing Authority (NYCHA) Training Academy to prepare public housing residents for jobs with NYCHA; Brooklyn Tech High School, among the top high schools in the country, that prepares its students for further education in the fields of technology and engineering; and the recently announced Brooklyn Technology and Education Consortium (B-TEC), a taskforce aimed at preparing Brooklyn's most underserved communities for careers in the tech industry.

Training programs such as the Hacker School, The Flatiron School, and General Assembly provide high-end, deep-dive training in web development, coding, design, and other technical areas. Businesses themselves are also in the mix, with companies such as Technology Services Corporation and Cisco Systems providing training in the Tech Triangle.

Across the country, regions are addressing talent pipeline needs in creative ways to leverage local resources and expand economic opportunities.

- In Wisconsin, the SC Johnson Integrated Manufacturing and Technology (iMET) Center is a public/private partnership that serves the training needs of business, industry, and individuals within their geographic service areas. (http://www.gtc.edu/location/sc-johnson-imet-center)
- In San Francisco, the Mid-Pacific ICT Center (MPICT) coordinates, improves, and promotes information and communication technologies (ICT) education through research, conferences, faculty development, community-building activities, business and industry interactions, best practice dissemination, and resource sharing. (http://www.mpict.org/)
- Through Opportunity Chicago, the City of Chicago trained and placed over 5,000 unemployed public housing residents in jobs over a five-year period. (http://cjc.net/opportunity-chicago/)
- The EntreTech Forum in greater Boston consists of monthly panel discussions on emerging academic research and the commercialization of this technology. (http://entretechforum.org/)

- **Challenge 1: New tech jobs, from advanced manufacturing to coding, require specific training.**
- **Challenge 2: The unique synergies between tech, universities, and local schools need to be more closely drawn together so that tech needs are met and local graduates have local opportunities.**
- **Challenge 3: The retail and cultural communities need to be pulled into the Tech Triangle to truly make a dynamic live-work-play ecosystem.**

Challenge 2A

**New tech jobs, from advanced manufacturing to coding, require specific training.**

*Rendering of potential new building along Navy Street, part of Admirals Row, possible location of innovation hub.*

Tech firms are increasingly turning to specific, non-accredited programs to find the best talent. Likewise, advanced manufacturing companies are finding that a specifically taught workforce, often trained first through internships or bespoke programs, can be very reliable over longer periods of time.

### Initiative 2A

## Coder Training Program

Workforce preparation from entry level through incumbent worker training will be developed and delivered in response to the needs of media, creative, manufacturing, and tech businesses in the Brooklyn Tech Triangle and throughout New York City. These education and training programs must leverage public and private education and training programs, and provide for the skills and competencies as well as credentials needed to enter and advance in career-track jobs.

A first step will be the Web Development Training Program. This immediate opportunity dovetails with the New York City Department of Small Business Services (SBS) interest in supporting New York City's tech industry. SBS has determined a need for web developers within the Tech Triangle and across New York City. A Tech Triangle Web Development Training Program can be designed as a short-term, deep-dive training program.

### Initiative 2B

## Internship Expansion

The Tech Triangle College Internship Program would involve placing 50 college students in internships with technology employers in the Tech Triangle. The program will build on and expand the efforts under way through the Brooklyn Navy Yard Summer Internship Program and the newly implemented high school/college internship program. The internship program will offer interns hands-on experiences through discrete projects with Tech Triangle employers. The program will also provide an opportunity for employers to train students as interns, with the potential to hire them upon graduation. The internship program will be managed by the Brooklyn Navy Yard Employment Center, in partnership with the Downtown Brooklyn Partnership and the DUMBO Improvement District.

### Initiative 2C

## Tech Triangle Innovation Hub

The proposed Brooklyn Tech Triangle Innovation Hub would be a nonprofit, public-private venture designed to meet the education and training needs of technology, creative, media, and advanced manufacturing firms at the Brooklyn Navy Yard, throughout the Brooklyn Tech Triangle, and across the City. It would build on promising practice at the CUNY schools, private institutions, technology training schools, and community-based organizations, and provide for recruitment, assessment, training, hands-on experience, career placement, and follow-up services.

The Innovation Hub would also leverage research and development efforts under way in local schools and at the Navy Yard-based New Lab, a collaborative of design firms and universities located in a cutting-edge facility that will promote design and manufacturing innovation using the latest in environmentally-conscious processes and machinery.

The Innovation Hub would be housed in the Brooklyn Navy Yard with programs implemented by the area's higher educational institutions, community-based organizations, private technology schools, and other entities as appropriate. The Hub would be established to create a talent pipeline for Brooklyn Tech Triangle businesses, and technology-focused businesses throughout New York City, while at the same time providing local residents with the skills they need to enter and advance in careers in technology, creative, media, and advanced manufacturing.

As the services grow, the Innovation Hub may emerge as a center for establishing model programs and curricula meeting the needs of the creative/tech sector that could be used both within the Brooklyn Tech Triangle and across New York State and the country.

The Innovation Hub has the potential to attract funding from a variety of public

and private sources including: President Obama's Manufacturing Innovation Hub initiative and the National Science Foundation's Advanced Technological Education Centers program; Governor Cuomo's new Next Generation College Linkage, NYCUNY 2020 programs, and Innovation Hot Spots; and Mayor Bloomberg's Made in New York initiative, a network of technology incubators, and applied sciences schools. The Innovation Hub could also potentially align with the priorities of private funders such as the Robin Hood Foundation, corporate investments, and sponsorship from the Tech Triangle and other New York City-based technology firms.

**Initiative 2D**

## Support NYU Center for Urban Science and Progress

In 2012, Mayor Bloomberg designated a major new applied sciences campus—the Center for Urban Science and Progress (CUSP)—in Downtown Brooklyn to tackle urban challenges with New York City as its laboratory and classroom. CUSP will set the research agenda for "the science of cities" and will "educate the next generation of engineers in how to apply that research, bring innovative ideas to a world market, and create a new, fast-growing, and indispensible industry." CUSP's long-term home will be 370 Jay Street, an underutilized building at the crossroads of Downtown Brooklyn. CUSP will serve as a catalyst for new entrepreneurial ventures and an anchor for established tech companies.

Challenge 2B

**The unique synergies between tech, the universities and local schools need to be drawn more closely together so that tech needs are met and local graduates have local opportunities.**

In order to get more local graduates into Tech Triangle jobs, there are a range of collaborative efforts that can be undertaken between educational institutions and tech firms. The Strategic Plan, over the last few months, has gotten this process started.

**Initiative 2E**

## Curriculum Alignment

An ongoing dialogue within the Tech Triangle between local colleges and universities and employers in the tech and creative industries is necessary. To that end regular meetings, interactions, and activities aimed at better aligning curriculum to employer talent pipeline needs should occur. Activities would involve focus groups, utilizing technology to refine curriculum, implementation of pilot initiative, documentation, and dissemination of the process and results.

**Initiative 2F**

## K-12 STEM Expansion

Encourage NYU-Poly to build out their STEM initiative to include additional Tech Triangle employers. The purpose would be to expand on teacher training and experiential learning available to students in the 27 Brooklyn-based partner schools and build on the recommendations of B-TEC.

Challenge 2C

**The retail and cultural communities need to be pulled into the Tech Triangle to truly make a dynamic live-work-play ecosystem.**

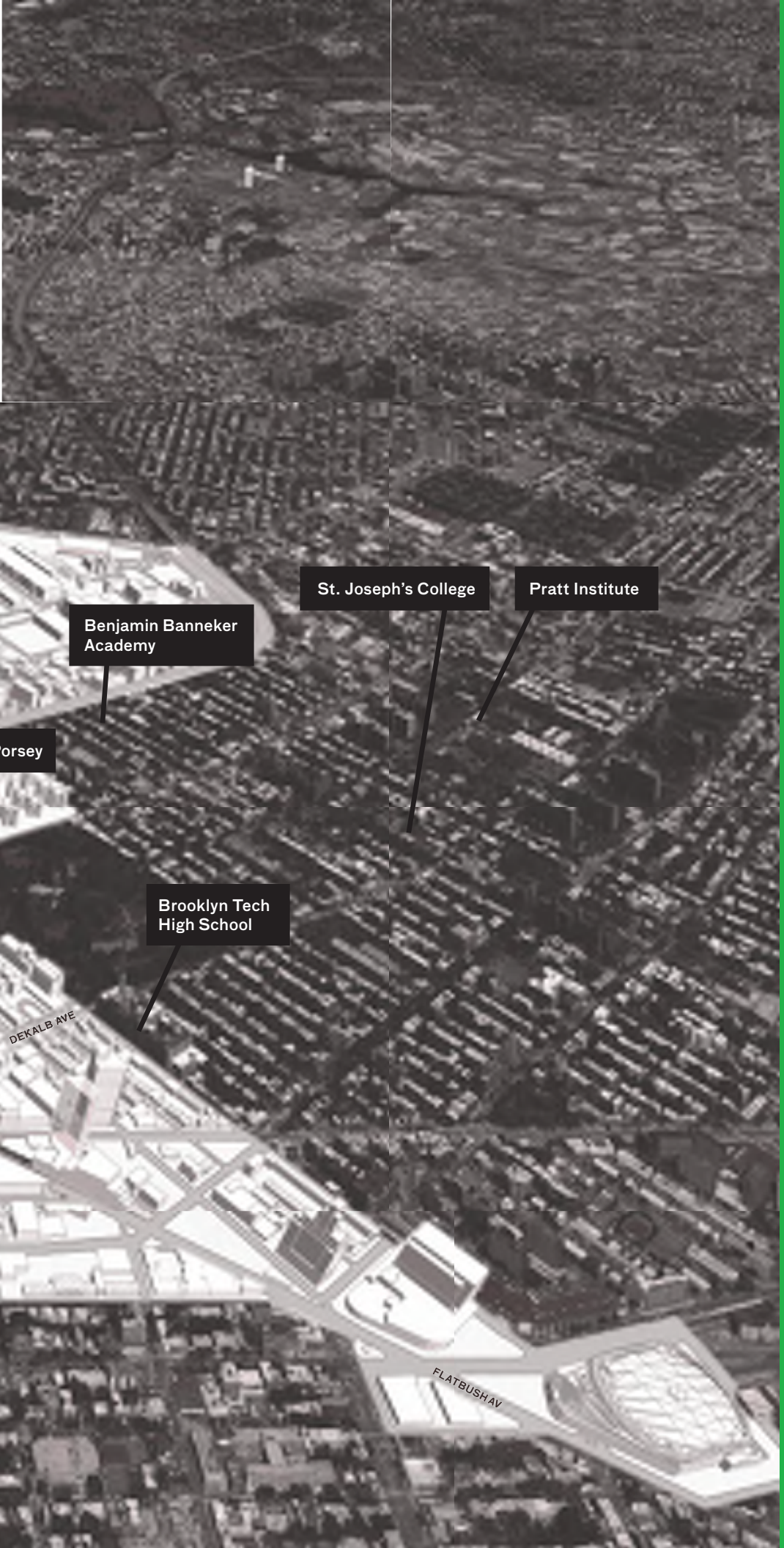
The synergies within the Tech Triangle should include other institutions, from the Brooklyn Academy of Music and BRIC to West Elm's Retail Group. The Tech Triangle's appeal lies with its ability to play off a live-work-play continuum that creates a dynamic space for innovation.

**Initiative 2G**

## Maker Product Development Center

This initiative would create a hub for "physical makers" in the Tech Triangle, to create a self-enhancing network of support for these makers at all stages of maturity, clustering them to leverage expenses and expertise, and using this community as a draw for like-minded producers and consumers. A key component of this goal is the creation of a make/sell environment, providing the incubator space that would allow makers to both create and sell their products in collaboration with DUMBO-located groups such as West Elm and Etsy. Utilizing the social component of co-working through shared expertise and expenses—along with the addition of resources providing small business services, mentorship, and networking—there is an opportunity to support and grow the local maker community to drive job creation and economic development.


2C. Tech Triangle Innovation Hub
PS 307 Daniel Hale
Freedom Academy High School
Building 92
New York City College of Technology
McKinney Secondary School
WATER ST
YORK ST
PS 287
2G. Maker Product Development Center
FLUSHING AVE
Brooklyn International High School
PS 67 Charles P
PARK AVE / BQE
Westinghouse Career and Technical Education
Institute of Design and Construction
City Polytechnic High School
TILLARY ST
MYRTLE AVE
LIU Brooklyn
NYU-Poly
JAY ST
ADAMS ST
UA Institute of Math & Science for Young Women
2D. Support NYU CUSP
2A. Coder Training Program
Brooklyn Law School
FULTON MALL
St. Francis College
St. Joseph's High School
SUNY Empire State College
Berkeley College
ASA College
COURT ST
BOERUM PL
SMITH ST
ATLANTIC AVE




# 2

# A NEW TECH ECOSYSTEM

**Initiatives**

2A. Coder Training Program (on map)
2B. Internship Expansion
2C. Tech Triangle Innovation Hub (on map).
2D. Support NYU Center for Urban Science and Progress (on map)
2E. Curriculum Alignment
2F. K-12 STEM Expansion
2G. Maker Product Development Center (on map)

COMPONENT

# CONNECTIONS ACROSS THE TECH TRIANGLE

It is easier to get to Manhattan from Downtown Brooklyn than it is to other parts of the Tech Triangle. Traveling between points within the Tech Triangle neighborhoods of DUMBO, Downtown Brooklyn, and the Navy Yard by modes other than car is a challenge. Bus service and subway stations are clustered in certain areas such as Cadman Plaza and Jay Street/MetroTech. Some stations are difficult to find for those unfamiliar with the area and some stations, such as the High Street station for the A/C trains, and can leave a person in a "no man's land" in the midst of parking lots, cut off from adjacent neighborhoods.

Pedestrian and bicycle connections should be strengthened within the study area, particularly along the key corridors of Cadman Plaza East, Jay Street, and Flushing Avenue through transportation enhancements such as traffic calming improvements, geometric modifications, and streetscape treatments. The development of low cost, short-term remedies, as well as longer-term, capital-intensive solutions would soften these barriers. In addition, pedestrian and bicycle treatments have been focused on establishing and strengthening distinct, safe north-south and east-west connections—connections currently constrained by highway off-ramps and bridge/highway infrastructure. While Sands Street, Navy Street, and Flushing Avenue are well-established east-west corridors, connections to the north and south of this axis are lacking.

Jay Street is a primary corridor that could connect Downtown Brooklyn and DUMBO. However, Jay Street lacks a two-way bicycle route for a portion of its length, and is also not an established connection on most pedestrians' mental map. A two-way bike lane along Jay Street would create a safe cycling path from Downtown to the water. Lastly, New York City's bike share program has tremendous potential to provide more travel options for tech workers. Bike sharing will be important to provide first-mile/last-mile transportation to many existing and future cyclists, bridge numerous gaps in the bus and subway network, and provide more convenient transportation for shorter trips.

The MTA's approval of the extension of the B67 bus route, which would connect Kensington, Park Slope, and Downtown Brooklyn to the Navy Yard and southern Williamsburg, is an important first step to getting people to the Navy Yard, and additional measures can be taken to improve access from northern Brooklyn and the ferry stop at Shaeffer Landing to the Tech Triangle. Many people working in the Tech Triangle area live in Williamsburg/Greenpoint and providing convenient transit access is critical. Recent news of a proposed "nerd" ferry connecting points along the East River (including the Cornell-Technion campus on Roosevelt Island) to a proposed landing at Jay Street would also strengthen ties with northern Brooklyn and Manhattan. The East River Ferry service has proven to be even more popular than projected, providing a direct transit route between Brooklyn's waterfront neighborhoods, and the Plan encourages ferry landings at the end of Jay Street and the Navy Yard.

A 21st-century trolley service that connects Barclays Center with Downtown Brooklyn and DUMBO and all the way to Brooklyn Bridge Park could be implemented within a very short timeframe and as part of a larger marketing strategy. The marketing effort would include branding the shuttle bus with a name to gain exposure and attract potential riders. The shuttle vehicle might also include bike racks to further extend its usefulness and the range of its passengers.

- **Challenge 1: The Brooklyn Navy Yard needs to be better connected by public transportation.**
- **Challenge 2: Jay Street needs to be an active, walkable corridor all the way from Downtown to the East River.**
- **Challenge 3: Making east-west connections are difficult.**
- **Challenge 4: There should be better transit connections between Barclays Center and Brooklyn Bridge Park.**

*A view of the Brooklyn Navy Yard from the East River.*

**Challenge 3A**

**The Brooklyn Navy Yard needs to be better connected by public transportation.**

As the Navy Yard increasingly becomes a center of employment, there is a need to establish better transit connections, such as frequent buses from nearby subway stations and ferry landings.

**Initiative 3A**

## B67/B24 Extension

The Plan proposes the extension of the B67 route from Kensington/Park Slope/Downtown Brooklyn/York Street station terminus to Wythe Avenue. This would allow for links to the J/M/Z train. This proposal requires the two-way conversion of York Street between Bridge and Jay Streets.

The Plan also proposes extending the B24 routes from southern terminus at Williamsburg Bridge Plaza to enter the Navy Yard at Clymer Gate and then follow the same routing as the B67 through the Navy Yard to York Street station. The extension of the B24 route would create a new single route connection from Greenpoint and Williamsburg, linking L train stops to the Navy Yard and to DUMBO.

The B67 extension in combination with the B24 extension would mean eight buses per hour between York Street and the Navy Yard.

**Initiative 3B**

## Navy Yard Ferry Landing

There is clear interest from Navy Yard businesses for a ferry landing within the Navy Yard. While a location has not been set out, future studies should look at suitable locations.

*An aerial view of DUMBO, flanked by the Manhattan Bridge and Brooklyn Bridge, and greater Downtown Brooklyn.*

**Challenge 3B**

**Jay Street needs to be an active, walkable corridor all the way from Downtown to the East River.**

The Jay Street corridor is the prime connection between DUMBO and Downtown Brooklyn and is also one of DUMBO's main streets. Yet the street faces several challenges, including a major crossing at Tillary Street, poor pedestrian and cycling access on the east side of Jay Street by the Manhattan Bridge, and a circuitous route underneath the Manhattan Bridge at Sands Street.

**Initiative 3C**

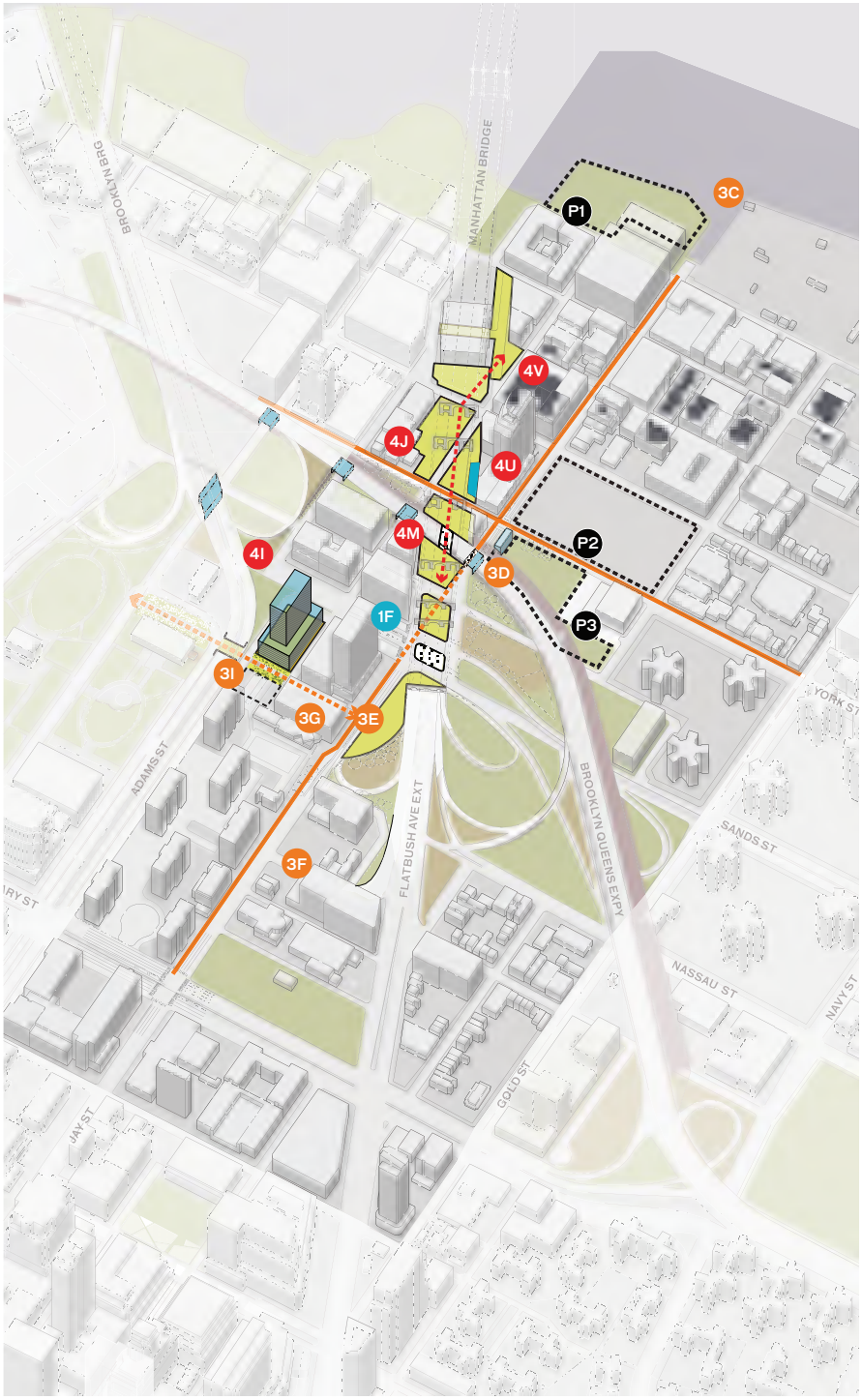
## Jay Street Ferry Landing

The Plan proposes a new ferry landing at the end of Jay Street that would connect to the larger ferry network on the East River, from the Upper East Side to South Brooklyn. Ensuring that ferry tickets could be tied-in with MetroCards could increase commuter ridership as people could transfer from bus/train to ferry. Currently the York Street station is the primary means of public transit to DUMBO, and its ridership over the last few years has been increasing substantially. A ferry landing at the end of Jay Street as part of the final expansion of Brooklyn Bridge Park would provide another important means of access to DUMBO, particularly from tech workers in Williamsburg and Greenpoint. In addition, the ferry landing would continue to strengthen Jay Street as a key corridor all the way to the water's edge.

**Initiative 3D**

## Jay Street bike improvements between York and Sands Streets

Currently bicyclists are supposed to use Pearl Street as the designated exit from DUMBO toward Downtown Brooklyn, but many riders illegally use Jay Street between York and Sands Streets to link up with the Jay Street bike corridor. The Plan proposes that a two-way bike lane be established on this section of Jay Street to allow cyclists to make this logical connection.




*3C. Jay Street Ferry Landing*
*3D. Jay Street Bike Improvements between York and Sands Street*
*3E. Linking Jay Street beneath the Manhattan Bridge*
*3F. Two-Way Bike Lane on Jay Street between Tillary and Sands Streets*
*3G. York Street Station Southern Entrance onto Jay Street*
*3H. A/C High Street Station Connector*
*4I. Tech Terrace*
*4J. DUMBO Dogs*
*4M. Extending the Diagonal to Sands Street*
*4U. York Street Station Lighting*
*4V. Under the Bridge Lighting*
*P1. Brooklyn Bridge Park – Future park area, John Street site*
*P2. Development Lot – Funding for Bridge Park 2 renovation*
*P3. Bridge Park 2 – Renovation to active recreation*

### Initiative 3E

## Linking Jay Street beneath the Manhattan Bridge

To allow a safe pedestrian flow along Jay Street from Downtown Brooklyn to DUMBO, the Plan suggests strengthening the pedestrian path along the west side of Jay Street, including the crossing of Sands Street. At this point, a discrete pedestrian path should cross diagonally underneath the Manhattan Bridge, reconnecting to Jay Street within DUMBO and leading down to York Street. Signage, lighting, and paving materials should reinforce this path.

### Initiative 3F

## Two-Way Bike Lane on Jay Street between Tillary and Sands Streets

Given the challenges of cycling along Jay Street due to the Manhattan Bridge vehicular off-ramp, the Plan proposes a two-way cycling route on Jay Street between Tillary and Sands Streets. At the intersection of Jay and Sands Streets, it is suggested that cyclists cross on the southern side of Sands Street onto the sidewalk, which would allow for connections to the Manhattan Bridge cycle route or the cycle route to DUMBO beneath the Manhattan Bridge.

### Initiative 3G

## York Street Station southern entrance onto

*Jay Street is a critical multi-modal connector for Downtown Brooklyn and DUMBO.*

# Jay Street

**(south of Sands Street)**
The Tech Triangle Strategic Plan proposes a southern entrance for the York Street station F train onto the western side of Jay Street near the new City Tech building at 300 Jay Street. The recent and planned development activity in this area would benefit from this new entrance. The proposed subway entrance would also create more foot traffic along this section of Jay Street.

**Initiative 3H**

# Expand DOT Wayfinding Signage

Even with smartphone maps, too many pedestrians are getting lost in the Brooklyn Tech Triangle. This year the NYC Department of Transportation unveiled a new citywide, wayfinding signage system to help pedestrians navigate neighborhoods. The system should be expanded throughout the area to facilitate critical pedestrian connections between the Tech Triangle's destinations and amenities.

*DOT wayfinding product rendering, example in situ.*


*Proposed A/C High Street Station Connector with pop up on High Street.*

*Proposed Fulton Bridge linking the bustling commercial corridor of Fulton Mall with the Civic Center.*

Challenge 3C

**Making east-west connections are difficult.**

While cycling connections to and from the bridges along north-south routes is good, there are surprisingly few east-west connections within the Tech Triangle. Major roads such as Flatbush Avenue and Adams Street, government institutions, and public housing areas all have resulted in fewer east-west through streets or challenging crossings. As a result, it is necessary to explore below- or above-street level options and traffic management measures to ensure better movement across the area.

Initiative 3I

## A/C High Street Station Connector

A major underutilized A/C entrance exists to the High Street station on the Adams Street service road extension that could serve the northeast portion of DUMBO and act as a key connection point between Downtown Brooklyn and DUMBO. A significant pedestrian challenge highlighted by constituents in our study is the east-west pedestrian connection across Adams Street that connects Concord Village to Whitman Park and Cadman Plaza. Our proposal is to connect High Street to Adams Street through a new pedestrian easement, expand the entrances at either end, and renovate the tunnel passage.

Initiative 3J

## Adams Street "Barnes Dance" Crossing

The current crossing at Fulton and Adams Street is crowded and confusing, offering minimal refuge at the center of the road and is in need of a grander gesture to match its central location. By widening the crossing to include the new desire path to Willoughby Plaza and cutting the curbs for a cohesive sequence, the crosswalk could also include the Boerum Place crossing and offer a diagonal crossing option to free the flow between points. The pedestrian path from Myrtle Promenade to Columbus Park requiring the crossing of two major streets (Adams and Jay Streets) is also in need of renovation, which would similarly improve pedestrian safety.

Initiative 3K

## Fulton Bridge

A new curved bridge connecting Fulton Mall to the southeast corner of Columbus Park would be a supplemental option to the improved crossing path. This connection would provide a key identifier and new raised social space, connecting between the Civic Center and the strategic site at the corner of Boerum Place and Fulton Mall (see Case Study 6: 1 Boerum Place). The scheme provides generous stairs and a simple elevator core on the Columbus Park edge, a continuous bench along the center line providing views of all the major axes of downtown, as well as stairs and an elevator integrated in the new retail space along Fulton.

Challenge 3D

**There should be better transit connections between Barclays Center and Brooklyn Bridge Park.**

The Barclays Center and Brooklyn Bridge Park are anchors in the greater Downtown Brooklyn area, and the lack of direct route between these two places, that could serve all attractions in-between, illustrate the importance of easier access to activities in the Tech Triangle. Barclays Center has already become a major destination for the borough and there is a need to provide additional destinations so people are able to attend pre-concert or pre-game activities in the area.

Initiative 3L

## Brooklyn Trolley

A 21st-century trolley service that connects Barclays Center with Downtown Brooklyn and DUMBO and all the way to Brooklyn Bridge Park could be implemented within a very short timeframe and as part of a larger marketing strategy. The marketing effort would include branding the shuttle bus with a name to gain exposure and attract potential riders. The shuttle vehicle might also include bike racks to further extend its usefulness and the range of its passengers.

An electric bus would be the ideal vehicle for a future shuttle service. At 35 feet, electric buses are slightly shorter than a transit bus, are zero emissions vehicles that are near-silent, inside and out. No overhead wires are needed as they operate on batteries. With their sleek, ultra-modern look, these vehicles would complement the Tech Triangle theme. Another alternative is the clean-diesel faux trolley which is approximately 30% the cost of the electric bus and available from a number of specialty manufacturers as a wheelchair-accessible (not low-floor) vehicle.

## Learning from the Past: The Future of Transit in the Tech Triangle

The Borough of Brooklyn once had a web of trolleys that included lines going over the Brooklyn Bridge, out to Coney Island, and connecting along the Brooklyn working waterfront from Sunset Park to Greenpoint and beyond to Long Island City. Many cities across the country have explored new surface transportation options, including New York City's Select Bus Service (SBS) operating on various routes throughout the City.

With the increasing connectedness between Brooklyn and Queens tech neighborhoods, and the rising demand for tech space in old waterfront development, a new SBS route could create a needed link between communities along this waterfront. The proposed SBS route would complement existing subway lines as there is no rail service that provides a similar connection. SBS routes offer great flexibility with minimal infrastructure costs. SBS buses can take the form of regular sized-New York City Transit buses or longer articulated vehicles. Where feasible, the SBS route would travel along dedicated bus lanes and be served by a signal priority system at intersections. With limited stops and an off-board payment system, the SBS route would provide a speedy and reliable connection between waterfront communities extending from Long Island City to Greenpoint/Williamsburg all the way to Sunset Park. SBS stops would also be located near existing subway stations and ferry landings, creating multimodal hubs. An SBS feeder route could be established along Flatbush Avenue in the form of a Shuttle Bus that would connect Barclays Center to the waterfront route.

The potential success of the waterfront SBS route would set the stage for replacing the bus route with streetcar/light rail. The system could be modeled on Berlin's tram network which dates back to 1865, or more recent American systems like Portland, Oregon's Streetcar or New Jersey Transit's Hudson-Bergen Line. Linking new transit with the tremendous development opportunities along Brooklyn's waterfront in places like Flushing Avenue near the Brooklyn Navy Yard and 2nd Avenue in Sunset Park could create an Innovation Corridor driving the Borough and City's economy for years to come.

### Urban Trolleys

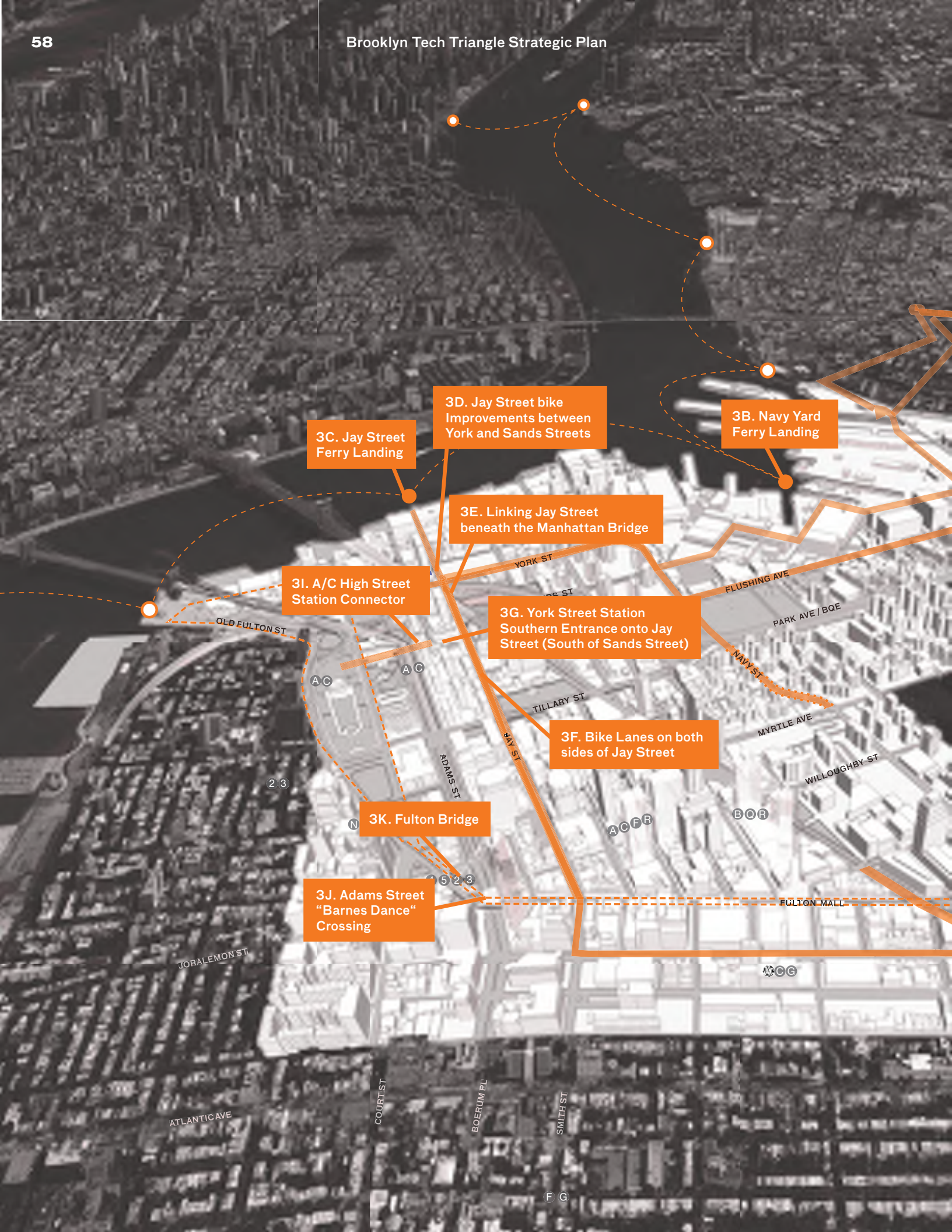
Cleveland Downtown Trolley, a network of five free lines, operates every 10-15 minutes. Orlando, FL operates the LYMMO, a free, downtown BRT shuttle that uses 35 foot buses. Long Beach, CA operated four free downtown circulators until 2012, when it merged three of them into regular transit routes. Old Town Trolley Tours operates faux trolleys in hop-on, hop-off services in Boston, Washington DC, Savannah, and Seattle.

*Brooklyn Streetcar, c1940.*

*Portland streetcar example at Portland State University.*

*Proterra Bus example.*


*A map showing a potential route for a future Select Bus Service (SBS) or streetcar line that would connect the growing tech communities along the Brooklyn-Queens waterfront.*


3C. Jay Street Ferry Landing
3D. Jay Street bike Improvements between York and Sands Streets
3B. Navy Yard Ferry Landing
3E. Linking Jay Street beneath the Manhattan Bridge
3I. A/C High Street Station Connector
3G. York Street Station Southern Entrance onto Jay Street (South of Sands Street)
3F. Bike Lanes on both sides of Jay Street
3K. Fulton Bridge
3J. Adams Street "Barnes Dance" Crossing
YORK ST
FLUSHING AVE
PARK AVE / BQE
NAVY ST
OLD FULTON ST
TILLARY ST
MYRTLE AVE
WILLOUGHBY ST
JAY ST
ADAMS ST
FULTON MALL
JORALEMON ST
ATLANTIC AVE
COURT ST
BOERUM PL
SMITH ST


# 3

# CONNECTIONS ACROSS THE TECH TRIANGLE

**Initiatives**

3A. B67 Extension
3A. B24 Extension
3B. Navy Yard Ferry Landing
3C. Jay Street Ferry Landing
3D. Jay Street Bike Improvements between York and Sands Streets
3E. Linking Jay Street Beneath the Manhattan Bridge
3F. Two-Way Bike Lane on Jay Street between Tillary and Sands Streets
3G. York Street Station Southern Entrance onto Jay Street South of Sands Street
3H. Expand DOT Wayfinding Signage
3I. A/C High Street Station Connector
3J. Adams Street “Barnes Dance” Crossing
3K. Fulton Bridge
3L. Brooklyn Trolley

COMPONENT

# DYNAMIC PLACES FOR TECH

While DUMBO consistently attracts tech firms due to the character of its old industrial buildings, its location by the waterfront and bridges, and its arts scene, the other points of the Tech Triangle need to show that they are dynamic places that will support a tech community interested in cultural activities, opportunities to cycle from home to work, and places to eat and meet. Much of the area is dominated by infrastructure from the Brooklyn-Queens Expressway (BQE) and the Brooklyn and Manhattan Bridges, creating barriers between the Tech Triangle neighborhoods. New York has a great history of transforming infrastructure elements into unique places and these spaces under and along the BQE and bridges must be embraced as part of the identity of the Tech Triangle.

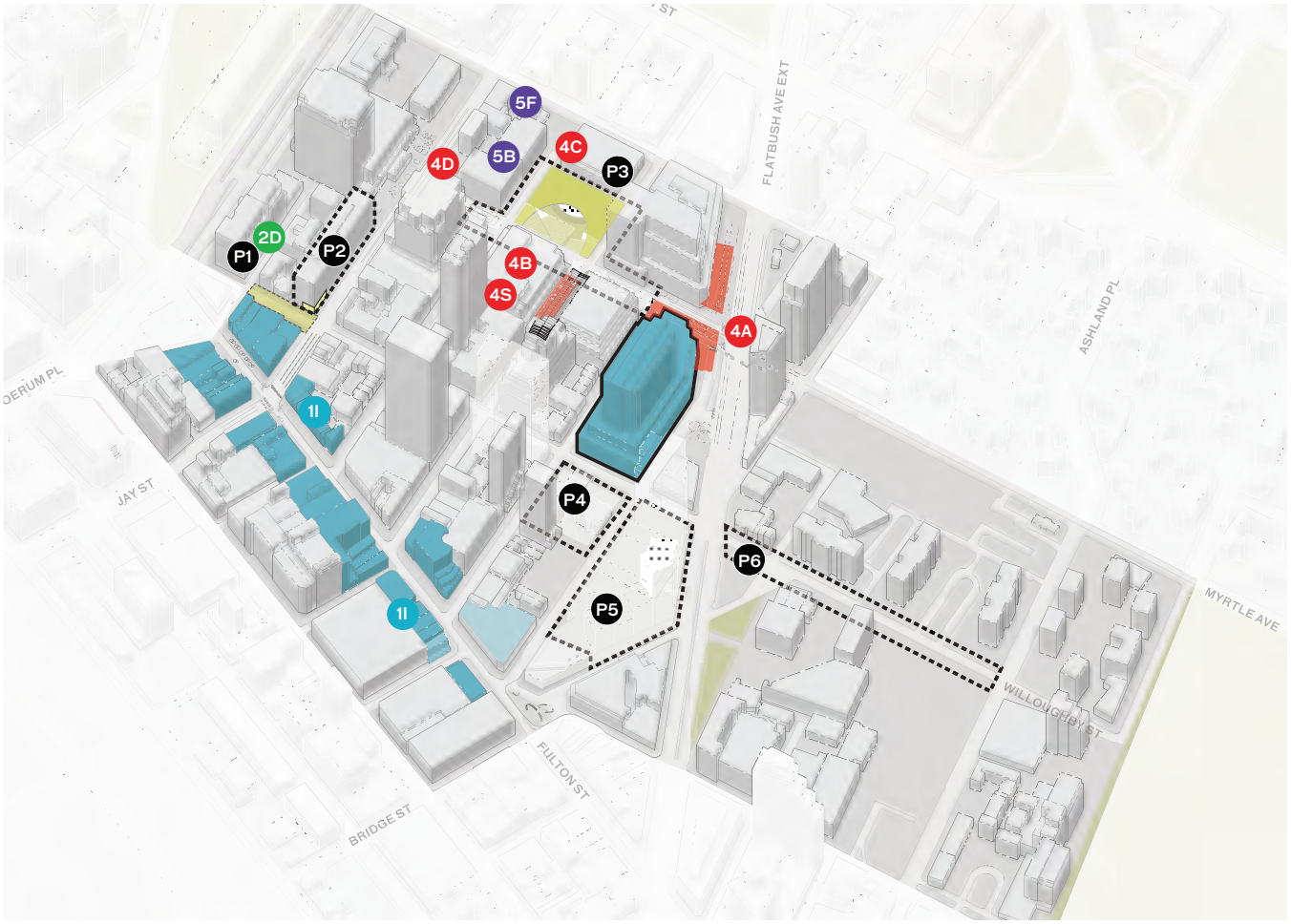
Like the unprogrammed spaces created as a result of infrastructure, existing public space is underutilized. Columbus Park and Cadman Plaza could become a major focal point for Downtown Brooklyn, with visitors walking over the Brooklyn Bridge and people making connections between DUMBO and Downtown.

Major roads like Flatbush Avenue, Flushing Avenue, and Adams Street have allowed cars to dominate. As a result, these roads generally have few restaurants or stores that generate foot traffic and are difficult to cross. Moreover, some of the major office space retains the aesthetic of 1980s back office space. The building lobbies, materials, and facades do not easily generate appeal among tech firms, even though the office spaces themselves offer dramatic views of the New York skyline.

The feeling of a lack of ground-floor activity and desirable buildings in some areas of the Tech Triangle is exacerbated by the presence of underutilized public space. While MetroTech Commons is heavily trafficked during business hours, more can be done to activate this charming public square through additional programming, seating, public art, lighting, and food and beverage options. The combination of more ground-floor activity and event space would mean that the programming already underway there could be extended into the weekend and evenings more often to draw in crowds from surrounding neighborhoods. Columbus Park and Cadman Plaza are also not robustly programmed for activities or evening uses, and these spaces need to be re-imagined to broaden the appeal of the Tech Triangle. Retail activation in the Watchtower Properties is a key opportunity. Marketing to tech-friendly retailers such as coffee shops, artisanal purveyors, and maker space, would catalyze the establishment of dynamic corridors.

Specifically, the challenges to making the Tech Triangle places more dynamic include:

- **Challenge 1: The MetroTech Campus has an opportunity to enhance its appeal as a public space destination.**
- **Challenge 2: Tech Triangle lacks a cohesive greenway linking Downtown to the waterfront.**
- **Challenge 3: The careful adaptation of infrastructure has transformed many Tech Triangle destinations into desirable public space (e.g.,the Manhattan Bridge Archway, Willoughby Plaza, and Pearl Street Triangle), but the areas beneath the Manhattan Bridge are loud and difficult to navigate.**
- **Challenge 4: The edge along the Navy Yard is harsh and feels unsafe to walk and cycle along.**
- **Challenge 5: Flatbush Avenue between the Fulton Mall and Barclays Center lacks identity.**
- **Challenge 6: Not enough attention has been paid to lighting the Tech Triangle at night, which could help turn the area into a series of safe and dynamic 24/7 destinations.**




*1I. Fulton Mall and Downtown Brooklyn Concepts*
*2D. Support NYU Center for Urban Science and Progress*
*4A. MetroTech/Flatbush Ave. Interplay*
*4B. MetroTech Commons Destination*
*4C. Bridge Street Market*
*4D. Jay Street at MetroTech*
*4S. Bridge Street Lighting*
*5B. Digital Touchpoint – MetroTech Commons*
*5F. Tech Triangle Pop Ups – Food Truck*
*P1. Willoughby Plaza – Complete*
*P2. CUSP Renovation, 370 Jay Street – Planned*
*P3. MetroTech Commons renovation – Schematic Design*
*P4. Willoughby Park – Planned*
*P5. City Point Phase 2 – In construction*
*P6. Willoughby Streetscaping – Planned*

*Rendering showcasing the unlimited potential of retail opportunities at MetroTech.*

**Challenge 4A**

## Enhancement of the MetroTech Campus.

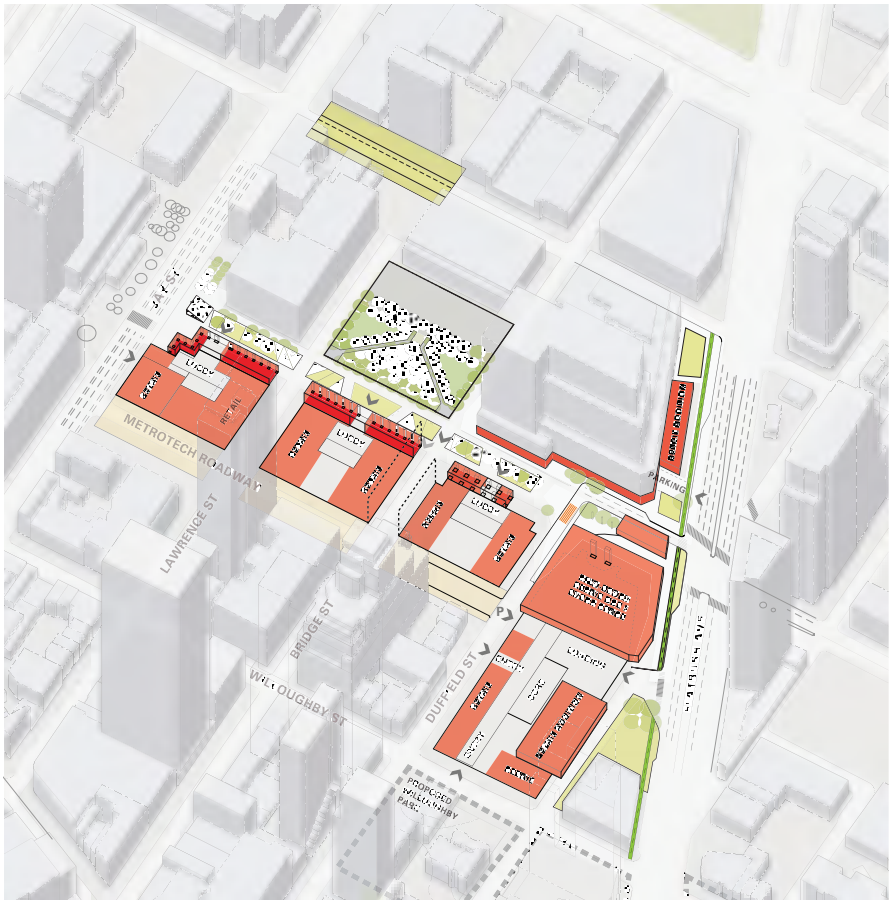
An increasing number of tech firms and university programs within MetroTech have started to change its nature. But even with the considerable use of the campus, there is very little awareness from the outside world of what goes on within MetroTech, and few activities take place on the weekends there. This Plan recognizes an enormous opportunity to further open up MetroTech to surrounding areas, and activate its edges in creating new opportunities for programming and repose within the MetroTech Commons.


*Rendering of potential opportunities for restaurants, exciting ground floor retail, and tech office spaces.*

**Initiative 4A**

# The MetroTech/ Flatbush Avenue Interplay

The Flatbush and Myrtle Avenues intersection is a key juncture that could create a strong link between universities, businesses, and residential buildings on either side of Flatbush Avenue. Reworking the Myrtle Street turnaround east of Flatbush into a through street with a single drop-off lane would open a large plaza along the North edge of the Chase building. This would create an opportunity for a unique restaurant or collaborative tech space above. In addition, the Chase building and 15 MetroTech building could have transparent retail spaces extending from them to create new retail frontage linking from City Point to Tillary Street.



*Rendering of potential Bridge Street Market, a convergence of vendors and leisure.*

**Initiative 4B**

## MetroTech Commons Destinations

The MetroTech Commons is a year-round active destination. By emphasizing more opportunities for events and by creating more food options, the Commons can create a dynamic 24/7 space in the center of Downtown Brooklyn. Through the inclusion of food trucks on Tech Place, the integration of public art, and the initiation of more nighttime events like outdoor films, MetroTech Commons can become a focal point for the tech scene.

**Initiative 4C**

## Bridge Street Market

This initiative would support greater street life by enhancing the north-south connector streets from MetroTech to Willoughby and Fulton Streets. At the centrally located Bridge Street, a series of food vendors would create a market-like atmosphere that would add vitality to a key street leading into MetroTech.

**Initiative 4D**

## Jay Street Plaza at MetroTech

This plaza is an important multimodal transportation interchange and Downtown Brooklyn gateway. The relocation of the TKTS booth to this space would create an additional focal point for the Jay Street corridor. The plaza also has opportunity for greater lighting and digital installations, which would help support the foot traffic tied to subway and bus arrivals.

Existing supportive initiatives:

- Willoughby Plaza – Complete
- Willoughby Square Park – Planned
- City Point Phase 2 – In construction
- Willoughby Streetscaping, connecting Fort Greene Park to Willoughby Plaza – Planned

**Challenge 4B**

**Tech Triangle lacks a cohesive greenway linking Downtown to the waterfront.**

An impressive but underutilized and under-programmed belt of parks and plazas begins at the Brooklyn Bridge and extends through the center of Downtown Brooklyn to Brooklyn Borough Hall. This 21-acre series of public spaces, which includes Cadman Plaza, Walt Whitman Park, the Korean Veterans Plaza, Columbus Park, and various vacant municipal lots and lawns are punctuated by substantial open areas, a community of mature and healthy trees and impressive civic architecture. Together, these parks serve thousands of people daily, from local students playing soccer on the turf lawns of Cadman Plaza to Downtown office workers and people serving

jury duty visiting the Greenmarket of Columbus Park. However, heavy usage is concentrated in two limited areas of the 21-acre stretch and the series of spaces lack cohesiveness or an overall sense of place.

Many of the other open spaces in the Tech Triangle can best be described as interstitial spaces alongside the infrastructure of the bridges and BQE or along streets or in other leftover spaces within the urban fabric. While individually small, these sites taken together as a network of spaces have great potential to provide necessary neighborhood amenities and green space. Columbus Park, Cadman Plaza, and these smaller open spaces should be designed to function in a fresh way that encourages flexibility of use, authenticity of place, and a neighborhood character that is youthful and dynamic. They should not only be pedestrian, bike- and dog-friendly, but also functional, green, and varied.

In aggregate, these spaces have the potential to serve as critical connective tissue between two borough-wide destinations (Brooklyn Bridge Park and Downtown Brooklyn) and many neighborhoods (Brooklyn Heights, DUMBO, Fort Greene, Downtown Brooklyn, etc.). An effort should be made to re-imagine these spaces as a whole rather a collection of disconnected parts—and as the Tech Triangle central commons known as the Brooklyn Strand.


*1F. Target Strategic Site: Brooklyn Landing*
*1F. Target Strategic Site: 271 Cadman Plaza East*
*1I. Strategic Site: 1 Boreum Place*
*3H. A/C High Street Station Connector*
*3I . Adams Street "Barnes Dance" Crossing*
*3J. Fulton Bridge*
*4E. The Brooklyn Strand*
*4F. Bluestone Repair and Fence Removal*
*4G. Cadman Café*
*4H. Brooklyn Landing/Clumber Corner*
*4I. Tech Terrace*
*4K. Anchorage Plaza*
*4T. Cadman Plaza Lighting*
*5B. Digital Touchpoint – Willoughby Plaza*
*5B. Digital Touchpoint – Tech Terraces*
*5F. Tech Triangle Pop ups – Cafe*

*P1. Cadman Plaza East Streetscape – Proposed*
*P2. Memorial Accessibility – Proposed*

*Rendering of a public plaza (currently a parking lot) at the central node of Downtown Brooklyn, at the intersection of Adams and Joralemon Streets, the start of the Brooklyn Strand.*

**Initiative 4E**

## The Brooklyn Strand

Columbus Park and Cadman Plaza can have the buzz of Madison Square Park, the elegance of Parisian promenade, or even the dynamism of the Ramblas in Barcelona. But there is a parking lot at the critical juncture where Adams Street, Willoughby Plaza, Fulton Mall, Joralemon Street, and Boerum Place all come together. Given its central role as the southern gateway to the Civic Center and Cadman Plaza, the space should be redesigned and reprogrammed as an open space for people to enjoy. While preserving all existing trees, the fences and barriers would be removed, opening the space to Adams Street and Fulton Street. Roughly one third of the ground plane would be planted with ornamental gardens, creating a green oasis. The remaining pedestrian plaza areas would be defined with alternating paving bands and site furnishings as well as seating areas. A sculptural folded topiary "arbor" would form a backdrop for the park, provide a structure for flowering vines and an armature for a series of urban porch swings. The new park would be inviting, green, and brimming with life and activity.

**Initiative 4F**

## Bluestone Repair and Fence Removal

The existing bluestone paving throughout Cadman Plaza has deteriorated into a public safety concern and should be repaired; a possible replacement that has been proposed is "blue mist granite" which is more durable than bluestone but aesthetically similar. Additionally, removing fencing along Columbus Park and by the Korean War Veterans Memorial would create a more seamless and inviting pedestrian pathway.

**Initiative 4G**

## Cadman Café

One way to make Cadman Plaza more dynamic would be to add activity areas. The Cadman Café would create a fantastic outdoor gathering point and serve as a key element of the Brooklyn Strand. In addition, the café

*Rendering of Cadman Café, an element of the Brooklyn Strand located at the oval north of the Brooklyn World War II Memorial.*

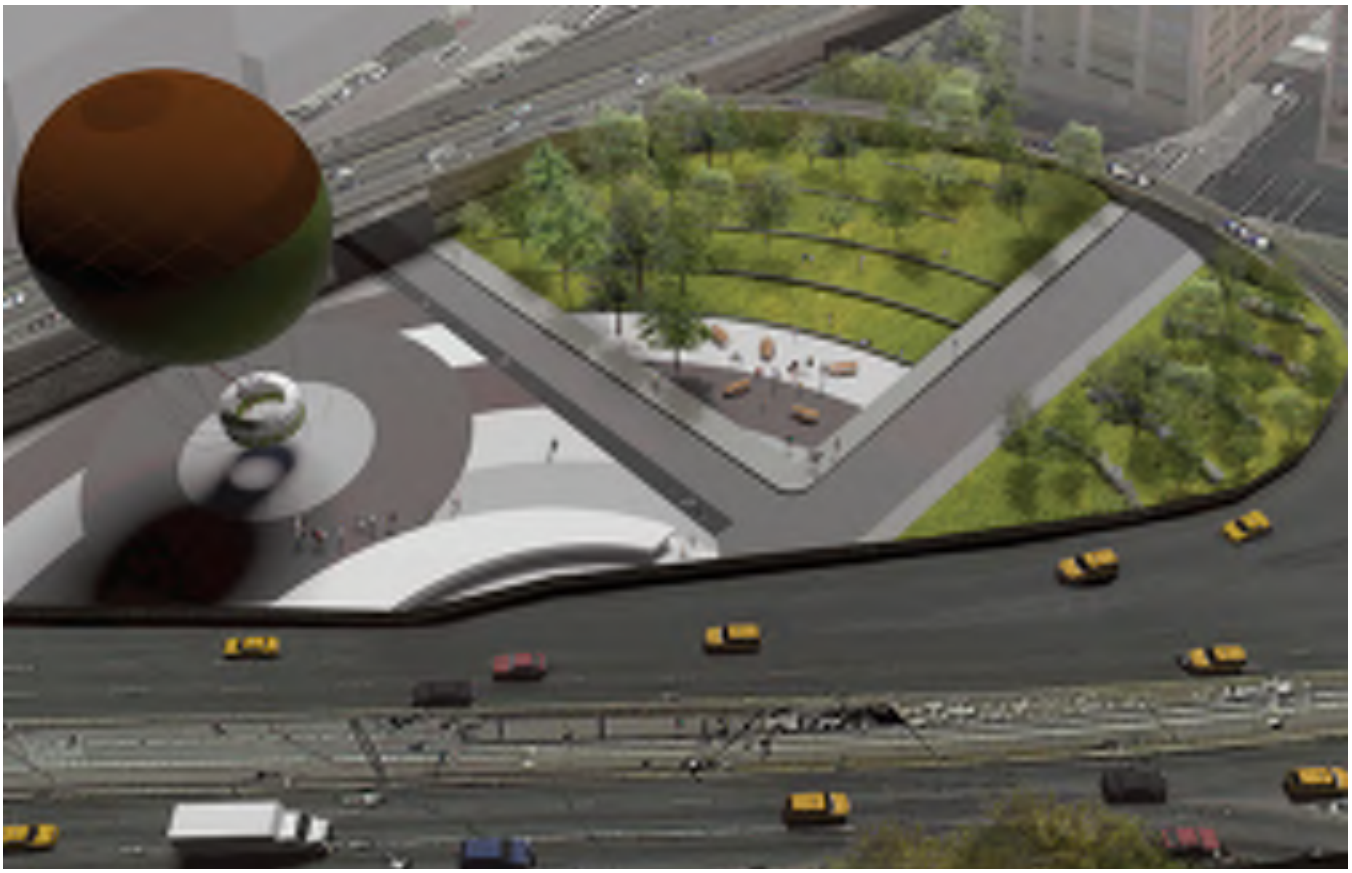
would appeal to visitors arriving off the Brooklyn Bridge promenade, offering them a reason to head south in the direction of Downtown. The café itself would be sited in a minimalist footprint so as not to disturb park activities or open space on the north side of the Brooklyn World War II Memorial, helping to revitalize an oval-shaped area at the northern end of the Plaza.

**Initiative 4H**

## Brooklyn Landing/ Clumber Corner

This site is wedged into the interstices of the Brooklyn Bridge and the BQE, and is divided by Washington Street and Prospect Street into three separate spaces. It is one of the first places pedestrians and tourists encounter when walking down from the Brooklyn Bridge. It is also visible in the sight lines of all persons using the bridge or highway. Proposed in the largest segment of the site is a tethered helium observation balloon called Brooklyn Rising. The balloon will symbolize the revitalization and growth of Brooklyn. The observation balloon would be an iconic element rising 600 feet in the air, and visible for great distances. It will afford balloon riders unprecedented views of the borough and surrounding city and harbor. The balloon would hold up to 30 passengers at a time and be a great tourist attraction and neighborhood amenity; it would also invite concessions who operate similar attractions in other places in the country (e.g., Orange County, CA) to the Brooklyn Tech Triangle to operate this attraction.

A series of concentric rings radiating out from the balloon organize the three open space parcels into a unified whole. At the base of the balloon would be a plaza with a queuing line and a visitor center with ticket booths and restrooms. Across Washington Street would be a terraced lawn and plaza with picnic tables and seating. This space would be suited for programmed events and performances, art installations, and hanging out. The third part of the space would be organized with concentric bands of recycled concrete and ornamental plantings. Clumber Corner would serve as an iconic marker for Brooklyn and a gateway to DUMBO and the tech community.



*Rendering of Brooklyn Landing/Clumber Corner, transforming interstitial spaces into destination places.*

*Rendering of proposed tech terraces at the corner of Sands and Adams Street, which would enliven the area with open space.*

*Rendering of an urban dog run in DUMBO along the BQE giving character to this small underutilized space.*

**Initiative 4I**

## Tech Terrace

The tech terraces are sited over an underutilized dead-end street adjacent to the Brooklyn Bridge. As the commercial district expands with the activation of the Watchtower Properties, it will be critical to improve the pedestrian experience that must coexist with this major entrance to the Brooklyn Bridge. Designed as a contemporary pocket park, this site has a series of flexible-use terraces. The terraces will be furnished with picnic tables, terraced benches, outdoor ping-pong tables, and ornamental plantings. A large digital screen will be interactive with users mobile devices for both work and play. A grove of scattered trees will provide a light dappled shade for comfort.

**Initiative 4J**

## DUMBO Dogs

This is a new kind of dog run, very urban in character. Located on a sliver of open space wedged between York Street and a tall retaining wall supporting the BQE, this dog run would create productive exercise space by using slopes and ramps to create the first vertical dog run in the City. Slopes will be landscaped with rockeries and ornamental planting and a grove of ornamental trees will provide shade for dogs and their caretakers.

**Initiative 4K**

## Anchorage Plaza

After the September 11th attacks, the anchorage to the Brooklyn Bridge was closed to the public. The Tech Triangle Plan proposes reopening the anchorage, which could house a museum recounting the history of the Brooklyn Bridge and the Brooklyn waterfront, and event space that generates revenue to underwrite the museum's operation.

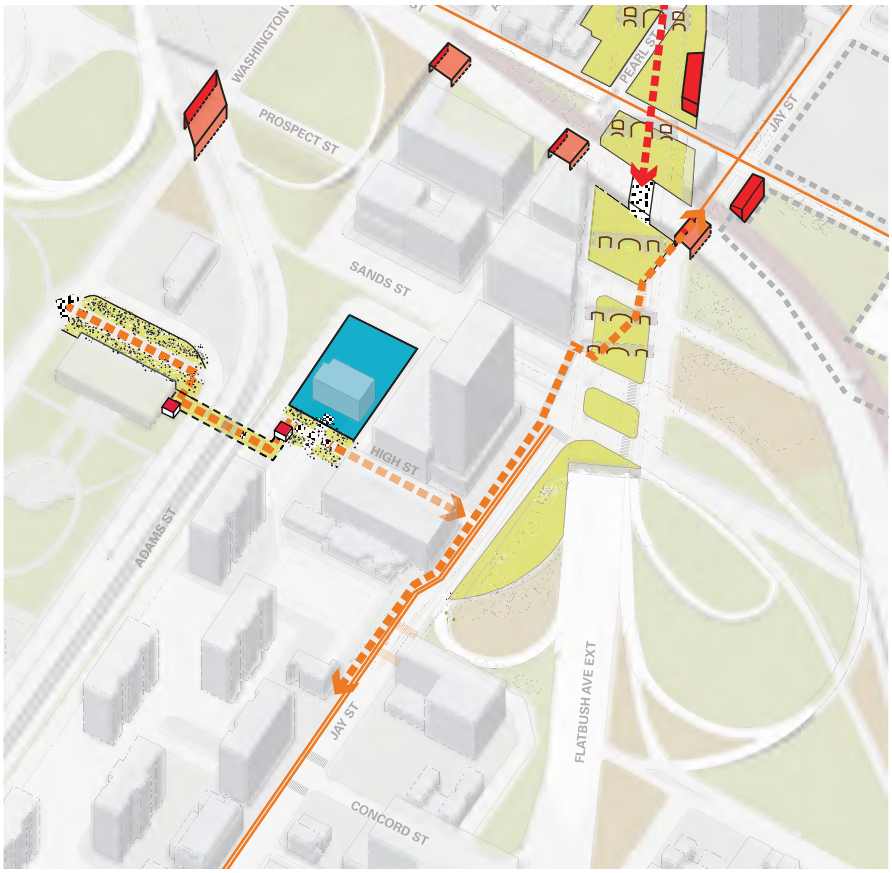
Existing supportive initiatives:

- Cadman Plaza East Streetscaping between Tillary and Prospect Street – Proposed
- World War II Memorial Accessibility – Proposed
- Tillary Streetscape Project – Planned

Challenge 4C

**The careful adaptation of infrastructure has transformed many Tech Triangle destinations into desirable public space, but the areas beneath the Manhattan Bridge are loud and difficult to navigate.**

Currently the areas beneath the Manhattan Bridge stretching from Sands Street to Water Street are a disconnected and disoriented set of spaces compromised with miscellaneous maintenance structures and fences, limiting the use of the open space and blocking the fantastic view corridors. There is a great potential to transform these spaces into a new sequence of eclectic places that could form the "Manhattan Bridge Bowtie." By opening up the spaces, a series of triangular areas would add up to very large urban plaza flexible for multiple uses. Rather than creating permanent facilities, a series of portable pop-up structures are proposed that will provide seasonal uses such as a café, mini-golf, performance stage, lounge, wading pool, and tot lot.




*Rendering of a potential plaza and diagonal connection below the Manhattan Bridge.*

**Initiative 4M**

## Extending the Diagonal to Sands Street

There is currently a NYC Department of Transportation staging area at the northern side of Sands Street. The removal of this staging area and creation of a new archway through the masonry wall of the BQE structure would create, with steps, the potential for a dramatic pedestrian connection down to Pearl Street.

Existing supportive initiatives:

- Brooklyn Bridge Park – Planned development
- Bridge Park 2 – Planned renovation
- Brooklyn-Queens Expressway Viaduct Murals – Planned


*1G. Special Innovation District Concepts*
*2C. Tech Triangle Innovation Hub*
*3A. B67/B24 Extension*
*3B. Navy Yard Ferry Landing*
*4N. Commodore Barry Park Edge Treatment*
*4O. New Sidewalks for Ingersoll Houses*
*P1. Flushing Bike Path – Planned*
*P2. Park Avenue Improvements – Myrtle BID, Proposed*
*P3. Admirals Row – Planned*

**Challenge 4D**

**The edge along the Navy Yard is harsh and feels unsafe to walk and cycle along.**

Currently the Flushing Avenue bike corridor is the most heavily trafficked bike route in the entire City. With the implementation of the Brooklyn Greenway and the Admiral's Row development, the edge along the Navy Yard will become more active. Even with these planned changes, there are other modifications that can make the area along and to the Navy Yard feel safer and more pleasant for people.

**Initiative 4N**

## Commodore Barry Park Edge Treatment

Commodore Barry Park is an important public space for many different communities. The park is also at the important nexus of Flushing Avenue and Navy Street. The edge of this park is ringed with high chain-linked fences and then another ring of iron gates, creating an inhospitable front on both those streets. Rising activity along these routes has created an important opportunity to soften these edges with landscaping. A complete renovation and upgrade to the Park would provide a major boost to the live-work quality of the Tech Triangle.

**Initiative 4O**

## New Sidewalk through Ingersoll Houses

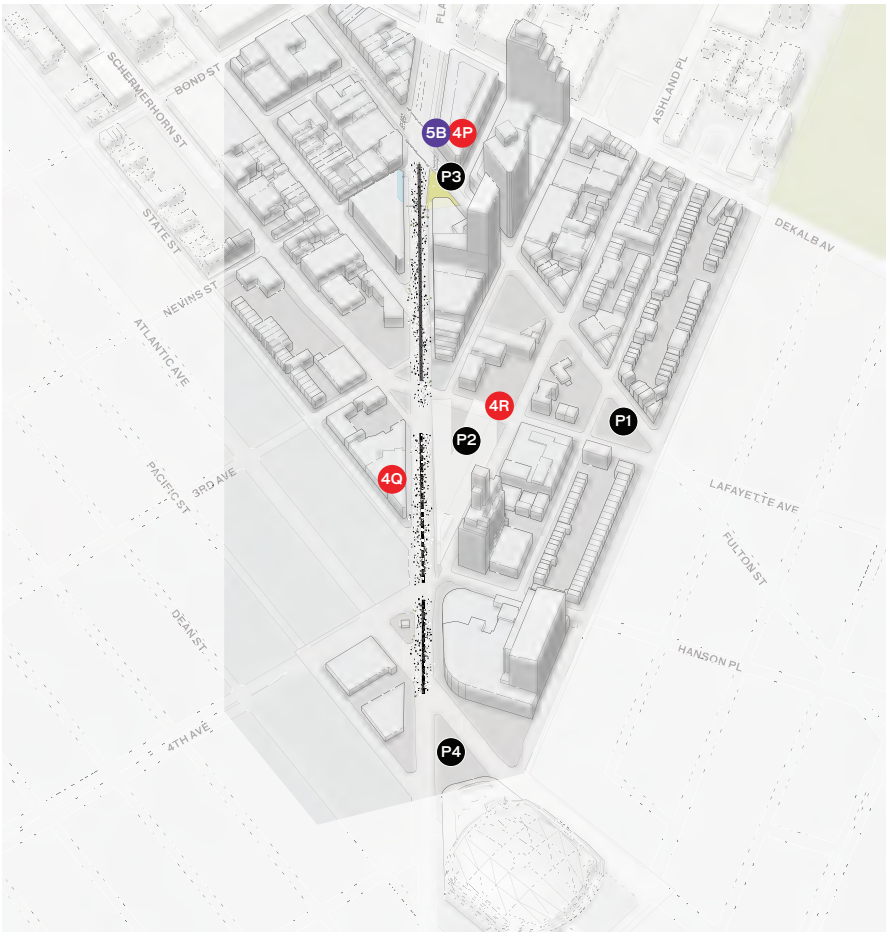
The stretch on Navy Street between Myrtle Avenue and Park Avenue is one of the few areas in the City where a typical City street does not have sidewalks. When Ingersoll Houses was built, sidewalks were created not too far from the roadway, but behind the iron gates within the NYCHA property. As a result, many people do not walk along Navy Street even though it is an important connector to Downtown Brooklyn, Commodore Barry Park, and the Navy Yard. The existing road width

*Rendering of the proposed Brooklyn Greenway along Flushing Avenue.*

on Navy Street provides enough space for sidewalks along the street and to eliminate fencing that walls them off.

Existing supportive initiatives:

- Brooklyn Greenway Initiative – Planned
- Park Ave Plaza – eliminating diagonal drive, Proposed
- Admiral's Row – Planned
- Navy Yard Cemetery / Memorial Landscape – Proposed




*4P. Fox Square/Flatbush Improvements*
*4Q. Flatbush Avenue Streetscape Extension from Dekalb Ave. to Fourth Ave.*
*4R. Distinct Cultural District Identity Development*
*5B. Digital Touchpoint – Fox Square*

*P1. BAM Park*
*P2. Cultural District Streetscape*
*P3. Fox Square Plaza renovation – Planned*
*P4. Barclays Center*

*Rendering of Fox Square and Flatbush Avenue median improvements at a key intersection of Flatbush Avenue and Fulton Street.*

**Challenge 4E**

**Flatbush Avenue between Fulton Mall and Barclays Center lacks identity.**

**Initiative 4P**

## Fox Square/ Flatbush Improvements

A key focus point in Downtown Brooklyn, Fox Square has potential to be reinvented as a kind of Times Square for Brooklyn. For Fox Square, strategies could include digital concrete, embedding sensors and other LED lighting effects in new plaza paving, and physical wayfinding markers as critical points in the lighting route. Activating the blank façade and ground floor of the ConEd Building (30 Flatbush Avenue) with new tech-oriented retail would help drive the reinvention of Flatbush Avenue.

**Initiative 4Q**

## Flatbush Avenue Streetscape Extension from Dekalb to Fourth Avenues

This stretch of Flatbush Avenue includes some of the most neglected blocks in the area. Yet this corridor provides key connections between the Fulton Mall, the BAM Cultural District, Atlantic Terminal, and Barclays Center, and therefore deserves a streetscape design worthy of these destinations and uses.

**Initiative 4R**

## Distinct Cultural District Identity Development

The BAM Cultural District has always been home to world-class venues and impressive architecture. Today the area is poised to explode as new theaters, public spaces, residential developments, and small businesses flock to the area. The District needs a well-thought-out streetscape and programming plan to knit this growth together.

Existing supportive initiatives:

- BAM Park renovation – Planned
- Cultural District Streetscape – Planned
- Fox Square Plaza renovation – Planned
- Atlantic Yards – In Construction (various phases)

Challenge 4F

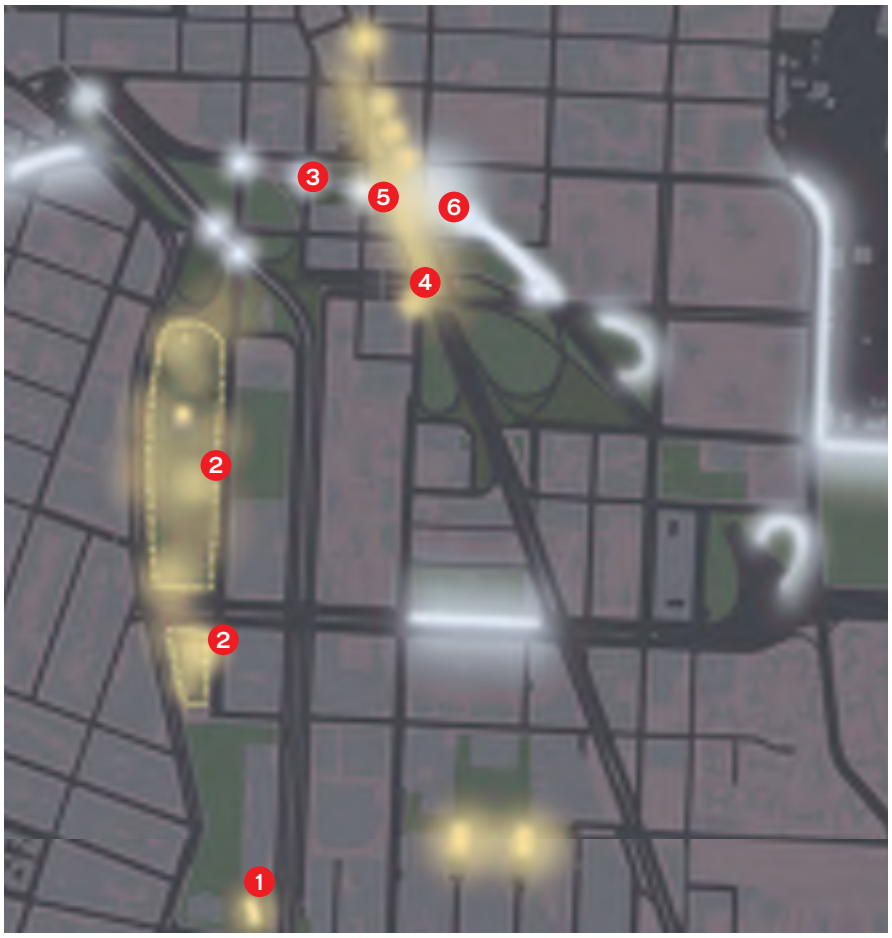
**Little attention has been paid to lighting the Tech Triangle at night, which could help turn the area into a series of safe and dynamic 24/7 destinations.**

Lighting can reinforce district identity, alleviate areas that may seem unwelcoming, and enliven key spaces. Lighting infrastructure can also serve to facilitate temporary or seasonal lighting elements and artwork, drawing in visitors and strengthening sense of place. A series of initiatives across the distinct areas of the Tech Triangle will emphasize the unique places and help make people comfortable walking around the area at night.

In addition to some bold lighting ideas outlined below, basic changes throughout the area could result in major benefits. Significant improvement can be envisioned at the many areas shadowed by roadway overpasses throughout the district by two means. The first involves encouraging NYC DOT to speed replacement of its existing lighting (low- and/or high-pressure sodium) with its new standard LED under-deck luminaire. A simple one-to-one replacement has the potential to improve perceived security, encourage positive nighttime activity, and save energy. Opportunities also exist to make spaces supportive of temporary or permanent murals and other artwork by washing overpass walls with linear fluorescent or LED lighting.

The second improvement involves the addition of new floodlights (mounted on existing NYC DOT street light poles and appropriate structures) and/or wall wash fixtures in conjunction with durable, very long-lived in-grade uplighting, to "lift" surfaces and alleviate darkness in these sometimes foreboding spaces. Both of these initiatives can improve visual quality in a cost-effective manner.

Temporary lighting events and lighting art installations can also be expedited by the addition of outdoor-rated outlets to NYC DOT street light poles (most easily when supplied as part of new poles and when offered by willing building owners). Initiatives such as these that increase interest in the neighborhood and raise awareness of local businesses—while getting temporary power trucks off city streets—can offer real value.




*A map of the Tech Triangle lighting plan, which will create connection between all three neighborhoods.*

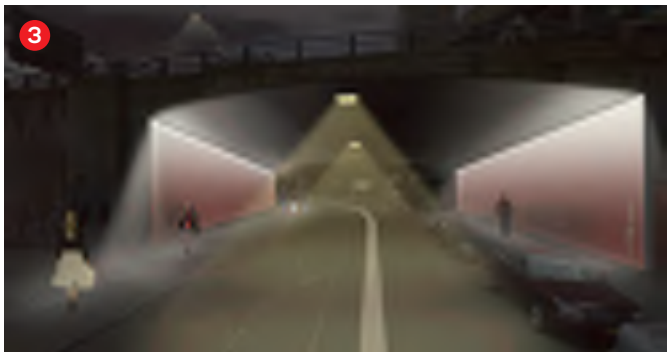
1. *Rendering of lighting highlights integrated into the proposed new park structure at Columbus Park starting the Brooklyn Strand.*
2. *Proposed twinkle lights in trees at Cadman Plaza would use a similar approach to this night-time photo of Columbus Circle.*
3. *Rendering of underpass lighting with new DOT standard LED fixtures in the center to light the roadway and wall wash lighting at the edges to highlight wall installations and the sidewalk surface.*
4. *Rendering under the Manhattan Bridge, uplighting the structure and highlighting the arches with this new diagonal connection.*
5. *Rendering at York and Pearl Streets, with similar uplighting affixed to standard street fixtures and highlighting the bridge supports.*
6. *Rendering of York Street Station with green lights signifying its open entrance.*

Initiative 4S

## Bridge Street Lighting

There is a need to make the north-south streets connecting MetroTech and Willoughby/Fulton Streets feel safer and more inviting, particularly as more hotels open in this area. Bridge Street's convivial festoon lighting extends the invitation of the plaza into evening hours, encouraging foot traffic and general activity. This simple lighting idea (as seen in the rendering on page 64) increases the light level along the passage and adds sparkle that can be viewed from a distance.









**Initiative 4T**

## Cadman Plaza Lighting

The theme of sparkle expands to Cadman Plaza and the Korean War Veterans Plaza by means of tree glitter, made possible by the addition of outdoor-rated outlets associated with select trees and hedgerows. Seasonal or temporary tree lighting can be festive and installed without harm to planting. In-grade lighting can also be located to enhance new shade structures at Fulton Place.

**Initiative 4U**

## York Street Station Lighting

York Street station is a destination in its own right. Taking full advantage of the station house's prominent site, lighting is proposed to welcome riders with a playful interpretation of the system's "green globe" (meaning "always-open entrance"): bright green windows that reinforce the neighborhood's open-for-business mentality.

**Initiative 4V**

## Under the Bridge Lighting

Proposals under consideration for the enhancement of the Manhattan Bridge anchorage and Pearl Street Plaza include the replacement of existing NYC DOT street lights by white (LED) fixtures in a new, pedestrian-friendly layout; floodlighting of the exterior bridge anchorages to wash the structure and catch the eye (especially from the Front Street vista); and a complete overhaul of the existing archway lighting with dynamic, color-changing, and energy-efficient LED lighting floodlights and wall grazers.


Planned Brooklyn Bridge Park Extension
4V. Under the Bridge Lighting
Brooklyn Gr Initiative
4J. DUMBO Dogs
4U. York Street Station Lighting
Brooklyn Bridge Park
4I. Tech Terrace
4M. Extending the Diagonal to Sands Street
Bridge Park 1 and 2
4N. Commodore Barry Park Edge Treatment
4H. Brooklyn Landing/ Clumber Corner
SANDS ST
FLUSHING AVE
PARK AVE / BQE
OLD FULTON ST
McLaughlin Park
4O. New Sidewalks f Ingersoll Houses
4K. Anchorage Plaza
NAVY ST
TILLARY ST
4C. Bridge Street Market
4G. Cadman Café
4D. Jay Street at MetroTech
4A. The MetroTech/ Flatbush Ave. Interplay
4T. Cadman Plaza Lighting
ADAMS ST
WILLOUG
Planned Willoughby Square Park
4P. Fox S Flatbush
4F. Bluestone Repair and Fence Removal
4S. Bridge Street Lighting
4B. MetroTech Commons Destinations
L'TON MALL
4E. The Brooklyn Strand
JORALEMON ST
4Q. Flatbush Avenue Streetscape Extensio from Dekalb Ave. to Fourth Ave.
ATLANTIC AVE
COURT ST
BOERUM PL
SMITH ST
4R. Iden


# 4

# DYNAMIC PLACES FOR TECH

**Initiatives**

4A. The MetroTech/Flatbush Ave. Interplay (on map)
4B. MetroTech Commons Destination (on map)
4C. Bridge Street Market (on map)
4D. Jay Street at MetroTech (on map)
4E. The Brooklyn Strand (on map)
4F. Bluestone Repair and Fence Removal (on map)
4G. Cadman Café (on map)
4H. Brooklyn Landing/ Clumber Corner (on map)
4I. Tech Terrace (on map)
4J. DUMBO Dogs (on map)
4K. Anchorage Plaza (on map)
4L. Expansion of New Citywide Pedestrian Wayfinding System
4M. Extending the Diagonal to Sands Street (on map)
4N. Commodore Barry Park Edge Treatment (on map)
4O. New Sidewalks for Ingersoll Houses (on map)
4P. Fox Square / Flatbush Improvements (on map)
4Q. Flatbush Avenue Streetscape Extension from Dekalb Ave. to Fourth Ave. (on map)
4R. Distinct Cultural District Identity Development
4S. Bridge Street Lighting (on map)
4T. Cadman Plaza Lighting (on map)
4U. York Street Station Lighting (on map)
4V. Under the Bridge Lighting (on map)

COMPONENT

# TECH TRIANGLE INTERFACE

The advantages and accessibility of the Tech Triangle are not apparent, which presents an amazing opportunity to brand a district area as tech-forward and test out new technology in municipal infrastructure. To facilitate the Tech Triangle transformation into a central hub for activity and amenities, it is increasingly important for people to digitally connect and access resources, opportunities, and information instantaneously. By building infrastructure that supports free and public wifi, the Tech Triangle will transform into an environment that promotes connectivity and community engagement—thereby thrusting the area forward into the 21st century. Startups can test their products locally and encourage innovation to be piloted in the Tech Triangle. A seamless wireless network is also a tool for economic development, and the Tech Triangle's ability to use it effectively will allow the area to be commercially attractive as well as competitive in the new economy.

- **Challenge 1: Positioning the Tech Triangle as the most connected neighborhood.**
- **Challenge 2: The tech revolution going on behind office doors is not reflected on the streets of the Brooklyn Tech Triangle, where tech tools can be used for navigation, dynamic placemaking, and outdoor working.**
- **Challenge 3: The advantages and activities of the Tech Triangle—ranging from the ability to benefit from the REAP incentive to the area's transportation offerings to local meet-ups—should be made as accessible as possible.**
- **Challenge 4: While there is broadband in the streets throughout the Tech Triangle, the costs of the "Last Mile" to bring the broadband into the buildings is a stumbling block to creating tech-friendly spaces.**


Challenge 5A

## Positioning the Tech Triangle as the most connected neighborhood.

The Tech Triangle is connected to today's fiber networks and public WiFi exists in many public spaces. However, to truly brand the district as a tech haven, this should be a place for investment in tomorrow's technologies.

**Initiative 5A**

# Free and Public WiFi

In 2011, the DUMBO Improvement District launched a ubiquitous WiFi network between the Manhattan and Brooklyn Bridges, and the media dubbed DUMBO "NYC's first wireless neighborhood." Free wireless data network is now available in DUMBO, parts of the Navy Yard, and several pilot sites in Downtown Brooklyn including Willoughby Plaza, Columbus Park, MetroTech Commons, and Albee Square—all which have been proven to be popular and indicates a growing demand for this amenity. It is a benefit to existing residents, visitors, shoppers, and workers, and a powerful marketing tool that continues to attract new investment. By expanding these independent networks to cover much of the Brooklyn Tech Triangle, and possibly creating the first wireless commercial office district in New York City, this initiative could stitch together the diverse stakeholders and digitally connect them to the Tech Triangle. Expansion of this wireless network throughout the Tech Triangle will require coordination with the City, property owners, and installation and monitoring of wireless transmitters to ensure data connection.


*Wayfinding is a necessary tool for navigating the Tech Triangle.*

**Challenge 5B**

**The tech revolution going on behind office doors is not reflected on the streets of the Brooklyn Tech Triangle, where tech tools can be used for navigation, dynamic placemaking, and outdoor working.**

**Initiative 5B**

## Digital Touchpoints

Brooklyn Tech Triangle can distinguish itself from other districts by taking a visionary lead in installing digital touchpoints throughout the district. These would provide simple, intuitive wayfinding; meaningful information for tourists, residents, and commuters; and a platform for event messaging and hyper-local advertising. The content would be be integrated from the physical touchpoint to the digital—with a corresponding mobile app that utilizes augmented reality and geolocation to create a full neighborhood navigational experience. The content could be pulled from local resources and social media and developed in collaboration between the organizations such as the Business Improvement Districts, Brooklyn Historical Society, NYC Department of Transportation, and the NYC Department of Parks and Recreation—and other relevant stakeholders. In presenting district information in a forward-thinking and engaging way, the digital touchpoints would help to solidify the Brooklyn Tech Triangle brand as vibrant center of innovation.

These digital touchpoints could exist as kiosks, or utilize storefronts or projections, becoming the first area in New York City to integrate the physical and virtual. They could have a fixed presence at key locations including York Street, Jay Street-MetroTech, Fox Square, and the Clumber Corner entrance to the Brooklyn Bridge. The Tech Triangle coalition is interested in inviting companies to the area to pioneer this technology.

**Initiative 5C**

# Brooklyn Tech Triangle Annual Event

To further solidify the Tech Triangle's growth, an annual tech event could increase exposure of the borough for newcomers and facilitate opportunities for collaboration among creative types. The event has the potential to be multi-tiered: while hackathons and competitions allow for innovation, mentoring sessions and keynote speakers can serve as inspiration. The area's numerous venues, from Barclays Center to Galapagos Art Space to the powerHouse Arena, are ideal backdrops for the tech event. Alternatively, the event could build on hackathons or conferences such as Brooklyn Beta to become large-scale events similar to SXSW. Existing events hosted in other parts of the City (e.g., TechCrunch, Northside Festival) or in Silicon Valley (e.g., TieCon, Hadoop Summit) could also be relocated to the Tech Triangle area.

**Initiative 5D**

# Tech Triangle Marketing Campaign

This campaign would include marketing key elements of the Tech Triangle initiative:

- Marketing available spaces in concert with the real estate initiatives discussed above, and the Brooklyn advantage as a creative live-work environment.
- Marketing the REAP initiative. Most companies are unaware of this incentive—and it dramatically changes their perceptions of moving to Brooklyn. As part of the larger promotional campaign, the top real estate brokers in New York City who represent tech tenants should be introduced to the Tech Triangle and informed of the incentive.
- Marketing Downtown Brooklyn transit access. Downtown Brooklyn has 13 subways lines. While DUMBO clearly has limited transit options, it does have stations on three subway lines, ferry service at Brooklyn Bridge Park, bike share, and more. As part of broader marketing efforts, existing transit options should be promoted for their connectivity to existing or potential clients. An example is: "The A/C train can take you from Google's front door to DUMBO in 10 minutes."

**Initiative 5E**

# Tech Triangle WiredNYC Plan

Growing tech and creative firms looking to move or expand are deciding where to locate using many different criteria. One of the most important of these is the availability of a broadband connection sufficient to meet their immediate and long-term needs. In making those decisions, it is important that potential tenants have information available to them about a building's broadband connectivity that can be used to compare it with other buildings they might choose. For a valid comparison, though, the information needs to be presented in a regular format based on a uniform set of standards.

Addressing this issue is one of the goals of WiredNYC, sponsored by the Office of the Mayor, New York City Council, NYC Economic Development Corporation (NYCEDC), and the NYC Department of Information Technology and Telecommunication. As originally articulated, "it is a building certification program that will evaluate the broadband infrastructure of New York City buildings in order to encourage and accelerate deployment of leading broadband technologies. This program will create transparency about broadband infrastructure in the commercial real estate market, giving businesses information about a building's connectivity when choosing where to locate, and allowing landlords to market their buildings' assets and compete for tenants."[1] It has a goal of cataloguing and ranking more than 300 commercial office buildings totaling more than 16 million square feet in the next two years.

The Plan proposes that, in tandem with an organized application to the ConnectNYC program, the Brooklyn Tech Triangle put itself forward to serve as the district in which the cataloguing and ranking of buildings begin. The WiredNYC program will already provide building certification grades through a single online platform that will collect the required information from landlords regarding broadband capabilities in their buildings, and that same information can be pushed out via Tech Triangle outlets. Some of the parameters that are already under consideration include the following:

- Number of unique physical building connections to any backbone located in the street.
- Number of existing internet providers (unique broadband providers) in the building.
- Fiber availability in the building and the percentage of floors that are directly connected.
- Types of connections with Point of Entry Agreements.
- Number of existing Point of Entry Agreements and the potential for agreements with other Internet Service Providers.

The grading system could be developed such that it is not a grade per se, but rather expressed as "levels" of digital readiness. For instance, we would not want a building to be graded as a "C" if it provided an appropriate "level" of service that is desirable to existing and potential tenants. Instead, we recommend an appropriately neutral color-coded system.

*1 Office of NYC Deputy Mayor for Economic Development Robert Steel press release, June 2012.*

*Proposed Tech Triangle Pop Ups, such as this one at Jay Street and Tech Place, will contribute to the area's overall branding.*

**Initiative 5F**

## Tech Triangle Pop Ups

Part of creating an appealing environment is being located near amenities. Pop-up stores and cafés could be encouraged across the entire Tech Triangle area where there are empty and underutilized spaces. Not only will this encourage branding of certain "low activity" areas, but it will also provide additional jobs. Stores could showcase items designed or produced in DUMBO and the Navy Yard or display temporary exhibits from the Downtown Brooklyn Cultural District. Pop ups could be in conjunction with NYC DOT's Street Seats, which is a program for a temporary installation of outdoor public open seating in an on-street parking space. There is the potential to locate a high-profile, temporary café within the oval at Cadman Plaza, similar to the Serpentine Gallery Summer Cafe.

**Initiative 5G**

## Meet-Up Coordinator

This position would act as the liaison for local firms and organizations that need event space within a short timeframe. Often groups or meet-ups need last-minute space at no cost but do not use university or college space because 1) they are unaware of its availability, 2) the school charges for its use, 3) the process for reserving space is lengthy and arduous. The coordinator could connect with student-led clubs as these groups often have a more direct association with those outside of the school. This person could also act as the go-between for utilities, tech firms, and landlords to make buildings digital-ready and make the Tech Triangle a next generation workplace.

**Initiative 5H**

## ConnectNYC Plan Expansion

We recommend the creation of a campaign and targeted promotion organized by utility providers, property owners, NYC EDC, participating BIDs, and other stakeholders to commercial tenants within the Brooklyn Tech Triangle to apply to ConnectNYC program. In that way, Brooklyn Tech Triangle can get a significant portion of the buildings/tenants to have their costs covered for getting business-class fiber. The intended result would be the the most connected district in the City. In addition, we encourage two further goals for amending the program: 1) differentiate the program to make it available to interested building owners; and 2) differentiate the program to offer different levels of service that are "right-sized" to tenants' immediate needs, with the option for fuller service later.

**Challenge 5C**

**While there is broadband in the streets throughout the Tech Triangle, the costs of the "Last Mile" to bring the broadband into the buildings is a stumbling block to creating tech-friendly spaces.**

Tech innovation is providing for one of the greatest sources for both jobs and tax base growth in the City. Broadband connectivity is one of the single greatest business considerations for growing tech and creative firms. As these firms grow, so do their needs with regard to the speed and capacity of their broadband connection, used by more and more employees to send and receive large data files. These evolving needs, however, are not always best captured under the current offerings in existing buildings in the Brooklyn Tech Triangle. So while there is a negligible percentage of commercial tenants without reliable access to high-speed broadband, the measure of high-speed connectedness is 4 Mbps download and 1Mbps upload. Growing firms that rely on access to real-time information to power solutions and products need access to more robust broadband, which is fiber-based and has upload/download time 100+ times faster than copper or coaxial-based services.

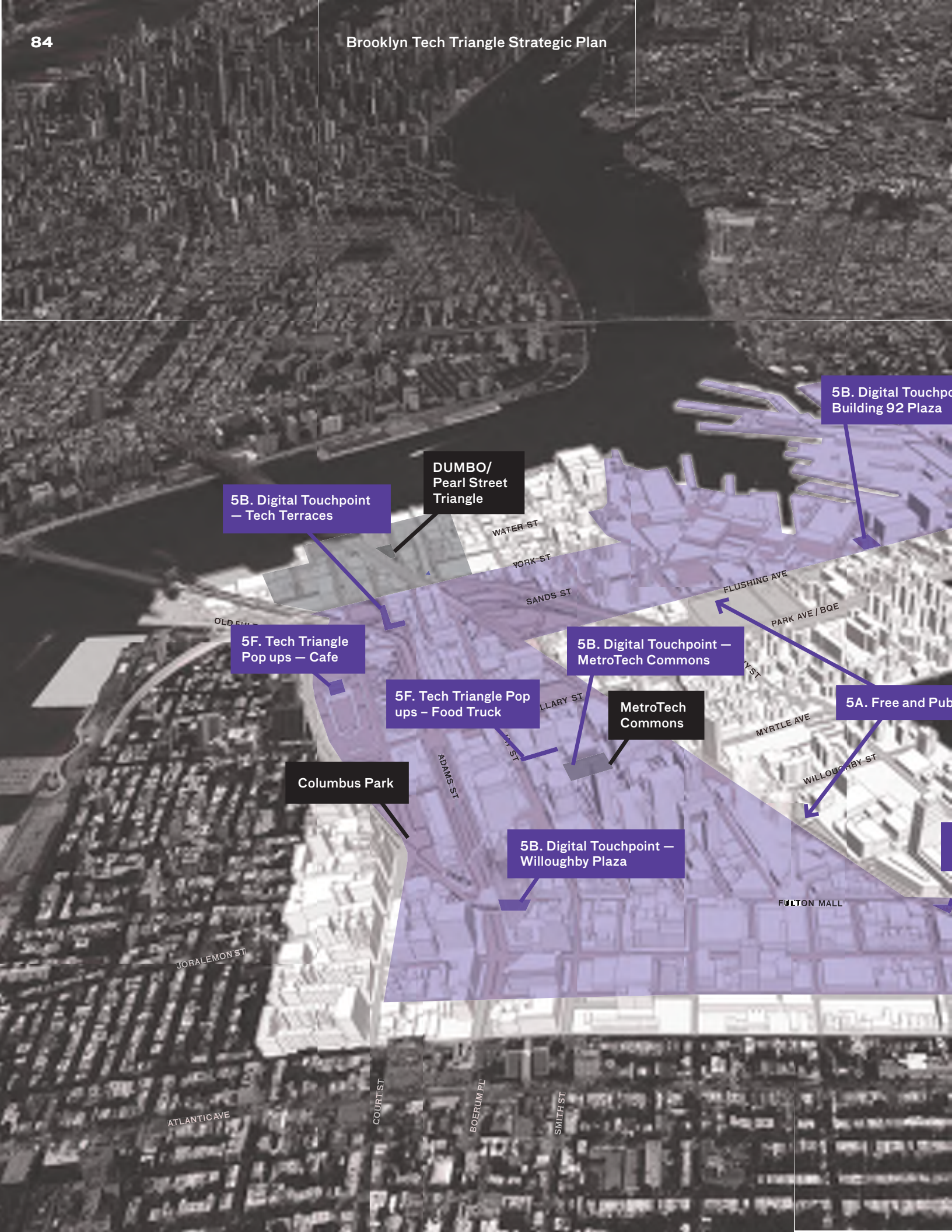
The availability of broadband fiber in the streets has been largely addressed within the district by Verizon and Time Warner. Main corridors in MetroTech, DUMBO, and the Brooklyn Navy Yard neighborhoods all have fiber below the street. This will help the proliferation of modern connections and bandwidth to establish a reputation within the Brooklyn Tech Triangle districts as "well-connected," with the goal of having this neighborhood lead the City as the most connected place to business in the City. It will also help the buildings qualify for "digital ready" certifications.

The biggest obstacle to tech and creative tenants getting the best connectivity available is bridging "The Last Mile," which refers to the expense, permitting, and cooperation needed to get fiber from the streets into the building and up to the office. Addressing this issue is one of the goals of ConnectNYC, sponsored by the Office of the Mayor, New York City Council, NYC Economic Development Corporation (NYCEDC), and NYC Department of Information Technology and Telecommunication. The initiative is funded by NYCEDC and is focused on commercial tenants requiring only that they 1) describe their need for business-class fiber and 2) obtain landlord permission for such work. The program selects appropriately qualified companies for free "turn-up," covering the costs of getting connectivity into the building from the street.

**Initiative 5I**

## Tech Test Kitchen

The three organizing entitities—the Downtown Brooklyn Partnership, the Brooklyn Navy Yard Development Corporation, and the DUMBO Improvement District—have much to offer local startups looking to test the market and their new technologies. They manage public spaces, have relationships with landlords, local retailers, host events, and manage local data. Allowing local innovators to tap into these resources to test their work would provide social benefits by facilitating innovative projects and further branding the Brooklyn Tech Triangle. The DUMBO Improvement District has begun using this model on a small scale with its "DUMBO Test Kitchen Program," kicking off projects with startups including Pensa (a solar paneled tourist kiosk), BioLite (a holiday lighting installation), Etsy (Hands-on-DUMBO program) and Flocabulary (a curriculum based experiment with local students) in 2013. Companies and organizations interested in piloting their innovations should reach out to their local economic development organization.


5B. Digital Touchpo
Building 92 Plaza
DUMBO/
Pearl Street
Triangle
5B. Digital Touchpoint
— Tech Terraces
WATER ST
YORK ST
SANDS ST
FLUSHING AVE
PARK AVE / BQE
5F. Tech Triangle
Pop ups — Cafe
5B. Digital Touchpoint —
MetroTech Commons
5F. Tech Triangle Pop
ups – Food Truck
MetroTech
Commons
5A. Free and Pub
MYRTLE AVE
Columbus Park
ADAMS ST
5B. Digital Touchpoint —
Willoughby Plaza
FULTON MALL
JORALEMON ST
ATLANTIC AVE
COURT ST
BOERUM PL
SMITH ST


# 5

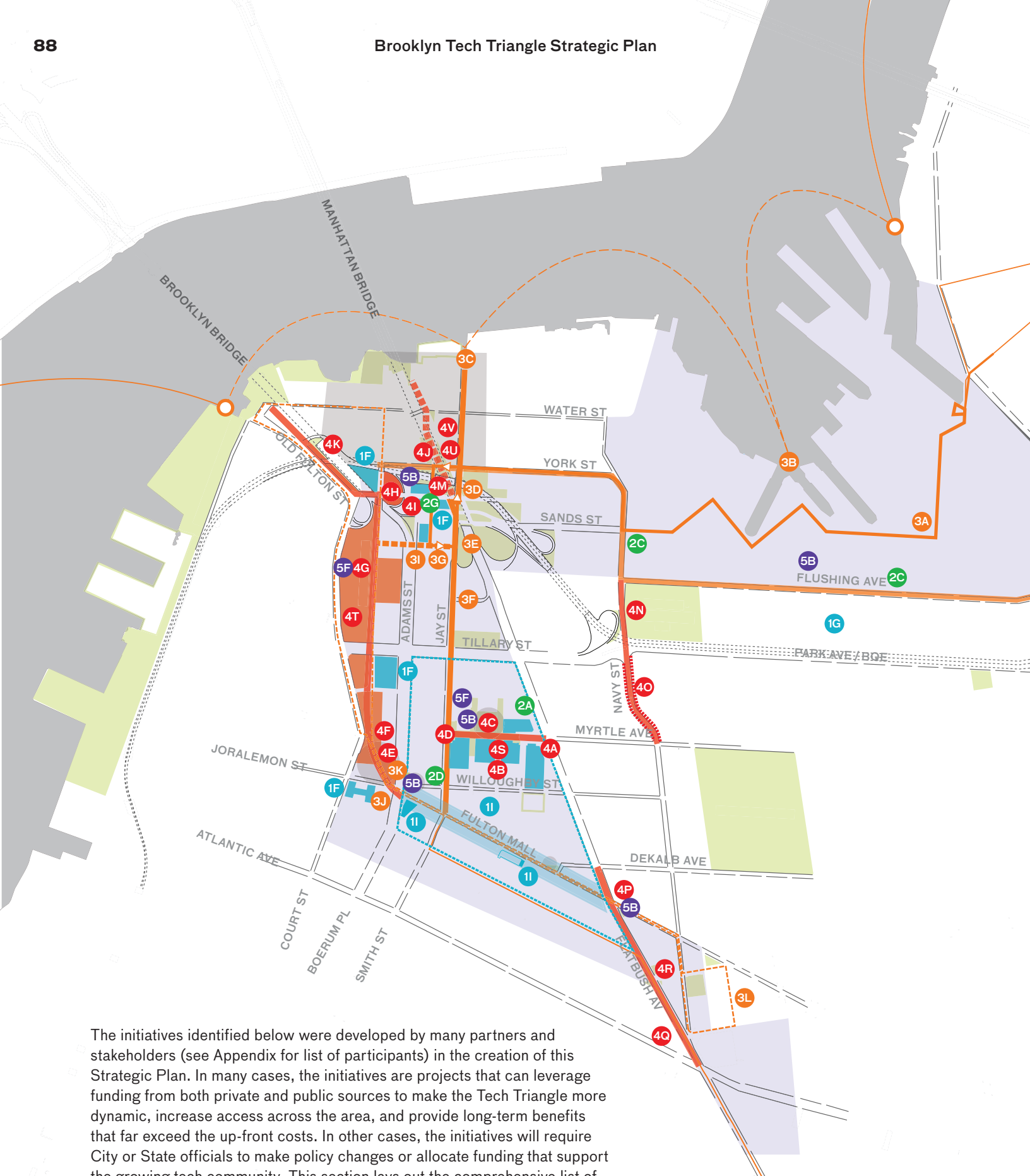
# TECH TRIANGLE INTERFACE

**Initiatives**

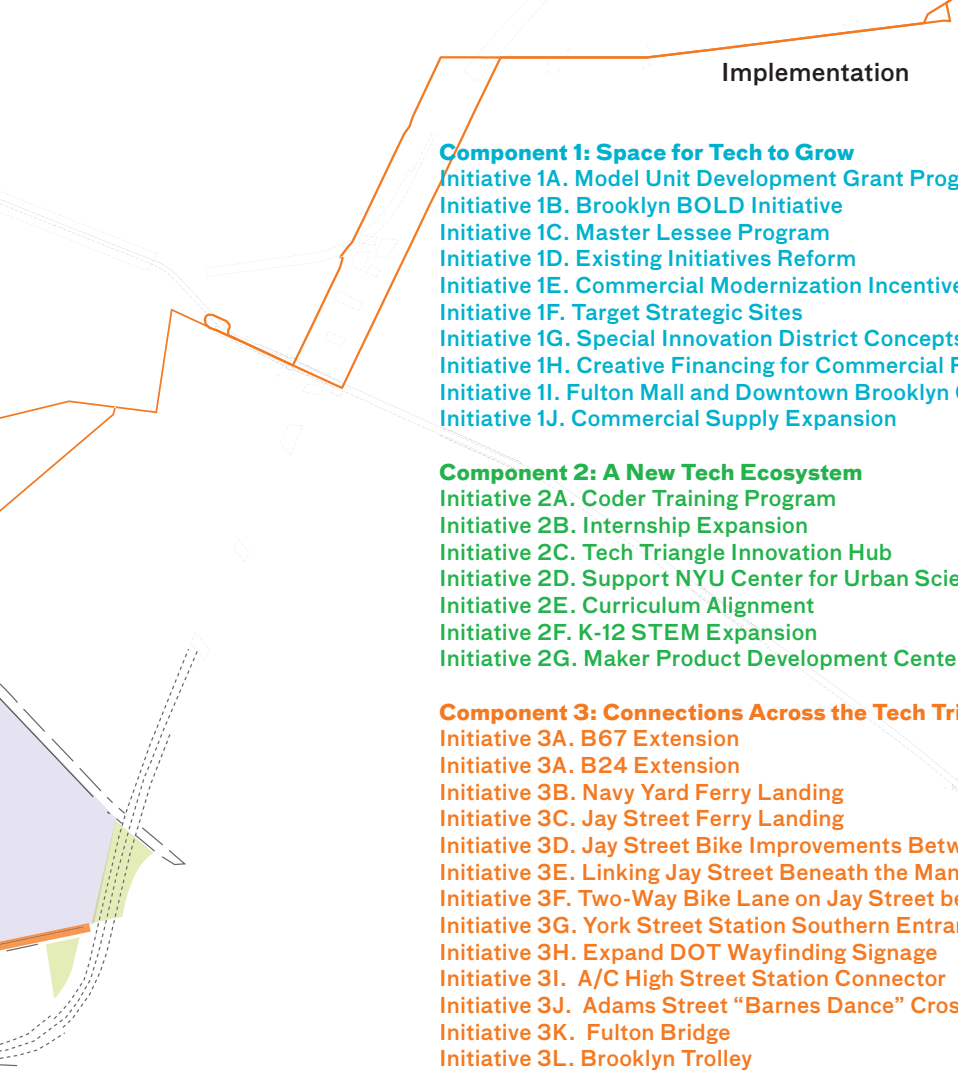
5A. Free and Public WiFi (on map)
5B. Digital Touchpoint – Willoughby Plaza (on map)
5B. Digital Touchpoint – Building 92 Plaza (on map)
5B. Digital Touchpoint – Tech Terraces (on map)
5B. Digital Touchpoint – MetroTech Commons (on map)
5B. Digital Touchpoint – Fox Square (on map)
5C. Brooklyn Tech Triangle Annual Event
5D. Tech Triangle Marketing Campaign
5E. Tech Triangle WiredNYC Plan
5F. Tech Triangle Pop Ups – Cafe (on map)
5F. Tech Triangle Pop ups – Food Truck (on map)
5G. Meet-Up Coordinator
5H. ConnectNYC Plan Expansion
5I. Tech Test Kitchen

*South-facing few of the Brooklyn Tech Triangle, with Lower Manhattan in the distance.*

# IMPLEMENTATION




The initiatives identified below were developed by many partners and stakeholders (see Appendix for list of participants) in the creation of this Strategic Plan. In many cases, the initiatives are projects that can leverage funding from both private and public sources to make the Tech Triangle more dynamic, increase access across the area, and provide long-term benefits that far exceed the up-front costs. In other cases, the initiatives will require City or State officials to make policy changes or allocate funding that support the growing tech community. This section lays out the comprehensive list of initiatives and identifies the short- and long-term priorities. Only initiatives tied to a specific address or location are depicted on the above map. The remaining initiatives will be applied generally in the Brooklyn Tech Triangle.



**Component 1: Space for Tech to Grow**

| | |
|---|---|
| Initiative 1A. Model Unit Development Grant Program | Short-term |
| Initiative 1B. Brooklyn BOLD Initiative | Short-term |
| Initiative 1C. Master Lessee Program | Short-term |
| Initiative 1D. Existing Initiatives Reform | Long-term |
| Initiative 1E. Commercial Modernization Incentive Program | Long-term |
| Initiative 1F. Target Strategic Sites | Long-term |
| Initiative 1G. Special Innovation District Concepts | Long-term |
| Initiative 1H. Creative Financing for Commercial Rehabilitation | Long-term |
| Initiative 1I. Fulton Mall and Downtown Brooklyn Concepts | Long-term |
| Initiative 1J. Commercial Supply Expansion | Long-term |

**Component 2: A New Tech Ecosystem**

| | |
|---|---|
| Initiative 2A. Coder Training Program | Short-term |
| Initiative 2B. Internship Expansion | Short-term |
| Initiative 2C. Tech Triangle Innovation Hub | Long-term |
| Initiative 2D. Support NYU Center for Urban Science and Progress | Short-term |
| Initiative 2E. Curriculum Alignment | Short-term |
| Initiative 2F. K-12 STEM Expansion | Short-term |
| Initiative 2G. Maker Product Development Center | Long-term |

**Component 3: Connections Across the Tech Triangle**

| | |
|---|---|
| Initiative 3A. B67 Extension | Short-term |
| Initiative 3A. B24 Extension | Long-term |
| Initiative 3B. Navy Yard Ferry Landing | Long-term |
| Initiative 3C. Jay Street Ferry Landing | Short-term |
| Initiative 3D. Jay Street Bike Improvements Between York and Sands Streets | Short-term |
| Initiative 3E. Linking Jay Street Beneath the Manhattan Bridge | Short-term |
| Initiative 3F. Two-Way Bike Lane on Jay Street between Tillary and Sands Streets | Short-term |
| Initiative 3G. York Street Station Southern Entrance onto Jay Street | Long-term |
| Initiative 3H. Expand DOT Wayfinding Signage | Short-term |
| Initiative 3I. A/C High Street Station Connector | Long-term |
| Initiative 3J. Adams Street "Barnes Dance" Crossing | Short-term |
| Initiative 3K. Fulton Bridge | Long-term |
| Initiative 3L. Brooklyn Trolley | Long-term |

**Component 4: Dynamic Places for Tech**

| | |
|---|---|
| Initiative 4A. The MetroTech/Flatbush Avenue Interplay | Long-term |
| Initiative 4B. MetroTech Commons Destination | Short-term |
| Initiative 4C. Bridge Street Market | Short-term |
| Initiative 4D. Jay Street Plaza at MetroTech | Long-term |
| Initiative 4E. The Brooklyn Strand | Long-term |
| Initiative 4F. Bluestone Repair and Fence Removal | Short-term |
| Initiative 4G. Cadman Café | Long-term |
| Initiative 4H. Brooklyn Landing/Clumber Corner | Short-term |
| Initiative 4I. Tech Terrace | Long-term |
| Initiative 4J. DUMBO Dogs | Short-term |
| Initiative 4K. Anchorage Plaza | Short-term |
| Initiative 4I. Expansion of New Citywide Pedestrian Wayfinding System | Short-term |
| Initiative 4M. Extending the Diagonal to Sands Street | Long-term |
| Initiative 4N. Commodore Barry Park Edge Treatment | Short-term |
| Initiative 4O. New Sidewalk for Ingersoll Houses | Long-term |
| Initiative 4P. Fox Square/Flatbush Improvements | Short-term |
| Initiative 4Q. Flatbush Avenue Streetscape Extension from Dekalb Ave. to Fourth Ave. | Short-term |
| Initiative 4R. Distinct Cultural District Identity Development | Short-term |
| Initiative 4S. Bridge Street Lighting | Short-term |
| Initiative 4T. Cadman Plaza Lighting | Short-term |
| Initiative 4U. York Street Station Lighting | Short-term |
| Initiative 4V. Under the Bridge Lighting | Long-term |

**Component 5: Tech Triangle Interface Improvements**

| | |
|---|---|
| Initiative 5A. Free and Public Wifi | Short-term |
| Initiative 5B. Digital Touchpoints | Long-term |
| Initiative 5C. Brooklyn Tech Triangle Annual Event | Short-term |
| Initiative 5D. Tech Triangle Marketing Campaign | Short-term |
| Initiative 5E. Tech Triangle WiredNYC Plan | Short-term |
| Initiative 5F. Tech Triangle Pop Ups | Short-term |
| Initiative 5G. Meet-Up Coordinator | Short-term |
| Initiative 5H. ConnectNYC Plan Expansion | Short-term |
| Initiative 5I. Tech Test Kitchen | Short-term |

## Appendix

### Brooklyn Tech Triangle Strategic Plan
### Advisory Committee, Taskforce and Stakeholder Participation

The Strategic Plan builds on the input gathered from surveys of local and national tech companies, meetings with more than 200 stakeholders, including 90 focus group participants, and guidance from an advisory committee of 27 government offices and agencies, as well as a taskforce of 36 local companies and organizations.

**Brooklyn Tech Triangle Advisory Committee**

Brooklyn Bridge Park
Brooklyn Community Board 2
Metropolitan Transportation Authority
New York State Empire State Development
New York City Deputy Mayor's Office for Economic Development
New York City Mayor's Office of Management & Budget
New York City Mayor's Office of Media and Entertainment, NYC Digital
New York City Department of Buildings
New York City Department of City Planning
New York City Department of Cultural Affairs
New York City Department of Parks and Recreation
New York City Department of Small Business Services
New York City Department of Transportation
New York City Economic Development Corporation
New York City Transit Authority
NYC & Company
Office of Hon. Charles E. Schumer, United States Senator for New York
Office of Hon. Kirsten Gillibrand, United States Senator for New York
Office of Hon. Nydia M. Velazquez, United States Congress 7th District
Office of Hon. Hakeem Jeffries, United States Congress 8th District
Office of Hon. Velmanette Montgomery, New York State Senate 25th District
Office of Hon. Daniel L. Squadron, New York State Senate 26th District
Office of Hon. Joseph R. Lentol, New York State Assembly 50th District
Office of Hon. Joan L. Millman, New York State Assembly 52nd District
Office of Hon. Walter T. Mosley, New York State Assembly 57th District
Office of Hon. Christine C. Quinn, New York City Council Speaker
Office of Hon. Marty Markowitz, Brooklyn Borough President
Office of Hon. Letitia James, New York City Council 35th District
Office of Hon. Stephen Levin, New York City Council 33rd District
United States Office of General Services Administration

**Brooklyn Tech Triangle Task Force Committee**

3rd Ward
Brooklyn Bridge Ventures
Brooklyn Chamber of Commerce
Brooklyn College
Brooklyn Community Foundation
Brooklyn Economic Development Corporation
Brooklyn Law School
Brooklyn Public Library
Brooklyn Technical High School
Carrot Creative
Consolidated Edison
Crown Acquisitions
Cushman & Wakefield
Downtown Brooklyn Arts Alliance
Duggal Visual Solutions
Etsy
Forest City Ratner Companies
General Assembly
Hamlin Ventures
Huge
Ingram & Hebron
LIU Brooklyn
MacroSea
MakerBot
Muss Development
National Grid
New York City College of Technology
New York University
NYU Center for Urban Science and Progress
NYU Polytechnic Institute
Pratt Center for Community Development
Red Antler
Small Planet
Steiner Studios
Time Warner
Two Trees Management Company

**Credits**



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**Prepared by WXY Architecture + Urban Design**
Principals: Adam Lubinsky, Claire Weisz, Mark Yoes
Project Team Members: Alice Shay, Elham Morovvati,
Jacob Dugopolski, Jae Lee, Maiko Shimizu,
Mia Pears, Paul Salama

**Logo design by** Pentagram
**Graphic Design by** Yeju Choi

BROOKLYN TECH TRIANGLE

NYC Small Business Services

Empire State Development

NEW YORK UNIVERSITY

NYU poly
POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY

CUSP
CENTER FOR URBAN SCIENCE+PROGRESS

BROOKLYN COMMUNITY FOUNDATION