Long Island City
Life Sciences Feasibility Study

Final Report | OCTOBER 2018

Long Island City Partnership

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Long Island City Partnership

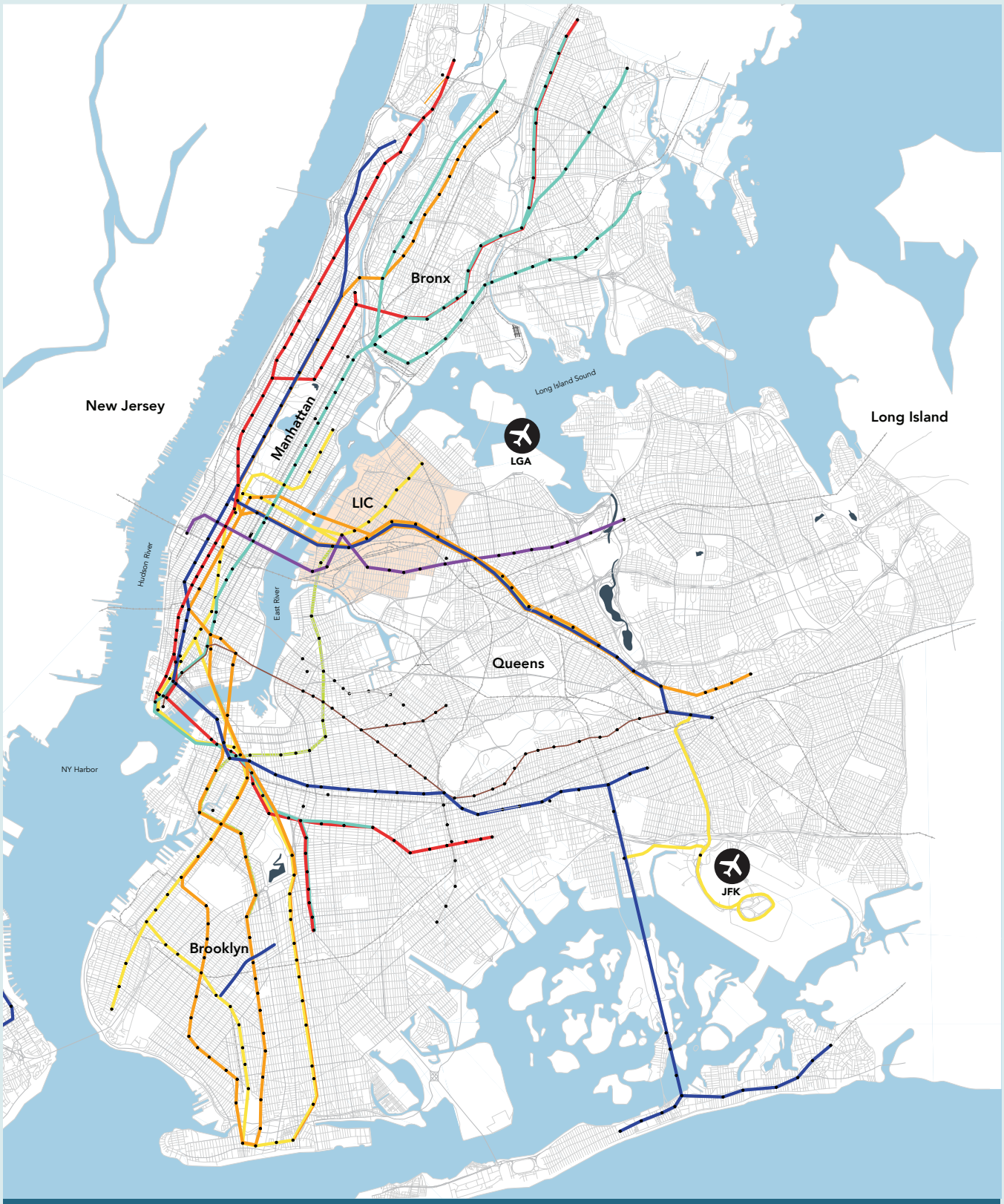
The Long Island City Partnership (LICP) is the local development corporation for Long Island City, Queens. LICP's mission is to advocate for economic development that benefits Long Island City's industrial, commercial, cultural, tech and residential sectors. The goal is to attract new businesses to LIC, retain those already here, welcome new residents and visitors, and promote a vibrant and authentic mixed-use community. LICP operates the Long Island City Business Improvement District and the LIC Industrial Business Zone, among other programs.

Long Island City (LIC), located directly across the East River from Midtown Manhattan, is a vibrant mixed-use community. LIC is home to Fortune 500 companies, world-renowned arts and cultural institutions, prominent film and television studios, a large industrial base, and has over 170,000 residents within the greater Long Island City neighborhood. LIC is a diverse and authentic NYC neighborhood in the borough of Queens – America's most diverse county.

EAST EGG project management

East Egg Project Management is a strategic consultant team with 15+ years of New York-focused experience in the life sciences, real estate, and economic development.

MAP A: NYC Metro Area Map



Long Island City is strategically located at the center of NYC and the New York Metro Region

EXECUTIVE SUMMARY

Key Findings

The Consultant Team's research indicates that there is **significant opportunity and enthusiasm** for growing the life sciences in LIC. Based upon the work of this study, it is clear that **Long Island City (LIC) is not only suitable but also necessary for creating the critical mass of life sciences space needed to establish New York City (NYC) as a leading national market in this sector**. With appropriate support from the State and City, and concerted action by the local community, LIC can be the key to delivering on NYC's goal of establishing itself as a prominent, self-perpetuating hub for the life sciences.

Introduction

Over the past decade, and especially as a result of recent public investments, NYC has made considerable strides in creating Class-A lab space and incubator facilities in addition to attracting venture capital funding for local start-ups. Both New York State and New York City now offer life sciences incentives that are among the most comprehensive in the nation, changing the national perception of NYC as a life sciences market. For NYC to continue this momentum and double its footprint, it needs more, conveniently located, and affordable space with the right amenities. The City's LifeSciNYC initiative has a stated target of developing three million square feet of life sciences space in the five boroughs. LIC can provide this space in optimal and accessible locations more than any other neighborhood. **LIC provides the city's greatest opportunity to fulfill NYC's life sciences space needs**.

Encouraged by the findings of a number of citywide studies and its own LIC Comprehensive Plan effort[1], the LIC Partnership (LICP), with support from an Empire State Development grant through the New York City Regional Economic Development Council (NYCREDC), set out to study the feasibility of developing a life sciences cluster in LIC. LICP engaged East Egg Project Management (East Egg or the consultant team), a strategic consultant team with 15+ years of New York-focused experience in the life sciences, real estate, and economic development, to undertake this study.

Study Goals:

- Identify and assess the key obstacles that have thus far prevented a life sciences cluster from developing in LIC;
- Estimate the potential magnitude and economic impacts of an LIC Life Sciences Cluster; and
- Identify and recommend what is needed to overcome the barriers and catalyze a self-sustaining cluster

Key Finding:

There is **clear and significant opportunity and enthusiasm** for growing the life sciences in LIC.

East Egg arrived at its findings after conducting an extensive series of interviews with nearly 50 key stakeholders with academic medical and research institutions, government, real estate developers and brokers, life sciences companies at all stages of the business life cycle, and venture capitalists. East Egg also undertook benchmarking analyses of three other U.S. life sciences hubs and conducted an economic impact analysis of two scenarios to identify jobs and spending that could be generated by a cluster's construction and operation. Finally, East Egg developed specific recommendations to address challenges, catalyze a life sciences sector in LIC, and initiate sector growth in both the near and longer terms.

1. The Comprehensive Plan was funded in part by NYS and NYC

NYC's Life Sciences Sector in Context

New York has now entered JLL's ranking of the top 15 life sciences clusters in the U.S.,[2] but at **less than three million square feet** it is still relatively small, and trails behind the clusters even in mid-size metro regions like Denver and Minneapolis. By adding **five million square feet**, the NYC region could evolve to the next level as a 'Breakout Hub' similar to metro Philadelphia, North Carolina's Research Triangle Park, and metro DC/Maryland.

NYC's life sciences sector is experiencing rapid growth and boasts strong fundamentals. The many life sciences incubators open or opening in NYC (LaunchLabs, JLabs, BioLabsNY, Harlem BioSpace, SUNY Downstate) are generating an unprecedented number of **new sources of demand for lab space**. Companies growing out of these spaces and the Alexandria Center are **frustrated by the lack of NYC options;** some have even called it a crisis.

East Egg's analysis indicates that LIC, with its access to transit, growing amenities, and appropriate building stock, is ideally positioned to develop space that can meet this critical demand. In particular, these spaces could be built near LIC's transit hubs as an initial play, with ample, larger-scale lab space built out in additional parts of LIC in future phases.

NYC Life Sciences Market Conditions

- Unprecedented **demand for small and midsize space** by growing companies in NYC
- Institutional and small-company **needs for shared facilities** too expensive to host on campus/solo (data storage, imaging, research support facilities)
- Expressed desire by companies and VCs for **alternatives to expensive existing space** in Manhattan

LIC as a Life Sciences Hub: Creating the Value Proposition

LIC's strengths align well with both universal life sciences company needs and the NYC market's specific demands. There was a great deal of consensus across East Egg's stakeholders about how much LIC had to offer the life sciences sector and where improvements could be made. While the East Side, West Side/Hudson Yards, West Harlem, and Hudson Square have also been identified as potential locations for life sciences clusters, LIC's assets give it a competitive advantage over those Manhattan neighborhoods.

Life Sciences Industry Needs	LIC Assets
Accessibility Educated workforce; transit and airports; access to major academic institutions (though not required to be adjacent)	**Access to Region and Workforce** Excellent transit (8 subway lines, 15 bus routes, 3 ferry landings); 30 minutes or less to both LGA and JFK; commuter and regional lines that link LIC to entire NYC region
Quality of Life Attractive and livable communities with good schools and ample amenities, including cafes and conference venues	**Vibrant Live-Work-Play Neighborhood** 39+ arts and cultural destinations; 150 dining and drinking establishments; good schools with more planned; 50,000 higher-education students; diverse housing stock and rich offerings in healthy living
Affordable, Flexible Space and Ready-to-Go Space Appropriate zoning and building stock that can more quickly accommodate facilities for companies of all stages with room to grow	**Affordable Space, Strong Building Stock and Appropriate Zoning** Lower land costs; additional incentives for companies relocating

2. JLL US Life Sciences Outlook 2016

A number of trends within the life sciences industry (e.g., more dry lab requirements) and specific needs of those companies within NYC (e.g., critical need for graduate space), have provided a window of opportunity for the NY market. With the recent opening of new incubators in Manhattan, the increased interest from developers and venture capital, a growing entrepreneurial environment, and LIC's emergence as a high quality, transit rich live-work-innovate neighborhood **now is the time for LIC to play the decisive role in the City's life sciences plans**.

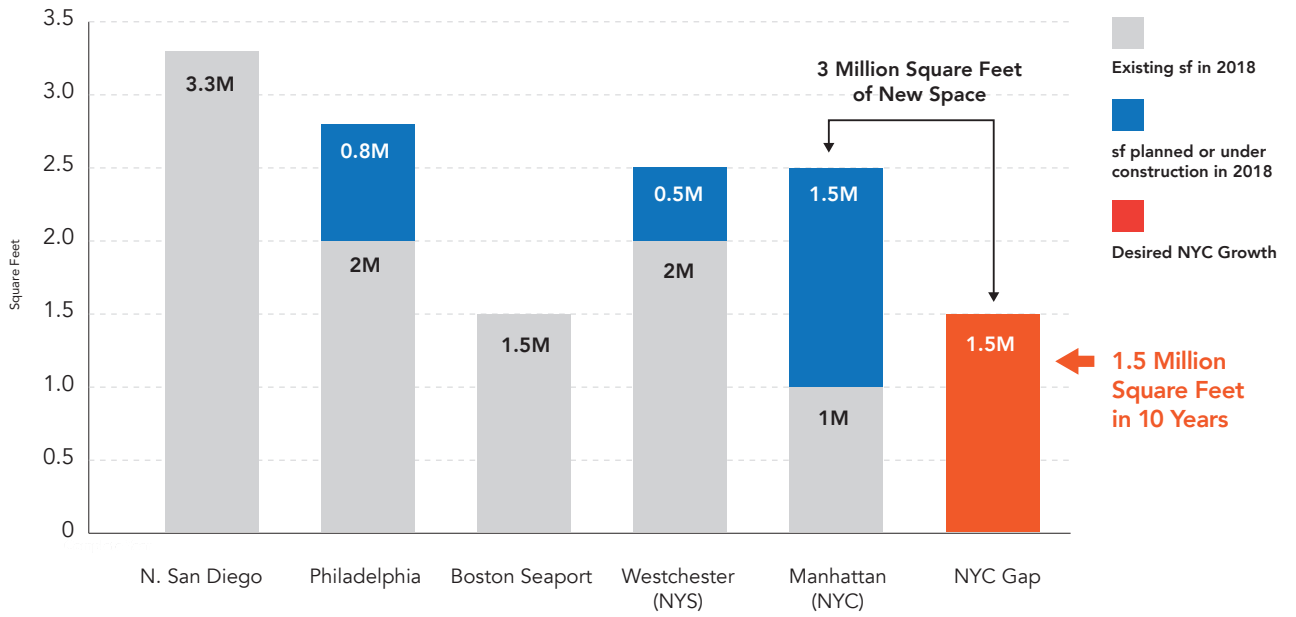
Challenges

- **Misperception** that LIC is far from and hard to get to from Manhattan's East Side medical corridor and other parts of region
- **Lack of existing cluster** and academic research institutions (AMIs)
- **"Credit/cost conundrum"** increased financing risk due to high construction costs + low/no tenant credit among small companies

Addressing Perception. Two challenges that East Egg repeatedly heard were common misperceptions about LIC: (1) many decision-makers in the life sciences sector are simply not aware of LIC's assets (such as restaurants, retail, etc.), and (2) LIC is too far and inconvenient from Manhattan. These same concerns had been felt by the film and television industry in the 1980's, but were overcome with targeted marketing efforts. Misperceptions of LIC can be addressed through **marketing efforts that illustrate current realities and work that is already going forward.**

Addressing AMI Proximity. While some companies, especially smaller ones, prefer to be directly adjacent to AMIs, many successful urban sub-clusters have developed within larger regional clusters without that adjacency. Lower price points, amenities, and transit options make these sub-clusters attractive and viable alternatives to the more established and expensive hubs. LIC is well suited to serve as major sub-cluster with its **lower land costs, ease of access, existing building stock and development sites, and zoning.**

TABLE A: NYC Potential Growth in Life Sciences



Queens Plaza North towards Manhattan Photo: LICP

Addressing Financing Challenges. One of the challenges of developing life sciences facilities in NYC is the gap between the cost to develop such space and the rents that life sciences companies, especially new, non-credit ones, are willing to pay for it. This cost/rent gap challenge also applies in LIC, despite rents being lower than they are in Manhattan. **The cost/rent gap needs to be mitigated by public incentives or assistance** in order for LIC, or any other location, to develop an initial cluster.

Given that LIC's industrial buildings — with their heavy floor loads, wide column spacing, and appropriate zoning — are well suited for life sciences companies requiring wet labs, and that life sciences space is trending toward more office/dry lab and less wet lab space, LIC is a step closer than other areas of the city to closing the financing gap, but targeted public incentives will still be needed to do so.

Economic Impacts

In assessing the feasibility of life sciences in LIC, East Egg considered the potential economic impact that such development would have on the NYC economy. Economic impact is measured in, among other metrics, the number of construction (short-term) and permanent jobs created. The development of 1.5M sf of life sciences facilities in LIC by 2028 would provide over 5,500 short-term jobs and almost 15,000 permanent jobs (direct, indirect, and induced), generating over $2 billion in annual earnings and over $7 billion in annual citywide economic output.

How to Make it Happen

Based on the findings of their extensive interviews and comprehensive analyses, East Egg developed a series of core recommendations for the public sector and LICP. These Short- Mid- and Longer-Term action items can unlock LIC's potential in filling in a critical piece of NY's life sciences cluster puzzle.

Short Term

1. Address financing hurdles
2. Address competitive real estate market challenges
3. Establish Life Sciences Resource/ Industry Desk at LICP
4. Accelerate and expand placemaking
5. Change perceptions: marketing

Mid Term

6. Support development of shared Facilities
7. Foster live-work aspects of LIC (e.g., schools, retail, open space)
8. Workforce development: encourage AMI and industry collaboration with local groups

Longer Term

9. Leverage critical mass of step-out space, incentive programs, and shared facilities to continue to attract larger life sciences and Pharma companies for ground-up development
10. Invest in improving regional transit
11. Build upon earlier successes

Public Sector

- Identify and develop assistance and incentive programs to close the cost/rent gap:
  - Supply Side: tax abatements; reduce cost for public sites; loan guarantees; capital grants
  - Demand Side: TI fund; loans for security deposits
- Fund a Life Sciences Resource/ Industry Desk
- Accelerate and expand public capital investments in transportation, infrastructure, and streetscape improvements
- Consider LIC for Downtown Revitalization Initiative (DRI) funding
- Invest in placemaking to transform public sites under elevated roadways and viaducts into open-space, plazas, and parks with WiFi
- Partner with LICP in marketing LIC

- Incentivize shared facilities (e.g. large research support facilities, conference and event spaces) through public-private partnerships and zoning
- Expand top-quality primary and secondary schools within LIC
- Create additional active open space
- Invest in workforce development programs at all skill levels (lab techs, data analysts, etc.)
- Expand the State's START-UP NY program to include LIC locations

- Engineer and implement ferry landing at or near East 68th Street
- Implement Sunnyside Intermodal Station accommodating regional and local transit with rail and surface routes

LICP

- Undertake a residual land value analysis and pro forma based on specific sites to quantify gap between construction premium and market rent for lab development in LIC
- Establish a Life Sciences Resource/ Industry Desk at LICP to track pipeline of step-out companies, establish inventory of properties, guide private developers and companies through approvals, etc.
- Expand placemaking and community activities: wayfinding, streetscape and arts initiatives
- Continue to assist in programming events and activities
- Target marketing efforts to life sciences stakeholders

- Work with public and private sectors to locate suitable sites for shared facilities
- Use network, events to connect LaGCC with life sciences stakeholders

- Identify sites that could accommodate ground-up development for AMI expansion needs

INTRODUCTION AND APPROACH

Photo: LICP

Introduction

Based upon the work of this study, it is clear that **Long Island City (LIC) is essential to** creating the critical mass of life sciences space needed to **establish New York City (NYC) Region as a leading national market in this sector**. After more than 15 years of concerted efforts by the State and City to grow a life sciences cluster, the market finally seems to be at a turning point. With the opening of new incubators in Manhattan, the increased interest from developers and venture capital, and a growing entrepreneurial environment, now is the time for LIC to play a decisive role in the city's life sciences trajectory.

Life sciences real estate developers have increasingly noted LIC's many assets: ample development sites, appropriate building stock, favorable zoning for life sciences uses, relative real estate costs, proximity to both Manhattan's East Side medical research corridor and the Cornell Tech innovation campus on Roosevelt Island, convenient access to two major airports and high quality live-work character. With eight million square feet (sf)[3] of existing office and industrial space, LIC is one of NYC's largest central business districts. It boasts a significant hub of strong, middle-class jobs and has also emerged as a vibrant residential community with a wide variety of housing stock. With a population of 170,000[4] and over 16,800 new units[5] developed since 2006, LIC has been identified as America's fastest growing neighborhood.

In 2016, the Long Island City Partnership (LICP) issued its first *Comprehensive Plan* (the "Plan"), funded in part by NYS and NYC, which explored ways to leverage the neighborhood's assets to strengthen its authentic, mixed-use character. The Plan concluded that LIC "remains and is becoming ever more attractive for commercial office, retail, light industrial, design, tech, and cultural uses, reinforcing its regional reputation as a neighborhood ripe with opportunity."[6] One of the opportunities highlighted in the Plan was the potential for a life sciences cluster in LIC.

The same year that the Plan was released by LICP, the Partnership Fund for New York City issued a report,

3. LICP Neighborhood Snapshot, September 2018
4. LICP Neighborhood Snapshot, September 2018
5. LICP Neighborhood Snapshot, September 2018
6. LICP LIC Comprehensive Plan 2016

New York's Next Big Industry: Commercial Life Sciences, which found that the life sciences sector in NYC was positioned for considerable growth. The report highlighted new talent and leadership at the city's academic medical institutions, convergences between the life sciences and tech sectors, and increased interest by global pharmaceutical companies in locating in New York. In subsequent conversations, the leadership of the Partnership Fund has noted the assets of LIC, particularly its adjacency to the East Side medical research corridor and ability to accommodate large quantities of relatively affordable wet lab space, that make it an ideal location for a New York City cluster.

Further, in its well-respected annual survey of commercial life sciences markets in the United States, the global real estate investment management firm JLL reported in 2016 that NYC had emerged as a leading national hub, calling Manhattan a rapidly growing "global powerhouse in the commercial life sciences real estate market."[7] In its 2017 update report, JLL ranked the New York region (including Westchester and Long Island) 14 out of the top 15 life sciences hubs in the nation, noting that, despite an abundant amount of resources, NYC is held back by the dearth of the necessary life sciences infrastructure and the high operating costs: Manhattan had the highest rents in the nation for life sciences space and a zero vacancy rate.[8]

There is a growing collaborative effort among institutions, government, and the private sector to develop a meaningful commercial life sciences cluster in the city. The recent life sciences initiatives from both the State[9] and the City[10] together total over $1 billion in support. In moving the City's initiatives forward, the New York City Economic Development Corporation (NYCEDC) recently issued a Request for Expressions of Interest (RFEI) for a life sciences hub that offered three City-owned sites as potential locations, including the Department of Education Building at 44-36 44th Drive in LIC. Moreover, even prior to the RFEI, LICP had met with and given tours to a number of prominent life sciences developers, who have noted the many assets LIC has to offer.

Objectives of the Report

Despite all the advantages and recent interest in LIC, a life sciences cluster has not developed organically to date. To understand why, LICP engaged East Egg to:

1. **Identify and assess the key obstacles** that are preventing a life sciences cluster from developing in LIC;
2. **Estimate the potential magnitude and economic impacts** of an LIC Life Sciences Cluster; and
3. **Identify and recommend what is needed** to overcome the barriers and catalyze a self-sustaining cluster.

Definition of Life Sciences

Life sciences is a broad sector whose definition evolves as it advances. For the purposes of this report, the Consultant Team defined life sciences to encompass the fields of biogenerics, bioinformatics, biomedical engineering, biopharmaceuticals, biotechnology, chemical synthesis, chemistry technology, medical diagnostics, genomics, medical image analysis, marine biology, medical devices, medical nanotechnology, natural product pharmaceuticals proteomics, regenerative medicine, RNA interference, stem cell research, medical and neurological clinical trials, health robotics and veterinary science. This definition is widely accepted among life sciences stakeholders and was confirmed by the State and the City Life Sciences industry teams.

7. Data from JLL US Life Sciences Outlook 2016
8. Data from JLL US Life Sciences Outlook 2017
9. State: $650M announced in December 2016: https://esd.ny.gov/governor-cuomo-announces-groundbreaking-650-million-initiative-fuel-growth-world-class-life-science
10. City: $500M LifeSciNYC initiative announced in December 2016: https://www.lifesci.nyc/ten-point-plan

Project Approach and Methodology

Working closely with LICP, the Consultant Team analyzed each of the challenges, actual and perceived, that have historically hindered development of a critical mass of life sciences activity in LIC. The Consultant Team also explored the advantages that LIC has over other parts of NYC and identified potential opportunities to seize in order to address these challenges in the short and long terms.

The Consultant Team engaged in comprehensive information-gathering through stakeholder interviews, literature review, and a best-practices analysis that examined the dynamics of the life sciences markets in three major US life sciences clusters. Reviewing the results of the interviews and supplementary research, the Consultant Team identified LIC's principal assets and challenges and undertook a detailed SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis.

The SWOT analysis informed the development of two potential life sciences cluster scenarios — a first case defined as an initial, smaller-scale phase, occurring in the next three years, and a second case that considered a larger-scale, more mature phase of growth evolving over the next six to ten years if all development efforts proved successful. The Consultant Team undertook an economic impact analysis of the two scenarios, identifying jobs and spending that would be generated by the cluster's construction and operation. It should be noted that since the analysis was performed, indications from the marketplace are that even further potential is emerging, as momentum continues to build for this sector in New York. Finally, the Consultant Team developed specific recommendations to address challenges, catalyze a life sciences sector in LIC and initiate sector growth in both the near and longer terms.

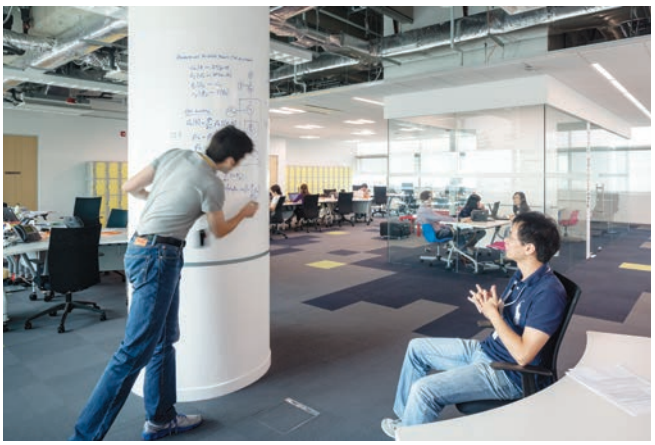


Photo: King Street Properties

FINDING

There is enthusiasm and clear demand for affordable, move-in-ready space for small companies growing out of Manhattan's incubators. "If there were a turnkey 10,000-sf space in LIC, we'd take it."

— NYC-BASED BIOTECH COMPANY

STAKEHOLDER INTERVIEWS

Companies | VC | Incubators | Institutions | Real Estate | Government

The Consultant Team conducted an extensive series of **interviews with nearly 50 key stakeholders** from academic research centers, medical and research institutions, government, real estate developers and brokers, life sciences companies at all stages of the business life cycle, and venture capitalists, among other aspects of the life sciences sector.

In undertaking these interviews, the Consultant Team was able to identify a number of clear themes, described in more detail below. There is increasing confidence in the NYC market across categories of stakeholders, and clear enthusiasm for continued growth. Despite the significant challenges in the NYC life sciences market and the allure of the larger markets of Boston and the Bay Area, more and more companies are trying to locate in NYC because their leaders generally want to be here. While Manhattan is the strong preference for many companies and their funders, there was a general consensus among many stakeholders that LIC could be a viable location for a life sciences cluster in NYC owing to its existing industrial buildings, favorable zoning, capacity for expansion, transit connections, and rents that are at least 20% lower than those in Manhattan (and are often even lower due to abatement and incentive programs).

TABLE B: **Interviews**

Service Providers	4
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Venture Capitalists/Funders	5

One challenge that the Consultant Team repeatedly heard about was a common misperception about LIC: many decision-makers in the life sciences sector are simply not aware of LIC's assets or believe that it is too far and inconvenient from Manhattan. This same misperception had been felt by the film and television industry in the 1980's, and was overcome with targeted marketing efforts.

A second major issue, one that really applies across the city and not just to LIC, is a "cost/credit conundrum," i.e., the lack of credit among the life sciences companies looking for space combined with the premium costs for lab construction and rents that may not provide developers with a sufficient return on those costs. This challenge has hindered lab development in NYC for years, and is one that can be addressed with State and City support.

The themes that arose (summarized below) were generally consistent within each category of stakeholder, while perspectives sometimes differed between categories. Many of the stated hurdles to an LIC location can be addressed as outlined in the Recommendations section of this report.

Not-for-profit life sciences organizations and thought leaders indicated that it is typically important to attract a large anchor to establish a life sciences cluster, but did admit to a "chicken and egg" challenge because large anchors are generally attracted by an existing innovation cluster. It would be optimal, therefore, to work to attract a full range of company types, particularly step-out companies. Many thought leaders also observed a blurring of the line between life sciences and tech, noting that as Big Pharma downsizes in the Northeast, a NYC life sciences cluster will likely be built around mid-sized biotech, digital health, and bioinformatics companies. There was also a general consensus that the recent initiatives by NYS and NYC are a good start and finally send the right signals of support to life sciences companies and real estate developers.

> To grow this sector the right way, the only place to do it in NYC is LIC.
>
> — NYC-BASED LIFE SCIENCES REAL ESTATE BROKER

Leadership at NYC's burgeoning cohort of **life sciences incubators** have a universal concern about the challenge of finding step-out space for the scores of companies that will be graduating from these facilities. These companies are generally looking for 5,000-10,000 sf of affordable, built-out lab space. **Every incubator leader expressed that LIC would be an ideal location if such space existed there**.

NYC start-up companies confirmed what the Consultant Team heard from the leadership of the incubators. Many of these companies that have already graduated from incubators have taken space in Manhattan or at SUNY Downstate in Brooklyn, but said they would have considered LIC if they knew

FINDING

There is and will increasingly be demand for pre-built, affordable space for small and mid-size companies that grow out of Manhattan's institutions and incubators; a broader, comprehensive ecosystem that included larger facilities could develop organically from that starting point.

more about it or if there were appropriate space there. **Access to talent** is key for these companies, a factor that makes NYC, and particularly LIC, attractive. Many start-up companies, often founded and led by New Yorkers, are committed to remaining in NYC, even though the ecosystem is stronger in Boston or the Bay Area. **Affordable, move-in-ready lab space is their greatest hurdle to remaining in the city.**

Larger companies in the New York region have historically located in large, cohesive campuses in New Jersey, Westchester, or Connecticut, drawn to suburban campuses with ample parking. The companies that spoke with the Consultant Team noted that due to the history of legacy pharma companies in the region and their large and long-term investments in their facilities, new location considerations would be unlikely at this time. One company that started in NYC recently landed in Connecticut due to a large state incentive package.

> In thinking about LIC for potential expansion, we have to think about housing and commutes for post-docs and grad students and industry employees; also start-up spaces — wet bench space for companies, incubator space, step-out space.
>
> — AMI TECH TRANSFER GROUP

This said, there is a **growing preference for amenity-rich urban communities among younger talent**, particularly within the tech and life sciences careers. While the larger companies noted that their workforce is more suburban, they now have employees who commute from the city. It should also be noted that some larger companies have located facilities in the city, particularly at the Alexandria Center, in order to be closer to smaller innovative companies and their talent. These types of companies, not surprisingly, are far less price-sensitive than other parts of the sector, as evidenced by Pfizer's recent lease of new space at Hudson Yards, perhaps the most expensive commercial real estate currently in NYC.

Decision-makers from **academic medical institutions** (AMIs) that spoke with the Consultant Team expressed no plans to locate facilities in LIC, primarily because they believe it is just too far from their research cores. Their scientists do not like to go off campus, even if within a block or two. Some, however, noted a longer-term **acute need for large shared research facilities** that would not fit on their existing campuses but could be accommodated in LIC. They also acknowledged that at some point in the future, Manhattan would simply run out of space, and so **LIC could be an expansion option out of necessity**, especially if other life sciences entities were in the area.

The Consultant Team spoke with many **real estate developers** from both NYC and the Boston area. There was a notable difference between the two groups: Boston life sciences developers — including those considering entering the NYC market — expressed more comfort with speculative life sciences development and a higher appetite for risk than some of their NYC counterparts, whether deeply experienced in the sector or starting to explore it. In general, **LIC will need speculative capital** to establish a life sciences market, though government incentives

will be necessary to "break the ice," particularly as many first-in developers are risk-averse. There was a lack of consensus among developers as to the efficacy of the State and City's current incentive programs, with some developers saying they are helpful and others saying they are not enough to mitigate risk.

Alexandria Center for Life Science, NYC
Photo: Alexandria Center

Life sciences-focused real estate brokers told the Consultant Team that for life sciences tenants looking for space, **speed to market** is key. Step-out companies want to move into turnkey space right away and do not have capacity to pay for expensive tenant improvements, nor the expertise and time to manage a build-out. The brokers agreed that the lines between the life sciences and general tech are blurring, so tenants' lab space needs have changed toward more dry lab and computational space. More flexible, modular lab space is also desired due to rapidly changing technologies, instruments, and types of research. While most life sciences tenants want to be in Manhattan, **most brokers noted the advantages of LIC**, which makes more sense from **cost, zoning, and expansion opportunity** perspectives. The biggest challenges facing LIC are perception and lack of knowledge. The brokers recommended that LIC market itself not just as adjacent to Manhattan but as the only place in NYC that is widely accessible and has the ability to support the breadth of a life sciences ecosystem.

More **venture capital firms and funders** are investing in NYC companies in recent years. The VCs that spoke with the Consultant Team were **all very bullish** about the prospects for this sector in NYC. The research talent is here, though the management talent is not yet as prevalent as in Boston or California. Some VCs who have funded NYC companies have guided those companies to space in the Alexandria Center, but this is partly due to it being the only Class A lab space in the city. Most every VC that spoke with the Consultant Team welcomed competition to the Alexandria Center. While their knowledge of LIC was low, **many VCs said they would be open to considering LIC if the appropriate space existed.**

Casa Enrique, one of LIC's Michelin star rated restaurants
Photo: LICP

Summary of Life Sciences Company Needs

As reflected in the diversity of the stakeholders interviewed, the life sciences ecosystem includes academic institutions and companies at various stages and levels. While their space and logistical needs vary, there are a number of basic common needs the life sciences sector requires to thrive. Table C provides an outline of these.

TABLE C: Life Sciences Company Needs

Scientific talent	**Access to top talent** is a key factor in companies' locational decisions. NYC, with its numerous world-class academic research institutions, certainly has talent comparable to Boston and San Francisco. Companies insist that they must be easily accessible to the widest sector of talent, **both national and from abroad**.
Executive talent	Finding **experienced C-level and other managerial talent** in the life sciences has historically been a challenge in the NYC market but is getting easier in recent years as the sector grows. Another theme was that the NYC academic institutions train their students primarily for careers in academia or big Pharma, whereas schools in the Bay Area and Boston/Cambridge strongly **emphasize entrepreneurship** and foster commercialization.
Space needs	The **proliferation of incubators in NYC** has been a boost for this market and has done much to fill the need for start-up space here, but **NYC needs move-in-ready, small and midsize space** for companies graduating out of the incubators in the coming years. The lack of existing, affordable lab space seems to be the **biggest impediment** to the growth of New York's life sciences sector.
Amenities, community	An attractive cluster needs **amenities** — **restaurants, bars, coffee** — and other life sciences organizations of varying sizes to collaborate and connect with. **Outdoor / open-space** opportunities are also important, as is access to high-quality **education for children** of life sciences employees.
AMI adjacency	As companies mature, **direct proximity to AMIs becomes less important**. Academic and institutional researchers, however, only want to be on campus and are unlikely to travel to a remote facility under most circumstances.
State support	Appreciation of the **State's recent life sciences initiative** and **its multi-targeted focus** on **tax incentives** for both new and existing companies, **capital funds** for new facilities, and **investment capital** has led to an **accelerating interest in the NY market.**
City support	In parallel, there is satisfaction **that EDC and the City** in general are showing willingness **to invest in this sector** and consensus that the **recent RFEI** has been helpful in **raising the profile and perception of LIC** as a potential life sciences market.

LIFE SCIENCES CLUSTERS IN THE UNITED STATES

Benchmarking and Best Practices

Photo:King Street Properties

The Consultant Team undertook a benchmarking analysis of leading US life sciences clusters and sub-clusters in order to frame and guide the analysis and recommendations for LIC. This evaluation examined rentable square feet, types of companies, rents, vacancies, and the role of public incentives in ensuring success. As a life sciences hub in LIC would technically be a sub-cluster within a larger NYC cluster, the Consultant Team also examined sub-clusters that have emerged in several urban markets, most notably Boston and Philadelphia, in order to determine how their success may inform efforts in LIC. Within some larger regional clusters, successful urban sub-clusters have developed as viable alternatives to more established and expensive hubs in their respective markets, despite their lack of adjacency to AMIs.

Defining a Life Sciences Cluster

A healthy, established life sciences ecosystem is composed of organizations of all sizes, from small start-ups to large corporations and institutions. These uses, naturally, each require different types of space:

- Lower-cost, smaller units with shared amenities for earlier-stage companies
- Larger, open floorplates with more intense and specific infrastructure for later-stage firms
- Amenities like restaurants, bars, and retail
- Conference / event spaces
- Shared intensive uses, research support imaging centers, data storage

While still small at less than three million sf, NYC has recently emerged as one of the top 15 life sciences markets in the country. Manhattan has the lowest vacancy rate and highest rents in the nation.

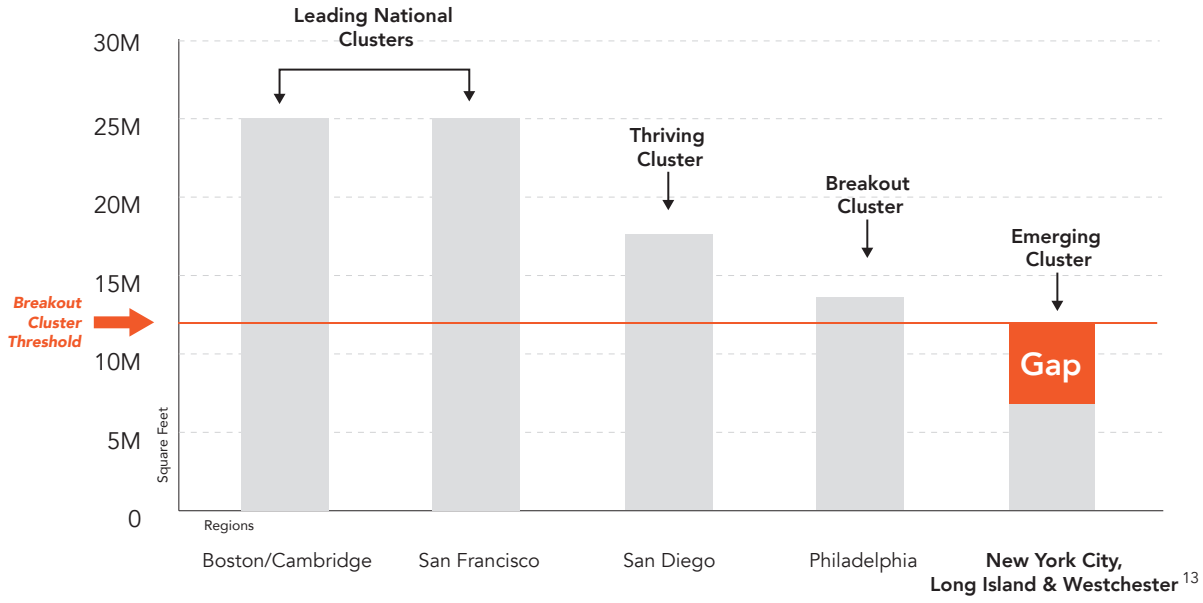
> What makes a cluster are location, cost, amenities, shared facilities, and a sense of community.
>
> — LIFE SCIENCES COMPANY CEO

Access to institutions, including their research and development, technology transfer, and core research facilities is a key element in the formation of a self-sustaining cluster, although adjacency to AMIs is generally not a primary concern for later-stage companies. Other factors for success are access to talent including executive-level managers, well-trained scientists, and support staffing; proximity/connections to other life sciences companies; and opportunities for private and public funding. Ease of access — via public transportation and/or car — is also essential for companies for attraction of both venture capital and employees. As the industry becomes more globalized, airport proximity is another draw; clusters such as South San Francisco and Boston Seaport have benefited from proximity and easy access to major airports.

The Nation's Leading Life Sciences Clusters

The life sciences industry in the US is largely concentrated in 15 metropolitan clusters around the country that, while diverse in expertise and concentration, all include at least one major academic institution and a well-developed medical sector. These elements enable the clusters to attract venture capital and talent that spur commercial activity. These 15 clusters are significantly dominated by four regions — Boston/Cambridge, the San Francisco Bay Area, the San Diego area, and North Carolina's Research Triangle — that together accounted for almost 80% of venture capital funding in the life sciences nationally in 2016.[11]

TABLE D: US Life Sciences Regional Clusters by Total Square Feet[12]



11. PwC Moneytree Q4 2015 - Q3 2016 as cited in *JLL Life Sciences Outlook 2017*
12. Data from JLL US Life Sciences Outlook 2017; table created by East Egg
13. New York City Regional Market can be broken down as follows: NYC: 2.5 million sf; Westchester: 2.7 million sf; Long Island: 1.5 million sf

Table E: **Notable Sub-Clusters in the United States (by Total Square Feet)**[14]

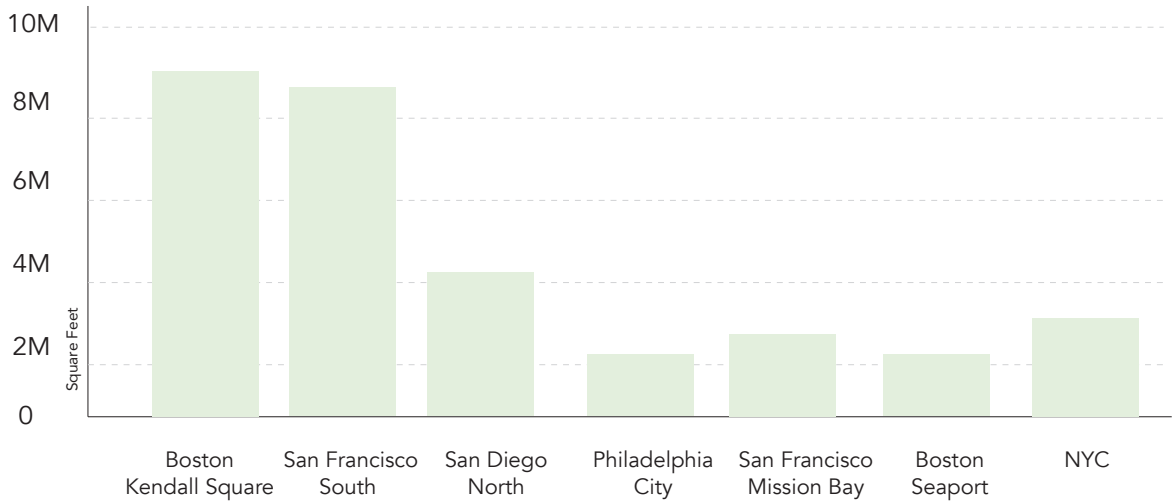


Table D compares four categories of life sciences clusters in the US as defined by JLL: the "Alpha" or dominant clusters of Boston/Cambridge and the San Francisco Bay Area, "Major" clusters as represented by San Diego, "Breakout" clusters as seen in metro Philadelphia, and newly "Emerging" clusters such as the New York region, which includes Long Island and Westchester but excludes New Jersey, which is considered its own market. The Emerging clusters, which also include such markets as Denver, Orange County (California), and Seattle, rank among the top 15 life sciences clusters in the nation. Each of these, however, comprises less than 10 million sf of rentable life sciences space, which is generally JLL's threshold for a Breakout cluster (see the orange line in Table D). By adding an additional five million sf, the NYC region could rise to that next level of strong, nationally recognized clusters that include North Carolina's Research Triangle, DC/Suburban Maryland, and metro Philadelphia. JLL's *U.S. Life Sciences Outlook 2017* identifies over one million sf of life sciences development currently in the pipeline in Manhattan, should the third phase of the Alexandria Center be built, and two million sf in the early planning stages at the North 60 site in Westchester County. The City's LifeSciNYC initiative has a stated target of developing three million sf of life sciences space in the five boroughs. LIC can provide more of this space than any other neighborhood.

> Two of the most successful emerging urban life sciences sub-clusters — Boston Seaport and Philadelphia Navy Yard — have benefited from targeted state and city incentive programs.

As Table E illustrates, the largest life sciences clusters in the U.S. also have multiple sub-clusters that complement one another while sometimes competing on cost and space availability. For example, the Boston-Cambridge cluster consists of the large and mature sub-clusters in Kendall Square and Route 128, in addition to emerging sub-clusters at the Boston Seaport and West Cambridge. The San Francisco Bay Area cluster is centered on its largest sub-cluster in South San Francisco/North Peninsula, but also

14. Data from JLL US Life Sciences Outlook 2017; table created by East Egg. NYC bar includes 1.3M sf in Manhattan (effectively zero vacancy) and 1.5M sf in Brooklyn (>40% vacancy).

Table F: Select Life Sciences Regional Clusters: Sub-Clusters, Rents, Vacancy Rates and Incentives[15]

Regional Cluster	SF Bay Area	Boston/ Cambridge	San Diego County	Philadelphia Region	New York City Region
Regional Cluster Size (sf)	25 million	25 million	18 million	12 million	7 million
Primary Sub-clusters	Mission Bay, South San Francisco	Kendall Square	La Jolla	University City	Manhattan East Side, Westchester
Secondary Subclusters	Palo Alto, East Bay	Boston Seaport	North County	Philadelphia Navy Yard	LIC, Brooklyn
Lease Rates in Primary Sub-clusters	$60 – $70	$75 – $90	$50	$38	$90 -$120 (Manhattan)
Vacancy Rates in Primary Sub-clusters	1.2%	3.6%	5.9%	1.9%	0% (Manhattan)[16]
Incentives	None	Tax Credits for Jobs	None	Tax Abatements and Credits	Tax Credits

includes smaller and emerging sub-clusters in Palo Alto, Oakland/Emeryville, and Mission Bay. In NYC, the East Side Medical Corridor currently forms a primary sub-cluster, and there are small pockets of activity elsewhere in Manhattan. Significant sub-clusters are shown in Table F.

Trends in Clusters

JLL's U.S. Life Sciences Outlook 2017 found that growth in the nation's largest life sciences clusters, many of which have single-digit vacancy rates, is being driven by **demand for talent and a pent-up demand for space**. In order to further understand what factors and forces go into the development of a sustainable life sciences cluster, the Consultant Team evaluated several of the most successful clusters and sub-clusters, including the elite global clusters in Boston/ Cambridge and the Bay Area, and the emerging sub-clusters growing in the Boston Seaport District and the Philadelphia Navy Yard. For each of these markets, the Consultant Team examined multiple factors, including rents, costs, public incentives, and vacancy rates in order to determine the most applicable lessons for guiding the development of a successful life sciences hub in LIC. A summary of these findings is shown in Table F.

Bronstein Building in Boston Seaport District
Photo: Related Companies, L.P.

15. JLL US Life Sciences Market Outlook 2017; Boston Business Journal; Boston Globe; San Francisco Business Times; San Francisco Chronicle; Philadelphia Business Journal; Philadelphia Inquirer; The Real Deal; Xconomy; NYCEDC; NYS ESD; Biospace;
16. While Manhattan, with over 1.3 million square feet of life sciences space, is currently experiencing a zero percent vacancy rate, Brooklyn, with 1.5 million square feet of facilities (of which almost 500,000 square feet is at the City's BioBAT project) has vacancy rates at over 40 percent.

While many older life sciences sub-clusters developed in a suburban context — for example, La Jolla, CA; Route 1 in New Jersey; Research Triangle Park in North Carolina; and Boston's Route 128 — JLL has identified a **significant shift toward urban lab development** so that companies can be **closer to new talent pools that have migrated to cities.** Many of the Consultant Team's interviews confirmed this trend. Younger talent is drawn to the amenities, energy, and diversity of population that cities bring, and there is a stronger focus on public and bike transit over driving. The urban shift is evidenced at the Boston Seaport, Mission Bay in San Francisco, Center City and the Navy Yard in Philadelphia, and in Manhattan.

Reflecting the blurring lines between the life sciences and general tech sectors that is also seen in NYC, many of these new urban clusters are developing as diverse hubs that accommodate a **wide array of technology companies**, not just wet-lab-based life sciences. While the Boston Seaport began as a life sciences hub, attracting companies from Cambridge, non-life-sciences tech companies now make up a majority of the businesses in the district and this will only accelerate with GE's planned relocation to this area. At Mission Bay, life sciences companies are now being joined by the likes of Uber and Dropbox. Life sciences companies in Manhattan are competing not only with big Pharma for talent but also with Google and Facebook. As the tech and life sciences sectors increasingly overlap, a forward-thinking life sciences cluster might consider these trends and include dry lab and office space that can accommodate a wide array of technology companies.

Boyce Technologies, one of LIC's growing tech companies
Photo: LICP

JLL also found that high construction costs in many markets have made **conversions of existing space more attractive as initial investment options** because they are faster to market and more economically viable than new construction. For example, almost all the space in the Sorrento Mesa sub-cluster of San Diego was delivered via conversion of industrial and flex buildings into wet lab facilities.[17] While an adaption of existing buildings at this scale in LIC could prove a challenge given the low availability of vacant existing space, some initial conversion would be advantageous in terms of speed-to-market and would likely catalyze new construction going forward.

LIC, with its concentration of tech-friendly buildings, is already an emerging innovation district. The Queens Borough President's recently released tech action plan — ***Live, Work, Create: A Road-map For Equitable Growth of Western Queens Tech Ecosystem*** — identifies people-, place- and program- focused initiatives to equitably grow the tech ecosystem. These recommendations and those of this report are complementary and highlight how well-positioned LIC is to accommodate and grow these overlapping tech and life sciences sectors.

17. JLL US Life Sciences Outlook 2017

Role of the Public Sector

Public incentives play an important role in the formation and sustaining of most of the country's leading life sciences clusters and sub-clusters. Even Massachusetts, home to what is considered the largest and most elite life sciences cluster in the world, utilizes a comprehensive toolbox of incentive programs to attract, retain, and grow companies and jobs in Boston/Cambridge and other hubs in the state. The Massachusetts Life Sciences Center, a government-funded investment agency, is the principal vehicle for incentives in the state and offers comprehensive incentives and programs.[18] These include capital grants, tax incentives, and equipment and supplies grants, in addition to investment funds targeted to local start-ups. There are also support services to find space, jobs, employees, investors, among other necessary elements for start-ups.[19]

Similar tools have been used by the City of Philadelphia and the Commonwealth of Pennsylvania to foster a sizable sub-cluster at the Philadelphia Navy Yard, where tax credits to new companies and a ten-year abatement of real estate taxes contributed to GSK's decision to develop a 208,000-sf headquarters building. In Pennsylvania, the Keystone Innovation Zone and Keystone Opportunity Improvement Zone programs, both of which apply at the Philadelphia Navy Yard, provide life sciences and other innovation companies with a package of tax credits, including corporate, income, and real estate taxes, in addition to loan financing.

California's mature mega-clusters in the Bay Area and San Diego developed organically around major AMIs decades ago and did not depend on life sciences-specific statewide incentive programs. Individual California jurisdictions, however, have provided targeted tax incentives that have proven successful for local economic development efforts. The City of San Francisco, for example, offered a payroll tax waiver to lure life sciences companies from elsewhere in the Bay Area; this program helped spur the development of a commercial biotech cluster in Mission Bay.[20]

Several jurisdictions have utilized much larger discretionary benefits that are targeted toward single companies. The City of Boston and the Commonwealth of Massachusetts, for example, provided $22 million in tax incentives to the pharmaceutical company Vertex in 2011 to leave its Cambridge facilities and build a headquarters complex in the Boston Seaport District that would catalyze a life sciences sub-cluster in that neighborhood.

Other examples of large discretionary packages securing companies closer to home include Modern Meadow, to whom New Jersey offered $35 million, and Mount Sinai-founded Sema4, given $20million to move to Connecticut. Incentives, while key, are not the only factor. In September 2017, Alexion Pharmaceuticals announced it was moving its headquarters from New Haven to Boston, despite an offer of $26 million in incentives from the State of Connecticut to expand its headquarters there; the desire by Alexion to be closer to the talent pool and existing cluster in Boston outweighed the Connecticut incentives.

Several companies interviewed by the Consultant Team noted that personal income tax credits and other tax abatements, similar to those in the START-UP NY program, but without the requisite university affiliation, would make NYC and, more specifically, LIC, more competitive in their location decision process.

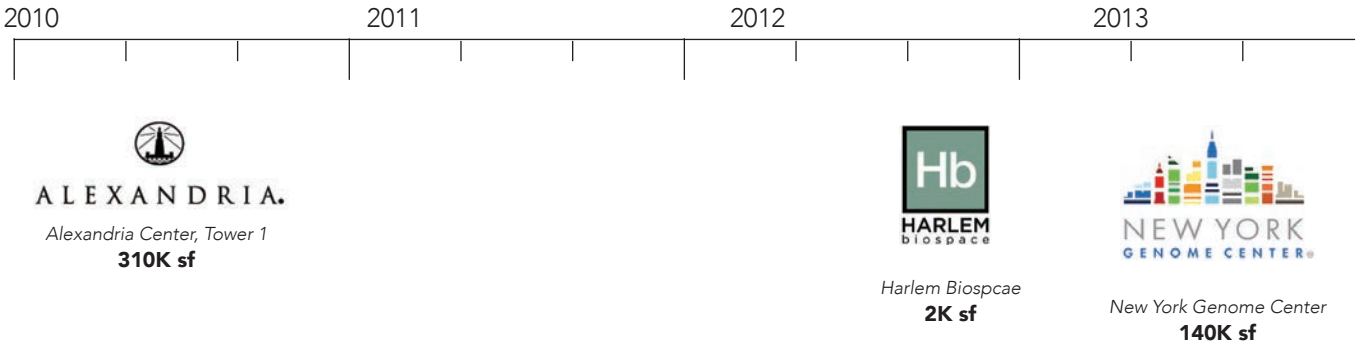
18. JLL US Life Sciences Outlook 2017
19. http://www.masslifesciences.com/why-ma/
20. *KALW Radio; Is the Bay Area Losing Money to Corporate Tax Incentives? April 2018*

THE LIFE SCIENCES SECTOR IN NYC

Photo: New York Genome Center

NY's life sciences sector has been developing over the past 15 years, albeit in fits and starts. It is now in a very strong position for its next stage of growth, having emerged as the nation's 14th largest life sciences cluster in the *JLL Life Sciences Outlook 2017*. While it currently represents a small portion of the city's overall economy, the growing life sciences sector is crucial to supporting and strengthening the healthcare industry and academic medical centers, both of which are major economic forces in NYS and NYC. NYC's healthcare sector contributes $40 billion to a Gross City Product of $700 billion, accounting for annual earnings exceeding

TABLE G: New York's Progression in the Life Sciences



$13 billion for 160,000 workers.[21] Statewide, academic medical centers in New York employ almost 545,000 people, more than in any other state, including California, which has almost double New York State's population.[22]

Over the past two decades, as a culture of entrepreneurship and commercialization has become an important component in academic medicine, more research institutions and academic medical centers have begun to realize that, in order to succeed in the competitive attraction of top talent, a vibrant life sciences cluster is an increasingly vital factor. Institutions such as MIT, Harvard, Stanford, and the University of California campuses at San Francisco and San Diego were early leaders in recognizing this trend and have served as engines for growing large and diverse life sciences sectors in the Boston, San Francisco, and San Diego areas. The academic medical and research institutions of NYC, the largest such cluster in the nation, now recognize that building a strong commercial life sciences sector is integral to their ability to compete for talent and research dollars with peers in more mature markets.

For many years, New York lacked three critical elements to growing a life sciences sector: space for life sciences companies (including turnkey wet labs), experienced managerial talent, and availability of venture capital funding. Progress has been made on all fronts: Alexandria Center, the New York Genome Center, and Harlem Biospace created space for life sciences companies; executive talent is being drawn to New York; and funders like Deerfield, Versant, Arch, Flagship, and Lux have all entered the New York market.

Photo: NYGC

2014 2015 2016 2017 2018

ALEXANDRIA.
Alexandria Center, Tower 2
440K sf

NEW YORK STATE
ESD Life Sciences Initiatives

Life·SciNYC
New Discoveries. New Jobs.
LifeSciNYC

NYSCF
New York Stem Cell Foundation
45K sf

ALEXANDRIA LaunchLabs
15K sf

JLABS
Johnson & Johnson INNOVATION
30K sf

biolabs
50K sf

21. New York Building Congress; Healthy City; December 2016
22. Association of American Medical Colleges; April 2018

In December 2016, both the State and City announced major initiatives to promote the life sciences in New York that resulted in additional significant steps toward a strong ecosystem. While New York has historically lagged compared to other incentives providers, these recent initiatives currently place New York's programs among the largest in the country. **Empire State Development's** programs, to the tune **of $650 million, include tax credits and incentives, capital grants, and investment and operating funds. The State's NYC Regional Economic Development Council** (NYC REDC) has also made the life sciences a priority sector in its regional plan.

The new New York State and City life sciences incentives are among the most comprehensive in the nation and have changed the national perception of NYC as a life sciences market.

NYC's LifeSci NYC comprises a $500-million ten-point plan including capital funding for incubators and non-profit facilities; an internship program; working capital for start-ups; management matching and training; tax abatements; and an advisory board. In the last two years, three incubators — BioLabsNY, JLabs, and LaunchLabs — have been established and additional incubators like San Francisco's IndieBio are imminent, all with State and/or City support. This past spring the City put out an RFEI offering up to $100 million in capital and other resources — including a City-owned site in LIC — to establish an applied life sciences "Hub," modeled after the successful Cornell Tech campus on Roosevelt Island. This RFEI, as well as any subsequent RFPs (Requests for Proposals) and RFIs (Requests for Information), generated a great deal of interest among entities in and outside New York. In 2017, the NYC REDC funded three life sciences companies in NYC through its Consolidated Funding Application program, allowing them to stay in the state as they grow; it also funded this LICP study.

From the interviews, certain themes emerged that aligned with the Consultant Team's other research and its years of experience working in the city's life sciences sector: **primarily, NYC is making significant strides toward a true cluster, but still has work to do to create a self-sustaining ecosystem.**

- Commercial life sciences — a relatively small portion of NYC's overall economy — have become integral to helping the city's AMIs and research hospitals — one of the largest employers in NYS and NYC — attract the top national research talent they need to sustain their sector.
- In the past three years, NYC has made considerable strides in creating Class-A lab space and incubator facilities in addition to attracting venture capital funding for local start-ups.
- Despite new acute demand for step-out and pre-built lab space, NYC still suffers a deficit of such space.

FINDING

The development of a strong, self-sustaining life sciences cluster in NYC is essential to supporting and strengthening the city's world-class medical institutions, and **the only place** to provide space for this cluster — at the necessary scale and price point — **is Long Island City**.

LONG ISLAND CITY AS A LIFE SCIENCES HUB

Creating the Value Proposition

Photo:LaGuardia Community College, LIC

Identifying the assets that LIC has and the challenges it faces in creating a life sciences cluster was one of the key objectives in this study. There was a great deal of consensus across the Consultant Team's stakeholder interviews about how much LIC had to offer the life sciences sector, and where improvements could be made.

Assets

The opportunity and the enthusiasm to foster the life sciences in LIC were common themes in the interviews. The Consultant Team's interviews and analyses confirmed that **LIC may be the only area in NYC that can accommodate a substantial life sciences cluster** that includes space for companies at all stages of growth and institutional users, and that has the **essential qualitative characteristics** necessary to do so.

LIC's strengths, discussed below, include a number that align with life sciences company needs (see page 4), and give it competitive advantage over the Manhattan neighborhoods that are considered contenders for life sciences sub-clusters. While the East Side, West Side/Hudson Yards, West Harlem, and Hudson Square have all been identified as potential locations for a life sciences cluster, **Table H** illustrates how LIC compares favorably to these neighborhoods in terms of what companies look for: access to the research core, transportation, amenities, zoning, cost, and available sites.

1. LIC is part of NYC's surging Life Sciences market and ecosystem.

In the past five years, NYC has become a stronger national life sciences market; this overall growth serves to boost LIC's position as a potential cluster.

- NYC's AMIs continue to produce world-class talent and research with an even stronger focus on applied research and commercialization.
- The growth of life sciences incubators in New York, including LaunchLabs, JLABS, IndieBio, and Biolabs, is creating many new NYC-based companies each year that will be looking for step-out space in NYC to grow.

TABLE H: **Potential Life Sciences Cluster Locations**

	Long Island City	East Side	West Harlem	West Side	Hudson Square
Access to Medical Corridor	+	+	–	–	–
Access to Region	+	+ –	–	+	+
Development Sites	+	–	+	–	–
Zoning	+	–	+	+	–
Amenities	+	–	–	+	+
Affordability	+	–	+	–	–
Perception	–	+	+ –	+	+
AMI Presence	–	+	+	–	–

- The Alexandria Center has put NYC on the national life sciences map by providing Class-A flexible wet lab space, allowing venture-funded companies to grow in NYC.
- A growing number of VCs, both NYC-based and from life sciences centers like Boston/Cambridge and the San Francisco Bay Area, are increasingly seeing NYC as a vibrant life sciences market and investing in life sciences companies with the expectation that they may remain in New York as they grow. International investors also like New York's easy routes to Europe and Asia.
- NYS's $650 million life sciences program and NYC's $500 million LifeSciNYC initiative and have demonstrated the public sector's commitment to this industry in NYC and have the potential to address the capital cost challenge of developing new lab space in NYC. NYCEDC's inclusion of the DOE building on 44th Drive in its recent RFEI demonstrates that LIC is an important part of this vision.

> Whatever happens first will happen in Manhattan, but as those users grow they'll go to LIC.
>
> — LIFE SCIENCES REAL ESTATE DEVELOPER

2. LIC is accessible.

No area of NYC outside Manhattan is as accessible to Midtown Manhattan, the East Side medical corridor, and the city's two major airports as LIC.

- Easy subway access from Grand Central (five minutes via the 7 train) and Penn Station (13 minutes via the E train) connect LIC not just to Midtown but to the larger Tri-State regional workforce. Some Manhattan neighborhoods, like the far west side of Midtown and

Kips Bay on the East Side, are at least a 10-minute walk away from the nearest subway stops.

- The F train connects LIC to Cornell Tech on Roosevelt Island as well as to tech clusters in Flatiron, Chelsea, and DUMBO/Brooklyn Tech Triangle.
- The newly expanded NYC Ferry links LIC to Cornell Tech (5 minutes) and NYU Langone and the Alexandria Center (8 minutes). Further exploring the feasibility of an additional stop in the East 60's could provide further benefit.
- LIC offers easy and fast access to JFK and LGA airports via car or public transit, without the tunnels or bridges needed to get to Manhattan.
- In addition to easy access to Grand Central and Penn Stations, LIC has direct LIRR service from Hunters Point and the LIC station at Borden Avenue and Second Street.
- The importance of accessibility is evident in the fact that, while Brooklyn boasts 1.5M sf of leasable life sciences space, it also suffers from an over 40% vacancy rate. Stakeholders interviewed for this report attributed this to the inconvenient location of the majority of Brooklyn's life science facilities.

The 7 train at Queens Plaza Photo: LICP

3. LIC has the types of building stock well-suited for the full trajectory of life sciences development.

- Much of LIC's older existing building stock has been identified by life sciences developers as ideal for this use, specifically because they have the appropriate floorplates, ceiling heights, and floor loads wet labs. Renovating existing buildings can be a cost savings and takes less time than new construction, which is crucial in an environment where speed-to-market is a major driver in projects.
- The subdistricts of LIC provide opportunities for space for different types and sizes of companies: Court Square/Queensboro Plaza for office and lab spaces that need to be close to the subway; Waterfront for companies needing larger floorplates, labs, and protomanufacturing that would benefit from ferry links to Cornell Tech and the East Side; and the eastern Industrial Business Zone (IBZ) for large-scale lab and manufacturing uses.

4. LIC also has the appropriate manufacturing, commercial, and mixed M/R zoning for life sciences development, in addition to its expansive Industrial Business Zones (IBZ).

- LIC has significant areas zoned for manufacturing that can accommodate commercial life sciences laboratories and are located near subway or ferry transit with easy access to Manhattan. In addition, LIC's IBZs facilitate life sciences manufacturing with as-of-right relocation tax credits and other support.
- There are a number of developable sites in LIC that are appropriately zoned for life sciences uses beyond manufacturing; Manhattan has only limited readily available, properly zoned sites for life sciences construction.
- Almost all of Manhattan's East Side on and near the medical corridor is zoned residential or commercial, and may need lengthy special permit or variance processes depending on the types of research and testing done by life sciences companies.

The Brewster Building, LIC Photo: Fantástica

5. LIC is developing as a vibrant live-work neighborhood with amenities that support talent attraction and business development.

- Live-work environments are becoming an important talent-attraction factor for life sciences companies.
- More than 16,700 new rental apartments and condo units have come online since 2006, and just under another 12,000 are set to be completed by 2020 — many in full-service, amenity-rich buildings with unparalleled views of Manhattan and the East River.
- There are over 3,200 existing hotel rooms in 32 hotel properties, including upscale business hotels, and over 5,200 new hotel rooms in the pipeline.
- Unique and bustling retail and restaurant corridors are growing along Vernon and Jackson corridors, with 421,000 sf of retail currently in mixed-use buildings and an additional 411,000 sf planned by 2020.[23] These spaces are in addition to nearby retail districts elsewhere in LIC and Astoria. LICP manages the LIC Business Improvement District, which recently doubled in size and contains significant and growing retail.
- LIC has over 150 restaurants/bars, 39+ cultural institutions, award-winning waterfront parks, and multiple schools.

6. LIC provides access to the broad range of workforce needed by the life sciences sector.

- NYC sits in the middle of the **highest density of elite educational institutions in the world**, and several of NYC's AMIs are located directly across the East River from LIC. In addition, LIC is home to LaGuardia Community College (LaGCC), which is already training lab technicians and other support level staff for the academic medical sector. LaGCC is prepared to follow the successful model it has deployed in other sectors of working directly with companies to develop new programs relevant to industry. Directly connected to LIC is Roosevelt Island with the new applied sciences Cornell Tech campus.

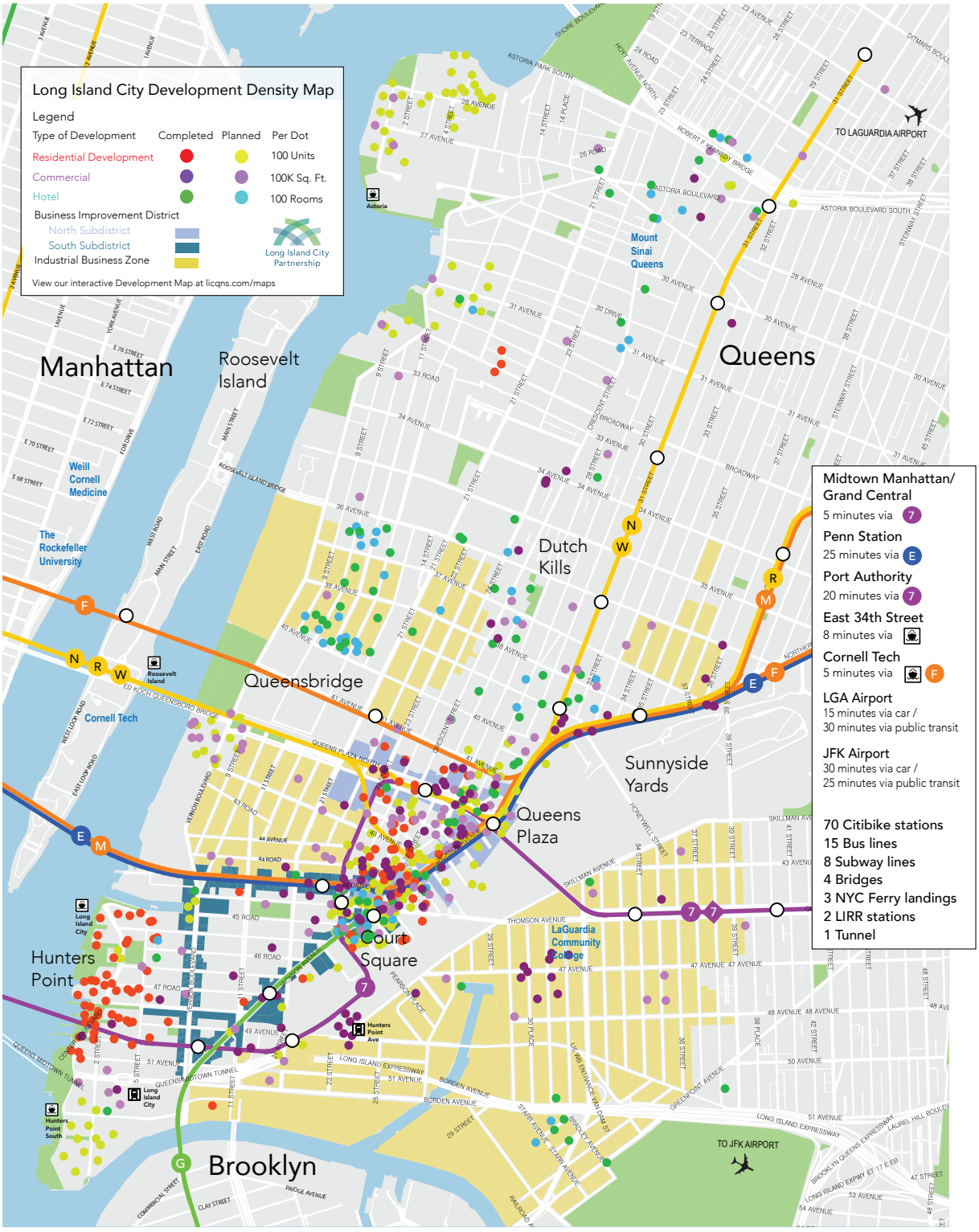
Cornell Tech's new campus is under 5 minutes by ferry
Photo: Cornell Tech

7. LIC real estate is more affordable than Manhattan.

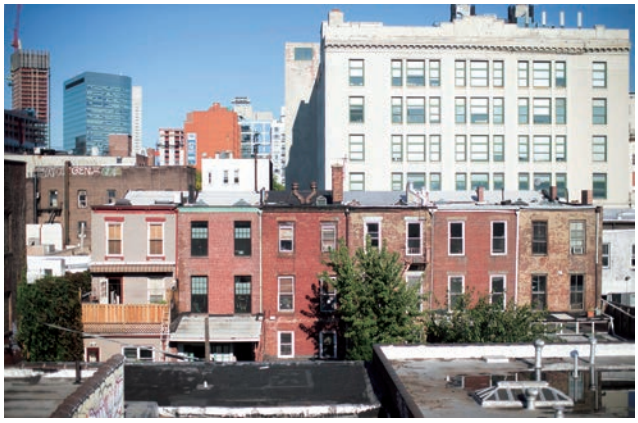
- Younger companies with recent funding are required to spend it on research and hiring, not expensive construction. LIC's existing buildings and less-expensive land contribute to rents that are generally 20% less than Manhattan, and public incentive programs that apply only to areas outside of Midtown mean LIC rents are potentially even more affordable (e.g., 40% less).

23. LICP website, www.licpqns.com

MAP B: **Transportation and Development Map**



- LIC is also a more affordable place to live than Manhattan, with a variety of residential options — from highly amenitized modern towers to older single-family homes — with easy access to employment centers.



LIC offers a range of residential options. Photo: LICP

Challenges

Several challenges have prevented LIC from definitively capturing and growing the life sciences sector, thus far. The challenges LIC needs to address in order to accommodate the growth of this sector are outlined below.

1. Development Risk and Economic Challenge

One of the challenges of developing life sciences facilities in NYC is the gap between the cost to develop the space and the rents that life sciences companies, especially new, non-credit ones, are willing to pay for it. Banks are reluctant to finance commercial real estate development without credit tenants and without rent projections that correspond to the premium on construction costs. Yet, the mid-scale and step-out life sciences companies looking for space are generally not credit tenants, and the leasing market in New York does not predictably indicate that life sciences space can achieve the necessary rent premium.

The Consultant Team did not perform a formal market study or pro forma analysis of specific sites or properties. Instead, the Consultant Team undertook a high-level review of the difference between the cost to build wet lab space in NYC versus the cost to build standard office space. The team then examined rents in this market for lab and office to determine if there was a commensurate difference between these rents that reflected the premium cost of delivering lab space. It was determined that no commensurate rent premium existed. These particular issues are not exclusive to LIC and have been hindering NYC for years. **One distinct advantage for LIC is that with its lower land costs and available incentives, the gap between costs and rent should be measurably less than in Manhattan.**

On a per-square-foot (psf) basis, the hard and soft costs to construct new lab space in NYC are in the range of $200 psf or 40-50% higher than traditional office.[24] As the ratio of lab to office space for a typical life sciences company shifts toward more office, the impact of the premium on lab space decreases, but still exists. In life sciences spaces that are 60% office and 40% generic (i.e., not specialized) lab space, for example, the premium could be closer to 20% over a space that is entirely composed of standard office.

24. Consultant Team research, current estimates from industry

> Once there's a stake in the ground by either a developer or a tenant (or ideally both), it provides cover for others to take the risk. If you're the second one in you can cite the precedent to the bank.

— COMMERCIAL MORTGAGE LENDER

In addition to the additional hard and soft construction costs, lab space entails extensive infrastructure, equipment, and fit-out requirements, that add to the premium. Previous analyses conducted by the Consultant Team indicated that fit-out costs can add anywhere from $250 to $350 psf to core and shell construction costs. This fit-out premium is an important consideration when planning for space for step-out and early-stage companies.

At the Alexandria Center for Life Sciences, a premiere life sciences space in NYC, the rents are about 25% higher than office space in the surrounding neighborhood ($100+ psf for Alexandria vs. $79 psf for office space in Gramercy/Midtown East areas[25]). The Alexandria Center, however, is known for being expensive and beyond the means of many of NYC's emerging life sciences companies. The asking rent for lab space at Taconic's Hudson Research Center at 619 West 54th Street (per the interview with the company, not signed deals) is just under $80 psf, about 23% over the average office rents[26] of $65 psf in the western part of Midtown. This delta indicates that there is uncertainty from real estate development and investment perspective about whether the NYC life sciences market currently can capture the necessary rent premium to address the higher construction costs.

Photo: LICP

Newmark Knight Grubb Frank and JLL both list average LIC office rents at $43 psf in the first quarter of 2018. The life sciences developers that were interviewed believe they could secure psf rents near $70 in LIC, although, like at the Taconic property, no leases have yet been announced at these rates. Based on the Consultant Team's interviews, only companies with significant funding can even consider the Alexandria-level rents close to $100 psf; most companies have said that their acceptable rent range is $65-$75 psf.

25. JLL New York Office Market Outlook Q1 2018
26. JLL broker information

2. Lack of Existing Facilities and Life Sciences Cluster

NYC, as stated above, has a dearth of existing wet lab space for companies looking to grow or locate here. In LIC, there are currently no existing commercial wet lab facilities. The recent growth in incubators in Manhattan will significantly change the life sciences landscape in NYC by generating many companies each year that will be looking for ready-built step-out space. These smaller companies are not prepared or able to move into space that they would have to fit out themselves; they would rather move into pre-built lab space where the costs to fit out the spaces are included in the rent. Some companies are additionally wary of locating in LIC because there is no existing cluster here — no anchor tenants, large companies, or institutions — and many companies are not willing to be pioneers in a new market. **Despite these obstacles, some developers and companies are recognizing the impending demand for step-out space and are already exploring opportunities in LIC.**

3. Lack of Available Industrial Space and Competition from Other Uses

While there is significant new commercial development in the pipeline in LIC, including the 1.2 million sf JACX complex being developed by Tishman Speyer, the market for industrial space is much tighter. Out of a total supply of 7.62 million sf in buildings 100,000 rsf or larger, only 6.8% (or 536,000 sf) is currently available, with relatively little development activity in the pipeline (250,000 sf in two buildings under construction and 363,000 sf in two buildings proposed).[27] Industrial buildings, with their heavy floor loads, wide column spacing, and appropriate zoning, are well suited for life sciences companies requiring wet labs; the low availability plus the additional required infrastructure for lab spaces is a challenge. One mitigating factor here is that life sciences space is trending toward more office/dry lab and less wet lab space.

The JACX, LIC's newest creative office development
Photo: Tishman Speyer

Additionally, the residential market in LIC has clearly been booming in the last year, with more units still on deck. Since 2006, 16,800 residential units have been built, almost half in the past three years, with just under 12,000 more on the way.[28] With all of this residential growth, there is some concern that the economics of life sciences will become even less attractive because in certain areas it will never be the highest and best use. It should be noted that this concern does not apply in LIC's IBZs as residential uses are not allowed in these areas, although competition from traditional office and hotel uses is affecting the market.

27. CoStar data Q1 2018
28. LICP Quickfacts June 2018

LIC Springs! annual community celebration on Vernon Boulevard Photo: LICP

4. Lack of Institutional Presence

NYC's AMIs have no presence in LIC; even a lab built by Memorial Sloan Kettering Cancer Center was recently closed down in favor of a new Manhattan facility. Mount Sinai Queens in LIC is a clinical facility only and has no research activity. Based on discussions with a number of the institutions, there are currently no plans to locate any core research facilities in LIC. The scientists at each school tend to want to stay on campus as much as possible; NYU Langone, for example, said that their researchers do not even like to work at the Alexandria Center, which is immediately adjacent to the hospital facility. As noted earlier in the report, there may be space challenges for Manhattan's AMIs in the long term if they outgrow their campuses; **some AMIs noted that LIC could become an option out of necessity.**

5. Perceived Lack of Amenities and Neighborhood Cohesiveness

Despite so much new development, LIC seems disjointed to many people and has an urban geography that is sometimes difficult to grasp. While the neighborhood's profile is rising, even many long-time New Yorkers are not aware of the attractions of LIC or its rapidly emerging assets. For some people, there is no "there" there and they would need to be made aware of LIC's changing landscape, cultural assets, and easy connectivity. More broadly, LIC needs to promote a comprehensive and expansive vision that clearly outlines its geography, advantages, and opportunities for the life sciences sector.

LIC waterfront and new public library Photo: LICP

Despite its assets, LIC (like all areas of NYC outside Manhattan) lacks the cachet of Manhattan for life sciences companies. Particularly for companies from elsewhere in the country that are establishing initial footholds in New York, there is a sentiment among some that any location outside of Manhattan is simply a non-starter, despite cost and real estate advantages.

Finally, with all the residential development over the past few years, there are limited good public school options in LIC, which is a challenge for attracting top talent who may want to locate their families close to work. New school facilities are due to come online; however, more will be needed to keep pace with this already growing demand.

> Developers need the credit tenants and the bigger companies. But it's in everyone's interest to have the mix. The diversity of the market is what makes it work.
>
> — LIFE SCIENCES PRACTICE LEADER, NATIONAL ARCHITECTURE FIRM

6. Perceived Distance and Inconvenience

While not accurate, there is a widespread misperception among those in the industry that LIC is too far and inconvenient from the Manhattan core. Many companies said they did not even consider LIC because they did not know enough about it and assumed it was not convenient. Some companies fear LIC's perceived distance and inconvenience presents a hurdle to talent attraction and retention, which is a primary consideration in selecting a location.

As noted above, **LIC's actual proximity and transit connections to Midtown make it extremely convenient for life sciences companies.** NYC Ferry service has also been transformative in connecting LIC's waterfront to the Cornell Tech campus on Roosevelt Island and to NYU and Alexandria. The ferry service complements existing subway service and expands LIC's already robust transportation options. While NYCEDC at this time is not planning to expand NYC Ferry Service to the East Side Medical Corridor, such service would enhance LIC's connectivity even further.

Two ferry landings in LIC and one in Astoria provide quick connections to Cornell Tech and Manhattan.
Photo: LICP

SCENARIO ANALYSES

Photo:LICP

The Consultant Team analyzed the impacts of two scenarios in order to estimate potential economic benefits of different scales of cluster development in LIC. The analyses revealed significant potential for city-wide spending, tax revenues, and job creation, making a strong argument for large-scale public investment in the life sciences in LIC. Below are the findings for each case scenario.

CASE ONE

The Consultant Team defined **Case One** as comprising **375,000** sf of life sciences and related space, developed through renovations of existing buildings, with construction starting toward the end of 2018 and being ready for occupancy in 2021. From the team's interviews and understanding of demand in the market, Case One assumes space in two categories:

- **"Step-out" space** for life sciences companies graduating out of the new incubators around Manhattan and who need approximately 3,000 — 5,000 sf of basic lab and office space for 10+ employees
- **Growth-stage/mid-stage space** for companies beyond step-out, who have received some funding and are growing into 25-50 employees; these spaces are generally 10,000-30,000+ sf

The analysis assumes a **40:60 ratio of lab to office space** based on the trends of life sciences companies toward more dry/office use. This scenario also includes **18,750 sf of community/ event space**, rentable by tenants or others and similar to District Hall in the Boston Seaport area. Such spaces are key to promote networking, a sense of community, and opportunities for conversation and collaboration.

CASE TWO

Case Two is a more aspirational vision of a highly successful life sciences cluster developing in LIC over the next ten years. The City of New York has set a goal of three million sf of life sciences space to be developed in the city over the next decade.[29] Should the Alexandria Center's third building and other projects now in the pipeline be realized, over 1.5 million sf of new facilities would be located in Manhattan; the balance of space to meet the City's goal would likely be developed in the other boroughs. West Harlem has been mentioned as a potential sub-cluster for many years; projects are tentatively moving ahead there. While BioBAT theoretically might present an opportunity to absorb some of this demand, however for more than ten years the market has clearly indicated that BioBAT is not a desirable location for a life sciences hub. Based on the company needs and other criteria detailed earlier, it is clear that LIC is the only area in the outer boroughs that can support a viable and contiguous life sciences cluster. The Consultant Team has therefore defined this second case, as including **1.5 million sf** of space to be developed over ten years, as follows:

Renovated space (500,000 sf):

- 110,000 sf of step-out space (44,000 sf of lab, 66,000 sf of office per the Case One ratio)
- 110,000 sf of growth-stage space (also 44,000/66,000)
- 100,000 sf of industrial space for a medical device manufacturing company or companies
- 150,000 sf of shared support facilities: 120,000 sf of research support/data storage and 30,000 sf of conference, meeting, and event space
- 30,000 sf of open, shared collaboration spaces

New construction (1 million sf):

- 330,000 sf of step-out and growth-stage space (132,000 sf of lab, 198,000 office)
- 170,000 sf of space for one or more established[30] life sciences companies
- One 500,000-sf building occupied by a single, well-established pharmaceutical company[31]

Not all of the space in this scenario has to be immediately adjacent; as described in the LIC Strengths section, different sub-neighborhoods in LIC lend themselves to different types and sizes of space suitable for different life sciences uses.

It should also be noted that, under certain conditions — such as the designation of areas in LIC as Opportunity Zones by the federal government and/or the attraction of a large anchor company to LIC, or the rapid acceleration of the NY cluster — additional cases comprising more square feet of development could be considered.

29. www.lifesci.nyc
30. Defined as revenue-positive and financially self-sustaining, possibly post IPO.
31. Defined as revenue-positive for most of the last 15+ years, operates internationally, and has at least 2,500 employees

Assumptions: Construction Costs

In the Case One scenario, where all 375,000 sf of space is to be created through renovation, the Consultant Team assumed a psf retrofit cost of $500 psf for lab space and $337 for office space.[32] Based on a similar space currently being developed in Manhattan, the estimated cost of community/event space would be approximately $293 psf.

Since Case Two has a longer horizon for development, a five-year escalation was included. The following cost numbers were estimated for the 500,000 sf renovation of existing space:

- $295 psf for repurposed industrial/medical device space[33]
- $585 psf for lab space
- $394 psf for office space
- $673 psf for redevelopment of existing industrial space for use as a shared research-support facility

For the 1M sf of new construction (again, escalated to 2023), the Consultant Team assumed a cost of $787 psf for lab space and $530 psf for offices.

Temporary Economic Impact for Construction Spending

Based on the cost and density assumptions above, the team's analysis indicated a set of job creation numbers for short-term construction-related jobs and long-term / permanent jobs (i.e., people working at and around the built space). These two categories each contain three types of jobs calculated: direct, indirect, and induced. The direct effect of construction is the impact of direct spending by developers on design, construction, financing, etc. Its indirect effect is the effect of spending by contractors and subcontractors on goods and services (insurance, construction materials, etc.) purchased from other businesses. Its induced impact is the impact of household spending by residents directly or indirectly employed in the construction work. The Consultant Team produced estimated impacts for LIC, Queens, and NYC as a whole; the NYC numbers are shown here.

For Case One, it was estimated that construction spending on the 375,000 sf would generate the following for NYC (in 2019 dollars):

- Employment earnings of nearly $74.8 million
- A one-time increase of nearly $170.8 million in the city's economic output[34]
- A one-time increase of nearly $99.0 million in the city's GDP[35]

For Case Two, it was estimated that construction spending on the 1.5 million sf (again, 1M sf in new construction, 500,000 sf in renovations) would generate (in 2023 dollars):

- Employment earnings of nearly $529.4 million
- A one-time increase of $1.23 billion in the city's economic output; and
- A one-time increase of $699.3 million in the city's GDP.

Table I shows potential estimated jobs created from the construction spending:

TABLE I: **Potential Jobs from Construction**

Jobs	Case One: NYC	Case Two: NYC
Direct	394	2,510
Indirect	203	1,359
Induced	257	1,695
Total Effect	**854**	**5,564**

32. These and all cost numbers are based on the Consultant Team's market knowledge, research, and discussions with industry experts.
33. Based on a 2017 estimate of the cost of rehabilitating an existing Queens industrial building for use by multiple small to mid-sized manufacturing firms, escalated to 2023.
34. Output is a measure of the total sales by NYC companies (including the "sale" of labor by NYC households) generated by construction and related spending under Case One.
35. Value-added is equivalent to the total output produced during the construction period by all New York City firms directly or indirectly engaged in the development of 375,000 square feet of space in Long Island City, minus the cost of purchased inputs. It also represents the increase in the City's gross domestic product resulting from this development.

Permanent/Ongoing Economic Impact

The Consultant Team also estimated the potential impact of the ongoing operations of companies occupying the space that would be developed in LIC under both scenarios.

For Case One, the team's analysis indicated that the operations of companies occupying space in LIC would account for (in 2021 dollars):

- 2,815 jobs (direct, indirect, and induced) in NYC, with nearly $276.5 million in annual earnings
- Nearly $696.9 million in City-wide economic output
- An increase of $408.9 million in the City's GDP

For Case Two, the numbers were projected out to the year 2028, where development would directly and indirectly account for (in 2028 dollars):

- 14,927 jobs in NYC, with $2.21 billion in annual earnings
- $7.16 billion in City-wide economic output
- An increase of more than $3.83 billion in the City's annual GDP

Table J, below, shows the estimated permanent / long-term jobs:

The impact of an LIC life sciences cluster is clearly significantly larger under Case Two. This is in part due to the inclusion of space for an established pharmaceutical company in this scenario, although there is the possibility that this type of company could choose to locate in LIC in the shorter term (e.g., Case One timeframe). Such companies are characterized by high output per worker and strong indirect and induced effects. **These impacts highlight the value to NYC of supporting the development of space that can accommodate the needs of a diverse array of life sciences companies, from cutting-edge start-ups to established drug companies.**

The significant potential for spending, tax revenues, and job creation as described above makes a strong argument for large-scale public investment in the life sciences in LIC. New York has long been lagging behind other areas in this sector — far behind Massachusetts, for example — and recently lost two promising New York-founded companies to New Jersey and Connecticut due to major capital attraction packages. **With both the State and the City touting their new life sciences initiatives, now is the time for both to apply a significant focus of those initiatives in LIC in order to capture these opportunities for New York.**

TABLE J: **Potential Permanent Jobs**

Jobs	Case One: NYC	Case Two: NYC
Direct	1,387	5,388
Indirect	834	5,378
Induced	594	4,161
Total Effect	**2,815**	**14,927**

RECOMMENDATIONS

Photo Credit:LICP

The Consultant Team has put together a number of preliminary recommendations — short-, medium-, and longer-term — to address the challenges discussed above. LICP's existing relationships with the State and City put it in an excellent position to encourage action on the part of government (e.g., Empire State Development, Department of Buildings, NYCEDC). In addition, LICP can leverage its community and business relationships and work closely with other stakeholders (e.g., the real estate community and LaGuardia Community College) to implement its own initiatives and foster ties with NYC's life sciences incubators, emerging companies, and AMIs.

Short-Term

1. Address Financing Hurdles

a. Quantify Gap Between Construction Premium and Market Rent for Lab Development in LIC.

The costs/rent gap described earlier will need to be mitigated by public incentives and assistance if New York is to capture the tremendous growth in life sciences and tech companies that come out of its own academic and research institutions. Subsidies should be site-specific and, in order to provide public officials with a credible estimate of required subsidy, LICP should undertake a residual land value analysis and a basic pro forma based on actual development opportunities at specific sites. An integral next step is to locate the strongest viable development sites in LIC for life sciences development and then work with owners, developers, potential tenants, and public officials to quantify the specific hurdles related to these sites, potentially addressing those hurdles through the tools identified in this report.

b. Identify and Develop Assistance and Incentive Programs.

While the City and State have numerous incentive programs either in place or being developed, there are some forms of assistance that have been called for by developers (i.e., on the supply side of the equation) or companies (demand side) and that do not currently exist. Life sciences stakeholders would applaud NYCEDC and ESD for efforts like these.

- **Supply side:** Take-out/commercial mortgage loan guarantees and/or upfront capital grants from the City, State, or even other entities like the Partnership Fund for NYC. These two services would assure lenders, encouraging them to finance such projects, both by reducing exposure and demonstrating confidence in the development. Studies have shown that capital grants are the most efficient tool to close the gap given the favorable cost of capital for the city as compared to the developer.
- **Demand side:** A revolving tenant improvement fund would allow companies to tailor spaces for their particular needs; as the tenant's lease term progressed and/or if large investment rounds were made, the money would be repaid into the fund for use going forward. Loans for tenant security deposits, to be amortized over the company's lease term, would also be helpful with landlords requiring large lump sums up front. The START-UP NY program offers personal income tax reductions for life sciences employees of companies located at or affiliated with universities and are extremely useful for talent attraction; non-affiliated companies have been requesting similar benefits.

2. Address Competitive Real Estate Market Challenge

Identify and Incentivize Development Opportunities that could Include Space for Life Sciences, especially as part of Mixed-Use and Office Developments.

In today's real estate market, life sciences will rarely be highest and best use, particularly in LIC's M-1 and R zoning districts. The growth in digital health and bioinformatics means life sciences companies are using more office space than wet-lab, which could translate to fewer zoning restrictions, lower fit-out costs, and in turn a reduced gap between office and traditional life sciences returns. An LIC Life Sciences resource desk, described below, could coordinate with stakeholders and the appropriate local agencies to help identify these opportunities.

3. Establish a Life Sciences Resource/ Industry Desk at LICP

Fostering a life sciences ecosystem in NYC is clearly a top priority for both the City and the State, and this report details the strong indications that LIC is the optimal location in NYC to focus a cluster that is able to accommodate NY's desired growth targets. There are a number of steps that would help translate these priorities into action, but LICP may not, at the present time, have the capacity to implement them. The Consultant Team, therefore, recommends establishing an LIC Life Sciences Resource Desk or "concierge," funded by the State and/or the City, to help execute the initiatives toward cluster development here. There is precedent in establishing targeted City and State support for development efforts led by local development corporations and other entities, e.g., in Downtown Brooklyn and Lower Manhattan.

As discussed above and throughout this report, LIC offers broad — and smart — opportunities for accommodating the State's and City's objectives of creating a sustainable life sciences cluster and developing jobs in this sector. A principal challenge that the Consultant Team identified is a general lack of knowledge among principal stakeholders in the life sciences sector about the assets and opportunities that exist in LIC, coupled with an expressed desire to know more. By establishing a "one-stop shop" dedicated to the life sciences, LIC would truly distinguish itself from the other neighborhoods and help the city compete with neighborhoods in other states' life sciences clusters.

This staff resource, which would ramp up as the pipeline of space is established, would coordinate closely with counterparts at ESD and NYCEDC to, for example:

- *Track pipeline of young step-out companies that need ready space and cultivate their awareness of opportunities in LIC*. The Consultant Team's interviews and research showed that a large anchor tenant is not the only starting point for a cluster. The proliferation of incubators in NYC over the past three years means an unprecedented number of start-ups will require space as they grow or "graduate." Demand for this small (3,000 to 5,000 sf and up), turnkey space exists now and will only increase among companies growing out of the City's and State's incubators and even from Alexandria. Eventually, a critical mass of smaller and mid-size life sciences companies would attract larger pharma tenants to the cluster, as seen at Alexandria Center. By working with its network of real estate brokers and other experts, and engaging with incubator tenants as they prepare for their next step, LICP can be a key liaison between these growing companies and potential new landlords.
- *Establish an inventory of properties appropriate for conversion and sites appropriate for development to life sciences*.
- *Guide private developers and companies through zoning, permitting issues, and incentives*. While LIC already has the appropriate zoning for life sciences uses in many parts of the neighborhood, providing guidance (e.g., through simple one-pagers or maps) with zoning, the permitting process, and as-of-right incentives would invariably be helpful, especially to those from outside New York. Another advantage that LIC has over much of Manhattan is the additonal incentive programs that do not apply to Midtown sites.

Hunters Point Park waterfront Photo: LICP

4. Accelerate and Expand Placemaking

a. Accelerate and Expand Public Capital Investments in Transportation, Infrastructure, and Streetscape Improvements.

The City should continue to make the necessary investments and implement the plans and projects that have been called for in LICP's Comprehensive Plan and other initiatives. These include street reconstruction, infrastructure upgrades addressing drainage and resiliency, and pedestrian safety and enhancement projects. Specifically, the City should fully fund and implement the following work, previously called for:

- 44th Drive from Jackson Avenue to Anable Basin – DOT's planned work as part of its *Long Island City/ Hunters Point Area-wide Reconstruction Project* ("*LIC/HP Project*") could be accelerated, along with any infrastructure work required by DEP.
- Vernon Blvd. from 44th Drive to Queens Plaza – At present the LIC/HP Project only extends up to 44th Drive. This project could be expanded to include full upgrades to Vernon Boulevard as far north as possible, and certainly to Queensbridge Houses.
- Queens Plaza South from Vernon Blvd. to 21st Street — The original plan for improving Queens Plaza included upgrades to the rest of the corridor. These could be implemented to connect the waterfront, Queensbridge, Queens Plaza, and complete the rectangle of main streets.
- To further connect to the waterfront, the city could re-open 43rd Avenue, a mapped street, and remove the salt pile.

b. Consider LIC for DRI Funding

The State, in addition to funding LICP's efforts, should consider using its Downtown Revitalization Initiative ("DRI") to coordinate and implement public and private investment in upgrading the public realm. The $10 million DRI would not only incentivize greater public and private investment in LIC, but would also elevate LIC's visibility.

c. Public Investment in Placemaking

Every innovation community needs an abundance of great public spaces and open space to gather, to think, to get energized. LIC presents a fantastic opportunity to create a necklace of such spaces, linking Court Square, Queens Plaza, the Waterfront and Queensbridge. Fortunately, the land needed is all within City control. DOT has jurisdiction over a substantial amount of property under the elevated structures, which could be opened up to create a linear promenade of enhanced public walkways, courts, playgrounds, artwork, plazas and fit zones, as has been implemented under other viaducts around the city (e.g., Astoria Park, Riverside South).

If the State and City were to make investments to make the public realm more inviting, e.g., creating new public plazas and more open space, including with Wi-Fi, near transit hubs and potential life sciences spaces, it would send a clear message to potential developers and companies that they are committed to LIC.

d. LICP Expand Placemaking and Community Activities

LIC has started to benefit from recent streetscape improvements, mapping and wayfinding, and other greening and placemaking projects. Some stakeholders interviewed talked about the remaining pockets of inactivity or "dead spots" around LIC,

especially between transit stops. LICP should coordinate and continue to expand efforts toward reducing pedestrian confusion and neighborhood barriers, engaging the community through and improving access to LIC's cultural assets, and reclaiming open space. LICP could incorporate and/or continue commercial attraction efforts with developers to increase retail amenities close to life sciences sites and along routes to transit nodes. LICP should continue to move forward on the work it is already pursuing, including the LIC Compass wayfinding program, which received both State and City funding, LIC Arts Connection, and other placemaking initiatives.

Photo Credit:LICP

5. Change Perceptions: Marketing

The perception issues that challenge LIC are not new; in the early 1980's the film and television industry had held a "Manhattan only" viewpoint and did not understand the assets LIC had to offer. As demonstrated by the thriving film and television sector in LIC today, those issues were clearly overcome; marketing and communication efforts were key.

MoMA PS1 Warm-Up, LIC Photo: MoMA PS1

Target marketing efforts to Life Sciences Stakeholders

LICP should initiate a robust marketing campaign highlighting **LIC's convenient location and accessibility.** No area of NYC outside Manhattan is as accessible to Midtown Manhattan and the East Side medical corridor as LIC, but many do not recognize this fact. Marketing should include, but not be limited to:

- *Highlight LIC's assets over competing neighborhoods*. A few Manhattan neighborhoods have also been identified as having potential for life sciences development: the East Side medical corridor along First Avenue, West Harlem near 125th and Amsterdam, Midtown West (50's between 11th and 12th Avenues), and Hudson Square. While there are pros and cons to every development site, LIC has cost, access, and other advantages over all of these areas.
- *Develop interactive tool for LS companies and developers that frames a vision for a potential cluster in LIC*. Especially because LIC has more potential for a true cluster than other neighborhoods in NYC, a comprehensive, easy-to-envision plan on a dynamic website would go far in attracting stakeholders.

- *Address perceptions about LIC's lack of amenities.* LICP's Experience LIC campaign highlights the many retail, cultural, dining, and open-space amenities that the neighborhood has to offer. This and other campaigns could be built upon to target life sciences developers, companies, and potential employees. Additionally, LICP could highlight LIC-based service providers (legal, accounting, HR) that small life sciences companies need but often cannot afford to bring in-house.

Mid-Term

6. Support Development of Shared Facilities

Certain types of specialized facilities are in short supply in NYC, and are often too expensive for one particular organization or company to independently develop. These facilities, like **research support facilities, imaging centers, and data storage farms**, can be shared by small companies in the cluster and by academic medical institutions that do not have room on campus for their own. Developer-financing tools such as reduced leases for City land, loans, or grants could aid in the creation of these scarce, specialized life sciences facilities in LIC. **Shared event venues** are also important, as networking, educational, and conference opportunities are key to fostering a cluster. District Hall in Boston's Seaport District is a model for a successful, P3-developed facility.

7. Foster Live-Work Aspects of LIC with Great Schools and Active Open Space

One of the primary hurdles for developing a life sciences cluster in New York has been the city's lack of experienced executives who know how to build a life sciences company. Building these companies, therefore, means recruiting such talent to NYC. A number of stakeholders interviewed expressed the need for more and better-quality K-12 schools in LIC, specifically in the context of attracting C-level talent to the neighborhood. Given that this talent pool is more likely to be older business veterans, often with families, one of the first concerns is top-quality local schools for their children. **By making increased investments to develop exceptional K-12 schools, and active recreation open space, the City and State can position LIC competitively with the suburbs, including those out of state, for employee attraction.**

8. Encourage AMI and Industry Collaboration for Workforce Development

La Guardia Community College has approximately 45,000 students. Photo: LICP

Much of the conversation around attracting and retaining life sciences talent has been focused on C-level management and lead scientists. There is no doubt that these positions are essential to building the sector, but there is also a need to consider and explore workforce development at all levels, e.g., lab

techs and data analysts. LIC's LaGuardia Community College (LaGCC) has a strong track record of company and local hospital externships, training programs, and faculty affiliations to connect students and understand hiring needs. LaGCC works very closely with Boyce Technologies in LIC, for example, in workforce training and internships related to engineering and computer science, and with Google in Manhattan to better understand that company's workforce needs and to develop programs to meet them. LICP can use its extensive network to connect LaGCC and other appropriate workforce providers with life sciences stakeholders in NYC (and beyond) to develop similar relationships.

In addition, the State's START-UP NY incentive program could be extended to include LIC space in order to attract companies to form affiliations and leverage the program's benefits. The City and State can also encourage the city's AMIs to develop partnerships and cross-curricula with LaGCC and other schools in order to symbiotically build on the strengths of each school. These efforts will go a long way toward diversifying the city's economy, creating jobs at numerous income levels, and building up the life sciences sector for the city as a whole.

Longer-Term

9. Leverage critical mass of step-out space, incentive programs, and shared facilities to continue to attract larger life science and pharma companies for ground-up development

LIC's many advantages for life sciences, with the addition of incentives and shared facilities, may well attract large scale users in the nearer term. As a cluster of small and mid-sized companies builds in LIC, creating a highly valuable talent pool, larger life science companies and AMIs will find LIC even more compelling and make further ground up development feasible.

10. Invest in Improving Regional Transit

An additional ferry landing at or near East 68th Street, would connect LIC, the East Side Medical Corridor, and Alexandria Center through a very short direct connection. In addition, to maximize the strength of NY's life sciences cluster and LIC's subcluster, it would be highly beneficial to further integrate and extend the regional rail system through an intermodal station at Sunnyside Yard. While LIC is a short subway ride from the commuter hubs of Penn Station and Grand Central Terminal, such a station could bring both Amtrak and NJ Transit passengers (both train systems already lay over in LIC) into Sunnyside Yard, joining LIRR and the subway.

11. Build upon Earlier Success

As the cluster emerges, it will be important to leverage a critical mass of step-out space, incentive programs, and shared facilities to attract larger life sciences and pharma companies; new, ground-up development for these and other companies will be a natural next step in the growth trajectory. And while there is not a lot that can be done now to convince the city's AMIs to plant footholds in LIC, in the longer term, their Manhattan campuses will run out of space. A growing cluster of small companies and shared facilities in LIC combined with available, appropriate space might prove an attractive location for future institutional growth.

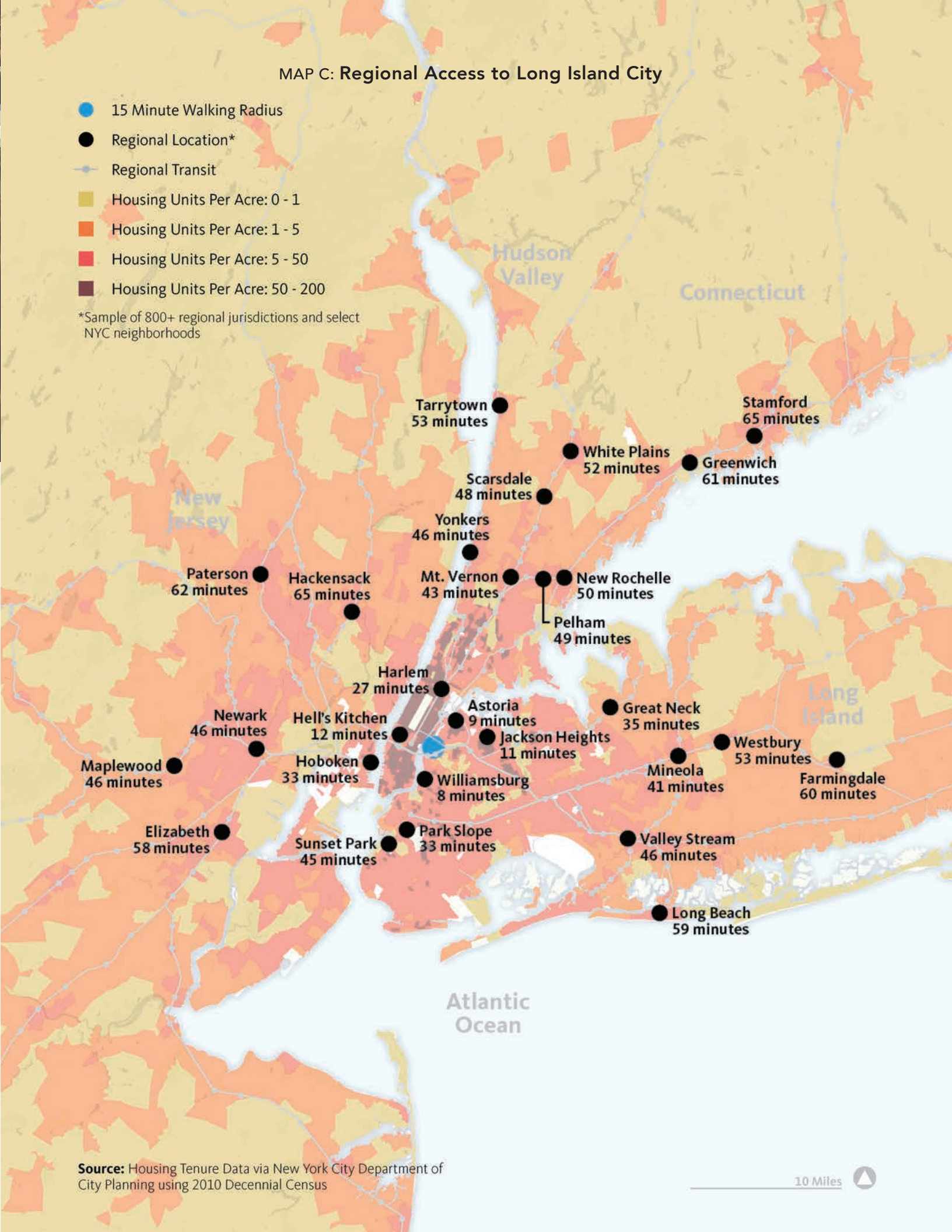
CONCLUSION

Photo Credit:LICP

All of the growth in NYC's life sciences sector over the past 15 years, and especially in the last two, provides so much to build upon going forward. The landscape of the market here will change significantly even this year, as the results of the City's recent RFEI and other projects are announced, and as JLabs and BioLabsNY open their doors (with IndieBio on the near horizon). The primary reason a cluster has not yet developed in LIC is because the city's overall activity had not, until this point, reached a level where it could extend beyond the nucleus of Manhattan. In addition, both the evolving industry desires and LIC's emerging characteristics only recently came into alignment. Yet, with help from the City, the State, and other stakeholders, the NYC life sciences market has grown and finally emerged among the top 15 life sciences hubs in the nation.

A major impediment to sustaining this growth, however, is still the lack of affordable and contiguous space, especially for the rapidly growing universe of early and mid stage companies. Manhattan distinguishes itself as the most expensive among the top 15 markets and is the only life sciences market in the country with a zero percent vacancy rate. Unlike Cambridge or South San Francisco, there are too many competing uses in Manhattan and it is unlikely that the critical mass of affordable and flexible additional lab space that is needed in NYC can be built in that borough.

LIC is accessible and affordable, and its assets and advantages are increasingly aligned with the trends in this sector and the rapidly evolving needs of life sciences companies. City and State investments and support, and increased interest from venture capital and developers, are also key factors that have emerged to catalyze growth. If there were ever a time for New York to take a major step forward in the development of this sector, it is now, and all indications are that this step cannot happen without LIC.


MAP C: Regional Access to Long Island City
15 Minute Walking Radius
Regional Location*
Regional Transit
Housing Units Per Acre: 0 - 1
Housing Units Per Acre: 1 - 5
Housing Units Per Acre: 5 - 50
Housing Units Per Acre: 50 - 200
*Sample of 800+ regional jurisdictions and select NYC neighborhoods
Hudson Valley
Connecticut
New Jersey
Long Island
Atlantic Ocean
Tarrytown 53 minutes
Stamford 65 minutes
White Plains 52 minutes
Greenwich 61 minutes
Scarsdale 48 minutes
Yonkers 46 minutes
Paterson 62 minutes
Hackensack 65 minutes
Mt. Vernon 43 minutes
New Rochelle 50 minutes
Pelham 49 minutes
Harlem 27 minutes
Astoria 9 minutes
Great Neck 35 minutes
Newark 46 minutes
Hell's Kitchen 12 minutes
Jackson Heights 11 minutes
Westbury 53 minutes
Maplewood 46 minutes
Hoboken 33 minutes
Mineola 41 minutes
Farmingdale 60 minutes
Williamsburg 8 minutes
Elizabeth 58 minutes
Park Slope 33 minutes
Sunset Park 45 minutes
Valley Stream 46 minutes
Long Beach 59 minutes
Source: Housing Tenure Data via New York City Department of City Planning using 2010 Decennial Census
10 Miles

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LIC is Key to NY's Life Science Growth

If there were ever a time for New York to take a major step forward in the development of this sector, it is now, and all indications are that this step cannot happen without LIC.

With appropriate support from the State and City, and concerted action by the local community, LIC can be the key to delivering on NYC's promise as a significant, self-perpetuating hub for the life sciences.

EAST EGG
project management

East Egg Project Management provides real estate project management and advisory services on projects that have a positive impact for users and the surrounding community. Founded in 2015, we work primarily with life sciences companies, private developers, and non-profit organizations to find, lease, and fit out new office and lab spaces; we also advise institutional organizations on development and planning initiatives, strategy, and policy. The East Egg team is a strong combination of public-sector veterans who bring extensive private-sector experience in real estate, master planning, company space needs, and economic development. Members of our team have been intimately involved in almost every major life sciences initiative undertaken in New York City and the surrounding region over the last 15 years, and have worked closely with the life sciences industry – developers, academic medical centers, universities, hospitals, and life sciences companies – in New York City and around the country. We are firmly rooted in our belief that the sector can and should thrive here.

appleseed Appleseed is a NYC-based economic consulting firm with more than 20 years' worth of experience conducting economic impact analyses and economic development studies.

Long Island City Partnership

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