Southeast Florida/ Caribbean

Leadership Institute
ULI Southeast Florida/Caribbean

Prosperity NoMi

A Plan to Drive Economic Growth in the City of North Miami for 2021 & Beyond.

Planting the seed for medical innovation.

Prepared By:

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Executive Summary:

Task:

The city envisions a focus on health care, "green" technology, and climate research and science along the Biscayne Boulevard Corridor.

Priorities:

Leveraging the existing presence of UHealth, SoleMia, FIU's Sea Level Rise Solutions Center and Johnson & Wales campus.

Attract new businesses while respecting / enhancing existing. Creating greater opportunities for existing operations.

Project Intent and Approach:

The city of North Miami is a city nestled in the center of North Miami-Dade and has a vision to create a medical and technology innovation district anchored by UM Health's Sole Mia facilities with focus on climate research and science to support a thriving real estate market specifically in the Biscayne Corridor District.

The leadership team was tasked to discover best practices and land use types that would activate this sector within this district and to help position North Miami as a premier location for climate service providers.

Prosperity NoMi Innovation District is a phased, mixed-use and innovation project focused on entrepreneurship, technology, sustainability, resiliency, and community prosperity. The study areas consist of a) Midtown, which is largely compromised of the Johnson & Wales Campus, as well as land that lies in the middle of the city along the Biscayne Boulevard Corridor and NE 125th Street / NE 123rd Street (Ex. A-1), and b) North District, which is comprised of land located west of the master planned Sole'Mia PUD, separated by Biscayne Boulevard and the Florida East Coast Railway (FEC), and the Regional Activity Center (RAC) to the west.

The Prosperity NoMI Innovation District consists of the redevelopment of land with the purpose of revitalizing and supporting the economic growth of North Miami and its neighborhoods to create a world class destination. Prosperity NoMi will become a hub of innovation, attracting entrepreneurs and startups to facilitate economic development and shared community prosperity. Prosperity NoMi will leverage local business and community networks to provide learning opportunities with leaders in the field.

The primary purpose of the Prosperity NoMi Innovation District is consistent with the Comprehensive Plan and City Codes to build an equitable economy, build an economic development hub to accelerate technology, incubate startup enterprises, and facilitate integration of infrastructure improvements, building structures and uses, and corridor enhancements.

The Prosperity NoMi Innovation District is guided by the following principals:

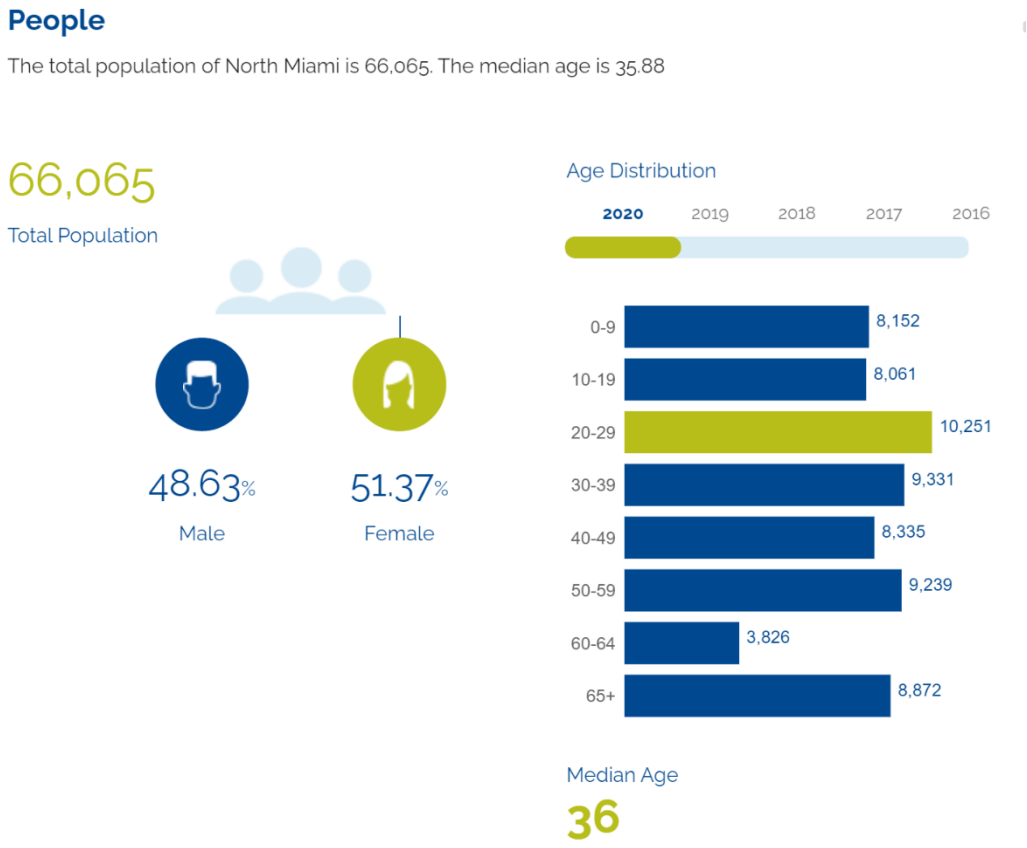
- *Diversity and Inclusion – intentionally reflecting the rich North Miami community.*
- *Cultural Heritage – preserve and incorporate the cultural identity of the community.*
- *Entrepreneurship – create an economic development ecosystem that leverages available resources to grow startup and small businesses.*

- *Community Resiliency – support community economic resiliency and empowerment.*
- *Sustainability – minimize environmental impact.*
- *Connectivity – enhance community integration through effective land use and mobility solutions.*
- *Activation – incorporate indoor and outdoor community event spaces.*

The leadership team conducted best practices research, met with key stakeholders, research current land use policies and reviewed agency documentation. This report is intended as a concept-based framework in which next steps can be further advanced.

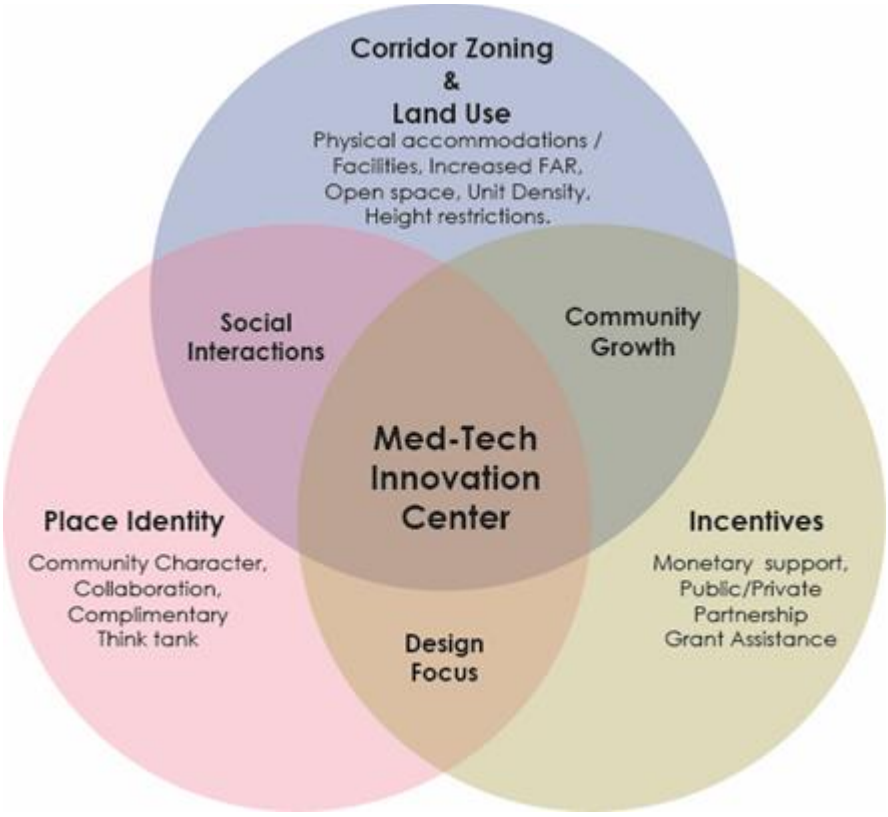
History & Analysis:

A 2010 All-America City award winner, North Miami is conveniently located between Miami and Ft. Lauderdale, and provides easy access to Miami International Airport, PortMiami, and a wide array of attractions. The fifth largest city in Miami-Dade County is also home to a growing business community and the Museum of Contemporary Art (MOCA), Biscayne Bay Campus of Florida International University, Johnson & Wales University and Oleta River State Park, the largest urban park in Florida. North Miami proudly has the second highest percentage of Haitian residents in the US. (Beacon Council)



Project Recommendation:

We believe the City of North Miami is on track and strategically focused on creating target areas of greater density and mixture of uses but can be pushed to take a more aggressive strategy. The recommendations of this report are focused on long-term goals that will organically grow existing business and create catalyst for more dramatic opportunity.



Through a multi-pronged approach, we believe the City of North Miami can become one of the most diverse and innovate areas in Miami-Dade. Through methodical revisions to ***Zoning & Land Use****, partnering with the private sector in the form of* ***Incentives*** *and through* ***Place Identity*** *– we believe North Miami can further nature the diverse uses emerging in the city.*

Corridor Zoning & Land Use

- Midtown
- North District
- PD-1 City Site

Incentive

- Public/Private Partnerships (PPP)
- Grants
- Tax & Fee Considerations

Place Identity

- Alterations
- Street Scape – Case Study (Nova Scotia)
- Branding

Table of Contents:

Glossary of Acronyms

EDA	*Economic Development Administration*
FAR	*Floor Area Ration*
TOD	*Transit Oriented Development*
TIF	*Tax Increment Funding*
LDR	Land Development Regulations
RAC	*Regional Activity Center*
FEC	*Florida East Coast Railway*
CFU	*Community Facility University (110 ft)*

List of Appendices

History:

About North Miami

Within North Miami's 9.98 square mile area and population of 61,578, they have struck a thriving balance between modernization, industrialization, and diversification and an excellent residential environment. Of the City's total land area; approximately 4 percent is allocated to commercial uses and approximately 3 percent to light industrial uses. Understanding their growing population and aging housing stock, the City and its CRA has focused on incentives to assist in attracting new development at higher intensities that will likely spur economic development. Recent land use shifts in the City have provided mixed-use categories encouraging the creation of mixed-use downtown districts in the City.

As many coastal cities in Florida are grappling with high risk for water inundation, coastal erosion and aging infrastructure, the City of North Miami has elevated conservation efforts to a high priority. To support this vision, the City, a certified green local government, requires energy efficient and associated green standards for all new construction.

It's only natural that the City of North Miami is interested in focusing on a plan for a more sustainable vision for the future through polices that address adaptation, future land use, economy and culture of a City that is evolving and strides towards meeting the needs of current and future residents for generations to come.

Education Pool in North Miami:

There is a wealth of educational opportunities in the City ranging from elementary to university level. North Miami is one of the cities in the Miami-Dade and Broward region which has a State university campus within its municipal boundaries. The City's educational facilities include four elementary schools, a middle high school, a senior high school, two charter schools, eight private schools, the North Miami Campus of Florida International University (FIU), and satellite sites for Barry University. FIU offers both undergraduate and graduate programs and contains a major library facility, classrooms, residential housing, Olympic-sized swimming pool, tennis courts, and is renowned and ranked nationwide for the quality of its hotel management program.

Also within easy reach are Miami-Dade Community College, one of the largest community colleges in the nation, Barry University, St. Thomas University, which includes a Law School with, among others, an International Law program, and Florida Memorial College, one of the oldest universities and historically Black colleges in the State of Florida.

Access To North Miami:

Not only is the City well placed in terms of potential markets and labor pools, but in terms of accessibility. It lies adjacent to Interstate 95, the Golden Glades Interchanges and N.W. 7th Avenue, all of which provide easy access to the rest of Miami-Dade and Broward Counties. Major transportation hubs include the Port of Miami, Miami International Airport, Broward County's major Air- and Sea-ports, and the Florida Turnpike.

Freight traffic is easily accommodated via the Florida East Coast (FEC) railway line running through the heart of North Miami's Industrial Area. The Tri-Rail Coastal Link, an initiative to implement passenger rail service

on the FEC railway, is proposed to connect activity centers along the Southeast Florida coastline - 125th Street in North Miami is one of the stations proposed.

SoLē Mia:

Set in a community in North Miami that is poised to become South Florida's next iconic neighborhood, SoLē Mia is a joint-venture development created by Turnberry Associates and LeFrak. Sprawling across 183 acres, this master planned community will rise just south of Aventura at 15045 Biscayne Boulevard on the largest remaining parcel of undeveloped land in South Florida east of the Boulevard. The development will feature a diverse landscape of residential and commercial complexes, intertwined with 37 acres of parks and recreation space and two swimmable 10-acre crystal lagoons. The center of the community, SoLē Mia Mainstreet, will be ideally situated at the crossroads between Miami and Fort Lauderdale. This pedestrian friendly, lifestyle shopping center will feature popular retailers, high-end cinema with table service for patrons, a gourmet grocery, and Warren Henry Group dealership.

Topics of Focus: Zoning & Land Use

Introduction:

The City of North Miami has proposed "Creating a Medical & Climate Science Technology Innovation District" by Taking Bold Action. The Challenge: For the Biscayne Boulevard Corridor (the "Corridor"), the City envisions a focus upon health care, "green" technology, and climate research and science. To further leverage the existing businesses and enhance their presence and impact to the area.

As part of our team's recommendation, we have reviewed the existing zoning and land uses along the Corridor and several focused areas. We believe through revisions to existing zoning criteria, and a complete reclassification in one case, can be one catalyst to promote a more aligned policy which will be supportive to the targeted med-tech uses. We believe this can further enhance and support existing businesses as well.

We will be examining two major areas; the greater area surrounding the Johnson & Wales Campus (Midtown) and the Northwest corner of the Regional Activity Center (RAC) which is directly across from Sole'Mia. These are the anchors, or barbell ends, to the Biscayne Boulevard Corridor within North Miami. We believe through the focus on the "ends" of the Corridor, rather than solely focusing on the Corridor itself, will lead to the means of improving the overall area to become more complimentary and supportive in total.

- Midtown -

- North District -

Existing Zoning & Land Uses: Midtown

Below is a map of the existing zoning of a central part of North Miami. We have chosen to study several areas, one of which we are referring to as Midtown, which is largely compromised of the Johnson & Wales Campus, as well as land that lies in the middle of the city along the Biscayne Boulevard Corridor and NE 125th Street / NE 123rd Street (Ex. A-1). We believe that these properties are all integral parts of the city, given the redevelopment opportunities, and by the potential this area has to connect the Biscayne Boulevard Corridor to downtown and future proposed Brightline Station (proposed in the vicinity of NE 125th Street).

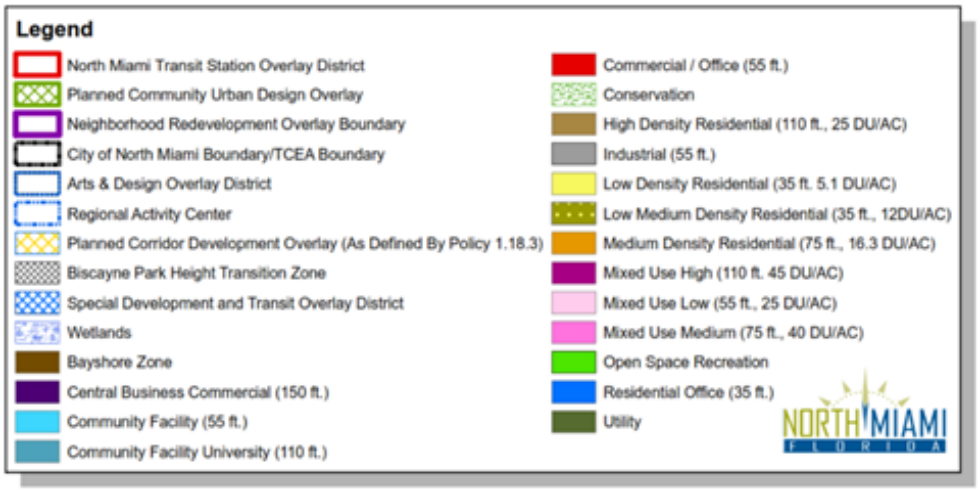


Exhibit A-0 (Zoning Legend)

Exhibit A-1 - "Midtown" (Existing Zoning)

The exhibit illustrates the existing zoning, which while quite diverse, could be further refined in order to allow greater flexibility for desired uses and density. However, we believe that several of the in-place zoning conditions could create constraints in achieving a more diverse environment.

Example; In the commercial corridor on Biscayne Boulevard beginning at NE 123rd Street north to NE 135th Street, the majority of land is zoned C-2BE and C-2BW commercial districts. While the purpose is to "enhance the high-quality commercial areas along the Biscayne Boulevard" we believe that the maximum height of forty-five (45) feet with a fifty-foot rear minimum setback is overly prohibited. [Ord. No. 1442, § 1((exh. 1), 9-10-19)]

Example; Along the east side the Florida East Coast Railway, outside of the North Miami Transit Station Overlay District, area is zoned Residential R-6. While this does allow for 25 du/acre we feel as though there are constraints to the limitations in height at 110 ft., and setbacks of 25 ft.

Exhibit A-2 (Biscayne Boulevard Corridor)

As per Exhibit A-2 above, the Johnson & Wales Campus, as well as the remainder of the area shaded in blue, which while not a part of the Johnson & Wales Campus, is currently zoned as a Community Facility University (110 ft) (CFU). The purpose of a CFU District, also known as Public Use District (PU), is to allow the development of publicly owned or used lands in an efficient, innovative, and flexible way in order to maximize the benefit to the public of the use of the lands designated for public use.

In reviewing the current code for the City of North Miami, the uses that are currently permitted for the Public Use District, that would support the Med-Tech Development, subject in certain instances to obtaining a conditional use permitted, include, but is not limited to, the following:

1. Government use
2. Public Facilities
3. Community facilities
4. Educational facilities
5. Cultural/Civic Center/Convention Center (subject to special exception review)
6. Nursing/Convalescent Homes
7. Educational – Public
8. Parking Garage/Lot
9. Educational, Scientific and Research
10. Laboratory – Research, Development, Testing and Manufacturing (subject to special exception review)
11. Urban Agricultural Gardens/Community

There are also uses conducive to Med-Tech facilities that are currently not allowed in the Public Use District in this specific area that we feel should be permitted or acceptable subject to special exception review:

1. Live/work Studio
1. Educational – Private, Including Charter
2. Educational – Technical, Vocational, Specialty
3. Restaurants – Sports, Coffee, Cafeteria, Café
4. Brew/Pub (Winery/Microbrewery Distillery
5. Banquet Hall
6. Museum
7. Office – Business, Sales, Professional
8. Office – Medical, With Clinic
9. Office – Medical, No Clinic
10. Financial Institution
11. Studios (Photographic & Instructional (Fine Arts)

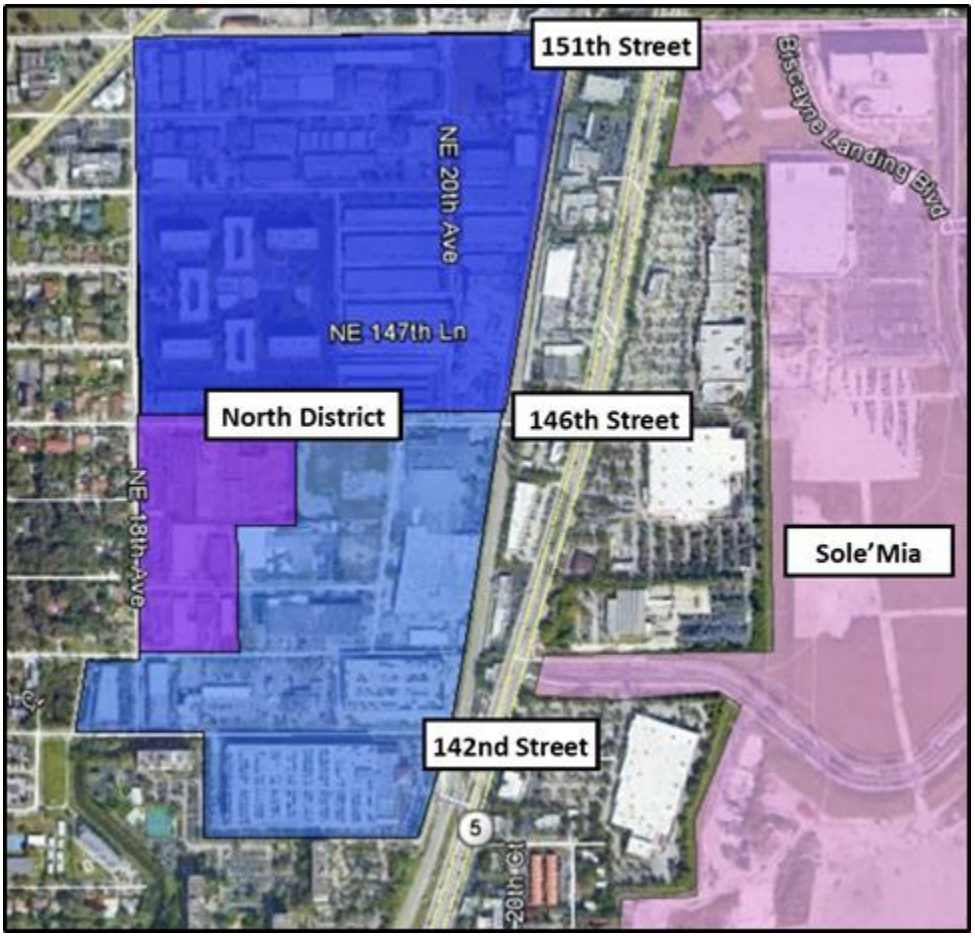
While the list of permitted uses allows for public facilities, community facilities and educational facilities, which each would absolutely be necessary in order to further the Med-Tech Development, it is the office uses that are not currently permitted, which are integral and necessary to actually further the cause. In order to fully be able to attract non-current residents of the City of North Miami to come here, the Med-Tech Development, especially the use of a Public Use district, needs to allow for offices to be built and utilized by tech companies looking to expand. It is not an overnight decision for companies to pick up their entire offices from out of state and decide to relocate all at once, but rather strategic alignment with a new location to ensure synergy. Even whether it is just by having a tech or medical office user have a satellite office here or the creation of an incubator that focuses on the development of medical or technology that can provide space.

In order to advance this area into becoming a district for health care, "green technology", and climate research and science, you need to be able to permit uses that fit within these core industries, as well as permit for ancillary ones that could also touch upon and support these industries.

The other major zoning in place is High Density Residential, Mixed Use Low and Commercial / Office. It is worth noting that the Commercial / Office along the west side of Biscayne Boulevard falls under the Planned Corridor Development Overlay (as defined by Policy 1.18.3). While these current zoning districts allow for a mixture of use, we believe that a more uniform, or broader "overall" approach could be beneficial. The approach could be form-based, with graphic guidelines intended to guide development within the district. The plan would include a heavier focus on intent driven language that is not meant to be prescriptive in all situations, to allow for a qualitative design-oriented approach to development and redevelopment proposals. (FLL Downtown RAC)

Existing Zoning & Land Uses: North District

We have also looked at the area located within the Regional Activity Center at the north end of the city. Again, this area provides a unique opportunity to leverage Sole'Mia and provide for expansion among the lower density area much of which is currently zoned Industrial (Ex. A-3). We feel there is much opportunity to expand on the existing businesses in the district and to ultimately create a cluster of more innovative and non-traditional industrial uses in the area.



- Exhibit A-3 (North District RAC) -

The underlying zoning and land use is currently M-1 Industrial. The basic parameters are having a minimum 20,000 sf lot, a maximum of 75% lot coverage and up to 55 ft. In height. The existing uses consist of a fairly broad range with a few examples being; auto repair shops, marine service, exercise & training, and music rehearsal studio. While the existing uses are relatively diverse, we feel that district, has a great deal more potential.

It is important to point out that the subject area is within a Regional Activity District and partially in a Special Development and Transit Overlay District (SDTOD). Recently there is also additional parcels being annexed into the SDTOD which are highlighted in purple (reflects above in Ex. A-3). This is a positive step given the greater flexibility it provides and the residential use it contains.

An alternate for the industrial zone would be to focus in providing Medical Industrial or Medical Device Fabrication in the existing infrastructure this area already possesses. Having research and production next to each other might be an asset to the Med-Tech industry. It would be a great opportunity for the city to bring in some of the top 10 medical device companies including Stryker, Johnson & Johnson, Henry Schein, Danaher, Cardinal Health, GE Health Care or Medtronic. Rather that removing industrial it would be critical to provide incentives for industrial owners to update, mix or allow for the medical fabrication facilities to be integrated.

Proposed Recommended Rezone / Overlay District: Midtown

An existing TOD Overlay is highlighted in Red. A proposed "Midtown" Overlay is shown in Blue. It's possible that the objective could be accomplished by expanding the TOD Overlay, or annexing the "Midtown" district, into the overlay in order to provide for greater use flexibility (shown below in Ex. B-1). Given the location being in between Downtown and Sole'Mia is makes sense to allow for much greater density. This is further supported by the TOD overlay.

However, it is our understanding that the city is currently considering revising the PU District zoning to PD-3. PD-3 is the cities mixed-use high designation and allows for more flexible and private business-oriented uses compared to the existing PU District parameters. Per ordinance Sec. 4-302 the purpose and applicability of the above-listed planned development districts is to provide a means of:

1. Promoting greater innovation and creativity in the development of land.
2. Ensuring that the location of mixed-use development outside of the Neighborhood Redevelopment Overlay (NRO) is appropriate and compatible with adjacent land uses in accordance with the goals, policies and objectives of the comprehensive plan.
3. To promote a more desirable community environment through approval as a rezoning and the issuance of a conditional use permit.
4. A planned development district shall not be approved in an R-1 or R-2 district.

The PD-3 designation additionally allows for up to 45 residential units per acre with an ability for bonus up to an additional 15 residential units per acre (additional criteria can be found in the appendices). The units allocated would be from the remaining +/- 2,000 units that are outside the Neighborhood Redevelopment Overlay Boundary (NRO).

While we believe this is an effective strategy, we would encourage additional considerations to be made, such as:

- Extended height limitation greater than they permitted 110 feet. By promoting greater height, the footprint of the projects can be reduced, allowing for more open space and great walkability. The RAC permits height not to exceed 200', inclusive of parking, and Sole'Mia which shall be permitted up to 450 feet of building height above the parking pedestal. Height bonus is available under the NRO District along major corridors. We believe this should be strongly considered for all parcels located within Midtown.
- Opportunity for greater density through creating more open space, or the ability for open space to be satisfied by allocation of multiple parcels that seek entitlements in conjunction ("master plan").

Consideration should be given for allowing open space to be satisfied with elevated parks, roof top patios and other non-at-grade spaces.

- Consideration for additional residential density, similar to that provided within the NRO District.
- Further flexibility and guidance as to parking requirements; and consideration for significantly reduced parking requirements in exchange for maintaining and enhancing walkability and permeability of developments. Current multifamily requirement is 1.5 spaces per unit plus 5% of total required parking for guests. This is on the high side for market in most urban locations and propose a decreased parking requirement. The proximity to the proposed transit station also further supports reduced parking.

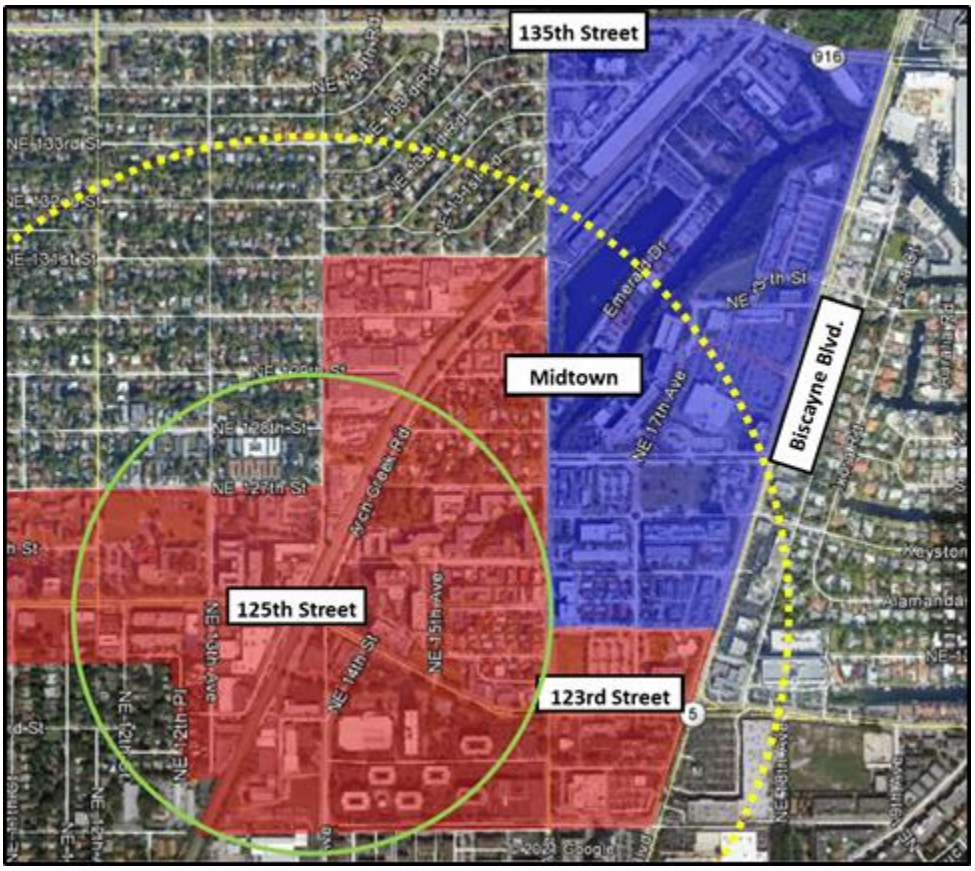


Exhibit B-1

A good case study of what portions of Midtown could become is the New Orleans' BioDistrict and the creation of the New Orleans BioInnovation Center (New Orleans BioInnovation Center - Empowering Biotech Innovators). The similar comparable of what could be built in this area in order to promote the district of health care, "green technology" and climate research and science, matches that of what New Orleans promoted and ultimately developed. The mission of the Bio Innovation District in New Orleans was to create a state-of-the-art development that would support bioscience research and industry by bringing together medical schools, economic development organizations and hospitals. The foundation of all of which already has been started in the Biscayne Corridor.

The New Orleans BioInnovation Center is a private, not-for-profit business incubator, that supports entrepreneurship and is dedicated to the development of bioscience innovation throughout the State of

Louisiana. The BioInnovation Center works directly with entrepreneurs and researchers to commercialize new technologies spinning out of the State of Louisiana healthcare facilities/institutions and universities, as well as those developed by independent innovators, to start and scale new globally competitive life science companies.

The City of North Miami, having the momentum of existing businesses and universities present, could re-create the New Orleans BioInnovation Center and mold the focus into something of their own.

Given the recent sale(s) of the Johnson & Wales Campus, there may be a good opportunity to coordinate for complementary future redevelopment. Although early in its stages the progression of multiple buyers appears to present an interest in diverse future utilization of uses. Perhaps a collaborative effort of the Midtown owners could create and promote for such a BioInnovation Center.

Proposed Recommended Rezone / Overlay District: North District

Directly west of Sole'Mia exists another district, a Regional Activity Center (RAC), in which is comprised of several zoning districts and overlays. This is reflected in the below Exhibit B-2 which shows the master planned Sole'Mia PUD directly to the east, separated by the Biscayne Boulevard Corridor and the Florida East Coast Railway (FEC), with the subject RAC district to the west.

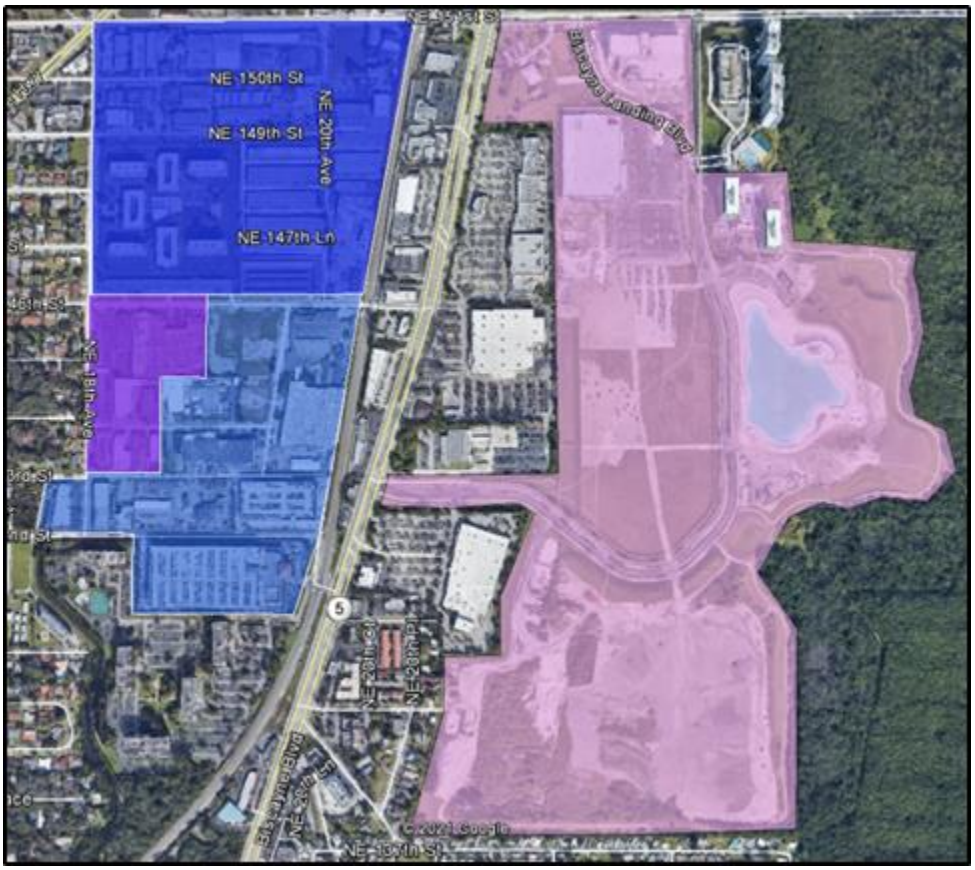


Exhibit B-2

The overall Regional Activity Center is quite large, encompassing much of northeast North Miami, including Sole'Mia. We have elected to focus on the area west of the FEC which is outlined in red on Exhibit B-3 below. The dark blue area is the Special Development & TOD Overlay. The purple shaded area is the recently annexed area showing the expansion of the Special Development & TOD Overlay. This expansion area was added in order to promote more residential development but was limited in order to maintain industrial zoned property at levels which would support critical mass or "clusters".

The overall RAC originated with 5,000 residential units and an additional 2,000 floating units available for use within the SDTOD, as established within the RAC agreement. Approximately 4,500 units were vested within the Sole'Mia PUD. The remaining 2,500 units are predominately allocated to be used within the SDTOD boundaries which is now being expanded. We believe the increased mixture of dense multifamily projects alongside side light industrial will spur re-adaptive uses; fostering an environment supportive of innovation, tech and ancillary uses such as shared-office and food & beverage. **Example, FAT Village where C&I Studio's was a catalyst to creating an arts & innovation district organically.** Following the percolation

of small incubator concepts, which gradually cluster, requires a need for more dense housing and service-oriented business.

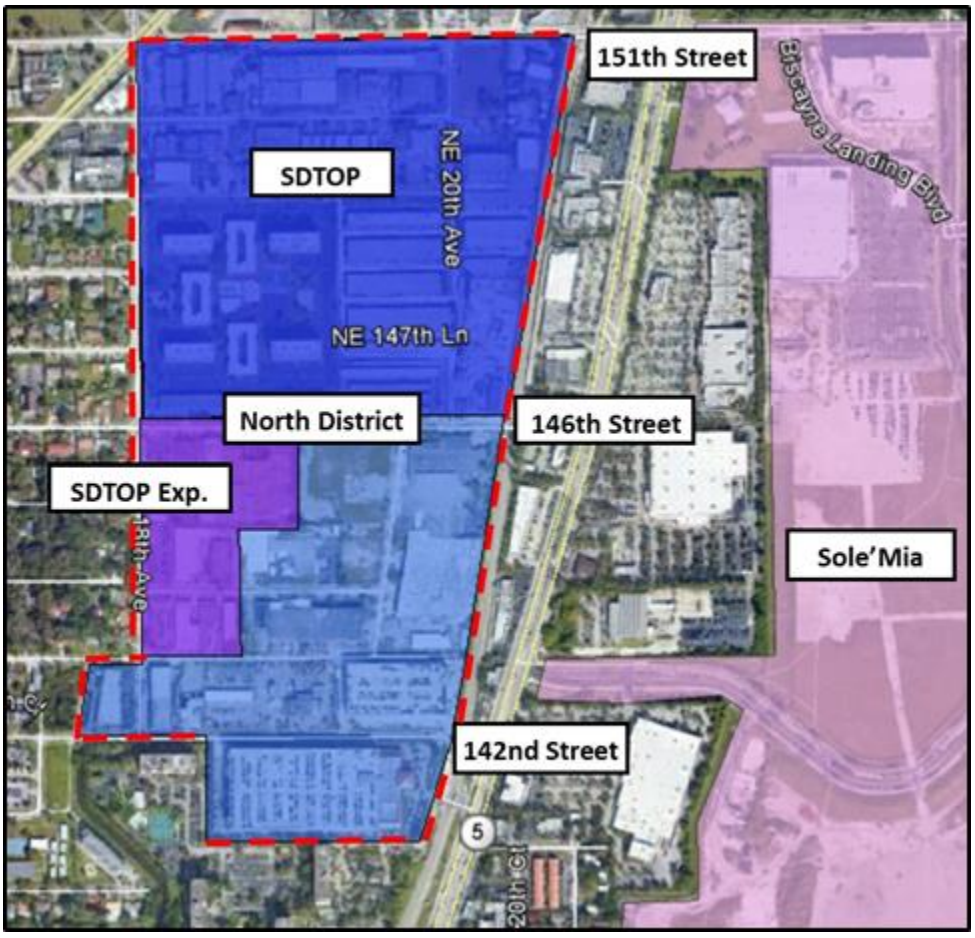


Exhibit B-3 (SDTOD Expansion)

The North District has a tremendous amount of potential. The further build out of Sole'Mia will assist in propelling this area and will create both a demand for more offering and housing for businesses located in the area. This is relevant given the trend in attracting qualified employee talent more than ever is requiring amenity driven work place. Not simply at the office but surrounding the office.

This is where the neighborhood's environment, branding and authenticity play a large role for attracting new businesses. An excellent example of this is South End, located in Charlotte, North Carolina. Over the past eight years South End has transformed from a light industrial blighted area into one of the nation's hottest submarkets. It has achieved this through a diverse offering in which the last part of the equation has been top tier office users relocating their businesses into the district. This goes back to laying the ground work by nurturing a diverse offering within the city.

Proposed Recommended Rezone / Overlay District: Expansion of PD-1 City Site:

While we have not gone into great detail, we want to point of the city owned parcel, which is nested in between Sole'Mia and the entry into FIU's Campus. This site could be difficult to fully develop, given wetlands, but do see it as a significant opportunity to deliver a site in coordination with a specific user wanting to locate into the city. At nearly 30 acres this parcel provides a unique opportunity within Miami-Dade and the barriers of entry the county has on related to large tracts of land.

Exhibit B-4 (PD-1 City)

This area is zoned as PD-1 which stands for Mixed-Use Low. The purpose of a PD-1 planned development district is to provide means of:

1. Promoting greater innovation and creativity in the development of land.
2. Ensuring that the location of mixed-use development outside of the NRO is appropriate and compatible with adjacent land uses in accordance with the goals, policies and objectives of the comprehensive plan.
3. To promote a more desirable community environment through approval as a rezoning and the issuance of a conditional use permit.
4. A planned development district shall not be approved in an R-1 or R-2 district.

Some of the uses that are permitted in PD-1 include:

1. Accessory uses, incidental, subordinate or related to any of the below uses

2. Community facilities;
3. Educational facilities;
4. Hospitals and/or medical facilities;
5. Hotels;
6. Office;
7. Residential;
8. Restaurants;
9. Research and technology;
10. Retail sales and service;
11. Mixed-use—Any combination of three (3) or more permitted uses, one of which must be residential.

Based on the above permitted uses that are currently allowed within the PD-1 area, the uses match up with what would likely be needed in order to develop the center that the City of North Miami desires to be built. However, there are some parameters we see as challenges and would envision the current PD-1 overlay being revisited in attempt to create even greater flexibility. The following minimum development standards are in place under the existing zoning:

A. Minimum site area. The minimum site area required for a planned development shall be not less than two (2) acres.
B. Configuration of land. The parcel of land for which the application is made for a planned development shall be a contiguous unified parcel with sufficient width and depth to accommodate the proposed use. The minimum average width and or depth for any planned development shall be one hundred (100) feet.
C. Density. The density requirements shall be in accordance with the provisions of the applicable land use classifications in the comprehensive plan for PD-1 is 25 du/acre.
D. Bonus density for mixed-use (outside the NRO): additional density may be granted up to fifteen (15) dwelling units per acre through conditional use approval.
E. Height. The maximum height for PD-1 is 55 feet.

CASE STUDY: Existing Parcel in Midtown

As an example, to help illustrate one of our suggested considerations we have created a simple summary below. This highlights an existing parcel that is currently zoned PU. We have shown what some of the basic parameters of the site could be should it be rezoned to PD-3 or perhaps PD-3(a) which incorporates some aspects of existing overlays already in place.

Address:	NE Corner of NE 126th St & NE 17th Ave	
Zone:	PU	
Lot Area:	102,000	SF (2.34 acres)
Existing Use:	Vacant Land	

	Current PU	PD-3	PD-3(a)
Use	Public Use / Educational	Multifamily	Multifamily
Height	110 ft	110 ft	200 ft**
Parking Ratio	5/1,000	1.50/Unit*	1.00/Unit
Density	n/a	60 du/acre	150 du/acre***
Multifamily Units	0	140	351
Parking Spaces	0	221	369
Parking Cost Per Dwelling	$0	$47,250	$31,500
Land Value	$0	$7,744,835	$12,908,058
Impact Fees (2% of TPC)	$0	$1,194,215	$2,985,537
Property Taxes (2% of Value)	$0	$1,404,959	$3,512,397

Notes:

PD-3(a) - "Proposed" for consideration within the "Midtown" district.
PD-3(a) - Propose reduced parking to 1/unit plus 5% of total required parking for guests.
PD-3 - Permits 45 du/acre and up to a bonus of 15 du/acre (Max of 60 du/acre)
Parking Cost - Assumed to be $30,000 per Space.
Land Value - Assumed to be $35,000 per Dwelling Unit.
Total Project Cost - Assumed to be $425,000 / unit
Total Stabilized Value - Assumed to be $500,000 / unit
* Multifamily requires 1.5/unit plus 5% of total required parking for guests.
** RAC SDTOD permits height up to 200 ft.
*** RAC SDTOD permits up to 150 du/acre.

Topics of Focus: Incentives

Incentives and programs combined with various funding sources from public and private sources are available to activate and support the potential desired uses in the area and ultimately assist the City of North Miami in bringing in new residents. Our research has found that grants are available from the state level and low-cost financing is available from the federal government, including the Qualified Target Industry Tax Relief, the High Impact Performance Incentive Grant, the U.S. Economic Development Administration's investment policy, the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grants and opportunity zoning.

Qualified Target Industry Tax Refund (QTI)

One of the already-available incentives that the City of North Miami could offer to new business (or even existing businesses) is the Qualified Target Industry Tax Refund incentive, which is open for specific companies that create high wage jobs in targeted high value-added industries. This incentive includes refunds on corporate income, sales, ad valorem, intangible personal property, insurance premium, and certain other taxes. Pre-approved applicants who create jobs in Florida receive tax refunds of $3,000 per net new Florida full-time equivalent job created; $6,000 in an Enterprise Zone or Rural Community (county). For businesses paying 150 percent of the average annual wage, add $1,000 per job; for businesses paying 200 percent of the average annual salary, add $2,000 per job; businesses falling within a designated high impact sector or increasing exports of its goods through a seaport or airport in the state by at least 10 percent in value or tonnage in each year of receiving a QTI refund, add $2,000 per job; projects locating in a designated Brownfield area (Brownfield Bonus) can add $2,500 per job. The local community where the company locates contributes 20 percent of the total tax refund. There is a cap of $5 million per single qualified applicant in all years, and no more than 25 percent of the total refund approved may be taken in any single fiscal year. New or expanding businesses in selected targeted industries or corporate headquarters are eligible.

High Impact Performance Incentive Grant (HIPI)

The High Impact Performance Incentive is a negotiated grant used to attract and grow major high impact facilities in Florida. Grants are provided to pre-approved applicants in certain high-impact sectors designated by the Florida Department of Economic Opportunity (DEO). In order to participate in the program, the project must: operate within designated high-impact portions of the following sectors-- clean energy, corporate headquarters, financial services, life sciences, semiconductors, and transportation equipment manufacturing; create at least 50 new full-time equivalent jobs (if a R&D facility, create at least 25 new full-time equivalent jobs) in Florida in a three-year period; and make a cumulative investment in the state of at least $50 million (if a R&D facility, make a cumulative investment of at least $25 million) in a three-year period. Once recommended by Enterprise Florida, Inc. (EFI) and approved by DEO, the high impact business is awarded 50 percent of the eligible grant upon commencement of operations and the balance of the awarded grant once full employment and capital investment goals are met.

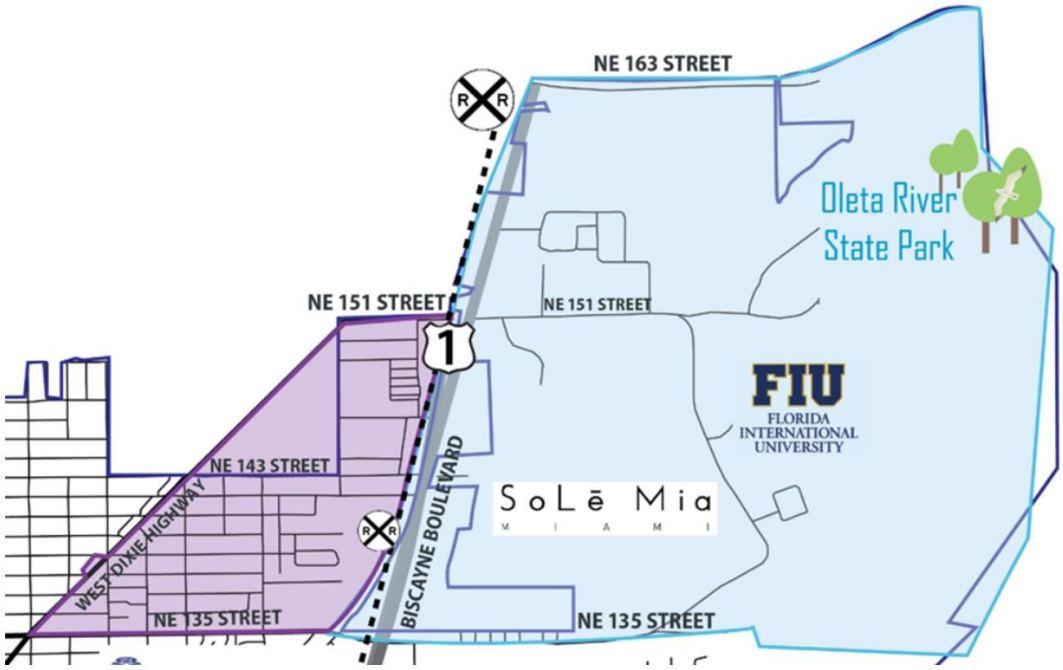
Economic Development Association

The U.S. Economic Development Administration's ("EDA") investment policy is designed to establish a foundation for sustainable job growth and the building of durable regional economies throughout the United States. This foundation builds upon two key economic drivers - innovation and regional collaboration. The EDA provides economic development financial assistance to communities so they can encourage innovation and entrepreneurship in a way that works best for them. EDA's flexible programs and structure enable nimble operations and allow for innovation and responsiveness to changing economic needs and conditions faced by its local and state government partners. Grants made under these programs are designed to leverage existing regional assets to support the implementation of economic development strategies that advance new ideas and creative approaches to advance economic prosperity in distressed communities.

US Department of Transportation

The U.S. Department of Transportation offers discretionary grant funding through the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grants. RAISE, formerly known as BUILD and TIGER, has awarded over $8.935 billion in grants to projects in all 50 states. Lake Nona, the property in our case study was awarded $20 million dollars to create a robust Local Alternative Mobility Network in Tavistock Group's Lake Nona community in the City of Orlando, accommodating and enabling new transportation solutions for metro Orlando's fastest growing region.

Opportunity Zones



The map above shows two of the three opportunity zones that are located in the City of North Miami that are home to several existing operations, including Sole'Mia and FIU, but also have potential sites for development.

Opportunity Zones offer tax benefits to business or individual investors who can elect to temporarily defer tax on capital gains if they timely invest those gain amounts in a Qualified Opportunity Fund (QOF). Investors can defer tax on the invested gain amounts until the date they sell or exchange the QOF investment.

Below are each of the current opportunity zones that are within the City of North Miami, which the City of North Miami combines the existing Opportunity Zones with other incentives and overlays:

NORTH MIAMI FLORIDA

Opportunity Zones can be combined with other North Miami incentives and overlays to create an attractive investment package. Fast-track permitting and fee reduction available for qualified projects.

Opportunity Zone 4.05

Opportunity Zone 2.09

Opportunity Zone 4.05

$1.8 million Consumer Expenditure | 4,821 Absolute Population

At the western edge of North Miami, Opportunity Zone 4.05 features the Chinatown Cultural Arts & Innovation District, which provides Chinese design guidelines within a developer-friendly planned corridor development overlay. Most notably, the Zone includes a 9 acre city-owned vacant parcel of land that is actively seeking investor and developer interest.

CHINATOWN CULTURAL ARTS & INNOVATION DISTRICT AND VACANT CITY-OWNED LAND

- The Chinatown Cultural Arts & Innovation District is a large master-planned corridor on NW 7th Avenue that includes incentives to spur development
- 9 acre city-owned vacant site abuts two 3-lane highways and a community center. The City is actively seeking interest in developing the following use(s): indoor recreation center, micro-theme park, recreation facility, cultural center, or other public use facility

ZONING CATEGORIES FOR DEVELOPMENT:

- Public Use (PU): recreational facilities, stadiums, amusement parks, educational facilities, laboratories
- Commercial (C-1): retail, office, light industrial, 55 ft heights

LAND USE OVERLAYS:

- North Miami Community Redevelopment Agency
- Planned Corridor Development (200 ft height, 125 du/ac, mixed use)
- New Market Tax Credits

AVERAGE DAILY TRAFFIC COUNTS:

- I-95: 240,000
- NW 7th Avenue: 27,500
- Opa-Locka Boulevard: 16,000
- NW 135th Street: 13,000

Opportunity Zone 2.09

$1.2 million Consumer Expenditure | 7,303 Absolute Population

Located in the heart of North Miami, Opportunity Zone 2.09 offers the most diverse and unique investment and development opportunities with four different commercial sectors available for fund investment and access to the Florida East Coast railway.

MULTIFAMILY DEVELOPMENT OPPORTUNITIES AND HIGH-REVENUE INDUSTRIAL DISTRICT

- Large apartment complexes sit on a collective 37 acres of land within the Opportunity Zone 2.09 with complexes allowing for 2,000 units and heights of 200 ft.
- Large numbers of manufacturing and warehouse businesses that offer diverse and high-revenue business opportunities within the industrial district

ZONING CATEGORIES FOR DEVELOPMENT:

- Industrial (M-1): light manufacturing, warehouse, laboratories, storage
- High-density residential (R-6): 110 ft heights, 25 du/ac
- Commercial (C-1): retail, office, light industrial, 55 ft heights
- Planned Development (PD-3): Mixed use allowing for 110 ft heights and 45 du/ac

LAND USE OVERLAYS:

- North Miami Community Redevelopment Agency
- Planned Corridor Development (100 ft height, 100 du/ac)
- New Market Tax Credits
- Special Development Transit-Oriented Development- 2,000 units available & allowance of mixed use
- Neighborhood Redevelopment Overlay- 2,500 units available & allowance of mixed use

AVERAGE DAILY TRAFFIC COUNTS:

- West Dixie Highway: 16,200

Opportunity Zone 1.09

$1.5 million Consumer Expenditure | 4,370 Absolute Population

Featuring the largest planned development in North Miami and the surrounding region, Opportunity Zone 1.09 features Sole Mia, a 184-acre plot of land. The tract also includes Oleta River State Park and Florida International University Biscayne Bay Campus.

SOLE MIA PLANNED DEVELOPMENT AND BISCAYNE COMMERCIAL FRONTAGE

- Sole Mia is a $4 billion dollar master planned development that will feature more than 4,000 residential units when completed and more than one million square feet of retail and entertainment space
- Biscayne Boulevard features property investment opportunities with highly desired real estate that attracts diverse national commercial tenants

ZONING CATEGORIES FOR DEVELOPMENT:

- Public Use (PU): recreational facilities, stadiums, amusement parks, educational facilities, laboratories)
- Planned Development (PD-2): 75 ft heights, 40 du/ac
- Commercial (C-2BE): retail, office, 55 ft heights
- Commercial (C-2BW): retail, office, 55 ft heights

LAND USE OVERLAYS:

- Regional Activity Center
- Planned Community Urban Design Overlay- Greater bonus density for residential units, mixed use, and greater height
- Special Development Transit-Oriented Development- 2,000 units available & allowance of mixed use
- Planned Corridor Development (110ft height, 125 du/ac)

AVERAGE DAILY TRAFFIC COUNTS:

- Biscayne Boulevard (US-1): 65,000
- NE 163 Street: 63,500

While the City of North Miami has in place the above opportunity zones at the moment, the City could also expand upon these three and create additional opportunity zones within its area geared towards the development and incubation of innovation and science, while also including existing incentives that the City offers plus some of the others that we speak about below.

ADDITIONAL INCENTIVES TO BE CREATED AND OFFERED

In addition to each of the above incentives that the City of North Miami could offer, we believe that the City could offer some additional incentives which include (I) job creation incentives, (ii) workforce development training grants, (iii) expedited permitting and (iv) a medical-technical business grant assistance program.

Job Creation Incentives:

With respect to the creation of a job creation incentive, the City of North Miami could create an incentive where if where a new company that was going to come to the City of North Miami and such Company were to either have 100 employees on day 1 or show that the Company were to have plans in the near future to get to such number by showing active job postings, the City of North Miami could offer to reimburse the company $3,000 per employee being paid above the then-current county average salary. The City of North Miami can look at taxes being paid by existing companies in the area to fund such incentive.

Workforce Development Training Grants

The goal of a Workforce Development Training Fund ("WDTF") would be to increase the economic mobility of residents of the City of North Miami through training that leads to job retention and wage gains, support the growth of the economy by assisting its employers with job creation and integration of technology, specifically through the development of skills not only for their existing employees, but also for new employees, promote innovation in the development of talent, and provide assistance to businesses while shifting focus to broader talent pipeline development strategies.

One of the leading examples is the Idaho Workforce Development Counsil. The Council focuses on getting Idahoans into careers that they desire and to put them on a path to prosperity, while also ensuring that their employers have the talent that is educated and skilled in order to thrive not only today, but also in the future. The funding of such program is generated by a 3% offset of unemployment insurance taxes.

Link to Idaho Workforce Development Counsel Site: Workforce Development Training Fund | Meeting employer's needs today and tomorrow Workforce Development Council (idaho.gov)

Expedited Permitting

Another way to incentivize economic development in the City of North Miami, is to offer expedited permitting. The City of North Miami could offer certificates of critical economic concern for high priority projects, which could be awarded to projects meeting a certain criterion based upon the projected economic impact that the project could have.

1) Fast-track review and permitting for the development review committee (DRC) & building permits
2) Reduced permitting fee.
3) Final project recognition by the city;

Med-Tech Business Grant Assistance Program

We find it critical to the development of a Business Grant Assistance Program managed through the city to streamline fledgling medical technology companies applying for grants. It would be the task of this program to establish working relationships with grants that specifically cater to the medical technology industry. This program would be a welcoming platform for incubator projects to receive funding. This assistance would come in the form of preparing prescreened application packages.

Similar programs exist such as Inspiralia that work the entities such as the (NIH) National Institute of Health. In NOMI's case, the city would establish their own endemic assistance program catering specifically to the medical technology industry growth in the city. Thus, increasing the probability of these projects receiving funding at the most essential project inception.

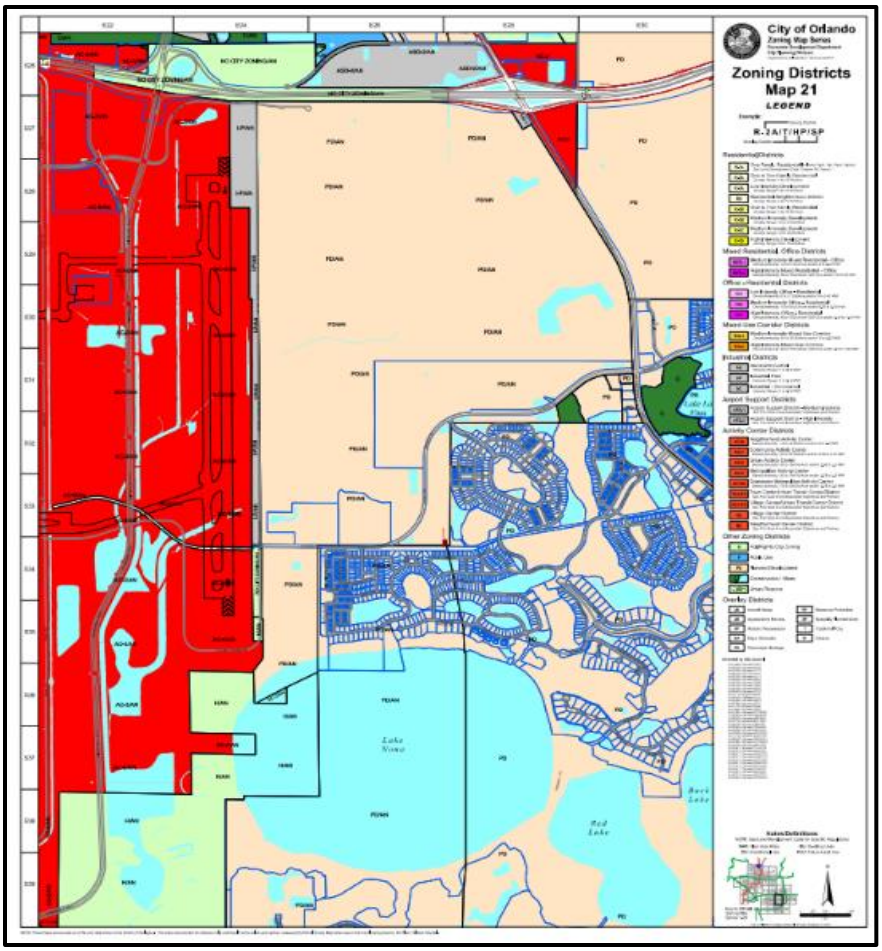
Partnering Funding & Grant Entities:

- AdvaMed Accel
- Agency for Healthcare Research and Quality's (AHRQ)
- AHRQ Digital Healthcare Research Funding Opportunities
- MedTech Innovator
- StartX Med
- Focused Ultrasound Foundation
- Medical Technology Enterprise Consortium
- America's Seed Fund (NSF National Science Foundation)

Case Study – Lake Nona Health and Life Sciences Cluster

Lake Nona's health and life sciences cluster is a landmark for Orlando, and a premier location for medical care, research and education. Lake Nona's cluster was built based on the proven theory that health care and life sciences facilities in close proximity to one another will accelerate innovation. In the years since, Lake Nona has become home to some of the nation's leading hospitals, universities, research institutions, and health and life sciences companies. As it stands, these pioneering institutions are forming networks and synergies to advance health care while creating a job engine for the region

(Aerial Rendering of Lake Nona)



(Zoning Map of Lake Nona Master Plan)

Place Identity - Med-Tech NoMI:

The formation of place identity is a process of shaping territorial boundaries, symbolism, and institutions (Paasi, 2003).

The creation of a place identity is a communal exercise in itself. This is the act by which a sector of people or place find common ground or accept the task of a community identification. Some of the essences of a place are found but most are intentional. In this case the intent is to create a place identity for the Med-Tech community.

Item No.1 (Alterations)

It would be wasteful to recreate already programed spaces but there is still time to make alterations to proposed projects if the intent is the promote a unifying spirit. What is required to make a medical village withing a city is to implement street scape improvement projects.

Item No.2 Street Scape – Case Study (Nova Scotia)

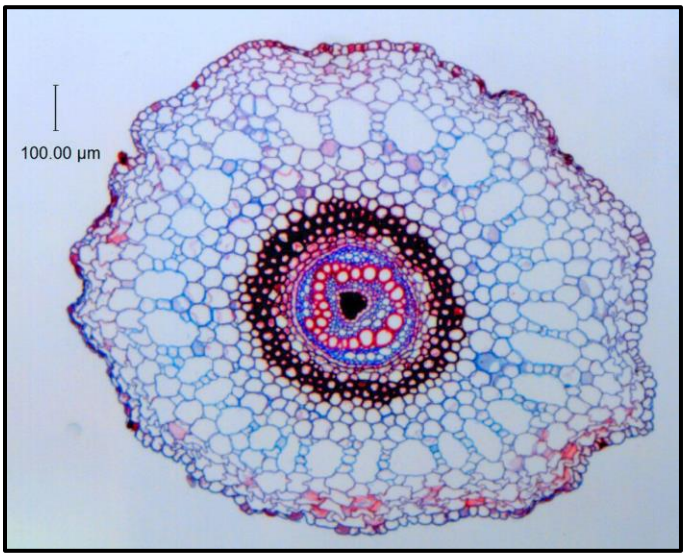
The intent is to make NoMI a world-renowned location where the medical technology field test its capabilities. Its geographic location allows incredible access to foster this type of development now the stage has to be set by accommodating this cross pollination. This is possible by creating Areas of Discourse and encouraging Public Displays of open source medical break throughs.

By creating sought after areas North Miami will be a place where the medical field can feel at home. A similar dynamic created years ago that activated the streets and brought people together was the Argyle Steet improvements. This was a remedial noninvasive strategic vision that brought spirit to an entire community.

(Argyle Street, Halifax, Nova Scotia)

Item No.3 Branding

Gumucio is one of the founders and director of the BioArtography project. The project, which was started in 2005, takes the images scientists at the University of Michigan see every day and brings them to the wider world in the form of art prints. She says the idea came to her and a couple other colleagues when they were talking about how beautiful they found images they were seeing under their microscopes.



"We actually react to those images very viscerally, like we see an image of bone marrow, and it's absolutely beautiful," Gumucio said.

The objective is to create a sense of place that comes from and belongs to the medical profession. This is one profession whose graphic identity is just starting to be explored. Projects such as Bioautography have brought to light a creative investigative aesthetic that clearly stands out. It would be imperative that these distinctive characters be used to explore different articulations either as patterns on walls, through signage or even landscapes.

Saleh (1998) used physical configuration of places or architectonics to describe place identity of Saudi cities, where local images are enhanced to meet individual and public needs.

What makes the identity of the place is the use of familiar elements to express the graphic language of the community. The intent is that street scapes, open areas, public spaces and street furniture are designed with a character reminiscent of medical discoveries. Items such as painted street pattern or right of way textures can give identifying elements throughout specific areas. Such characters can help in defining barriers and blurring edges for different activities.

Such as how the medical profession was accelerated to respond the demands of Corona Virus, the environments that we thrive in must also adapts using digital enhancements. The current new norm of communication will leave positive residual effects on how spaces will allow a no touch policy. We will still need spaces to commune but this consorting will be more spread out, more accessible even though not spatially compact. Here is the opportunity to use advanced technologies in all operations to propagate

intensive social interactions. Such environments can be created using interactive lighting and musical interfaces.

Politics of a place guide its citizens by allowing and restricting activities for a specific purpose. These activities include social gathering, active participation, creative engagements. Regulations on design are also restrictive or give focus to the identity that its regulators desire. Here is where norms can alter geography, sociology, collective psychologies, ecologies and ultimately spatial planning.

Implementation

Next Steps...

Create an Advisory Board for strategic initiatives and partnerships. This group could continue the efforts of Beacon Council or work in conjunction as a direct liaison with the City of North Miami's Chamber.

- North Miami - The Beacon Council
- Could include North Miami Chamber of Commerce, Community Planning & Development, Private Business Owner and University Representative.

Create a subcommittee to review land use and zoning code (believe they have a consultant working on reviewing their incentives or something for desire uses –we should reference this consultant).

Community / Existing Business engagement.

- Continue building upon community engagement. The existing Brewfest is an excellent example of how the city can support local small business and attract new interest. This is an excellent example of a partnership between North Miami, FIU and private businesses.

Marketing / Branding ("Prosperity NoMi an Innovation Hub")

- Prosperity NoMi Innovation District could establish a Community Trust to the purpose of providing community benefits in surrounding communities in the form of economic development and job creation programs that include small business development and local workforce development and hiring, development of affordable housing, and beautification and greenspace projects.
- Prosperity NoMi Innovation District could establish a Foundation to support economic development opportunities in the form of micro-loans to local businesses, job training, housing programs, and workshops on entrepreneurship.
- Prosperity NoMi Innovation District could enhance the local retail sector by reserving up to 20% of the Retail Merchandising Units for local businesses or enterprises owned by local residents.
- Prosperity NoMi Innovation District could establish an internship program offering internships to qualified high school or post-secondary minority students and graduates
- Prosperity NoMi Innovation District could partner with an accredited public or private post-secondary educational institution to include a physical indoor space reserved for an incubator for startup and early-stage businesses that incorporate an educational component in creating an innovation-oriented ecosystem.

Physical Community Branding (highlighting existing operations - FIU's Sea Level Solutions Center -signage or graffiti walls visible along Corridor). Possible opportunities with Dezer Park, Lost City Brewery and local property owners and business with building frontage along the FEC and Biscayne Blvd. Corridor.

(Wynnwood & FAT Village created an incubator environment which led to users)

Continuing to highlighting the diverse and natural resources NoMi has to offer – such a Oleta State Park.

- Oleta State Park -

Team Bios

Ben Boies

As a Senior Asset Manager with Stiles Financial Services, Ben is tasked with the creation and implementation of strategic initiatives for a diversified portfolio of properties with the primary focus on redevelopment and repositioning retail properties, ground-up development of office, and residential development projects. In addition, Mr. Boies works closely with Stiles Residential & Commercial Development, providing analytical analysis with a concentration on multifamily and retail properties.

Ben is specifically responsible for managing the debt placement, spearheading lease negotiations, creation of operational and development budgets, execution of design and approvals for redevelopment activities and overall management of the asset. In his tenure at Stiles, Ben has managed over 3 million square feet at a market value of over $925 million and assisted in the development, lease-up and sale of over 1,400 residential units at a market value of nearly $610 million, negotiated in excess of 300,000 square feet of retail leases, and has played an integral role in the transactional business in excess of $1 billion including acquisition, disposition and financing.

Prior to his current responsibilities, Ben served as an Investment Analyst focusing on cash flow projections, portfolio valuation and the overall financial analysis of development projects. Mr. Boies earned a master's degree in Real Estate Development from the H. Wayne Huizenga School of Business and Entrepreneurship, being distinguished as a member of the Alpha Sigma Gamma Society and attended the University of Oklahoma for undergrad.

Myles Burstein

Myles is a real estate and capital markets attorney with experience in advising private companies and individual investors in the acquisition, disposition and financing of real estate transactions. He recently joined Kawa Capital Management where he serves as Associate General Counsel. Prior to joining Kawa, he spent four years at a local law firm named Bilzin Sumberg, where he handled real estate acquisitions and financings, the purchase of b-piece bonds in CMBS securitizations, retail/commercial leasing and general corporate matters (including authorization documentation, joint venture agreements and fund formation).

Prior to that, he worked as an associate in the real estate practice group at Sills Cummis & Gross, where he participated in a range of real estate transactions. Myles received his bachelor's degree in business from the George Washington University, and his law degree from the University of Miami School of Law.

Sammy Lamy

Sammy is a real estate professional who also dedicates his time to serving the community. In the real estate profession, he provides consulting services to small real estate firms. He is dedicated to help tackling the affordable housing crisis that is affecting the community.

Sammy also serves as a board member for the city of Miami Code Enforcement Board. In this role, he hears code enforcement violations and is a voting member on the final outcome.

Sammy received his Accounting Degree from Florida A&M University. He received his Master's in International Real Estate from Florida International University.

Christina Lambert

Christina has defined her career leading organizations through change that creates results. As the Managing Director and Productivity Strategist at Productive Power, she helps other professionals avoid the guesswork and maximize productivity with technology. In her role, she works with local CEOs and business professionals on improving their corporate businesses practices, implementing better organizational policies, increasing efficiencies, and streamlining internal procedures.

In addition to her corporate job, Christina also serves as a West Palm Beach City Commissioner and serves on the Boards of many civic organizations to advance progress within her community including the Palm Beach County League of Cities and the Palm Beach County Transportation Planning Association. As a City Commissioner, she has focused on amplifying voices of those often marginalized in our community, increasing city-wide communications, and implementing efficiencies for overall better city service delivery. She prioritizes policies that increase public safety, provides more opportunities for economic development and affordable housing, decreases our carbon footprint and increases sustainability options, provides multi-modal transportation options, and helps families succeed through public education support.

Prior to these current roles, Christina served as Executive Director of Leadership Palm Beach County, where she brought together leaders to assess local issues, including economic development, education, homelessness, and public safety. Christina also served as the CEO of the Education Foundation of Palm Beach County, the leading philanthropic organization for the 11th largest school district in the US.

Christina graduated with High Honors from the University of Florida with a Bachelor of Arts Degree in Public Relations with a Minor in Business Administration. Following that she went on to Rollins College and graduated with a Master of Arts Degree in Corporate Communications and Technology. She is also an accomplished triathlete and bicyclist.

Steven Morales

Steven is a Licensed Architectural Professional with more than 18 years of experience on a multitude of projects ranging from Custom Interior Build Outs, Mixed Used Projects, Commercial, Religious Edifices, Airports, Educational, Custom Single- Family Homes, Restaurants, Social Housing and various Campus/City Master Plans. Mr. Morales has been involved in projects in different cities including Miami, New York, Los Angeles, Bogota and London. Steven's bulk of experience is in the educational sector starting from his days at PKSB to independent educational facilities in Colombia.

Additionally, he had leadership roles in various educational architecture projects while at Zyscovich including both Hillel Jewish Community School and Miami – Dade Hialeah Campus Buildings and Master Plans. For the past few years Steven has worked as Project Manager on AOR teams in Collaboration with Zaha Hadid and Foster & Partners on a number of mixed use tower projects. At PLUS he performs as Principal running business development and managing various projects both in US and Colombia. Mr. Morales has also been a visiting professor and critic at Sci-arc, Columbia University, Los Andes University, Pontificia Universidad Javeriana, Broward College and Florida Atlantic University. He has taught Thesis Studios, Eco- Social Studio, Architectural Drawing, Design Development, History, Theory and Dynamic Typologies - Digital Fabrication courses. Currently, he is also a board member as part of the Planning and Development Board of Hollywood, Florida.

Steven graduated from Southern California Institute of Architecture (Sci-arc), then earned his M.Arch from UCL (The Bartlett School of Architecture) in London and an M.S.Arch from Columbia University in the City of New York (GSAPP).

APPENDIX - A
TAKING BOLD ACTION

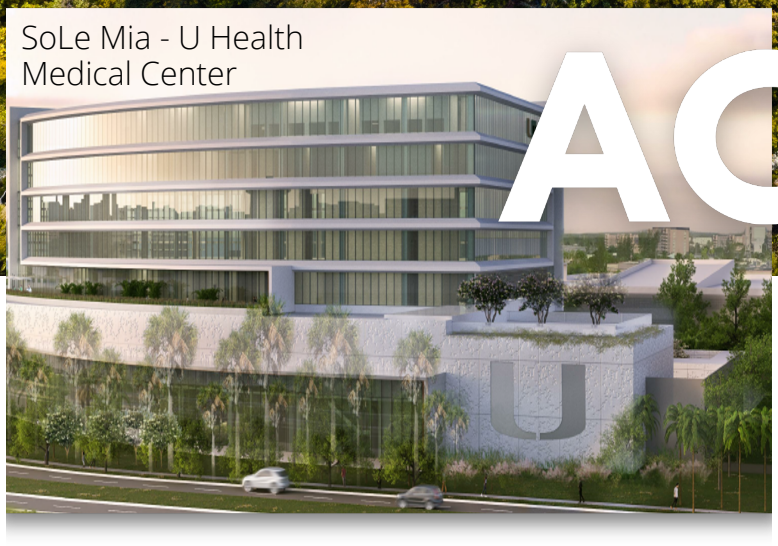
Aerial View of Biscayne Bay, North Miami

Urban Land Institute

Proposal for: ULI Leadership Project, September 2020
Julie Medley, Executive Director

TAKING BOLD ACTION:

Creating a Medical and Climate Science Technology Innovation District



SoLe Mia - U Health Medical Center

Johnson & Wales University - North Miami Campus

NORTH MIAMI FLORIDA

Contact: Tanya Wilson, AICP
Planning, Zoning & Development Director

Taking Bold Action: Creating a Medical and Climate Science Technology Innovation District

The city of North Miami (the "City") is pleased to submit this proposal for consideration by the Urban Land Institute (ULI) for a Leadership Team project.

THE CHALLENGE:

For the Biscayne Boulevard Corridor (the "Corridor"), the City envisions a focus upon health care, "green" technology, and climate research and science. With the threat of climate change, a global pandemic and the need to support a thriving real estate market where individuals can *live, work and innovate*, we ask that the ULI Leadership Team provide guidance and recommendations that will further that vision.

Questions to consider include:

- How can the City best leverage the presence of UHealth at Sole Mia; Florida International University - Biscayne Campus Sea Level Rise Solutions Center and Institute of Environment; and, Johnson & Wales University to create a *Medical and Climate Science Technology Innovation District* along the Corridor, anchored by UM-Health and FIU?

- What should the City consider to activate the Corridor and attract new businesses while respecting and accommodating existing businesses?

- How can we help existing businesses diversify and position themselves to take advantage of the new Innovation District?

- What private, federal, state and local funding sources can the City leverage to activate the desired uses in the area?

BACKGROUND:

Reflecting the City's desire to become more economically resilient, TIP Strategies, Inc. was commissioned by the Mayor and City Council to prepare a Targeted Industry Analysis (the "TIA") that would:

> *"…evaluate North Miami's potential for business growth, economic investment, and job creation…and, provide a clear strategy for identification and recruitment of industry sectors and business the City should target for development, attraction, and foreign direct investments within the City of North Miami's Industrial and commercial zoning districts."*

While the TIA, which was released May, 2020, analyzed a much wider area of the City, for the purposes of this proposal, the City wishes to focus upon the Corridor and the TIA recommendations specific to this area.

Assets: The TIA noted that, as shown in **Figure 1**, below, "Aside from its enviable location in one of the most dynamic regions in the US, North Miami has a wealth of its own assets, including…Florida International University (FIU) Biscayne Bay Campus, Johnson & Wales University (JWU), and one of the region's largest mixed-use development projects in Florida: Solé Mia, a 183 acre multi-phased mixed use public-private development between the City of North Miami and developer Oleta Partners, LLC. The project will include a new University of Miami Health System (UHealth) medical center, which will bring a range of specialized medical treatments—from cancer care and cardiology to neurology and orthopedics—into a 325,000-square-foot facility on a 10-acre site within Solé Mia that includes: a reflection garden, views of the turquoise waters of Biscayne Bay and lagoons, and a hotel for the convenience of patients and families traveling to receive care."

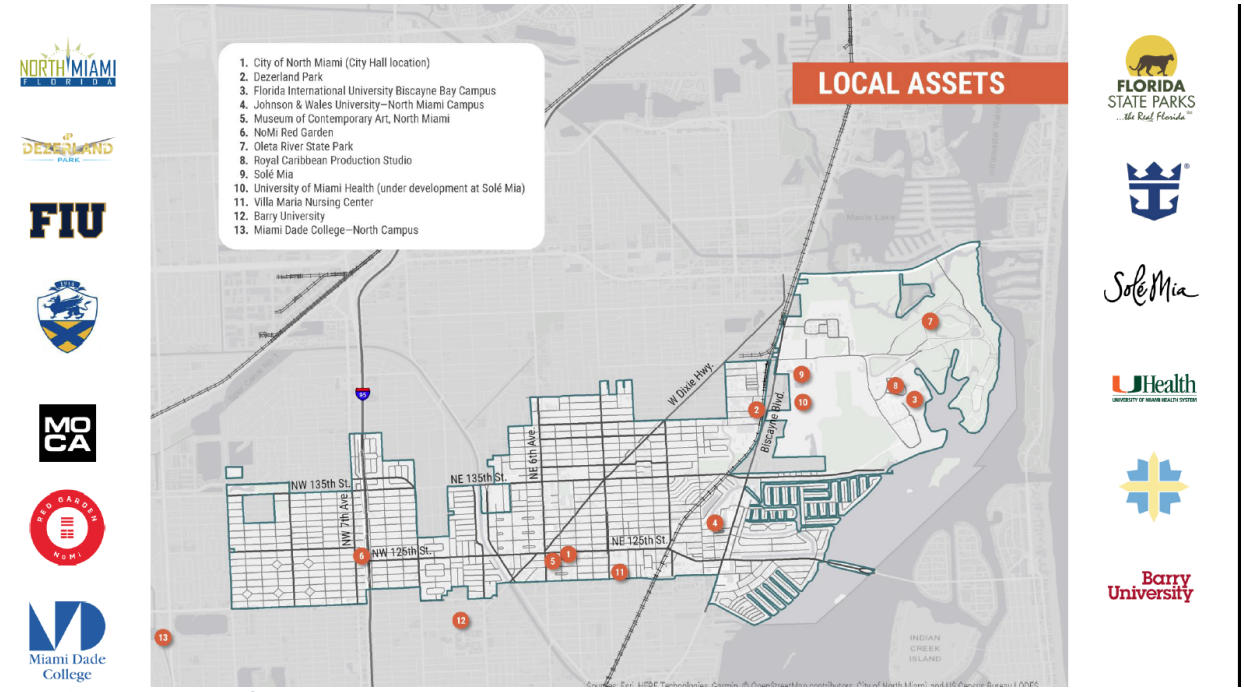


Figure 1: Local Assets - Source: North Miami Target Industry Analysis

Other Strengths: The City has a strong economic development partner in the North Miami Community Redevelopment Agency, and has a powerful arsenal of economic development tools to allow for bold changes. North Miami has established robust zoning overlays, including the Planned Corridor Development District (PCD) that provide for mixed use, various commercial uses, higher residential density and increased building heights (see **Figure 2**).

Golden Opportunities: Johnson & Wales University 28-acre campus is for sale; Oleta State Park is one of the largest tourist attractions to the region with over 10,000 visitors per month; Florida International University has a wealth of research and is a technical knowledge base; and, as illustrated in **Figure 3**, North Miami also has the benefit of three Opportunity Zones.

Biscayne Blvd. Planned Corridor Development District (PCD)

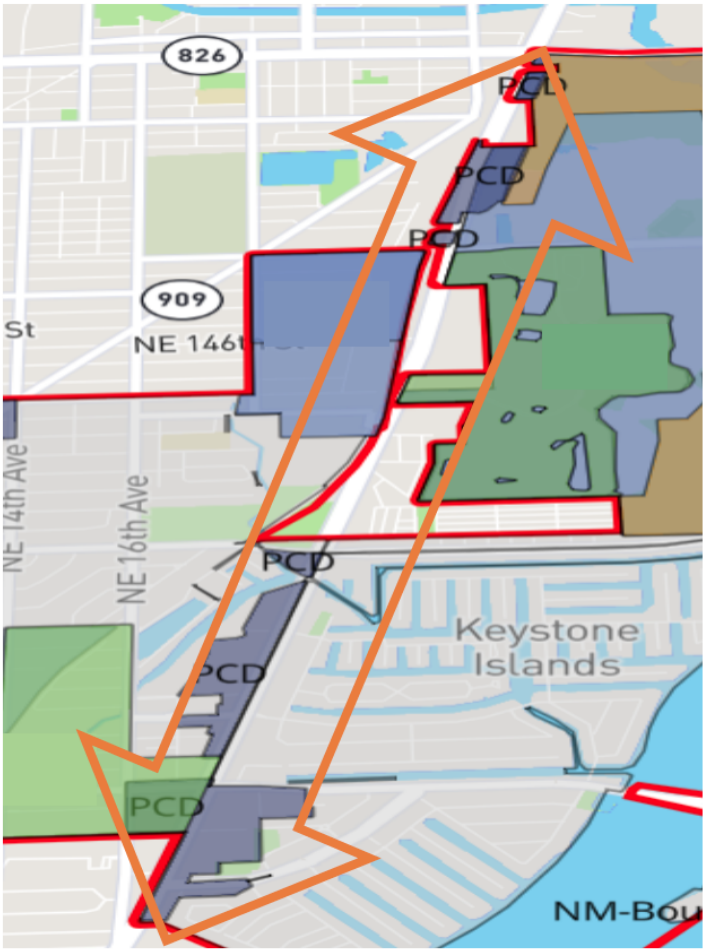


Figure 2: Biscayne Blvd. PCD

The purpose of the Biscayne Boulevard PCD Overlay District (PCD) is to encourage a compact, high-intensity mix of residential, commercial, employment and civic-institutional uses to support transit use, reduce single-occupancy vehicle use, increase pedestrian activity, and improve access and mobility. The PCD provides for a maximum height of 110' (with an available bonus of an additional 40'), and a residential density of up to 125 dwelling units per acre.

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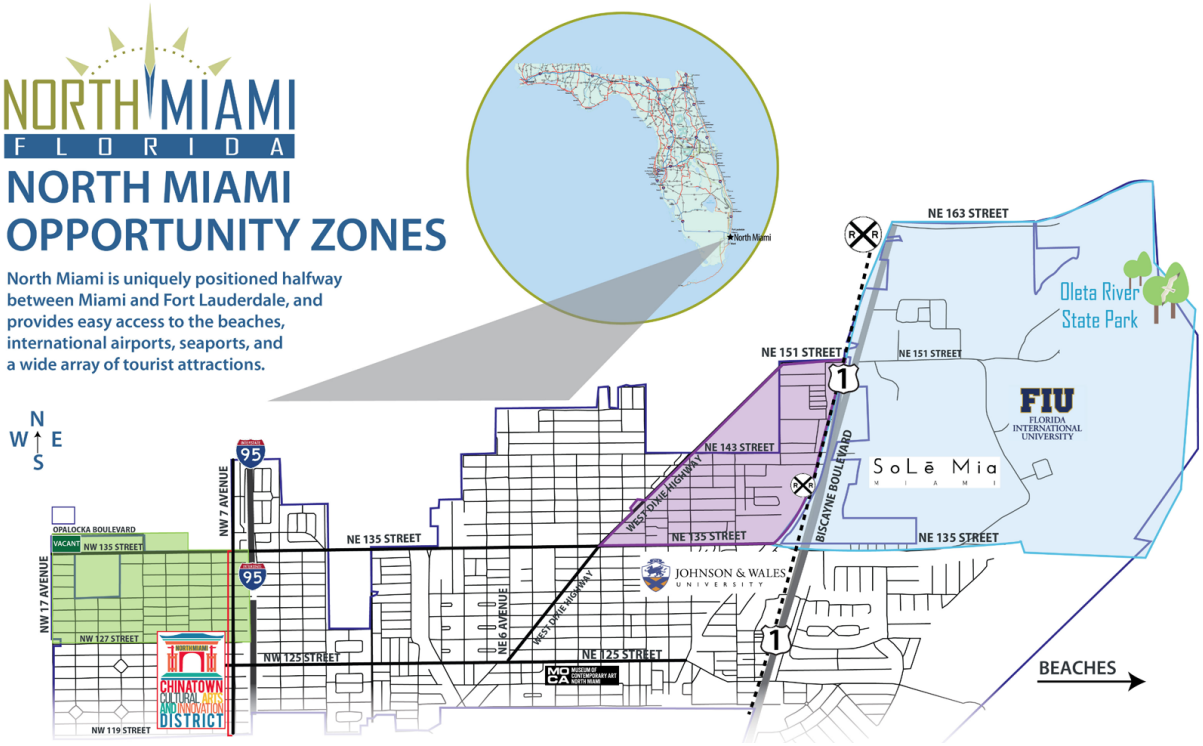

Figure 3: Opportunity Zones

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CORRIDOR CONTEXT

Figures 4-8 provide additional context, an inventory of existing businesses, demonstrates the growth potential, identifies anchors, and provides more detail regarding the Opportunity Zones within this area.

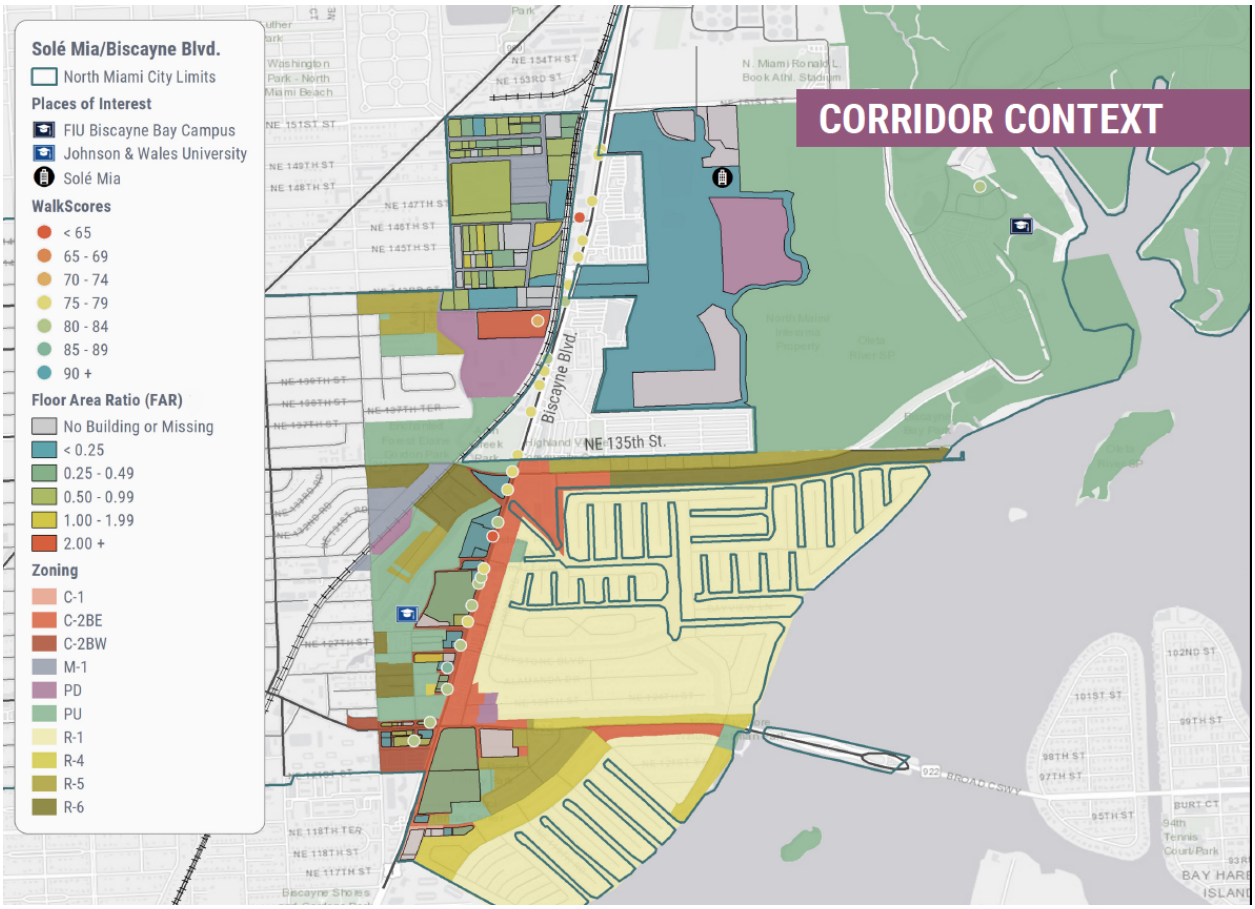

Figure 4: Biscayne Corridor Context - Source: Target Industry Analysis

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Figure 5: Biscayne Corridor Existing Business Activity - Source: Target Industry Analysis

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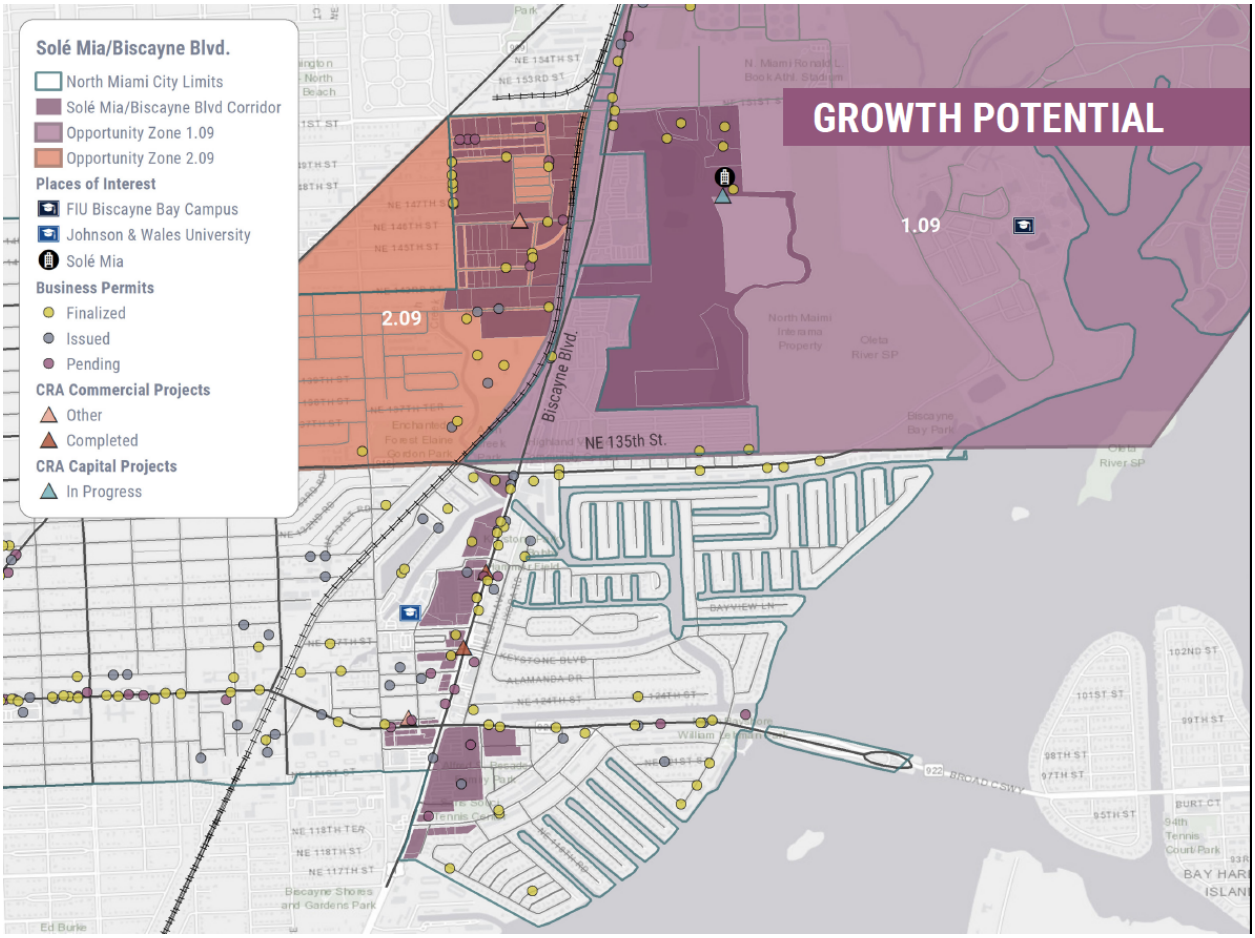

Figure 6: Biscayne Corridor Growth Potential - Source: Targeted Industry Analysis

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Biscayne Boulevard Corridor Anchors

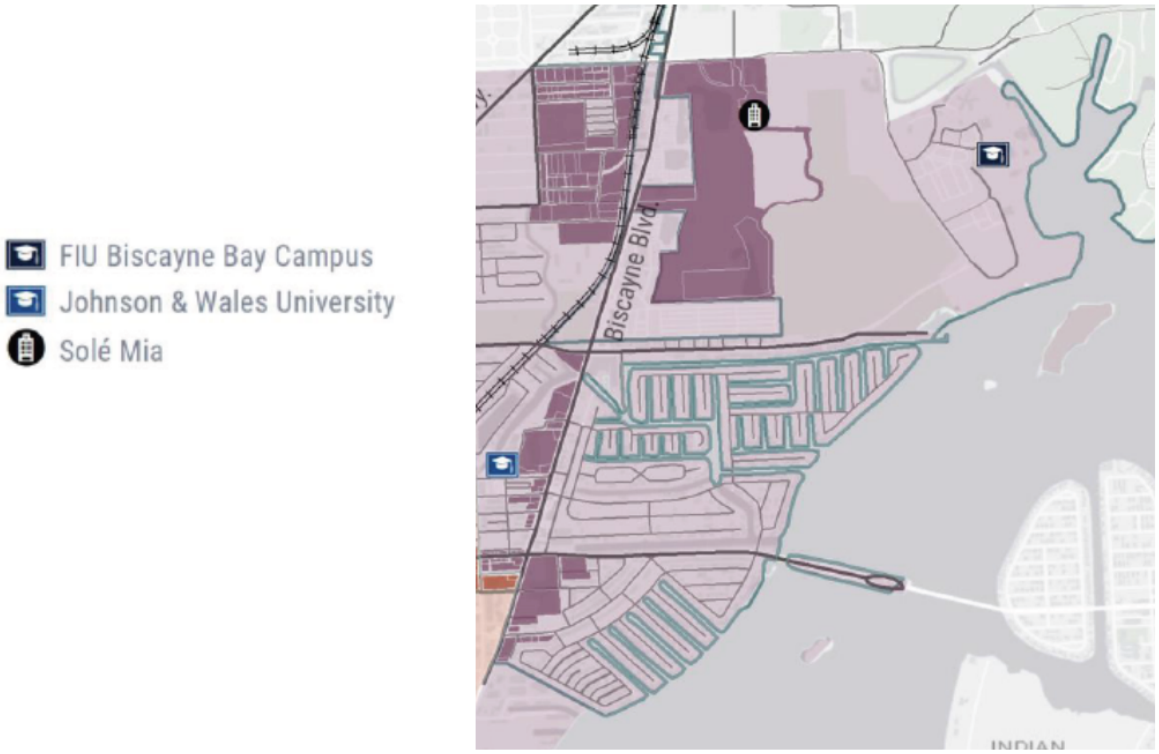

Figure 7: Biscayne Corridor Anchors – Source: Target Industry Analysis

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Opportunity Zone 2.09

$1.2 million Consumer Expenditure | 7,303 Absolute Population

Located in the heart of North Miami, Opportunity Zone 2.09 offers the most diverse and unique investment and development opportunities with four different commercial sectors available for fund investment and access to the Florida East Coast railway.

MULTIFAMILY DEVELOPMENT OPPORTUNITIES AND HIGH-REVENUE INDUSTRIAL DISTRICT

- Large apartment complexes sit on a collective 37 acres of land within the Opportunity Zone 2.09 with complexes allowing for 2,000 units and heights of 200 ft.
- Large numbers of manufacturing and warehouse businesses that offer diverse and high-revenue business opportunities within the industrial district

ZONING CATEGORIES FOR DEVELOPMENT:

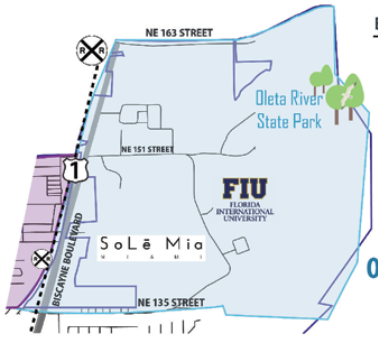
- Industrial (M-1): light manufacturing, warehouse, laboratories, storage
- High-density residential (R-6): 110 ft heights, 25 du/ac
- Commercial (C-1): retail, office, light industrial, 55 ft heights
- Planned Development (PD-3): Mixed use allowing for 110 ft heights and 45 du/ac

LAND USE OVERLAYS:

- North Miami Community Redevelopment Agency
- Planned Corridor Development (100 ft height, 100 du/ac)
- New Market Tax Credits
- Special Development Transit-Oriented Development- 2,000 units available & allowance of mixed use
- Neighborhood Redevelopment Overlay- 2,500 units available & allowance of mixed use

AVERAGE DAILY TRAFFIC COUNTS:

- West Dixie Highway: 16,200



Opportunity Zone 1.09

$1.5 million Consumer Expenditure | 4,370 Absolute Population

Featuring the largest planned development in North Miami and the surrounding region, Opportunity Zone 1.09 features Sole Mia, a 184-acre plot of land. The tract also includes Oleta River State Park and Florida International University Biscayne Bay Campus.

SOLE MIA PLANNED DEVELOPMENT AND BISCAYNE COMMERCIAL FRONTAGE

- Sole Mia is a $4 billion dollar master planned development that will feature more than 4,000 residential units when completed and more than one million square feet of retail and entertainment space
- Biscayne Boulevard features property investment opportunities with highly desired real estate that attracts diverse national commercial tenants

ZONING CATEGORIES FOR DEVELOPMENT:

- Public Use (PU): recreational facilities, stadiums, amusement parks, educational facilities, laboratories)
- Planned Development (PD-2): 75 ft heights, 40 du/ac
- Commercial (C-2BE): retail, office, 55 ft heights
- Commercial (C-2BW): retail, office, 55 ft heights

LAND USE OVERLAYS:

- Regional Activity Center
- Planned Community Urban Design Overlay- Greater bonus density for residential units, mixed use, and greater height
- Special Development Transit-Oriented Development- 2,000 units available & allowance of mixed use
- Planned Corridor Development (110ft height, 125 du/ac)

AVERAGE DAILY TRAFFIC COUNTS:

- Biscayne Boulevard (US-1): 65,000
- NE 163 Street: 63,500

Figure 8: Biscayne Corridor Opportunity Zone Areas

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TIA RECOMMENDATIONS: The TIA recommends the following:

- Establish a medical innovation district, centered around UHealth's Sole Mia facilities as the anchor but including a much larger zone of adjacent properties along Biscayne Boulevard.

- Position North Miami as a premier location for climate service providers, coastal zone resiliency engineering/planning firms, and other growing companies seeking a location in a community with forward-looking leadership and a culture that emphasizes sustainability and environmental stewardship.

CONCLUSION

The City is excited about the potential opportunity to partner with the ULI Leadership Team to discover best practices and land use types that would successfully and robustly activate the new district.

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APPENDIX - B
BIOINNOVATION CENTER NEW ORLEANS

Undeniably New Orleans

The urban presence of the façade changes at night, when passersby can catch glimpses of the biotech researchers working late. The non-profit lab/office incubator helps locally conceived ideas grow into jobs and industries.

BY Z SMITH, PH.D., AIA

RECOGNIZING THAT THE MOST IMPORTANT PRODUCT OF A RESEARCH LAB is not chemicals, but insights and innovation, designers of the New Orleans BioInnovation Center sought to maximize human performance with daylight, views to nature, and places for reflection and collaboration. This urban biotech incubator weaves classic New Orleans architecture with sustainable systems and technologies, proving just how far lab energy use can be reduced even in a hot–humid climate.

This non-profit lab/office exists to help ideas conceived locally to become local jobs and industries. NOBIC is a four-story, 64,500 ft^2 structure adjacent to New Orleans's historic French Quarter, downtown university campuses, and the Treme neighborhood.

Built on a brownfield site, this LEED Gold research facility includes labs, offices, a 100-person conference center, breakout spaces and a café. The design reinterprets vernacular regional climate-responsive strategies—the slatted shutter, the landscaped courtyard water feature, and the sheltered porch—to provide a facility that is modern but undeniably New Orleans.

This project also helps local innovators develop new businesses in a very New Orleans way—with a spatial organization that promotes chance meeting, social interaction, and improvisational collaboration, inviting busy people to linger centered on the porch or the garden.

Climate, Site, Envelope

The New Orleans climate alternately delights and exasperates: mild winters, hot–humid summers with little wind, abundant sunshine punctuated by periods of intense rainfall and the occasional hurricane.

Less than 1% of the hours in a typical year fall in the range of temperature and humidity required by the National Institutes of Health (NIH) for biotechnology labs, and 68% of the hours are too hot or too humid

(*Figure 1, p. 9*). High air-change rates and once-through ventilation air with tight temperature and humidity control dominate lab building energy use, dwarfing skin loads.

The building form provides a protected courtyard following French Quarter precedents. The glazing choices allow a strong connection to the city and the landscaped courtyard while limiting solar gain. While the building has a window/wall ratio of 33%, glass is deployed to maximum effect on the primary street façade and lobby atrium that opens to social areas on each floor.

The site, selected for its proximity to university research and its urban prominence on the city's main thoroughfare (Canal Street), came with a built-in orientation challenge: the primary façade, where one might like the greatest degree of transparency, faces southwest, exposed to the afternoon sun during the hottest part of the day.

The ground floor is recessed from the property line, allowing sun and rain protection to be provided by the overhanging floors above. Horizontal louvers of varying depth and spacing protect the glazing on the upper floors (*opposite page photo, Figure 3, p 11*). In fact, these shading strategies allow a southwest façade that is 63% glass to have the summer solar gain of a façade with only 20% glass.

The opaque portions of the building envelope provide good thermal isolation and inhibit infiltration. The minimum R-25 high reflectance and high emissivity cool roof keeps conduction and solar gain down. The wall systems, a hybrid thin concrete pre-cast panel supported by light gauge steel framing, is insulated after installation with a continuous R-19 closed cell spray foam, minimizing thermal bridging.

HVAC

The HVAC strategy could be described as "all the ventilation you need, but only where and when you need it." Labs use a lot of energy for two main reasons: the power draw of the scientific equipment, and the use of high ventilation rates intended to protect the safety of staff working with dangerous chemicals—at fume hoods and via bulk exhaust of the lab room volume.

Conditioning all of the air that is subsequently being exhausted can take substantial amounts of energy. Design teams have little control over the equipment loads—although designs that make it easier to share equipment can lead to lower overall energy use. For example, configuring the plan to allow a shared freezer can result in less energy use than each researcher operating multiple separate freezers.

But ventilation strategies offer huge opportunities for energy savings. The energy cost of providing conditioned air in hot–humid climates is dominated by dehumidification and cooling air, characterized by the Ventilation Load Index (VLI) as proposed by Harriman, et al. in "Dehumidification and cooling loads from ventilation

This project helps local innovators develop new businesses in a very New Orleans way—with a **spatial organization that promotes chance meeting, social interaction, and improvisational collaboration**, inviting busy people to linger, centered on the porch or the garden.

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Above Staff enjoys a break on the stacked porches looking out on the emerging BioDistrict.

Left The urban location of the New Orleans BioInnovation Center means it is accessible by public transit and is near collaborating institutions. The ground floor conference center enjoys views of passing streetcars on one side and the landscaped courtyard to the other.

BUILDING AT A GLANCE

Name New Orleans BioInnovation Center

Location New Orleans (downtown near BioDistrict and French Quarter)

Owner New Orleans BioInnovation Center

Principal Use Laboratory
Includes Café

Employees/Occupants 200

Expected (Design) Occupancy 200
Percent Occupied 100%

Gross Square Footage 64,500
Conditioned Space 64,500

Distinctions/Awards
2015 AIA COTE Top Ten, 2014 Green Good Design Award, 2013 American Architecture Award

Total Cost $34 million
Cost per Square Foot $527

Substantial Completion/Occupancy 2011

ENERGY AT A GLANCE

Annual Energy Use Intensity (EUI) (Site)
119.9 kBtu/ft^2
Electricity (Grid Purchase) 87.7 kBtu/ft^2
Natural Gas 32.2 kBtu/ft^2

Annual Source (Primary) Energy 309.2 kBtu/ft^2

Annual Energy Cost Index (ECI) $2.15

Annual Load Factor 42%

Savings vs. Standard 90.1-2004 Design Building
26.6% (actual; model not calibrated)

Carbon Footprint 17.6 lb CO_2e/ft^2 · yr

Percentage of Power Represented by Renewable Energy Certificates 64%
Number of Years Contracted to Purchase RECs 2

Heating Degree Days (Base 65˚F) 838

Cooling Degree Days (Base 65˚F) 2,645

Annual Hours Occupied 3,120

WATER AT A GLANCE

Annual Water Use 3,208,900

KEY SUSTAINABLE FEATURES

Water Conservation Domestic potable water use 40% below baseline through the use of low-flow plumbing fixtures. Landscaping and water features fed from captured rainwater.

Recycled Materials By value: 30% of building material content is recycled, 25% of materials were regionally sourced (within 500 miles), and 79% of construction waste was diverted from landfill.

Daylighting 75% of occupied spaces have access to daylight and views.

Individual Controls Each standard lab unit (~1,000 ft^2) has individual control of ventilation, temperature, and lighting, with the energy consumption associated with each lab unit individually sub-metered. Targeted ventilation strategy allows all of the airflow needed, but only when and where it is needed.

Carbon Reduction Strategies Envelope uses hybrid thin-wall (2 in.) precast concrete on light-gauge steel frame.

Transportation Mitigation Strategies Located on a major transit thoroughfare with five transit lines, WalkScore of 94/100. Bike commuter showers each floor. Electric vehicle station.

Other Major Sustainable Features "Working" water feature, bioswales, pervious paving over crushed stone water storage base allow 96% of rainfall over 20 year period to be handled on site.

BUILDING ENVELOPE

Roof
Type SBS (styrene butadiene styrene) with high-solar reflectance index (SRI) coating
Overall R-value R-25 minimum
Reflectivity 76%

Walls
Type Closed cell spray polyurethane foam inside precast concrete
Overall R-value R-19
Glazing Percentage 33%

Windows
Effective U-factor for Assembly 0.47
Solar Heat Gain Coefficient (SHGC) 0.26
Visual Transmittance 0.62

Location
Latitude 30 N
Orientation Front faces SW

BUILDING TEAM

Building Owner/Representative
New Orleans BioInnovation Center

Architect, LEED Consultant
Eskew+Dumez+Ripple

General Contractor Turner Universal

Local General Contractor Gibbs Construction

Mechanical, Electrical Engineer; Energy Modeler
Newcomb & Boyd

Structural, Civil Engineer Morphy Makofsky

Landscape Architect Daly Sublette

Commissioning Agent Newcomb & Boyd

air," published in the November 1997 issue of ASHRAE Journal. The load generated by one cubic foot per minute of fresh air brought from the weather to space-neutral conditions over the course of one year. Among major cities, the VLI for New Orleans is the second highest in the nation.

The NOBIC uses well-known strategies for reducing this impact (use of office return air as a dilutant for lab supply air, low-flow fume hoods, enthalpy recovery ventilation systems). But it gains most of its savings by allowing ventilation to be targeted strategically.

Not every type of research being performed needs a high ventilation rate. At NOBIC, each cellular lab is provided with independent control of airflow and temperature, allowing each lab to be set to the ventilation level appropriate to their kind of research (2/6/10 air changes per hour [ach]), and ventilation rates can be set back when labs are unoccupied.

A "panic" button is provided, which maximizes room flush-out and fume hood exhaust rates. Careful design and modeling of the air distribution system allows for lower air change rates without compromising safety.

The impact can be huge: in the New Orleans climate, the site EUI (energy use intensity) of an individual lab at 2 ach was modeled at 120 kBtu/ft^2 · yr, while one operated at 12 ach was modeled to consume twice as much energy (*Figure 4, p. 11*). In a facility like NOBIC with diverse users, the building's EUI will depend on the mix of ventilation policies. Over the life of the building, as the tenant mix changes, so will the EUI.

Energy Performance

Laboratory buildings are among the highest users of energy per square foot of any common building type. Since the average source EUI values for labs (from the Labs21 dataset) is four times that of office buildings, making a lab building that is just 25% better than

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Above Break areas from each floor of labs look out through an east-facing atrium onto the landscaped courtyard.

Above Right The landscaped courtyard, inspired by those found in the nearby French Quarter, provides a place for staff and visitors to relax and recharge. Pervious pavers allow rainfall to be absorbed into the soil rather than burdening municipal storm drainage.

Figure 2 ENERGY DATA

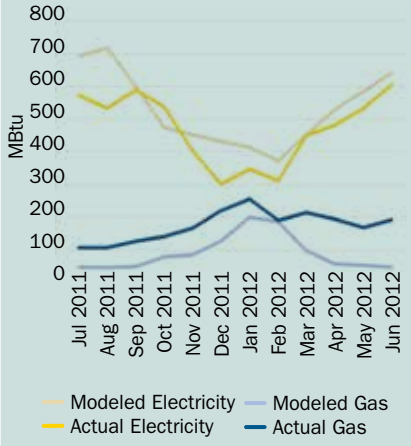
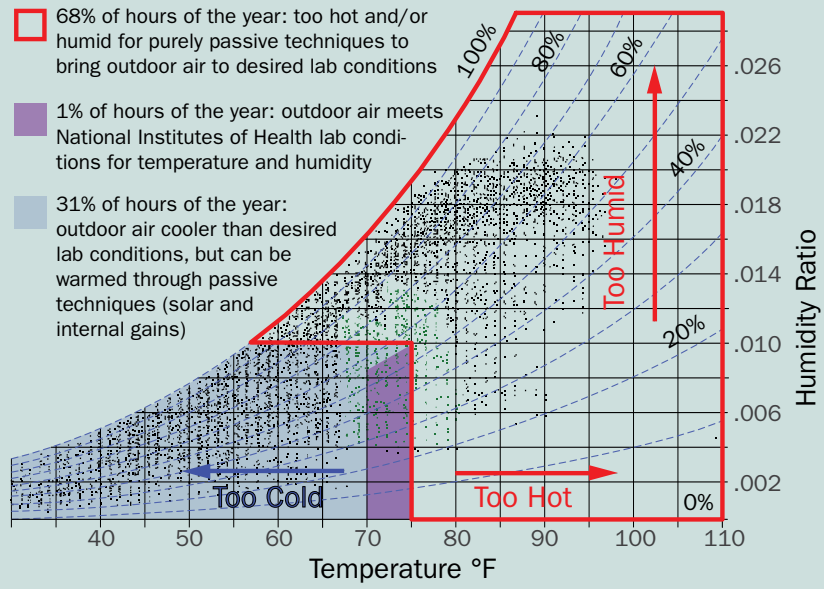


Figure 1 NEW ORLEANS CLIMATE CONDITIONS



Each dot on this psychrometric chart represents the temperature and humidity of outdoor air for one hour in a typical year. Sixty-eight percent of the hours in the year in New Orleans are hotter or more humid than the NIH guidelines for lab conditions.

Table 1 EUI COMPARISON

	kBtu/ft^2·yr
Median Lab Site EUI*	343
New Orleans BioInnovation Center Actual Site EUI	120
Savings Compared to Median Site EUI	223
Median Lab Source EUI*	601
New Orleans BioInnovation Center Actual Source EUI	309

*As defined by Labs21 Benchmarking Tool database.

average can save as much energy as a net-zero office building the same size.

This project uses less energy per square foot than 89% of the buildings in the Labs21 Benchmarking Tool database of almost 600 lab/office buildings nationally. The actual utility bills for the initial 12 month period (120 kBtu/ft^2·yr) closely track that projected by computer simulation (*Figure 2*). This savings of 223 kBtu/ft^2·yr (compared to the median site EUI for labs) is like making a net zero building of almost any other building type (*Table 1*).

Source EUI tells a similar story: The measured source EUI is better than 87% of labs, and is essentially half that of the median lab source EUI.

This level of verified performance is reinforced at the operations level by fine-grained energy and comfort monitoring. Each ~1,000 ft^2 lab plus support area unit is individually metered using a multi-channel submetering system

Surviving and Thriving after Katrina

By Mark Ripple, AIA

Above Mark Ripple's home in New Orleans' Lakeview neighborhood was still under 6 ft of water five days after Hurricane Katrina.

Right The offices of Eskew+Dumez+Ripple immediately after Hurricane Katrina.

When you say you're from New Orleans, everyone wants to ask you about Hurricane Katrina. My personal story was not too dissimilar from that of thousands of New Orleanians—our family evacuated to Baton Rouge, La., fully expecting to ride out the storm at a relative's house and return shortly to clean up the debris, perhaps replacing some broken windows. What transpired can only be described as surreal: watching the disaster unfold on national television while trying to fathom the magnitude of the destruction and the loss of human life.

With the city shut down for weeks and our firm's employees evacuated to multiple locations, we were left to improvise a means to communicate with each other and to retrieve critical files from our New Orleans studio. Since the city was under a government-ordered lockdown enforced by the National Guard, we created an official-looking document that allowed us emergency access into the city to retrieve our file server and other critical documents.

Climbing 31 flights of stairs to the top floor of our abandoned building, we found our open-plan studio decimated by the effects of several blown-out storefront windows. Wading through the wet debris, we retrieved the 40 lb file server and strapped it, Sherpa-like, to some 2 × 4's to facilitate the downward trek through the emergency stairs to the awaiting truck.

Twenty-four hours later, we completed the activation of a one-room office rental in downtown Baton Rouge. Together with a few staff members and some equipment loaned by the AIA, we were officially "open for business" again. We had absolutely no idea what lay ahead for New Orleans, but were confident that whatever transpired, we would be an integral part of it!

The damage to my own house and neighborhood was more severe. My neighborhood (Lakeview) had once been swampy land essentially at sea level; decades of drainage and pumping had caused the land to subside to 6 ft below sea level. If the topography of the city was thought of as a bathtub, my house was a few blocks from the drain!

Furthermore, being a quarter mile from one of the catastrophic levee failures, our house was flooded with over 6 ft of water, with 9 ft in the street, and stayed there for three weeks until the city was pumped dry. Borrowing a small boat from a relative, we managed to cross Lake Pontchartrain four days after the storm, and reach my flooded neighborhood by boat to retrieve the key items from our house.

Ten years later, we have rebuilt our house, thanks to the generosity of family and friends. More importantly, we have restored our firm and our community, thanks to the inspired passion and commitment of hundreds of individuals who cared deeply.

Post-Katrina rebuilding has also changed our firm, what we build, and how we build. We had always prided ourselves on our level of commitment to community, but participating in the rebuilding of our city, where neighbor helped neighbor while the government and insurance company officials wrote memos, made abundantly clear to us that it is communities that are resilient, not just buildings.

It forced us to double down on our commitment to engaging the community through pro-bono design services, from the Field of Dreams community sports field in the 9th Ward to the Martin Luther King Day of Service projects. We now look for opportunities to enhance resilience in all our projects, and have shared what we've learned in a monograph, "A Framework for Resilient Design," that we make freely available on our website, http://tinyurl.com/p3v6myh.

Katrina drew new attention to issues around climate change and healthy building materials (with residents developing respiratory problems from formaldehyde-laden FEMA-provided trailers). There was precisely one LEED-certified building in the entire state of Louisiana on the day Katrina struck. Today, between the rebuilt homes, schools, and commercial buildings like NOBIC, there are over 1,000.

One unexpected change post Katrina is the influx of idealistic, highly educated transplants to the city. The composition of our own firm has grown from almost entirely Louisiana natives to one with staff from around the world representing 40 university programs. And New Orleans has been recognized by Forbes and other organizations as one of the top cities for startups nationwide.

We are a firm and a city transformed.

Mark Ripple AIA, LEED AP BD+C, is a principal at Eskew+Dumez+Ripple in New Orleans.

with up to 160 circuits, enabling the building owner to track and compare lighting and plug load consumption, identifying best-practice high performers. Green power purchase agreements are used to reduce the carbon impact of the electricity consumed.

Living With Water

Located in a city that owes its existence to a river and its near destruction due to flooding, it was essential that the design embrace the theme of living with water. All phases of the water cycle were treated as a design opportunity, from dealing with the moisture that hangs heavy in the air on a summer day, to the frequent, intense rains, to the flow of surface water and its percolation into the city's heavy soils.

The project feeds all rainfall from the roof into a prominent water feature, which fluctuates in depth with the rains, allowing for biofiltration through water plants such as papyrus. Then it flows into a vegetated swale, on to detention in the parking lot subbase, and percolates back into the soils (*Figure 5, p. 12*).

This is the regional water/plant/soil ecosystem in microcosm, connecting people back to place. Simulations project that storm water will leave the site only a few times every 20 years. The water feature is also fed by the AC condensate, which provides all

landscape irrigation.

Low-flow plumbing fixtures are designed to reduce consumption of municipal water in the facility's washrooms by 40%. However, over 90% of the water used in the facility is the water evaporated by the cooling towers.

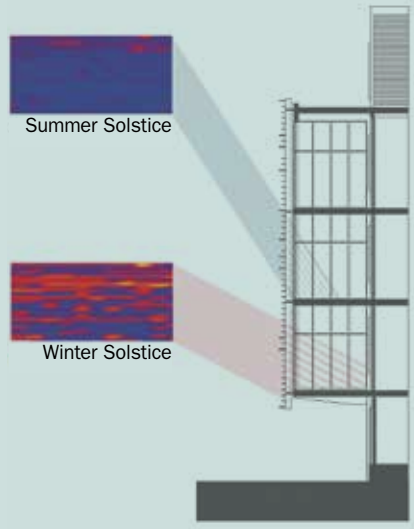
Reuse of rainwater for cooling tower makeup represents a huge opportunity for water savings. (The state plumbing code in force at the time of the facility's design required the use of municipal water for this application; in 2016, the state moves to the International Plumbing Code.)

Materials

The first strategy in reducing materials impacts of any project is to construct only as much building as is needed. The design team developed strategies for shared use between tenants to increase collaboration while decreasing building area. This produced spaces that serve multiple program needs and multiple users, resulting in a smaller building and reduced material use.

Figure 3

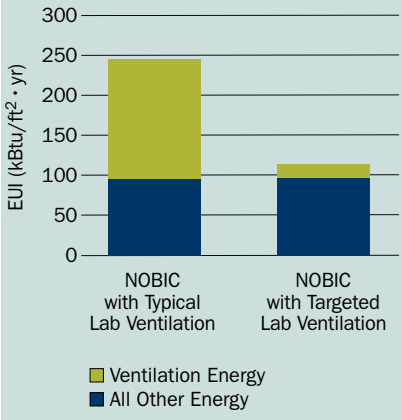
SOUTHWEST FAÇADE DESIGN



Solar exposure computer simulations show that although this southwest-facing façade is 68% glass, louvers and overhangs result in the same solar load as an unprotected façade with 18% glass.

Figure 4

VENTILATION STRATEGY COMPARISON



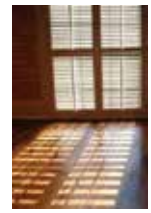
Energy model results for the site energy use intensity (EUI) of a laboratory in the New Orleans climate with bulk air change rates of 12 versus 2 air changes per hour (ach).

The building is designed to promote and thrive on change. Plan layout includes a mix of dedicated lab and office spaces and an almost equal area of flex spaces with infrastructure to accommodate lab use, but which can be alternatively built out to offices according to the needs of the tenants.

Some 79% of on-site construction waste was diverted from landfill, in part thanks to innovative relationships with waste handling firms, including one that began new diversion programs as part of the project.

Indoor Environment

The standard NOBIC lab unit provides daylight and views, while also providing lower-light entry zone for locating light-sensitive equipment such as microscopes. Seventy-five percent of regularly occupied spaces achieve daylight levels that would allow lights to be off during daylight hours, and 77% of spaces have views to the outdoors.



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Top The horizontal louvers protecting the southwest oriented glazing facing Canal Street are a modern reinterpretation of the Louisiana shutters.

Above The ground floor massing is pulled in to provide rain protection for passersby and solar protection for the cafe and conference center.

Project Economics

A tenet of integrated design is that sustainable design choices have more impact and less cost when incorporated early. But this project's path to high performance was more circuitous.

Construction documents were initially completed during the height of the post-Hurricane Katrina construction cost bubble, and the design team was directed to use code-minimum levels of insulation and building systems. Then the project went on hold for over a year as financing was being arranged. When the project was restarted, bidding conditions were more favorable,

Lessons Learned

- **Ongoing Commissioning and Maintaining Performance.** After substantial completion and occupancy of three floors of the four-story structure, the design team and commissioning agent initiated an ongoing commissioning exercise, monitoring energy consumption, systems, and comfort performance, identifying a substantial number of items that had cropped up after initial commissioning. These included the usual mix of sensors that fail, reheat control valves that indicate they are closed when they are not, maintenance warnings that get silenced and then forgotten about as staff turns over. After unsatisfactory experiences with visiting maintenance service companies, the owner has invested in hiring and training a full-time on-site facilities maintenance staff person.

  These efforts have allowed energy and comfort performance to be further tuned. The project is now part of a commitment of all design team members involved to long-term engagement and learning. The team continues to engage occupants and operators as the tenant mix changes, learning as they go.

- **People Use Ventilation Controls in Surprising Ways.** The interaction between occupant behavior and building performance is complex and has led to some surprises for the design team. For example, the design team assumed that occupants would set the ventilation rate according to their safety requirements and the temperature to suit their comfort. But some occupants treat the ventilation control like the fan speed control in their car: if they are feeling warm, they turn up the fan. Giving occupants more control means that we are not just designers of buildings and mechanical systems, but of user interfaces.

- **On-Site Storm Water System Proves Effectiveness.** When the site's storm water strategies—including the first installation of pervious concrete in the state over the parking area—were first proposed, it was decided to drain the loading dock area in the conventional manner, hard-piping that area directly to the municipal storm drainage systems. Weeks before the building opened, an especially heavy rainfall resulted in the municipal system backing up, shooting water into and flooding the loading dock. The rest of the site, with its unconventional storm water systems, remained dry. A backflow preventer was subsequently installed on the one portion connected to the conventional system. New Orleans has recently adopted a new Comprehensive Zoning Ordinance that requires all new commercial projects to handle a substantial portion of rain events on site, and NOBIC is provided as a reference for those who want proof that these systems can work even with our intense rains and heavy clay soils.

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The most prominent element of the New Orleans BioInnovation Center's storm water system is the "working" water feature. Rainfall flows from the roof, through the water feature and then into a vegetated swale. The city of New Orleans points to this system as a successful example of on-site storm water management.

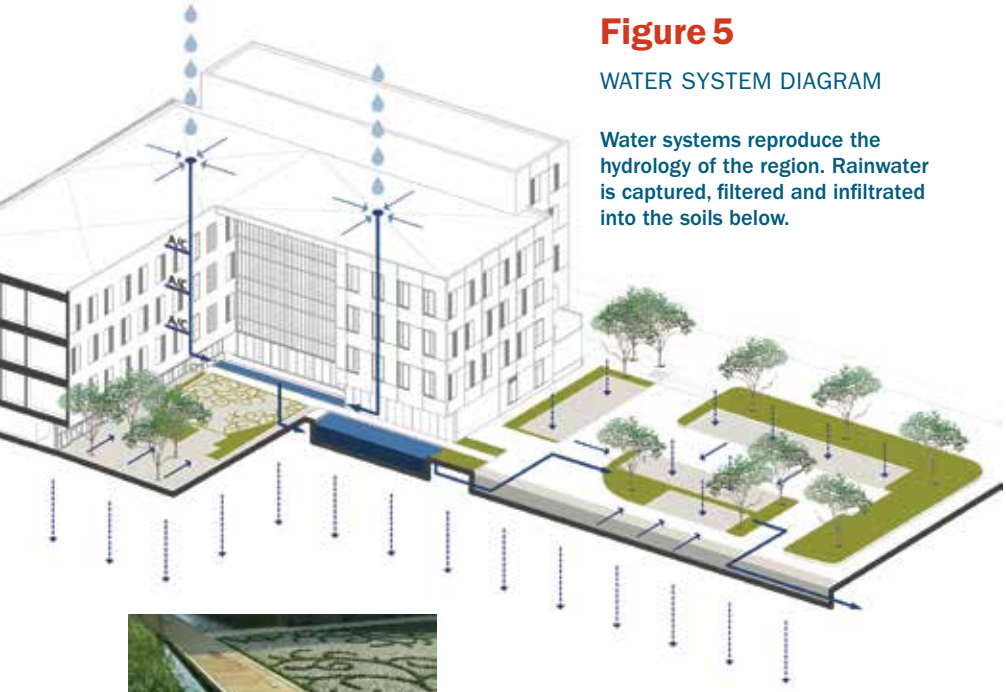

Figure 5

WATER SYSTEM DIAGRAM

Water systems reproduce the hydrology of the region. Rainwater is captured, filtered and infiltrated into the soils below.

Left The "working" water feature includes plants such as papyrus that like getting their feet wet. The microorganisms that grow on these plants help filter the collected rainwater and AC condensate before it is used for landscape irrigation.

and the owner asked the design team to recommend measures that might lower the long-term operating costs, "and could you do that LEEDs thing?"

The team explored opportunities for further enhancements in environmental impact and performance, identifying 21 possibilities for investigation.

Constraints were that the building's overall appearance could not change, and items that would have substantial schedule impact (e.g., major changes to the plan or structure) were not allowed. Computer modeling helped identify two kinds of items to pursue: items with good payback and low-cost items with big impact even if payback was negligible. Measures adopted included:

- Water-cooled chiller replacing air-cooled chiller;
- High-efficiency condensing boilers;
- Lab-by-lab VAV controls for airflow and temperature;
- High-efficiency power transformer;

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Every lab aisle enjoys a view to the outdoors.

Web Exclusive Q&A

Go in depth with author Z Smith.

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- Improved glazing system (low-emissivity, low solar heat gain coefficient, high visible transmittance glazing in a thermally broken framing system);
- High reflectance high emissivity roofing;
- Insulation R-values increased to 25% to 40% over code;
- Demand-controlled ventilation for conference room;
- Low-flow domestic plumbing fixtures;
- Enhanced energy metering at the level of individual labs;
- Bi-level light switching in labs; daylight dimming in other areas; and
- High-efficacy direct-indirect suspended linear fluorescent fixtures in labs.

The cost of these upgrades was equivalent to less than 2% of the project cost, but the simple payback was less than three years. It shows how much you can do with just a little more money.

Conclusion

The NOBIC demonstrates the energy savings that can be achieved despite the demands of a laboratory and the hot–humid climate. Sustainable strategies combine beauty and function, creating a more enjoyable, collaborative environment to encourage innovation. ●

ABOUT THE AUTHOR

Z Smith, Ph.D., AIA, LEED Fellow, is principal and director of sustainability and building performance at Eskew+Dumez+Ripple in New Orleans.

NEW ORLEANS BIOINNOVATION CENTER, INC. AND SUBSIDIARY

FINANCIAL STATEMENTS AND REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

June 30, 2017

CASCIO & SCHMIDT, LLC
Certified Public Accountants

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

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CASCIO & SCHMIDT, LLC

CERTIFIED PUBLIC ACCOUNTANTS

FRANCIS J. CASCIO, CPA
STEVEN A. SCHMIDT, CPA

MEMBERS
AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS
SOCIETY OF LOUISIANA CERTIFIED PUBLIC ACCOUNTANTS

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Board of Directors
New Orleans BioInnovation Center, Inc. and Subsidiary

Report on the Financial Statements

We have audited the accompanying consolidated financial statements of New Orleans BioInnovation Center, Inc. and Subsidiary (a nonprofit corporation), which comprise the consolidated statement of financial position as of June 30, 2017, and the related consolidated statements of activities and cash flows for the year then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal controls relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

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We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of New Orleans BioInnovation Center, Inc. and Subsidiary as of June 30, 2017, and the changes in its net assets and its cash flows for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis-of-Matter

The accompanying financial statements have been prepared assuming that the Corporation will continue as a going concern. As discussed in Note B to the financial statements, the Corporation's operations resulted in a decrease in net assets that raise substantial doubt about its ability to continue as a going concern. Management's plan in regards to this matter is also described in Note B. The financial statements do not include any adjustments that might result from the outcome of this uncertainty. Our opinion is not modified with respect to this matter.

Report on Summarized Comparative Information

We have previously audited New Orleans BioInnovation Center, Inc. and Subsidiary's consolidated financial statements, and our report dated December 1, 2016, expressed an unmodified opinion on those audited financial statements. In our opinion, the summarized comparative information presented herein as of and for the year ended June 30, 2016, is consistent, in all material respects, with the audited financial statements from which it has been derived.

Other Matters
Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements as a whole. The supplemental information listed in the table of contents, on pages 16 through 20, is presented for purposes of additional analysis and is not a required part of the basic financial statements. The accompany schedule of expenditures of federal awards on pages 21 and 22, as required by Title 2 U.S. *Code of Federal Regulations* (CFR) Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, is presented for purposes of additional analysis and is not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements taken as a whole.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated February 20, 2018, on our consideration of New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over financial reporting and compliance.

Carr, Riggs & Ingram, LLC

Metairie, Louisiana
February 20, 2018

NEW ORLEANS BIOINNOVATION CENTER, INC. AND SUBSIDIARY

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

June 30, 2017

	June 30, 2017	Summarized Comparative Information June 30, 2016
ASSETS		
Cash, including $421,907 in money market accounts (Note C)	$ 492,734	$ 1,108,013
Cash, money market, restricted - loan program	1,149,976	1,192,850
Receivables (Notes A6, A7, A8)		
Notes receivable, less allowance for possible loan losses of $279,533.	540,286	916,728
Grants receivable (Note D)	62,000	109,162
Other	45,699	46,873
Property and Equipment - At cost (Notes A10 and F)	39,698,089	41,011,230
Other Assets		
Investments (Notes A9 and E)	-	25,000
Deposits and prepaid expenses	173,253	138,300
Total assets	$ 42,162,037	$ 44,548,156
LIABILITIES		
Accounts payable	$ 88,193	$ 72,037
Rental deposits	67,185	56,286
Deferred revenue (Note G)	1,588,367	1,954,009
Total liabilities	1,743,745	2,082,332
COMMITMENTS (Note H)	-	-
NET ASSETS (Notes A3 and A4)		
Unrestricted	625,468	1,185,815
Temporarily restricted	39,792,824	41,280,009
Total net assets	40,418,292	42,465,824
Total liabilities and net assets	$ 42,162,037	$ 44,548,156

The accompanying notes are an integral part of this statement.

NEW ORLEANS BIOINNOVATION CENTER, INC. AND SUBSIDIARY

CONSOLIDATED STATEMENT OF ACTIVITIES

Year Ended June 30, 2017

	Unrestricted	Temporarily Restricted	2017	Summarized Comparative Information 2016
REVENUE				
Grant appropriations	$ -	$ 246,852	$ 246,852	$ 366,722
Public support	422,934	-	422,934	445,140
Rental income	757,646	-	757,646	733,291
Other	213,155	-	213,155	75,620
Net assets released from restrictions	1,734,037	(1,734,037)	-	-
Total Revenue	3,127,772	(1,487,185)	1,640,587	1,620,773
EXPENSES				
Salaries and related benefits	1,248,277	-	1,248,277	1,178,594
Contract labor	2,010	-	2,010	2,865
Contract outside services	200,663	-	200,663	148,197
Consulting and other	64,513	-	64,513	126,309
Supplies	14,219	-	14,219	13,949
Telecommunications	49,165	-	49,165	47,679
Postage & shipping	229	-	229	555
Printing & copying	10,897	-	10,897	9,097
Books, subscriptions, reference	2,384	-	2,384	386
Rent	26,259	-	26,259	21,021
Utilities	283,770	-	283,770	256,990
Equipment rental & maintenance	254,098	-	254,098	235,891
Travel & meeting expenses	55,878	-	55,878	91,245
Equipment	26,231	-	26,231	6,330
Depreciation	1,313,141	-	1,313,141	1,386,900
Insurance	38,542	-	38,542	133,740
Membership dues	11,069	-	11,069	13,504
Outside computer services	32,626	-	32,626	39,368
Marketing expense	21,291	-	21,291	12,807
Grants to organizations	27,500	-	27,500	27,500
Other costs	5,357	-	5,357	42,068
Total Expenses	3,688,119	-	3,688,119	3,794,995
Increase (Decrease) in Net Assets	(560,347)	(1,487,185)	(2,047,532)	(2,174,222)
Net assets, beginning of year	1,185,815	41,280,009	42,465,824	44,640,046
Net assets, end of year	$ 625,468	$ 39,792,824	$ 40,418,292	$ 42,465,824

The accompanying notes are an integral part of this statement.

NEW ORLEANS BIOINNOVATION CENTER, INC. AND SUBSIDIARY

CONSOLIDATED STATEMENT OF CASH FLOWS

Year Ended June 30, 2017

	June 30, 2017	Summarized Comparative Information June 30, 2016
Increase (decrease) in cash and cash equivalents		
Cash flows from operating activities:		
Increase (decrease) in net assets	$ (2,047,532)	$ (2,174,222)
Adjustments to reconcile increase in net assets to net cash provided (used) by operating activities:		
Depreciation and amortization	1,313,141	1,386,900
Changes in assets and liabilities:		
Decrease (increase) in receivables	424,788	228,358
Increase (decrease) in accounts payable	16,146	63,635
Decrease (increase) in deposits and prepaid expenses	(34,953)	(11,300)
Increase (decrease) in deferred revenue	(365,642)	(139,006)
Increase in rental deposits	10,899	(21,459)
Other	-	-
Net cash provided by operating activities	(683,153)	(667,094)
Cash flows from investing activities:		
Acquisition of investments	(233,517)	(25,000)
Loss on investments	283,517	-
Investments reclassified	(25,000)	
Acquisition of furniture & equipment	-	(35,506)
Net cash (used) by investing activities	25,000	(60,506)
Net increase (decrease) in cash and cash equivalents	(658,153)	(727,600)
Cash and cash equivalents, beginning of year	2,300,863	3,028,463
Cash and cash equivalents, end of year	$ 1,642,710	$ 2,300,863
Supplemental Non-cash Investing and Financing Activities:	$ -	$ -

The accompanying notes are an integral part of this statement.

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

June 30, 2017

NOTE A - SUMMARY OF ACCOUNTING POLICIES

A summary of the significant accounting policies consistently applied in the preparation of the accompanying financial statements follows.

1. Principles of Consolidation

The consolidated financial statements include the accounts of New Orleans BioInnovation Center, Inc. and its wholly-owned subsidiary New Orleans BioFunding, LLC. , a for-profit corporation. All inter-company accounts and transactions have been eliminated.

2. Nature of Activities

The New Orleans BioInnovation Center, Inc. (the "Corporation") is a business incubator, with the primary purpose of creating and supporting jobs, primarily in the bioscience and environmental science areas. This mission is supported by leasing office and wet-lab space and providing free or low-cost business services to local life science start-up companies. The Corporation also periodically holds public business coaching seminars/workshops provided by members of the business community. In addition, the Corporation supplies capital to emerging companies in the Greater New Orleans area in the form of loans and equity investments. The Corporation's activities are intended to foster economic development through the creation of new jobs, diversification of the local economy, and revitalization of an economically depressed area of the City of New Orleans. It is located in its 66,000 square foot facility located at 1441 Canal Street in downtown New Orleans.

The Corporation may also develop and manage other properties within the bio-medical corridor. Preliminary planning for a second facility is currently underway.

The Corporation is a private, non-profit entity that shall not be deemed to be a public or quasi-public corporation or an administrative unit, public servant, employee or agent of any institution of higher education for any purpose whatsoever, because the Corporation is organized and shall be operated for the principal purpose of supporting one or more programs, facilities or research or educational opportunities offered by Louisiana State University Health Sciences Center, Tulane University Health Sciences Center, Xavier University, the University of New Orleans, and the community at large.

The New Orleans BioInnovation Center, Inc. is organized and constituted as a nonprofit corporation exempt from income taxation under and in accordance with the provisions of Section 501 (c)(3) of the Internal Revenue Code and the Nonprofit Corporation Law of the State of Louisiana, La.Rev.Stat. 12:201-269. New Orleans BioInnovation Center has entered into a Cooperative Endeavor Agreement with the State of Louisiana through its Division of Administration/Office of Community Development to receive loan funds in order to provide loans and equity investments in an attempt to encourage private and philanthropic investments,

NOTE A - SUMMARY OF ACCOUNTING POLICIES - Continued

2. Nature of Activities - continued

diversify the economy, and extend opportunities to community-based start-up and early stage and innovative businesses. A wholly owned subsidiary, New Orleans BioFunding, LLC., was formed to originate and service the loan and equity portfolio.

3. Financial Statement Presentation

The Corporation's consolidated financial statements are presented in accordance with the requirements established by the Financial Accounting Standards Board (FASB), Accounting Standards Codification (ASC) as set forth in FASB ASC 958. Accordingly, the net assets of the Corporation are reported in each of the following classes: (a) unrestricted net assets, (b) temporarily restricted net assets, and (c) permanently restricted net assets. There were no permanently restricted net assets during the year ended June 30, 2017.

4. Revenue Recognition

For financial reporting, the Corporation recognizes all contributed support as income in the period received. Contributed support is reported as unrestricted or restricted depending on the existence of donor stipulations that limit the use of the support. When a donor restriction expires, that is, when a stipulated time restriction ends or purpose restriction is accomplished, temporarily restricted net assets are reclassified to unrestricted net assets and reported in the statement of activity as "net assets released from restrictions."

Grant, contract and rental revenue is recognized as earned in accordance with approved contracts and leases.

5. Cash and Cash Equivalents

For the purpose of the statement of cash flows, the Corporation considers all investments with original maturities of three months or less to be cash equivalents.

6. Notes Receivable

Loans are stated at the amount of unpaid principal, reduced by an allowance for loan losses. Interest on Phase 1 loans range from 5.25% to 7.25%, and interest on Phase 2 loans are at WSJ Prime, plus 100 to 225 basis points.

Loans are provided as explained in Note A-2, in accordance with the provisions of the Cooperative Endeavor Agreement.

Management reviews the loan portfolio to determine the existence of and extent to which there is any doubt regarding collectability.

At New Orleans BioInnovation Center's option, in the event that a loan becomes uncollectible, such loan may be assigned to the Louisiana Office of Community Development for collection.

NOTE A - SUMMARY OF ACCOUNTING POLICIES - Continued

7. Provision and Allowance for Loan Losses

The financial statements are prepared in accordance with FASB ASC 310. The allowance for possible loan losses is maintained to provide for possible losses inherent in the loan portfolio. Management determines the appropriate level of reserve to be maintained based on an analysis of the portfolio and evaluation of economic factors. Provision for loan losses are recognized by a charge to Deferred loan revenue, in accordance with the provisions of the Corporative Endeavor Agreement. Such factors as loan growth, the future collectibility of loans and the amounts and timing of future cash flows expected to be received on impaired loans are uncertain, therefore the level of future provisions generally cannot be predicted.

The allowance for possible loan losses for the year ended June 30, 2017 and June 30, 2016 was $279,533.

8. Grant Receivable

The Corporation considers accounts receivable to be fully collectible since the balance consists principally of payments due under governmental contracts. If amounts due become uncollectible, they will be charged to operations when that determination is made.

9. Investments

Investments are presented in accordance with requirements established by the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) as set forth in the FASB ASC 958-320, Investments-Debt and Equity Securities. Under FASB ASC 958-320, investments in marketable securities with readily determinable fair values and all investments in debt securities are reported at their fair values in the statement of financial position. Unrealized gains and losses are included in the change in net assets.

Dividends, interest and other investment income is recorded as increases in unrestricted net assets unless the use is restricted by the donor. Donated investments are recorded at fair value at the date of receipt.

10. Property and Equipment

New Orleans BioInnovation Center, Inc. and Subsidiary capitalize, at cost, all furniture and equipment in excess of $5,000. Deprecation is provided for in amounts sufficient to relate the cost of depreciable assets to operations over their estimated service lives, principally on the straight-line method.

NOTE A - SUMMARY OF ACCOUNTING POLICIES - Continued

11. Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly actual results could differ from those estimates.

12. Fair Values of Financial Instruments

Generally accepted accounting principles require disclosure of fair value information about financial instruments for which it is practicable to estimate fair value, whether or not recognized in the statement of financial position. Cash and cash equivalents carrying amounts reported in the statement of financial position approximate fair values because of the short maturities of those instruments.

13. Subsequent Events

The subsequent events of the organization were evaluated through the date the financial statements were available to be issued (February 20, 2018).

14. Summarized Comparative Information

Summarized Comparative Information is presented only to assist with financial analysis. Data in these columns do not present financial position or changes in net assets in conformity with generally accepted accounting principles.

NOTE B - CONTINGENCY - GOING CONCERN

As shown in the accompanying financial statements, the operations of the Corporation resulted in a decrease in net assets of $2,047,532 during the year ended June 30, 2017, and is continuing into the next year. That factor creates an uncertainty about the Corporation's ability to continue as a going concern. Management of the Corporation has evaluated the conditions and has proposed a plan, in the following paragraph.

State funding for the BioInnovation Center was eliminated in the Governor's 2015/2016 budget. This funding constituted roughly one-third of the Corporation's operating budget and has forced the Bioinnovation Center to reevaluate its business model. In 2016, the Board of Directors adopted in a strategic plan that called for a diversification of the Corporation's income stream. The management of the Bioinnovation Center has been implementing this strategic plan since its adoption and has taken several steps, including the hiring of a Development Director, the creation of an Advisory Board, and working with its university partners as a way to provide funding for operations. Management will continue the implementation of its strategic plan and expect these initiatives to provide ongoing support for the Corporation.

NOTE B - CONTINGENCY - GOING CONCERN - Continued

The ability of the Corporation to continue as a going concern and meet its obligations as they become due is dependent on management's ability to successfully implement the plan. The financial statements do not include any adjustments that might be necessary if the Corporation is unable to continue as a going concern.

NOTE C - CONCENTRATION OF CREDIT RISK

At June 30, 2017, the unsecured cash balances consist of the following:

Bank balances	$ 1,677,325
Less FDIC insurance	500,000
Unsecured cash balances	$ 1,177,325

NOTE D - GRANTS RECEIVABLE

Grants receivable at June 30, 2017, consist of the following:

Louisiana Economic Development Administration (LED -SEBD)	$ 10,000
LSU - HSC (Research & Technology)	52,000
	$ 62,000

NOTE E - INVESTMENTS

As of June 30, 2017, New Orleans BioFunding, LLC., the Subsidiary, has acquired investments consisting of preferred stock and convertible instruments of companies in the loan program, as follows:

Convertible promissory note	$ 50,000
Security agreement for future equity	50,000
Preferred stock	183,517
Total	$ 283,517

Generally accepted accounting principles require that investments be presented at fair value. The investments are with companies in the initial stage of development, and show the promise of growth in the local area. The companies are also working with the universities in New Orleans using university based technology to develop viable products. The fair value of the investments in these companies are considered to be zero at June 30, 2017, the loss on the investments was charged to Deferred Revenue - Miscellaneous Receipts, in accordance with the provisions of the Cooperative Endeavor Agreement.

NOTE F - PROPERTY AND EQUIPMENT

Property and equipment consists of the following at June 30, 2017:

Building	$ 45,247,408
Furniture and equipment	1,514,522
	46,761,930
Less accumulated depreciation	7,063,841
	$ 39,698,089

The building is on land leased from Louisiana State University, which has a reversionary interest in the building. See Note H.

Depreciation expense for the year amounted to $1,313,141.

NOTE G - DEFERRED REVENUE

Deferred revenue consists of the following at June 30, 2017:

New Orleans BioFunding, LLC	
Loan revenue	$ 132,626
Miscellaneous receipts	1,455,741
	$ 1,588,367

NOTE H - LEASE AGREEMENT

Louisiana State University (LSU) owns the land located at 1441 Canal Street, New Orleans. New Orleans BioInnovation Center, Inc.(NOBIC) entered into a lease agreement with LSU December 13, 2002 for a primary term of 20 years and options to renew the lease for two 10 year periods. Rental payments stated in the First Lease Amendment dated April 11, 2016, provides for $800 a month commencing upon substantial completion of construction and acceptance for occupancy by NOBIC. The rental rates for renewal option periods provided for by the Renovation Lease shall be calculated by first determining the value of the land as follows: capitalizing the net operating income for the project for the year preceding the exercise of the option at ten percent, and attributing twenty percent of the value so derived to the land; and, second, applying, ten percent of the land value so determined as the annual rent for the renewal period. Louisiana State University has a reversionary interest in the building.

Rental expense for the year ended June 30, 2017 amounted to $9,600.

NOTE I - TENANT LEASES

The Corporation leases office and laboratory facilities to tenants under operating leases. The leases are for an initial term of one year, with an option to renew. Lease revenue for the year ended June 30, 2017 amounted to $757,646.

NOTE J - INCOME TAXES

New Orleans BioInnovation Center, Inc. is exempt from corporate income taxes under Section 501 (c)(3) of the Internal Revenue Code.

New Orleans BioInnovation Center, Inc. has adopted the provision of FASB ASC 740-10-25, which requires a tax position be recognized or derecognized based on a "more likely than not" threshold. This applies to positions taken or expected to be taken in a tax return. The organization does not believe it s financial statements include any uncertain tax positions.

NOTE K - FUNCTIONAL EXPENSES

Functional expenses for the year ended June 30, 2017 are as follows:

Program Services	
Business services and support	$ 468,360
Incubator facilities	2,232,901
Loan program	274,761
	2,976,022
Support services	
Management and general	712,097
Total	$ 3,688,119

NOTE L - MARKETING EXPENSES

The Company expenses marketing expenses as incurred. Marketing expense was $21,291 for the year June 30, 2017.

NOTE M - RETIREMENT PLAN

The Corporation sponsors a defined contribution plan. All full-time employees are eligible upon date of hire, however, participation is voluntary. The Corporation contributes to the plan an amount equal to 100% of the employee's contribution, limited to 3% of the employee's salary. The contribution rate remained unchanged from the prior year. The pension expense for the year ended June 30, 2017 amounted to $25,193.

NOTE N - TEMPORARILY RESTRICTED NET ASSETS

Temporarily restricted net assets at June 30, 2017 consist of the following:

Grants receivable	$ 62,000
Building and equipment	39,698,089
Loan program (net assets)	32,735
	$ 39,792,824

NOTE O - ECONOMIC DEPENDENCY

The Corporation receives the majority of its revenue from building rents and some government grants. If the amount of building rents are reduced significantly, there could be an adverse impact on the operations of the Corporation. See Note B.

NOTE P - BOARD OF DIRECTORS' COMPENSATION

The Board of Directors is a voluntary board. Accordingly, no compensation was paid to any board member during the year ended June 30, 2017.

SUPPLEMENTAL INFORMATION

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

CONSOLIDATING STATEMENT OF FINANCIAL POSITION

June 30, 2017

	BioInnovation	BioFunding	Eliminations	Consolidated
ASSETS				
Cash	$ 478,103	$ 1,164,607	$ -	$ 1,642,710
Receivables				
Notes receivable	-	540,286	-	540,286
Grants receivable	62,000	-	-	62,000
Other	129,490	7,907	(91,698)	45,699
	669,593	1,712,800	(91,698)	2,290,695
Property and Equipment	39,698,089	-	-	39,698,089
Other Assets				
Investments	-	-	-	-
Deposits and prepaid expenses	173,253	-	-	173,253
Total assets	$ 40,540,935	$ 1,712,800	$ (91,698)	$ 42,162,037
LIABILITIES				
Accounts payable	$ 88,193	$ 91,698	$ (91,698)	$ 88,193
Rental deposits	67,185	-	-	67,185
Deferred revenue	-	1,588,367	-	1,588,367
Total liabilities	155,378	1,680,065	(91,698)	1,743,745
NET ASSETS				
Unrestricted	625,468	-	-	625,468
Temporarily restricted	39,760,089	32,735	-	39,792,824
Total net assets	40,385,557	32,735	-	40,418,292
Total liabilities and net assets	$ 40,540,935	$ 1,712,800	$ (91,698)	$ 42,162,037

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

CONSOLIDATING STATEMENT OF ACTIVITIES

Year Ended June 30, 2017

	BioInnovation	BioFunding	Eliminations	Consolidated
REVENUE				
Grant appropriations	$ 292,854	$ -	$ (46,002)	$ 246,852
Public support	415,068	7,866	-	422,934
Rental income	757,646	-	-	757,646
Loan program income	-	133,015	-	133,015
Other	73,142	6,998	-	80,140
Total Revenue	1,538,710	147,879	(46,002)	1,640,587
EXPENSES				
Salaries and related expenses	1,077,064	171,213	-	1,248,277
Contract labor	2,010	-	-	2,010
Contract outside services	180,409	20,254	-	200,663
Consulting and other	64,513	-	-	64,513
Supplies	11,066	3,153	-	14,219
Telecommunications	47,368	1,797	-	49,165
Postage & shipping	215	14	-	229
Printing & copying	9,998	899	-	10,897
Books, subscriptions, reference	2,384	-	-	2,384
Rent	26,259	-	-	26,259
Utilities	283,770	-	-	283,770
Equipment Rental & maintenance	247,354	6,744	-	254,098
Travel & meeting expenses	37,555	18,323	-	55,878
Equipment	26,231	-	-	26,231
Depreciation	1,313,141	-	-	1,313,141
Insurance	38,243	299	-	38,542
Membership dues	8,569	2,500	-	11,069
Outside computer services	30,791	1,835	-	32,626
Marketing expense	21,209	82	-	21,291
Grants to organizations	27,500	-	-	27,500
Management fees	-	46,002	(46,002)	-
Other costs	3,711	1,646	-	5,357
Total Expenses	3,459,360	274,761	(46,002)	3,688,119
Increase (Decrease) in Net Assets	(1,920,650)	(126,882)	-	(2,047,532)
Net assets, beginning of year	42,306,207	159,617	-	42,465,824
Net assets, end of year	$ 40,385,557	$ 32,735	$ -	$ 40,418,292

NEW ORLEANS BIOFUNDING, LLC

BALANCE SHEET

June 30, 2017

ASSETS		
Cash	$ 2,782	
Cash, money market, unrestricted	17,212	
Cash, money market, restricted	1,144,613	
Notes receivable, less allowance for possible loan losses of $279,533	540,286	
Receivable, other	7,907	
Investments	-	
Total assets		$ 1,712,800
LIABILITIES AND NET WORTH		
Accounts payable		$ 91,698
Deferred revenue		
Loan revenue	$ 132,626	
Miscellaneous Receipts	1,455,741	1,588,367
Net worth		32,735
Total liabilities and net worth		$ 1,712,800

NEW ORLEANS BIOFUNDING, LLC

STATEMENT OF INCOME

Year ended June 30, 2017

Income		
Miscellaneous Receipts	$ 133,015	
Contributions	7,866	
Miscellaneous income	6,998	
		$ 147,879
Expenses		
Salaries and related expenses	171,213	
Contract services	20,254	
Management fees	46,002	
Supplies	3,153	
Telecommunications	1,797	
Postage and shipping	14	
Printing and copying	899	
Facilities and equipment	6,744	
Travel and meeting expenses	18,323	
Insurance	299	
Membership dues	2,500	
Outside computer services	1,835	
Marketing expense	82	
Other costs	1,646	
		274,761
Net Income (loss)		$ (126,882)

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

SCHEDULE OF COMPENSATION, BENEFITS AND OTHER PAYMENTS TO AGENCY HEAD OR CHIEF EXECUTIVE OFFICER

For the year ended June 30, 2017

Agency Head Name: Aaron Miscenich

Purpose	Amount
No payments were made with public funds.	

NEW ORLEANS BIOINNOVATION CENTER, INC.
AND SUBSIDIARY

SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS

For the year ended June 30, 2017

PROGRAM TITLE	PASS THROUGH GRANTOR CONTRACT #	FEDERAL CFDA NUMBER	EXPENDITURES
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT			
Passed through State of Louisiana - Louisiana Office of Community Development, Disaster Recovery Unit			
Innovative Loan Program	711148	14.228	$ 819,819
Total U.S. Department of Housing and Urban Development			819,819
U.S. DEPARTMENT OF COMMERCE			
Louisiana Life Sciences Technology Commercialization Center (EDA - I6 Grant)		11.020	129,675
Passed through Louisiana State University Health Sciences Center			
Center for Bioscience Research Innovation and Commercialization	14-17-109	11.307	21,179
Total U.S. Department of Commerce			150,854
U.S. SMALL BUSINESS ADMINISTRATION			
Growth Accelerator Fund Competition		59.065	50,000
Total U. S. Small Business Administration			50,000
Total Federal Awards			$ 1,020,673

NOTES TO SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS

1. Basis of Presentation

The accompanying Schedule of Expenditures of Federal Awards (the Schedule) includes the federal award activity of New Orleans BioInnovation and Center, Inc. and Subsidiary under programs of the federal government for the year ended June 30, 2017. The information in this schedule is presented in accordance with the requirements of *Title 2 U.S. Code of Federal Regulations Par 200., Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards* (Uniform Guidance). Because the schedule presents only a selected portion of the operations of New Orleans BioInnovation and Center, Inc. and Subsidiary it is not intended to and does not present the financial position, changes in net assets or cash flow of New Orleans BioInnovation and Center, Inc. and Subsidiary.

2. Summary of Significant Accounting Policies

Expenditures reported on the schedule are reported on the accrual basis of accounting. Such expenditures are recognized following the cost principles contained in the Uniform Guidance, wherein certain types of expenditures are not allowable or are limited as to reimbursements.

3. Indirect Cost Rate

New Orleans BioInnovation and Center, Inc. and Subsidiary has not elected to use the 10% de minis indirect cost rate.

CASCIO & SCHMIDT, LLC

CERTIFIED PUBLIC ACCOUNTANTS

FRANCIS J. CASCIO, CPA
STEVEN A. SCHMIDT, CPA

MEMBERS
AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS
SOCIETY OF LOUISIANA CERTIFIED PUBLIC ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Board of Directors
New Orleans BioInnovation Center, Inc. and Subsidiary

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of New Orleans BioInnovation Center, Inc. and Subsidiary (a nonprofit corporation) which comprise the statement of financial position as of June 30, 2017 and the related statements of activities, and cash flows and for the year then ended, and the related notes to the financial statements, and have issued our report thereon dated February 20, 2018.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements we considered New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of New Orleans BioInnovation Center, Inc. and Subsidiary's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in the internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

3000 Kingman Street • Suite 104 • Metairie, Louisiana 70006 • 504.455.3182 • Fax 504.455.3076

Compliance and Other Matters

As part of obtaining reasonable assurance about whether New Orleans BioInnovation Center, Inc. and Subsidiary's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed an instance of noncompliance that is required to be reported under *Government Auditing Standards* and which is described in the accompanying schedule of findings and questioned costs as item 2017-001..

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the organization's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Standards Auditing* in considering the organization's internal control and compliance. Accordingly, this communication is not suitable for an other purpose. Under Louisiana Revised Statue 24:513, this report is distributed by the Legislative Auditor as a public document.

Carr, Riggs & Ingram, LLC

Metairie, Louisiana
February 20, 2018

CASCIO & SCHMIDT, LLC

CERTIFIED PUBLIC ACCOUNTANTS

FRANCIS J. CASCIO, CPA
STEVEN A. SCHMIDT, CPA

MEMBERS
AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS
SOCIETY OF LOUISIANA CERTIFIED PUBLIC ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE FOR EACH MAJOR PROGRAM AND ON INTERNAL CONTROL OVER COMPLIANCE REQUIRED BY THE UNIFORM GUIDANCE

To the Board of Directors
New Orleans BioInnovation Center, Inc. and Subsidiary

Report on Compliance for Each Major Federal Program

We have audited New Orleans BioInnovation Center, Inc. and Subsidiary's compliance with the types of compliance requirements described in the OMB Compliance Supplement that could have a direct and material effect on each of New Orleans BioInnovation Center, Inc. and Subsidiary's major federal programs for the year ended June 30, 2017. New Orleans BioInnovation Center, Inc. and Subsidiary's major federal programs are identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

Management's Responsibility

Management is responsible for compliance with the requirements of federal statutes, regulations, contracts, and the terms and conditions of its federal awards applicable to its federal programs.

Auditor's Responsibility

Our responsibility is to express an opinion on compliance for each of New Orleans BioInnovation Center, Inc. and Subsidiary's major federal programs based on our audit of the types of compliance requirements referred to above. We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. *Code of Federal Regulations* (CFR) Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, (Uniform Guidance). Those standards and the Uniform Standards require that we plan and preform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about New Orleans BioInnovation Center, Inc. and Subsidiary's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for each major federal program. However, our audit does not provide a legal determination of New Orleans BioInnovation Center, Inc. and Subsidiary's compliance.

Opinion on Each Major Federal Program

In our opinion New Orleans BioInnovation Center, Inc. and Subsidiary complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2017.

3000 Kingman Street • Suite 104 • Metairie, Louisiana 70006 • 504.455.3182 • Fax 504.455.3076

Report on Internal Control Over Compliance

Management of New Orleans BioInnovation Center, Inc. and Subsidiary is responsible for establishing and maintaining effective internal control over compliance with the types of compliance of requirements referred to above. In planning and performing our audit of compliance, we considered New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over compliance with the types of requirements that could have a direct and material effect on each major federal program to determine the auditing procedures that are appropriate to the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with the Uniform Standards, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of New Orleans BioInnovation Center, Inc. and Subsidiary's internal control over compliance.

A deficiency in internal control over compliance exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect, and correct noncompliance with a type of compliance requirement of a federal program on a timely basis. A *material weakness* in internal control over compliance is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency* in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be deficiencies, significant deficiencies or material weaknesses. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Purpose of the Report

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

Cassio + Schmidt, LLC.

Metairie, Louisiana
February 20,2018

NEW ORLEANS BIOINNOVATION CENTER, INC . AND SUBSIDARY

SCHEDULE OF FINDINGS AND QUESTIONED COSTS

For the year ended June 30, 2017

A. SUMMARY OF THE AUDIT RESULTS

Financial Statements

Type of auditor's report issued	Unmodified	
Internal control over financial reporting:		
• Material weakness(es) identified?	____ yes	X no
• Significant deficiency(ies) identified?	____ yes	X no
Noncompliance material to financial statements noted?	X yes	___ no

Federal Awards

Internal control over major programs:		
• Material weakness(es) identified?	____ yes	X no
• Significant deficiency(ies) identified?	____ yes	X none reported
Type of auditor's report issued on compliance for major programs:	Unmodified	
Any audit findings disclosed that are required to be reported in accordance with 2 CFR section 200.516 (a).	____ yes	X no

The program tested as a major program is:

U. S. Department of Housing and Urban Development
Passed through Louisiana Office of Community Development,
Disaster Recovery Unit

Innovation Loan and Technical Assistance Program (CFDA # 14.228)

The threshold for distinguishing Type A and Type B programs was $750,000.

Auditee qualified as a low-risk auditee. ____ yes X no

NEW ORLEANS BIOINNOVATION CENTER, INC . AND SUBSIDARY

SCHEDULE OF FINDINGS AND QUESTIONED COSTS - Continued

For the year ended June 30, 2017

B. FINANCIAL STATEMENT AUDIT

COMPLIANCE
2017-001 LATE SUBMISSION, REPORT

The report was not submitted to the Louisiana Legislative Auditor within six months of the year end, as required.

C. FINDINGS AND QUESTIONED COSTS - MAJOR FEDERAL AWARD PROGRAMS AUDIT

There were no items identified in the course of testing during the current year required to be reported.

D. STATUS OF PRIOR YEAR AUDIT FINDINGS

There were no prior year audit findings.

Corrective Action Plan

2017-1 Late Submission of Report

The financial statements will be filed timely to the Louisiana Legislative Auditor in future years.

APPENDIX - C
LAKE NONA - HEALTH & LIFE SCIENCES CLUSTER

EDITION 02

The Lake Nona Magazine


home sweet home

Find your future Home Sweet Home in Lake Nona

12

Table of

Contents

LOCAL PRODUCE, FRESH FLOWERS AND GOODIES GALORE

LAKE NONA *Farmers'* MARKET

With dozens of vendors offering local produce, fresh flowers, handcrafted jewelry, desserts and more – the Lake Nona Farmers Market will become your new Saturday staple. The Farmers Market takes place from 11:00AM – 3:00PM every Saturday at Lake Nona Town Center featuring live music.

FIND US ON

FACEBOOK AND INSTAGRAM!

HOME SWEET HOME

Lake Nona

90%
OF RESIDENTS HAVE A **COLLEGE DEGREE**

750+
COMMUNITY EVENTS EACH YEAR

44
MILES OF TRAILS

17
SQUARE MILE COMMUNITY

PRE-K TO PH.D. AND M.D.:
FROM EARLY CHILDHOOD LEARNING TO EARNING A PH.D AND M.D. ALL WITHIN LAKE NONA

20
MINUTES TO DOWNTOWN ORLANDO

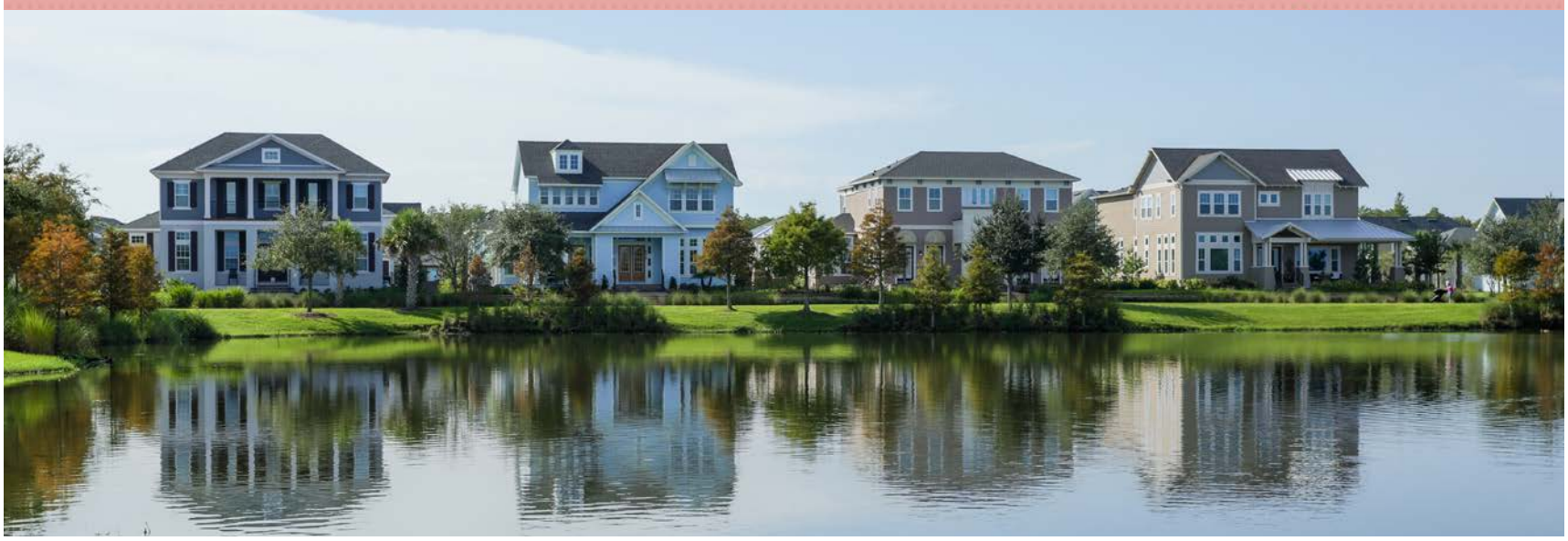
ORLANDO FLORIDA

ABILITY TO PARTICIPATE IN GROUNDBREAKING, MULTI-YEAR HEALTH STUDY THROUGH **THE LAKE NONA LIFE PROJECT**

TOP-SELLING MASTER-PLANNED COMMUNITY IN CENTRAL FLORIDA

35
MILES TO BEACHES

HOME TO **USTA NATIONAL CAMPUS** WITH
100 COURTS



LEARNING MATTERS

A Look at Lake Nona's Collaborative Learning Environment

Valencia College has made its name in the greater Orlando area as one of Florida's (and the nation's) top colleges. Opening doors for thousands of students, Valencia's diverse programming also grants degrees to numerous Lake Nona High School students each year, before they graduate from high school.

Since beginning in 2009, the Collegiate Academy program has offered students advanced opportunities in multiple areas of academic and professional interest with dedicated faculty and advisors to support and encourage students. The program allows Lake Nona High School students to build a highly competitive academic profile that exceeds the scope of traditional high school programs with the financial benefit of no tuition, book costs, or program fees. Because of the proximity of Lake Nona High School to Valencia College, Collegiate Academy students can also continue in other high school classes, sports, and extracurricular programs during the school year.

This year, the power of Lake Nona's collaborative learning environment produced the highest number of graduates from Lake Nona High School and Valencia College's Collegiate Academy. Last year, 29 Collegiate Academy students received Associate of Arts (A.A.) and Associate of Science (A.S.) along with their high school diplomas – a new record for the program that celebrated its 10th anniversary this year.

With more growth on the horizon, we sat down with Executive Dean Dr. Mike Bosley of Valencia's Lake Nona campus to talk about the school's business success, future plans, and direct impact on the Lake Nona community.

Lake Nona: We all know that our Lake Nona community is a special place, but can you tell us what makes Valencia's Lake Nona campus unique?

Dr. Mike Bosley: Capitalizing on the spirit of innovation and community in Lake Nona has been one of the most important accomplishments at the Lake Nona campus. Like the Lake Nona community, we welcome students from a wide variety of educational backgrounds – from honors students who are part of our Collegiate Academy to adult learners who are transitioning to a new career – and work hard to help them achieve their goals. We have created a welcoming environment for all students and our greater community that allows us to meet students where they are and help them achieve their goals.

Lake Nona: The campus has grown so much since opening. How many students are currently enrolled at the Lake Nona campus?

Dr. Mike Bosley: We currently serve 8,000 students in credit and non-credit programs each year.

Lake Nona: What are some of Valencia's strongest and most popular programs? Are there any specialty programs (in-class or extracurricular) that prospective students should note?

Dr. Mike Bosley: Valencia's Lake Nona campus offers all of the courses to help students achieve the Associate of Arts degree, which allows for University transfer. Additionally, our students have access to all of the bachelor's degrees Valencia College offers, including two new programs in Business and Software Development. And, we're proud that the Lake Nona campus offers an Associate of Science (A.S.) degree in Biotechnology Laboratory Sciences, which is a hands-on science program that provides students with tremendous opportunities in the growing life sciences industry in Lake Nona.

Lake Nona: One would imagine that the school's location within a state-of-the-art community like Lake Nona can certainly open doors to new opportunities. What would you say those benefits include?

Dr. Mike Bosley: Access to scientists, industries and medical partners that bring real-world experiences in our classrooms. Currently, Lake Nona has partnered with the college to support a new position that will serve as an Education Ambassador in the community. The ambassador will link business and industry with our education partners to develop community-wide education initiatives. I am very excited about this new position and look forward to seeing the results.

Lake Nona: Do you have any partnerships with neighboring universities within Lake Nona? How do you promote continued education with these partners?

Dr. Mike Bosley: Our largest partnership is with the University of Central Florida (UCF). In 2019, UCF and Valencia will open a joint campus in Downtown Orlando. All Valencia students are eligible to participate in Direct Connect to UCF, which provides guaranteed admission for our graduates. And here at the Lake Nona campus, we have a partnership with Florida Institute of Technology (FIT), which offers coursework for FIT's bachelor's degree in Logistics Management on our campus. That program has been very popular with our returning veterans. Lastly, our Biotechnology program partners with Biotility, which provides the BASE exam to our school teachers and students in biotechnology courses throughout Central Florida. We are also building a partnership with the University of Florida (UF) School of Pharmacy. These partnerships are important to the success of each our institutions and allows our students to take their courses close to home.

Lake Nona: What do you see for the future of Valencia and our community?

Dr. Mike Bosley: Valencia College is here to serve the growing needs of Orange and Osceola Counties and we stand ready to create opportunities for all students to learn, whether that be in a credit class toward a degree or a language or construction continuing education program. Meeting the needs of a growing diverse community is a challenge we are excited about and the Lake Nona campus is just one example of how we are fulfilling our community promise. I believe the Lake Nona community's innovative partnerships can serve as a catalyst for the larger Central Florida community and a model for communities. **LN.**

Pre-K to Ph.D/M.D.

Early Childhood Education:

Amazing Explorers Academy

Primrose School of Lake Nona

The Learning Experience

The Goddard School

Primary Schools:

NorthLake Park Community School

Laureate Park Elementary

Secondary Schools:

Lake Nona Middle School

Lake Nona High School

Graduate and Post-Graduate Schools:

Valencia College Lake Nona

UCF College of Medicine and Health Sciences Campus

UF Research & Academic Center

Recent graduates were accepted to:

Columbia University

University of Notre Dame

West Point Military Academy

University of California

Johns Hopkins University

Among Others

NOTABLE QUOTES

"Lake Nona, the most sophisticated example in the world of what master planning for wellness can accomplish."

- Global Wellness Institute

"With its innovative take on combining top-level healthcare, sports, technology and other amenities with residential planning, Lake Nona's offering a futuristic vision of how people should live — in a city better known for its tourists than its residents."

- Worth Magazine

"Innovative, fun, cutting edge place to live. Always new events and additions to our community to improve our lives. Truly someplace special!"

- Stephanie
Lake Nona Resident

"An important part of Orlando's emerging presence as a mature and innovative city is Lake Nona."

- The New York Times

"The future of leadership, the future of societies, the future of nations, depends on the well-being communities. Lake Nona is pioneering in that and I hope others will follow."

- Deepak Chopra
MD, FACP, Founder,
The Chopra Foundation

"I have lived all over the world and all over Orlando and ever since I have moved to Lake Nona, for the first time I feel like I'm part of a wonderful community and I'm home."

- Samia
Lake Nona Resident

"When we turn onto Lake Nona Boulevard, we both breathe a sigh of relief. We love all the social activities and the sense of community here."

- Laurie and Chuck
Lake Nona Residents

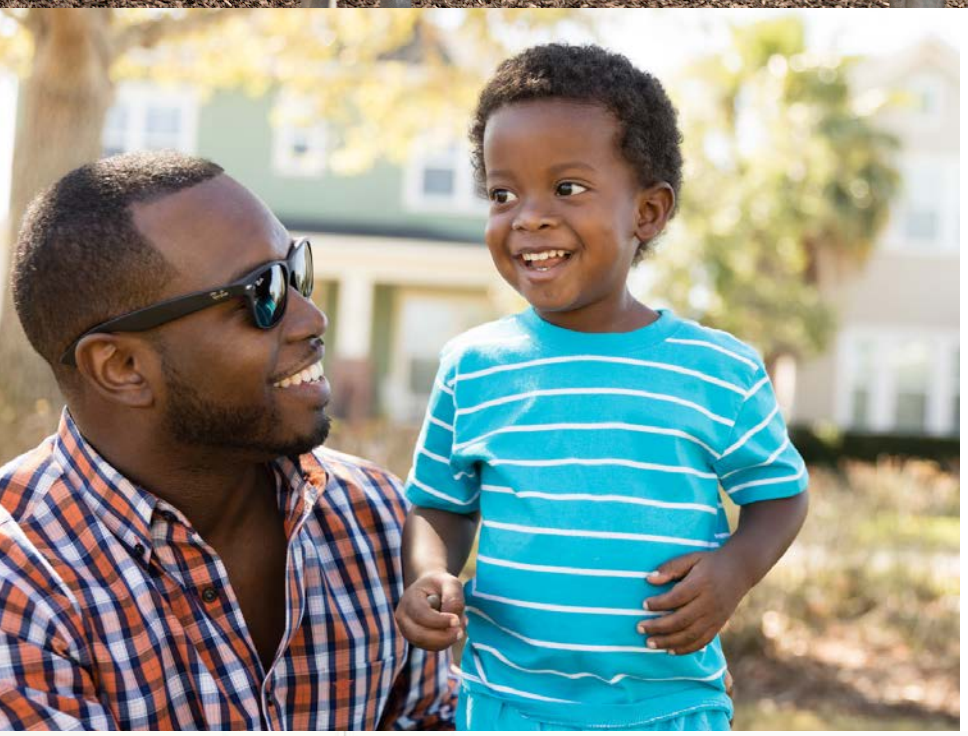
"Lake Nona is a one-of-a-kind, vibrant and beautiful community. It offers what all families would want in a place they call home; state-of-the-art models in housing, sports, medicine, education, business and shopping."

- Brenda
Lake Nona Resident

A HOME FOR EVERYONE

NONA HOOD!

Lake Nona is the fastest-growing community in Orlando, and it's no surprise why. We offer a broad collection of home options, from contemporary apartments and townhouses to single-family homes and spacious estates. Explore our engaging neighborhoods and discover how to live life the Lake Nona way.



Laureate Park

Somerset Crossings

Gatherings of Lake Nona

Isles of Lake Nona

Lake Nona Golf & Country Club

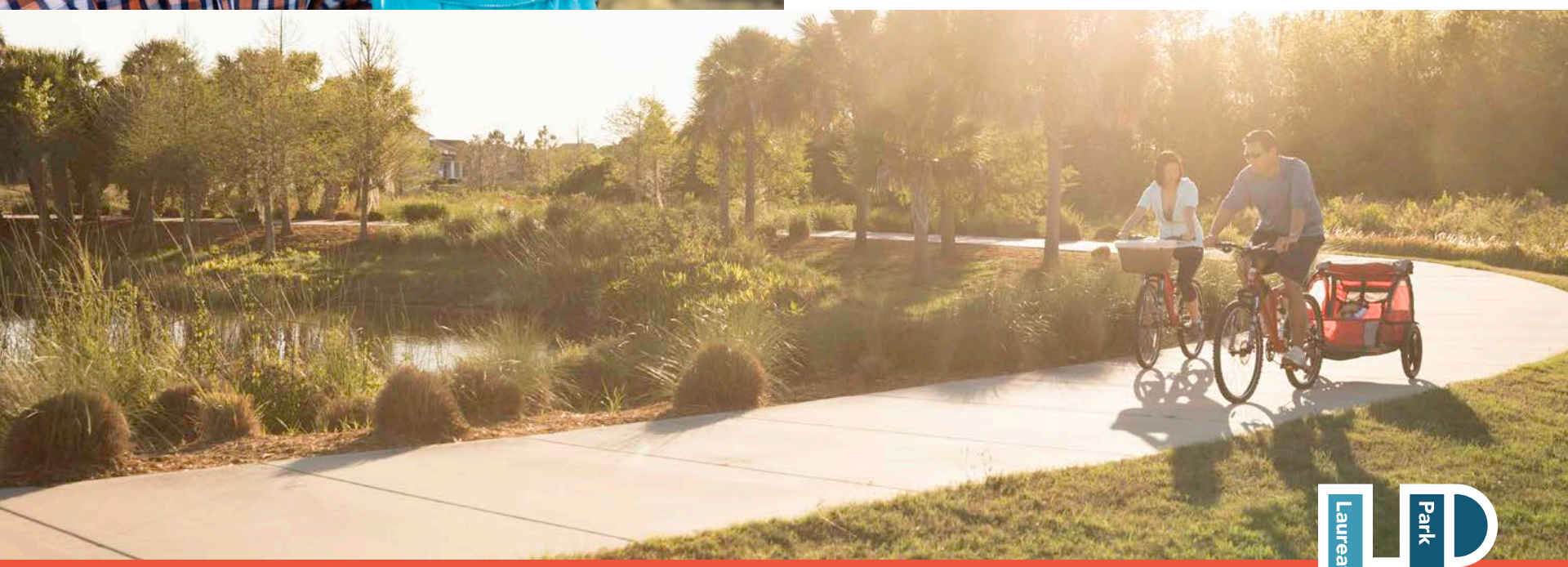
NorthLake Park

Somerset Park

VillageWalk

Enclave at VillageWalk

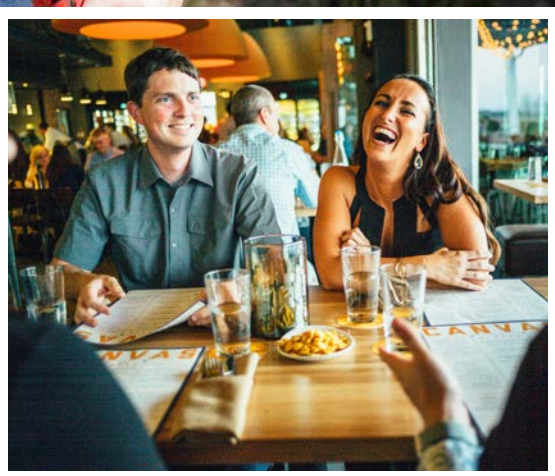
Ariel • LandonHouse • Pixon • WaterMark



Fun Fact: Visit the Lake Nona Info Center located in Canvas Restaurant & Market to purchase a Laureate Park magnet!

Laureate Park

Brightly colored bungalows, townhomes, cottages and multi-story homes are complemented by modern design and technology features, all situated around a Village Center with a resort-style Aquatic Center, LP Fit fitness center, Dockside event venue, Canvas Restaurant & Market, shops, schools, and Tom Fruin's *Glass House*.



Dockside is the venue for many community events, including yoga classes, neighborhood gatherings, and celebrations of all kinds. It can also be rented for private events.

VISIT **DOCKSIDELAKENONA.COM**

The Laureate Park community gardens offer residents the chance to grow their own fresh fruits, veggies and herbs to inspire healthy eating.

Lake Nona is home to Central Florida's first autonomous shuttle program. Shuttles operate daily between Laureate Park and key destinations in Lake Nona.

DOCKSIDE LAKE NONA

MOVE NONA

LP Fit is a 3,200-square-foot, state-of-the-art fitness facility for Laureate Park residents.

COMMUNITY GARDENS

BIKE SHARE

A new bike share program is blooming in Lake Nona, featuring dozens of bikes located throughout the community.

Bark Parks

LP | FIT

Paths & Trails

Miles of multi-use trails meander throughout Laureate Park to inspire active, healthy living.

Laureate Park's four-legged friends are invited to roam freely in the neighborhood dog parks.

TOM FRUIN'S "GLASS HOUSE"

CANVAS

Canvas Restaurant & Market features chef-driven cuisine accented with Florida seafood and an adjacent market, where guests can peruse the hand-curated collection of goods.

Aquatic Center

The resort-style Aquatic Center features a splash pool complete with deck jets and water cannons, a tranquil pool with private cabanas and a lap pool with five junior Olympic lap lanes.

Pocket Parks

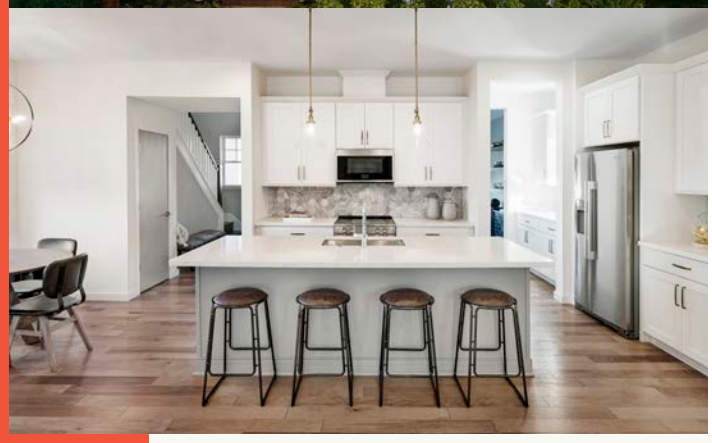
PLAYGROUNDS

Laureate Park's beautifully manicured pocket parks provide quiet spaces to walk through, get back to nature, and connect with neighbors. All with the comfort and convenience of being close to home.

Situated in the Laureate Park Village Center is artist Tom Fruin's *Glass House*, a stunning work of installation art that utilizes reclaimed materials and celebrates overlooked landmarks by pulling cues from urban design and American folk art.

Laureate Park kids can make the most of sunny Florida days by playing at the neighborhood playgrounds complete with slides, a rope climb and custom features created with little ones in mind.

Laureate Park



Ashton Woods Homes

ASHTONWOODS.COM

SIGNATURE SERIES
40 Ft. Homesites
3–5 Bedrooms
2–4 Bathrooms
From 1,957 Sq. Ft.
From the high $300s

HERITAGE SERIES
55 Ft. Homesites
4–6 Bedrooms
2–5 Bathrooms
From 2,876 Sq. Ft.
From the high $400s

CLASSICS SERIES
45 Ft. Homesites
3–6 Bedrooms
2–5 Bathrooms
From 1,961 Sq. Ft.
From the high $300s
Anderson Model Home:
8890 Tavistock Lakes Boulevard
Brigham Model & Sales Center:
8904 Tavistock Lakes Boulevard

TOWNHOMES
Village Center
3 Bedrooms
3.5 Bathrooms
From 2,016 Sq. Ft.
From the mid $300s

Cardel Homes

CARDELHOMES.COM

SINGLE-FAMILY HOMES
50 Ft. Homesites
3–5 Bedrooms
2–3.5 Bathrooms
From 2,101 Sq. Ft.
From the mid $400s
Allure Model Home (Coming Soon): 6905 Arnoldson Street
Symphony Model Home (Coming Soon): 6921 Arnoldson Street

Craft Homes

CRAFTHOMES.COM

STYLE SERIES
Townhomes
2–4 Bedrooms
2–2.5 Bathrooms
From 1,650 Sq. Ft.
From the low $300s
Tailor Model Home:
8472 Tavistock Lakes Blvd

ARTISAN SERIES
30 Ft. Homesites
3–4 Bedrooms
2–2.5 Bathrooms
From 1,773 Sq. Ft.
From the mid $300s
Brewer Model Home:
13426 Gabor Avenue

EXPRESSIONIST SERIES
Jewel Box Homes
3–4 Bedrooms
2.5 Bathrooms
From 1,864 Sq. Ft.
From the high $300s
Hatter Model Home:
13151 Bovet Avenue

GUILD SERIES
45 Ft. Homesites
3–4 Bedrooms
2–3.5 Bathrooms
From 2,001 Sq. Ft.
From the high $300s
Mercer Model Home & Sales Center: 13450 Gabor Avenue

Laureate Park

David Weekley Homes

DAVIDWEEKLEYHOMES.COM

TOWNHOMES
Village Center
(Coming Soon)

VILLAGE HOMES
50 Ft. Homesites
3–5 Bedrooms
2–4 Bathrooms
From 2,280 Sq. Ft.
From the mid $400s
Reef Model Home & Sales Center: 13575 Granger Avenue

PARK HOMES
55 Ft. Homesites
4–5 Bedrooms
3–4 Bathrooms
From 2,940 Sq. Ft.
From the low $500s

CARRIAGE HOMES
70 Ft. Homesites
3–5 Bedrooms
2–4 Bathrooms
From 2,472 Sq. Ft.
From the low $500s

Dream Finders Homes

DREAMFINDERSHOMES.COM

SINGLE-FAMILY HOMES
40 Ft. Homesites
3–4 Bedrooms
2–3.5 Bathrooms
From 1,976 Sq. Ft.
From the high $300s
Talbot Model Home & Sales Center: 8704 Crick Alley
Mableton Model Home: 8712 Crick Alley

Taylor Morrison

TAYLORMORRISON.COM

SINGLE-FAMILY HOMES
65 Ft. Homesites
4 Bedrooms
3.5 Bathrooms
From 3,134 Sq. Ft.
(Coming soon to Phase 10)

Lake Nona Golf & Country Club

Noted as one of the top private golf and country clubs in the world, Lake Nona Golf & Country Club is a sanctuary of luxury real estate and amenities nestled along the shores of Lake Nona. The community features a Tom Fazio-designed championship golf course, 40,000-square-foot Clubhouse with an 18-room guest Lodge, a Bath & Racquet Club with all-inclusive fitness and tennis facilities, a resort-style, lakeside pool, and outstanding water-based recreation.

CONTACT
LAKE NONA
REALTY

9801 LAKE NONA CLUB DRIVE ORLANDO, FL 32827
CALL: 407.851.9091
VISIT: LAKENONA.CLUB

Somerset Crossings

Somerset Crossings is a new townhome community by Pulte Homes featuring open-concept floor plans and resort-style amenities including a pool, cabana and playground. Residents can enjoy easy access to major highways, such as SR 417 and the Beachline (SR 528), and conveniently located near Lake Nona Town Center and Orlando International Airport. Somerset Crossings is located in the Orange County School District. Surrounding schools include: A-Rated Wyndham Lakes Elementary, South Creek Middle, and Cypress Creek High School.

3972 PLAINVIEW DRIVE, ORLANDO, FL 32824
CALL: 407.554.5475
VISIT: PULTE.COM/SOMERSETCROSSINGS

Gatherings of Lake Nona

Gatherings® is a 55+ active adult community from Beazer Homes featuring new condos with elevator access. Gatherings of Lake Nona offers lifestyle-focused, amenity-heavy, low-maintenance condominiums and offers residents prime location, within walking distance of Lake Nona Town Center, the VA Medical Center and Laureate Park. Each home has a private balcony, a 1-car garage and residents have access to a private pool, clubhouse and outdoor recreation within the community.

7573 LAUREATE BOULEVARD, ORLANDO, FL 32827
CALL: 321.445.5050
VISIT: GATHERINGSOFLAKENONA.COM

Isles of Lake Nona

Isles of Lake Nona is a new, gated community featuring single-family homes, townhomes and bungalows with open-concept floor plans, designer finishes and energy-efficient features by Pulte Homes. With every home backing up to a waterway, homeowners in Isles of Lake Nona will enjoy beautiful, scenic views of water.

10774 PAHOKEE BEACH PLACE, ORLANDO, FL 32827
CALL: 407.805.1637
VISIT: PULTE.COM/ISLESOFLAKENONA

VillageWalk

VillageWalk blends resort-style living with a unique neighborhood design, creating a new concept of living in Central Florida. The neighborhood Town Center is connected by bridges and canals leading to lighted walking trails, swimming pools, parks and sport courts. The VillageWalk Town Center includes conveniences such as a café, salon, post office, bank, gas station and fitness center.

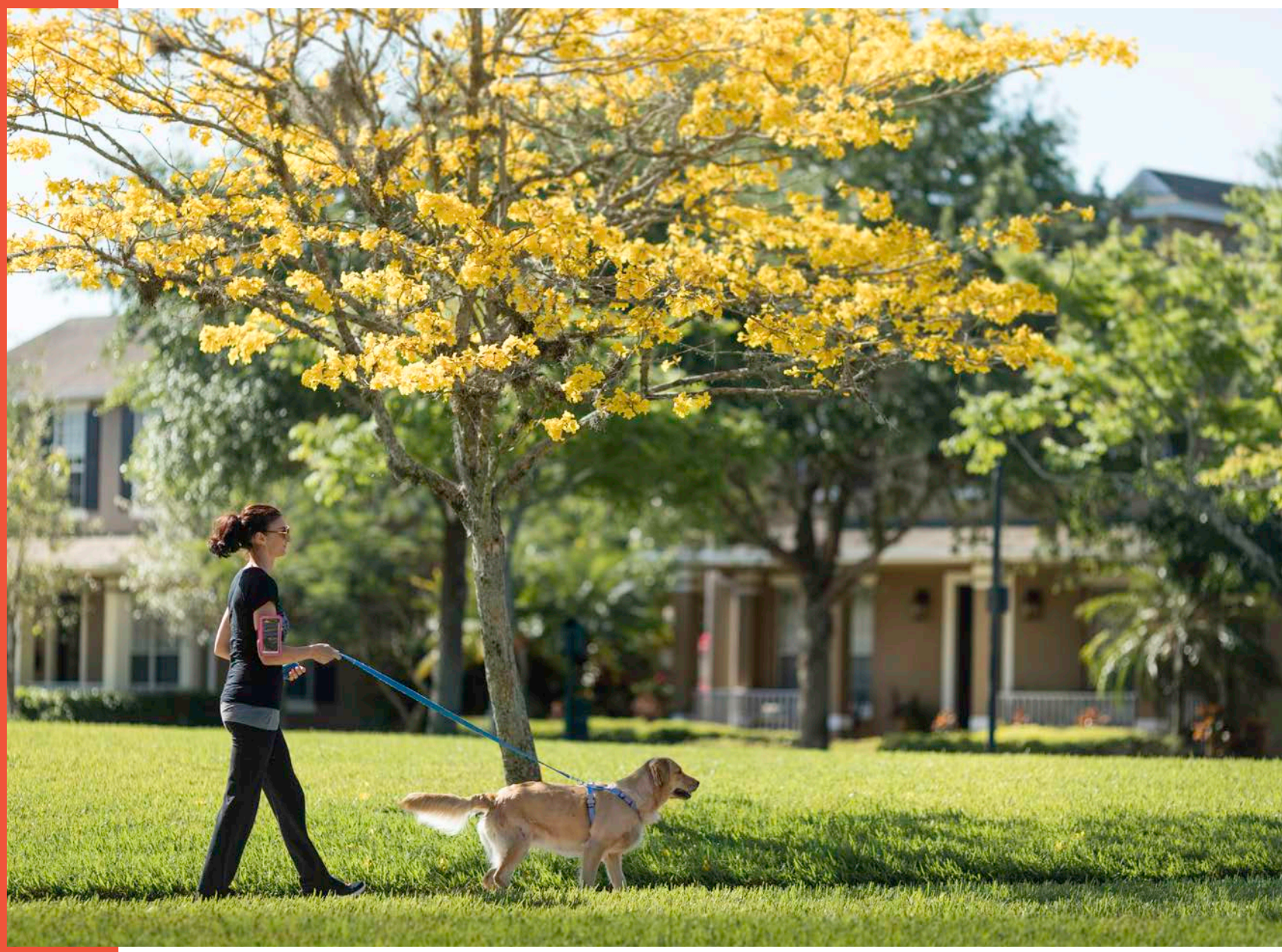
Enclave at VillageWalk

Mediterranean-inspired homes are built on large homesites with both water and conservation views. This gated, natural gas community offers executive home designs with stunning features, designer finishes, and quality options that let you customize your home.

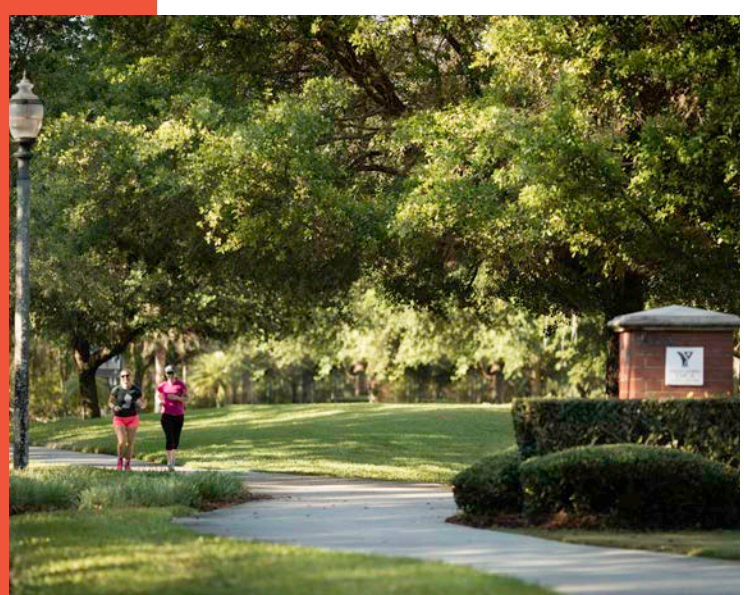
Residents have access to VillageWalk's community amenities including a fitness center with 24-hour access, a library, card room, and exclusive access to the ballroom that can host events for up to 160 people.

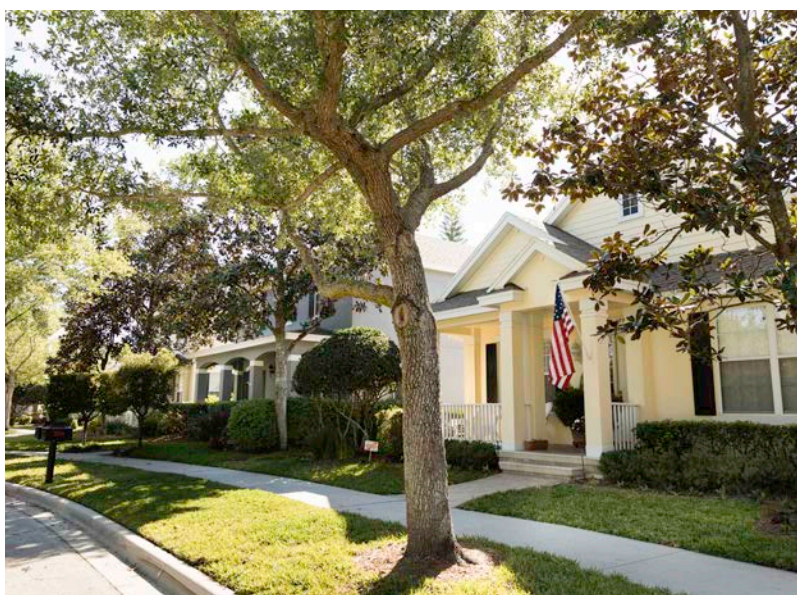
VillageWalk's outdoor amenities include a heated lap pool, heated resort pool, six clay tennis courts, a playground, basketball court and miles of beautifully landscaped paths and trails for running, walking or biking.

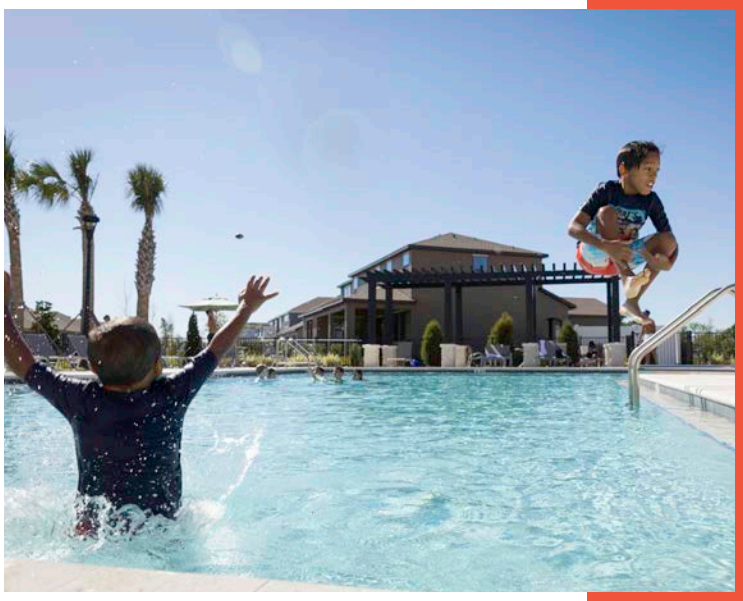
NorthLake Park



Situated on 500 acres in the northernmost point of Lake Nona, the NorthLake Park community offers single- and multi-family homes in addition to contemporary apartments. This expansive neighborhood is home to an award-winning school and YMCA, Olympic pool, sport courts and fields, and a dog park.







Somerset Park is a gated neighborhood located in the western portion of Lake Nona. Home collections from Century Homes and M/I Homes bring a wide variety of choices for homebuyers. This neighborhood features a pool, dog park and playgrounds.

Somerset Park

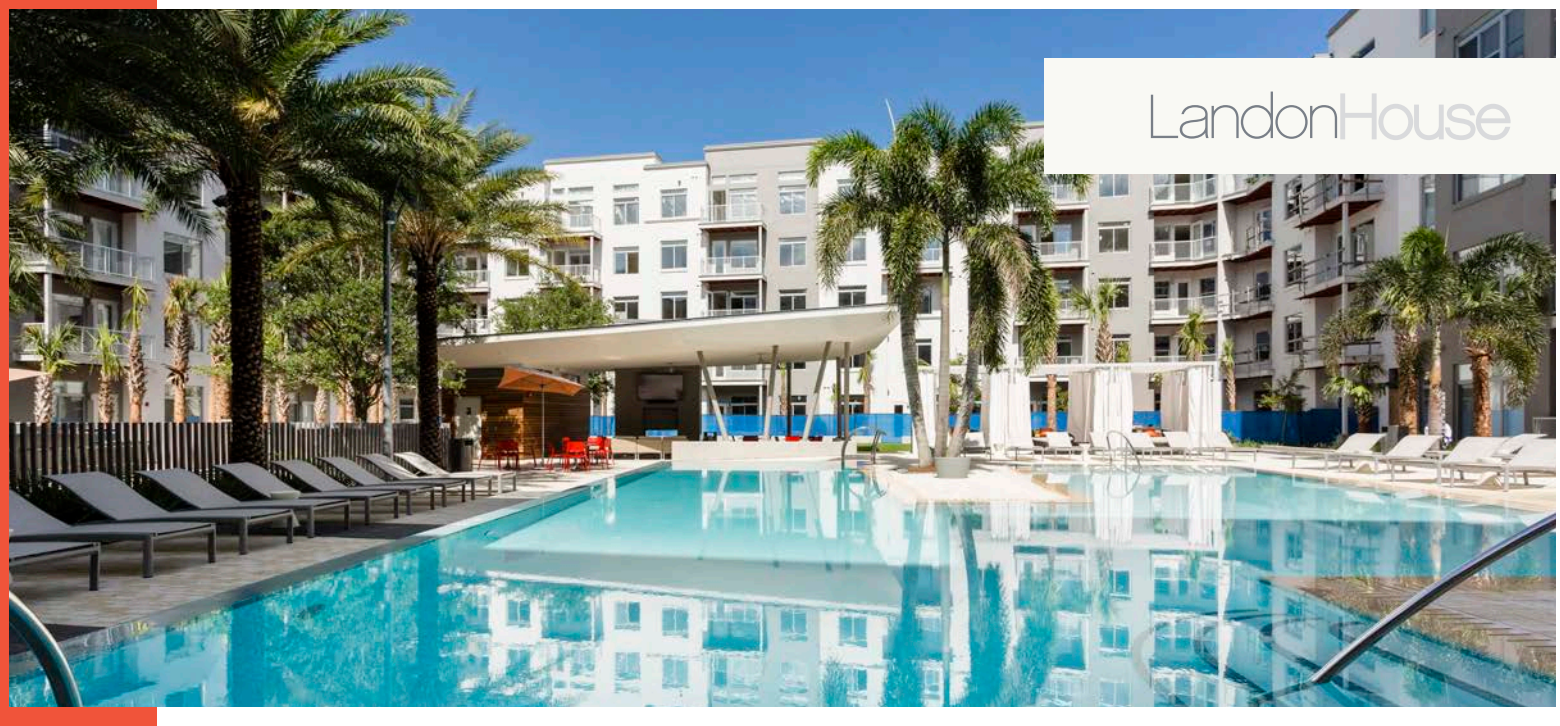
Apartments

ARIEL

Ariel, a luxury apartment community in Lake Nona, features one-, two- and three-bedroom apartments. Recently awarded the National Green Building Standard™ Silver Level Certification, Ariel Apartments are built with environmentally conscious designs including high-energy effecient windows, LED lighting and ENERGY STAR rated stainless steel appliances.

Each resident can access a 24-hour fitness club featuring Technogym© equipment and virtual classes.The community is pet friendly and includes a dog park, pet washing station and agility course.

LAKENONAARIEL.COM • 407.313.2660 • 14001 BENVOLIO CIRCLE, ORLANDO, FL 32824



LandonHouse

LandonHouse Apartments provides people seeking a vibrant, urban lifestyle a new place to call home. Residents can rent a one-, two- or three-bedroom apartment, or choose an open studio floor plan for true "urban" living. All 280 apartments are accented by ten-foot ceilings and great views of the expanding Lake Nona Town Center.

Amenities include a resort-style pool and green spaces, a game and media center featuring billiards, shuffleboard and retro arcade games, and a state-of-the-art fitness center. Additional amenities include a large outdoor pavilion with a fire pit and grilling area, a pet spa with grooming area, GroupX on-demand fitness classes, and an executive business conference center with printers, a copier, and Mac and Windows computers.

LIVEATLANDONHOUSE.COM • 407.313.2107 • 7010 LAKE NONA BOULEVARD, ORLANDO, FL 32827

· P I X O N ·

Located adjacent to Lake Nona Town Center, Pixon's 11-story main tower features a wide-range of housing options, including micro units, studios, one-bedroom and two-bedroom units, a 1,730-square-foot, three-bedroom penthouse with soaring ten-foot floor-to-ceiling windows, upgraded stainless steel appliances, European-style cabinetry and quartz counter tops.

The community features access controlled buildings, 24-hour express maintenance and trash service. Residents have access to an exclusive second-story lounge with a variety of work centers and outdoor amenity deck with an expansive backyard. The urban-inspired apartment community debuts an innovative car share program with multiple onsite Tesla vehicles, encouraging an eco-friendly and neighborly transportation option, in addition to electric car charging stations and bicycle storage. The 24-hour gym features Technogym© equipment with on-demand fitness classes.

LAKENONAPIXON.COM • 321.319.8755 • 7004 TAVISTOCK LAKES BLVD, ORLANDO, FL 32827

WATER MARK

Located near Lake Nona's Sports & Performance District, Lake Nona WaterMark is a collection of 278 luxury apartments with six unique floor plans offering spacious one-, two- and three-bedroom homes with striking features at every turn. The 7,515-square-foot community clubhouse boasts a zero-entry resort-style pool, fireside veranda, outdoor kitchen, and a business center.

LAKENONAWATERMARK.COM • 407.313.4663 • 7650 LOWER GATEWAY LOOP, ORLANDO, FL 32827

Living in an Eco-Friendly Community

LAKE

Here in Lake Nona, we are lucky to enjoy plenty of sunshine and summertime rain showers that help cool us off. Aside from giving us great beach days and lush lawns, our climate is ideal for growing trees and plants that help nourish our community. Some can even help save you money in your home.

Trees increase property values by as much as 20%.
A mature tree can be worth $1,000 to $10,000.

NONA

We're conserving 40% of our community for green space and waterways

Lake Nona plants trees to provide a homes for local wildlife and songbirds, improve water quality, and add value to your home.

NONA

Oranges from Florida's orange trees provide a $9 billion industry, employing nearly 76,000 Floridians

Plant a tree on the west side of your home today and reduce energy costs tomorrow
5 years down 3% • 15 years down 12%

NONA

1 acre of forest absorbs 6 tons of CO_2, produces 4 tons of O_2, and is enough to sustain 18 people for a year

The net cooling effect of a young, healthy tree: 10 room-sized air conditioners operating at 20 hours a day, reducing cooling needs by 20-50%. **LN.**

Sources: U.S. Department of Agriculture, The Arbor Day Foundation, Center for Urban Forest Research, Council of Tree and Landscape Appraisers, and the USDA Forest Service.

Waste Not, Want Not.

A Backyard Guide to Composting

We all know that reducing, reusing and recycling helps save energy and money. But what if you could do even more to cut down greenhouse gas emissions beyond resisting the urge to throw out those empty water bottles? Composting, the process of turning kitchen and yard waste into nutrient-rich soil for your garden, is our new favorite way to go green. Not only does it mean less trash, but it'll also help you maintain a lush lawn and grow fresh fruits and veggies in your own backyard – no green thumb needed.

1 Get a Composter

Start by signing up at orlando.gov/trash-recycling/request-a-free-composter/ to receive your free composter, thanks to the City of Orlando's Green Works initiative.

2 Save your Scraps

Gather leftover food waste in a large container lined with newspaper.

3 Start the Process

Once your container is full, empty all of the contents (including the newspaper) into the composter.

4 Add Yard Waste

Cover the fresh food waste in your composter with a layer of leaves and other dry plant trimmings.

5 Add Water

Pour in just enough to wet the compost to the consistency of a wrung-out sponge.

6 Stir it Up

Mix the contents of your composter every so often to help speed up the decomposition process.

7 Put it to use

Harvest your compost after four to six months when all matter is broken down into an earthy, slightly damp soil.

A composter is essentially a container that allows millions of micro organisms to decompose your waste into nutrient-rich soil for your plants.

What can I compost?

- Fruits and vegetables
- Crushed egg shells
- Coffee grounds and filters
- Grass clippings and houseplants
- Shredded cardboard
- Shredded black-and-white newspaper
- Hay, straw and wood chips
- Shredded cotton and wool rags
- Nuts, shells, bread, grains
- Yard trimmings and dry leaves
- Dryer and vacuum cleaner lint
- Hair and fur

Avoid Composting:

- Meat and bones
- Fat, lard, grease and oils
- Dairy (butter, milk, eggs)
- Diseased plants
- Charcoal ashes
- Toxic materials
- Non-biodegradable materials
- Pet waste or litter

DID YOU KNOW?

A TYPICAL HOUSEHOLD THROWS OUT 474 LBS OF FOOD WASTE EVERY YEAR. THAT'S 1.3 LBS PER PERSON, PER DAY.

Composting Benefits

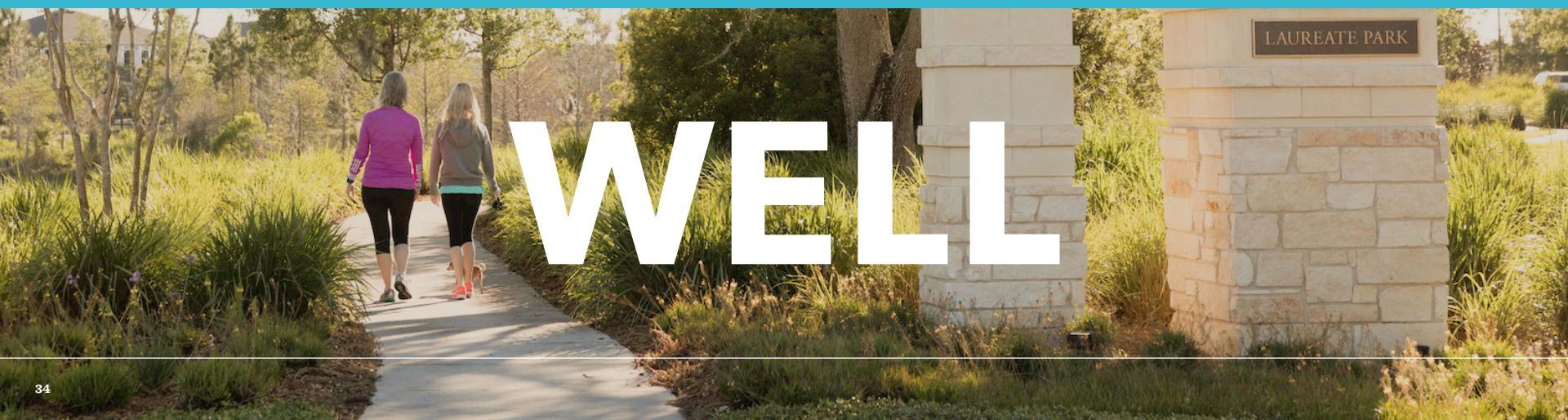
- Less waste in our landfills
- Fewer greenhouse gas emissions
- Creates enriched soil for your yard
- Reduces plant diseases and pests
- Saves you money on fertilizer costs

Compost Uses:

- Rejuvenate your garden by mixing fresh compost into your soil
- Sprinkle it onto your lawn as top soil
- Feed your trees by spreading it around the roots

Source: City of Orlando's Composting Guide; orlando.gov/trash-recycling/request-a-free-composter

STAYING ACTIVE & LIVING WELL



Running

Running for 30 minutes on our trails burns an average of 400 calories and gives the cows some company.

Swimming Laps

Swimming 33 laps in the Laureate Park Aquatic Center's junior Olympic pool equals about one mile.

Bike Ride

A bike ride on Lake Nona's miles of trails improves your energy level by 20% and decreases fatigue by 65%.

ADA Tour De Cure Lake Nona

This annual day of cycling, walking and running benefits the fight against diabetes with the American Diabetes Association. The 10-, 25-, 50-, 67-, 101-mile rides and the 5k end with a fun finish party supporting our participants living with diabetes, celebrating fundraisers and gathering as a community.

Run Nona

Run Nona is a party for all ages - packed with live music, runners and revelers enjoying a fun-filled family-friendly block party at Lake Nona Town Center. Grab those sneakers and start training for Run Nona 2021. Stay tuned at RunNona.com.


RED
MAPLE
SLASH
PINE
SABAL
PALM
LAKE NONA
ORLANDO
FLORIDA
TREE
CONSERVATION
PROGRAM
LIVE
OAK
PALMETTO
WATER
OAK

ENVIRONMENTAL INITIATIVE

RELOCATES TREES, ADDS SHADE

You may have noticed mature canopy trees appearing throughout Lake Nona's growing community, and the story behind it is one we are proud of.

The developer of Lake Nona, Tavistock Development Company, has been quietly relocating hundreds of trees. Home to a significant population of Live Oaks, Red Maples, Sabal Palms and Slash Pines, Tavistock's horticulture team saw an opportunity to relocate and extend the life of trees in Lake Nona that would have otherwise been recycled.

The tree conservation program is an environmental initiative dedicated to preserving viable, mature trees for future use. On average, the trees are estimated to be between 60-70 years old.

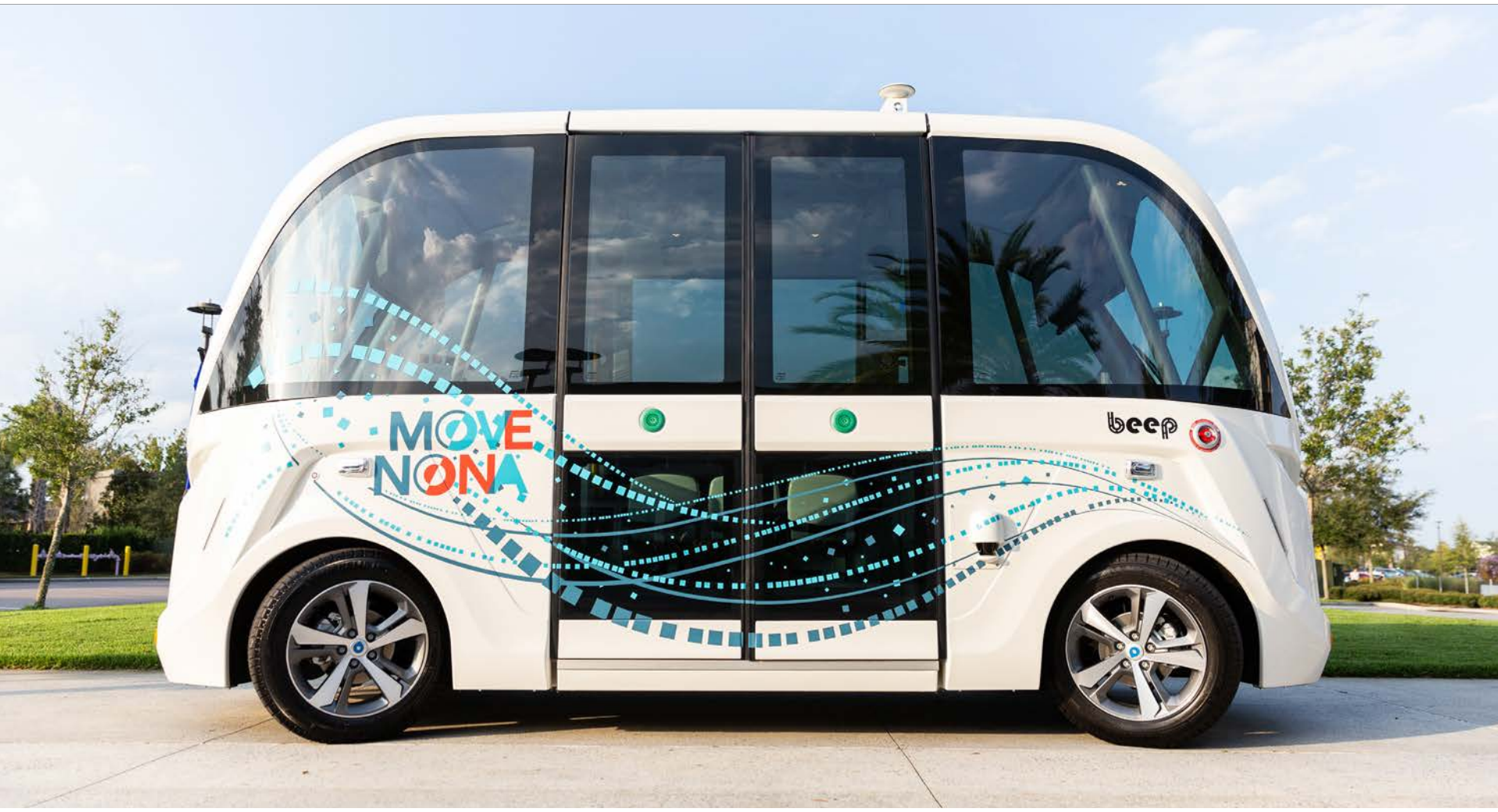
Dozens of relocated trees are being integrated into plans for current and future projects throughout Lake Nona including Boxi Park, Lake Nona Town Center, Laureate Park and other residential areas to enhance the quality of green space. Boxi Park features four 50-foot Live Oaks that were replanted when the open-air container park opened in early 2019.

To develop the program, Tavistock's horticulture team partnered with certified arborists to create a plan for how to select, root prune, move, and replant the dozens of tree species that live in Lake Nona. A comprehensive mix of fertilizers and fungicides in addition to a robust maintenance program ensure the relocated trees thrive in their new home.

Based on development timelines, some trees are moved temporarily before being planted in a permanent location. The average transfer takes about four months and involves a team of nearly 10 people.

In 2019, the team spent more than 1,000 hours identifying, pruning, moving, replanting, fertilizing, and watering the relocated trees to help maintain the arbor ecosystem's health and preservation.

With more than 40 percent of its land conserved as green spaces and waterways, Lake Nona is home to multiple neighborhood parks, 44 miles of trails, and more than 1,000 acres of lakes and waterways. Our community's landscape provides countless opportunities to extend the life of mature trees. **LN.**



MOVE NONA

Beep co-founder Mark Reid's journey to Lake Nona was anything but direct. His family was relocating from Jamaica to the Orlando area, and Reid used a list of the top-ten neighborhoods in Central Florida as a road map to find their new home.

"After visiting nine different neighborhoods we spent a weekend at the Courtyard Marriott and Residence Inn at Lake Nona Town Center," said Reid. "The energy, experiences and technology throughout Lake Nona were unlike anything my family had ever encountered, and we knew immediately this is where we wanted to call home."

Reid immediately started planting roots in Lake Nona. His family found their new home with, "the perfect floor plan," in The Preserve at Laureate Park. Next, came a new business inspired by Lake Nona's innovative community. Not only was he inspired by Lake Nona, but Reid also knew the business would thrive within our collaborative community.

"My passion for finding cutting-edge ways to integrate technology to improve quality of life combined with Lake Nona's smart and connected community led to the creation of Beep, an autonomous mobility solutions provider," said Reid.

Within a year Beep has grown from one to 25 employees, and the company is prepping to expand with a brand new 10,000 SF space in Lake Nona Town Center.

Lake Nona has engaged Beep to bring the region's first autonomous shuttles to our community as part of Move Nona, a bold new approach to transportation providing Lake Nona residents and visitors with a variety of efficient and inter-connected way to get from place to place.

Reid stood with pride as the Move Nona autonomous shuttles officially launched last year at Laureate Park Village Center and told us it's just the beginning. **LN.**

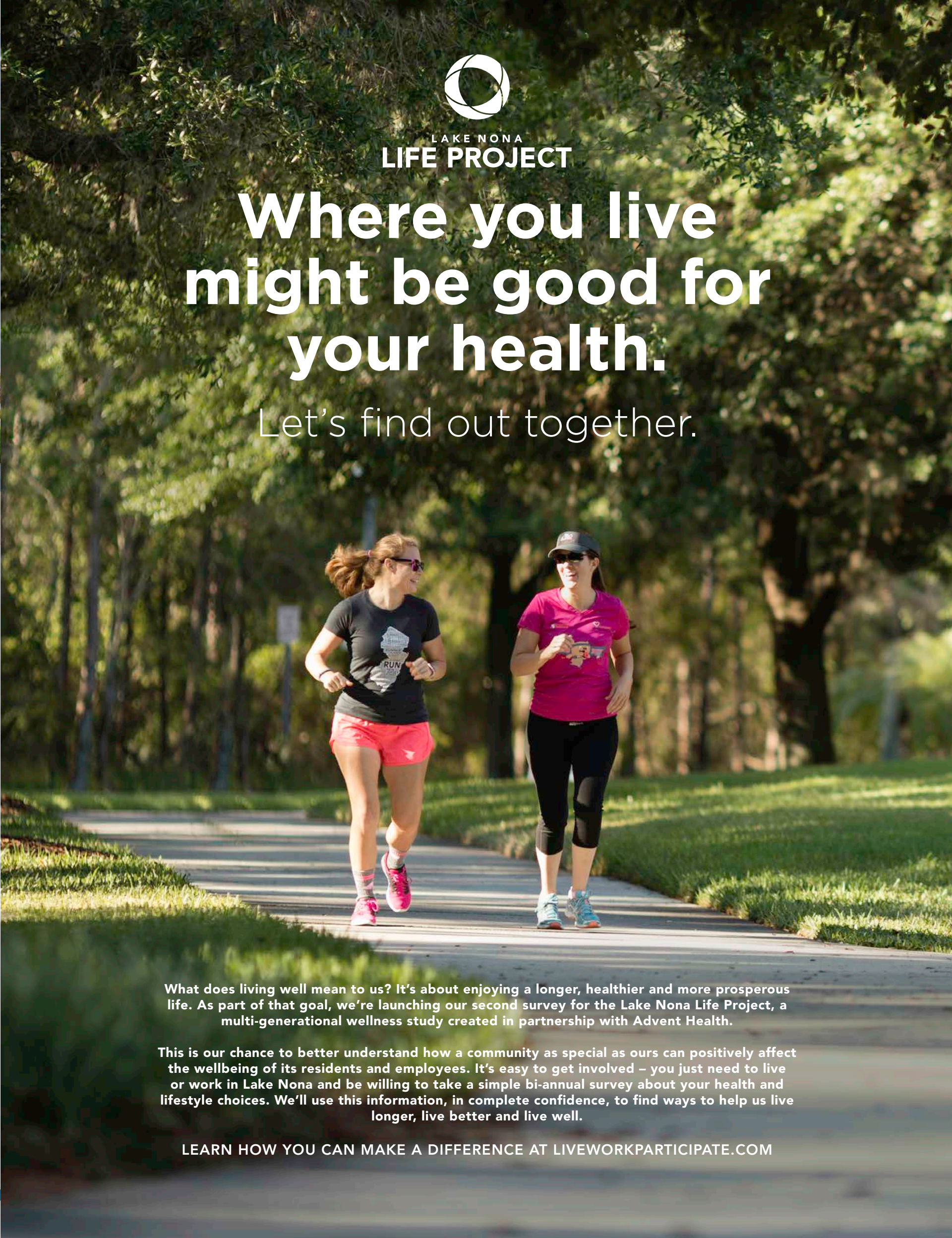
Experience the Move Nona autonomous shuttles for yourself now operating daily between Lake Nona Town Center and Laureate Park Village Center and other major points of interest within the community.

Follow @BeepMoveNona on Twitter for updates on routes and operating times.

LAKE NONA
LIFE PROJECT

Where you live might be good for your health.

Let's find out together.



What does living well mean to us? It's about enjoying a longer, healthier and more prosperous life. As part of that goal, we're launching our second survey for the Lake Nona Life Project, a multi-generational wellness study created in partnership with Advent Health.

This is our chance to better understand how a community as special as ours can positively affect the wellbeing of its residents and employees. It's easy to get involved – you just need to live or work in Lake Nona and be willing to take a simple bi-annual survey about your health and lifestyle choices. We'll use this information, in complete confidence, to find ways to help us live longer, live better and live well.

LEARN HOW YOU CAN MAKE A DIFFERENCE AT LIVEWORKPARTICIPATE.COM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GUIDEWELL
INNOVATION
CENTER
WHIT
SMART
HOME
AUTONOMOUS
SHUTTLES
GIGABIT
FIBER
LAKE NONA
IMPACT
FORUM

An Ecosystem for Collaborative Innovation

Lake Nona is a 17-square-mile community built on the premise that a collaborative effort can spark profound innovation. Designed and built from scratch, Lake Nona is anchored by clusters of excellence in wellbeing, sports and performance, education and technology.

This fast-growing, neo-urban environment was created with the building blocks for the future, and is pushing the boundaries of what it means to be a forward-thinking community. Connectivity, both physical and digital, is the main engine that powers Lake Nona's innovation ecosystem and is inspiring businesses, institutions and individuals to thrive.

From its technologically rich and innovative infrastructure to its globally recognized clusters of excellence, Lake Nona was created with a foundational strategy that guides not what is needed today, but what is going to be required decades from now to remain a healthy, vibrant and innovative community. **LN.**

WORLD-CLASS TRAINING

KPMG Lakehouse: Inspiring & Innovating

KPMG, a leading global professional services firm, provides audit, tax and advisory services to many of the nation's largest and most prestigious organizations. KPMG is widely recognized for being a great place to work and build a career. Its Orlando office, established in 1984, employs more than 150 partners and professionals. Expanding its footprint in the greater Orlando area, KPMG opened it's 55-acre professional learning, development and innovation center right here in Lake Nona earlier this year. *Continued on next page*

KPMG LAKEHOUSE IS A PLACE WHERE LEARNING EXISTS IN EVERYTHING, INNOVATION IS EVERYWHERE, CULTURE IS SHARED AND PEOPLE ARE INSPIRED.

For more information,

on Lakehouse or to view career opportunities, please visit:

INFO.KPMG.US/
KPMG-LAKEHOUSE.HTML

The new facility, which KPMG has named Lakehouse, will bring hundreds of new jobs to Lake Nona.

"We're so excited to bring our vision to reality at our new facility, and we're eager to be good neighbors and business partners in Lake Nona," said Sherry Magee, senior director of community relations at KPMG Lakehouse. "Lakehouse itself is exclusive to KPMG, but our people will be visible and active in our community."

We sat down with KPMG to find out a little bit more information about its newest project.

Q: What is Lakehouse and why did KPMG decide to invest in it?

A: KPMG Lakehouse is a learning and innovation center. It will be a place for KPMG professionals to gather—to renew skills, reflect on issues and opportunities, connect with colleagues and reinvigorate passion and purpose. After a visit at Lakehouse, our professionals will return to their work with a fresh perspective, ready to deliver value and make their mark.

We expect up to 800 KPMG partners and professionals will come to Lakehouse each week for hands-on, collaborative learning experiences.

We've invested in Lakehouse to support our greatest asset: our people. They are what differentiates us as a firm which allows us to excel in today's dynamic and global marketplace. By providing a space for our people to learn, innovate, and build KPMG culture, we are investing in the future of KPMG.

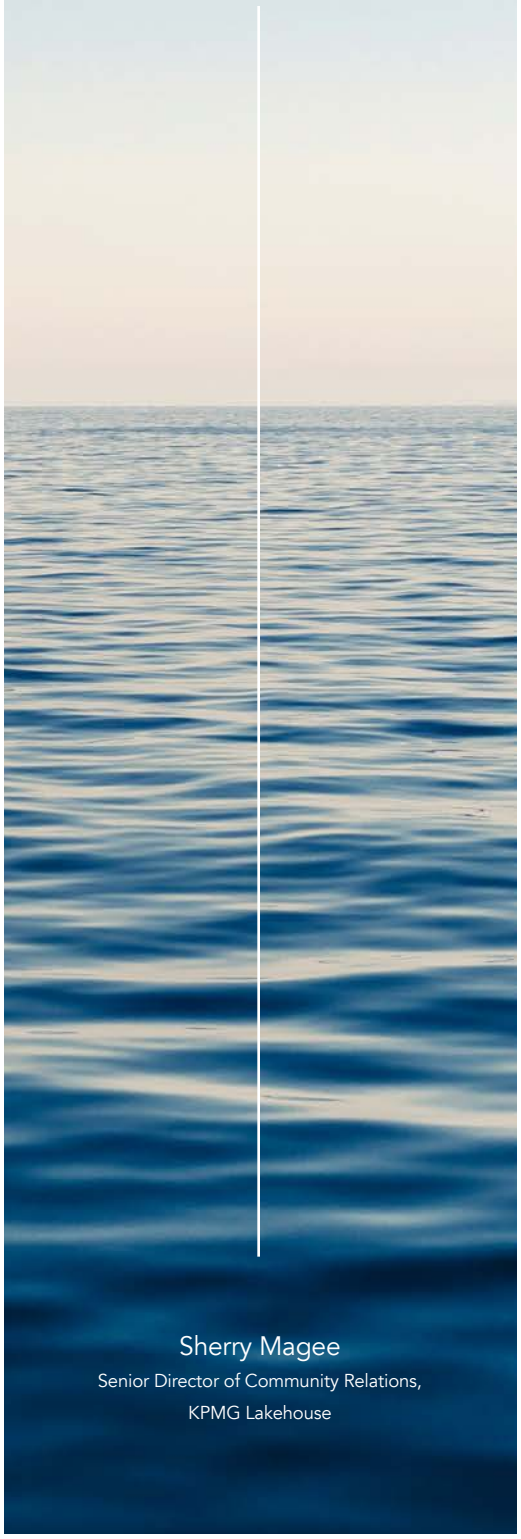
Q: Why did KPMG choose Lake Nona?

A: Site selection was very important as KPMG executives considered nearly 50 U.S. locations. KPMG leadership viewed the Lake Nona community as a thriving locale – an innovative, "smart city" with active and engaged residents and neighborhood business leaders. The Lake Nona community, conveniently located near Orlando International Airport, will allow our professionals and partners to experience lifelong learning and innovation at Lakehouse with minimal disruption to our clients.

Q: What type of innovation and technology will be displayed at Lakehouse?

A: Lakehouse will offer both in-person and digital courses to the KPMG partners and professionals learning and collaborating each week. Special mobile applications will provide learners with class registration, real-time schedules, wayfinding, dining and exercise options, as well as the ability to connect with other professionals. An Ignition Center featuring leading-edge, collaborative digital learning tools will create a fully immersive experience for our learners as they tackle challenges causing disruption for our clients.

"WE'RE SO EXCITED TO BRING OUR VISION TO REALITY AT OUR NEW FACILITY, AND WE'RE EAGER TO BE GOOD NEIGHBORS AND BUSINESS PARTNERS IN LAKE NONA."



Sherry Magee
Senior Director of Community Relations,
KPMG Lakehouse

Q: What are some of the features of Lakehouse?

A: Lakehouse will feature:

- 800 single-occupancy guest rooms
- 90 learning and innovation spaces
- A 1,000-seat assembly hall with design elements that reinforce the firm's rich heritage and culture
- An Ignition Center where professionals can meet with clients to explore potential disruptors, new business models and breakthrough solutions.

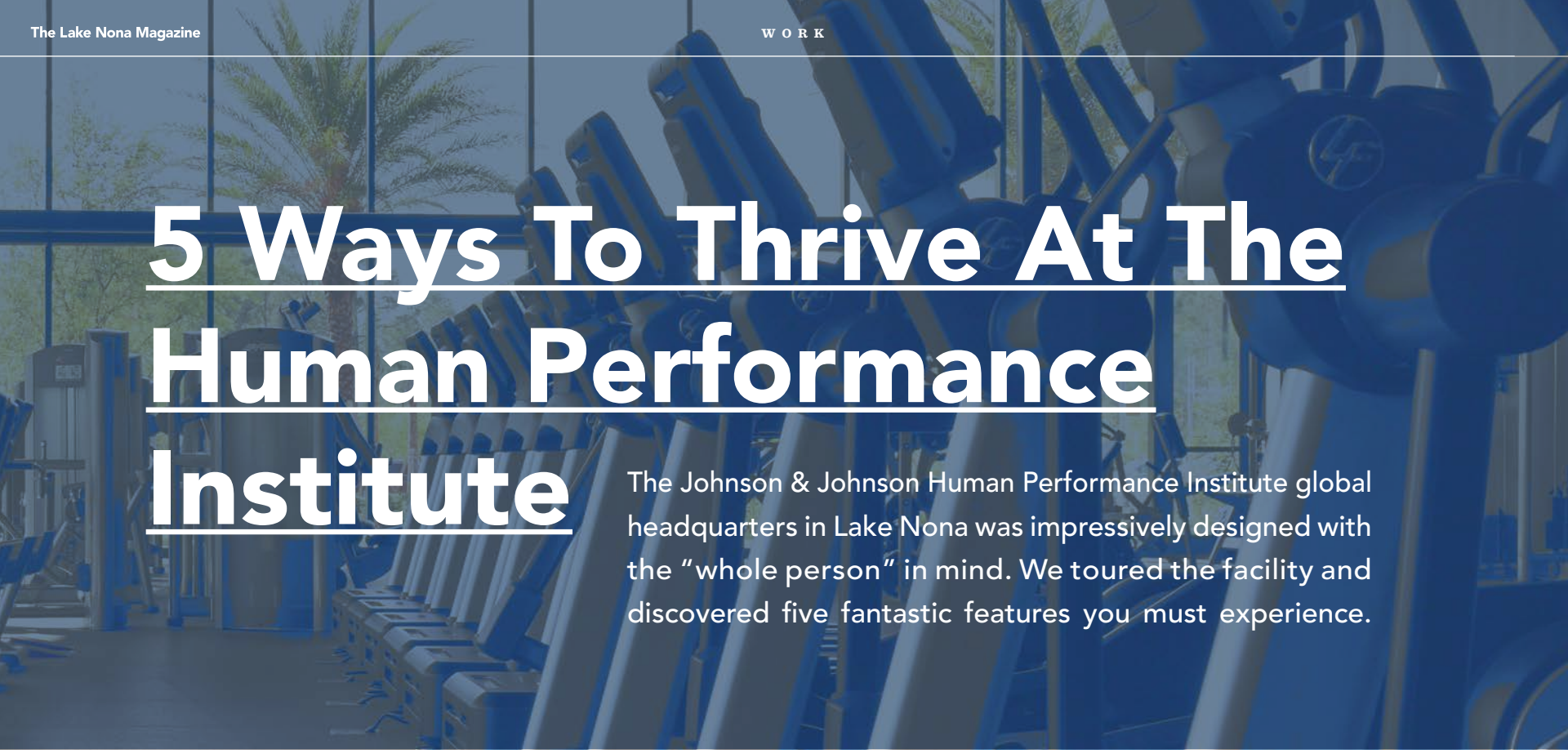
The 55-acre site will also include multiple dining areas, a separate social venue, and numerous fitness and recreational amenities to support the firm's focus on health and wellbeing.

Q: How important is sustainability at Lakehouse?

A: Sustainability is an essential part of the firm's business strategy, and Lakehouse was built with sustainability in mind. We followed the LEED (Leadership in Energy & Environmental Design) guidelines as a framework and targeted LEED Silver certification.

Other sustainability initiatives include:

- A commitment to operate on 100% renewable energy in 2020.
- Natural daylight will illuminate 90% of the interior spaces while energy efficient glazing on the windows will provide spectacular views and help keep the heat out.
- The main building will use 28% less energy than similar projects by optimizing mechanical systems and through the use of integrated building design technologies.
- 100% of irrigation on property will come from non-potable water sources. **LN.**



5 Ways To Thrive At The Human Performance Institute

The Johnson & Johnson Human Performance Institute global headquarters in Lake Nona was impressively designed with the "whole person" in mind. We toured the facility and discovered five fantastic features you must experience.

1

Every aspect of the LEED-certified training and research facility is designed to optimize human performance. The facility doubles the Human Performance Institute's teaching capacity and puts experience first from start to finish. Floor to ceiling windows create clear views of nature with natural light illuminating community spaces. The nod to nature continues the moment you step inside with a plant wall that welcomes guests. The biophilic, nature-connected design principles applied throughout can help reduce stress and improve wellbeing.

2

The Johnson & Johnson Human Performance Institute helps individuals and companies maximize energy and improve wellbeing. Professional athletes, corporate "athletes," and even hostage rescue teams have benefitted from the courses and enrollment is open to the public. Anyone can sign up for the programming, regardless of your job and the program lengths are flexible.

3

Participants in the 2.5 day performance course receive a sophisticated body composition analysis inside a Bod Pod, an air displacement plethysmograph that uses whole-body densitometry to determine body composition. The test is non-evasive and complete within five minutes. Trainers apply tailored coaching for participants using the individualized results.

4

The purpose is to unleash your full potential by blending sciences of performance psychology, exercise physiology, and nutrition to create a comprehensive behavior change solution. Participants learn about physical fitness, and receive tools to continue exercising after they leave.

5

As you move throughout the property there is a thoughtful approach to addressing physical, mental and emotional needs. Curated scent and sound inspiration energizes and relaxes participants at different points throughout the on-campus experience, drawing upon science that links smell and hearing to memory. **LN.**

DID YOU KNOW THAT YOU CAN MENTALLY RESET IN 16 SECONDS?

A scenic, mindfulness walking path outside of the Human Performance Institute guides you through a 16-second meditation, creating the opportunity for you to recover in today's 24/7 world.

Try it yourself with these simple steps: take a deep breath in, chin up, smile, exhale; deep breath in, shake your arms out, roll your shoulders, exhale; deep breath in, moment of focus, picture success, exhale; deep breath in, I am thankful for ____, hold that thought, and exhale.

Interested in attending a course and tapping into your optimal human potential? Visit:

www.humanperformanceinstitute.com

COMING 2021 TO
LAKE NONA TOWN CENTER

Precisely
you.

LAKE NONA
PERFORMANCE
CLUB

LAKENONAPERFORMANCECLUB.COM

ORLANDO

You Don't Know the Half of It

LAKE NONA

Orlando International Airport serves 50 million passengers annually, making it the 9th busiest airport in the U.S.

Lake Nona is one of the nation's **first gigabit fiber** communities, offering internet speeds 200 times faster than the average U.S. connection.

Orlando has over **$10 billion in infrastructure investments** underway.

Orlando has more than **5,000 restaurants** to tempt your taste buds.

Orlando has the highest concentration of simulation and training related activities in the country, setting the stage for virtual reality innovation in education, healthcare, defense training and more.

USTA's National Campus, is spread across 64 acres in Lake Nona. It is home to the USTA Player Development National Training Headquarters and USTA Collegiate Department and houses 100 fully lit courts.

Orlando is home to one of the only social enterprise accelerators in the country. The Central Florida Social Enterprise Accelerator connects social entrepreneurs with business training, mentorship and resources.

Only 20% of jobs in Orlando are from tourism and leisure. 80% of Orlando jobs are in diverse industries.

The Florida Interactive Entertainment Academy (FIEA) is the No. 1 ranked grad game design program by the Princeton Review for 2018.

UCF ranks among the nation's most innovative universities in the country, along with Harvard, Stanford and Duke, according to the U.S. News & World Report's Best Colleges of 2018 guide.

Orlando is one of 10 U.S. Department of Transportation autonomous vehicle (AV) proving grounds.

There are more than 500,000 higher education students within a 100-mile radius of Lake Nona, providing a rock-solid talent pipeline for companies in the region.

Cicso named Lake Nona one of only nine Iconic Smart + Connected communities in the world and the first in the nation.

Orlando is the fastest growing STEM job market in the nation – growing faster than Silicon Valley.

Full Sail University had 46 graduates credited on 11 Oscar Winning Films at the 2019 Annual Academy Awards.

Orlando was ranked No. 1 in job growth by the U.S. Bureau of Labor Statistics for 2015-2018, its population is growing by 1,500 people per week.

NeoCity in Osceola County is a 500-acre, master-planned technology district that is poised to be the "sensor technology hub, industry cluster and global center of excellence in the State of Florida – and beyond."

UCF's Institute for Simulation & Training developed the nation's first master's and PhD programs in simulation and human performance enhancement.

The National Training Center in Clermont has hosted thousands of athletes from more than 25 countries, hundreds of colleges and dozens of Olympic athletes in various sports for training and events.

Rollins College is the oldest college in Florida and the nation's premier liberal arts college. LN.

Source: Orlando Economic Partnership

Art.

ART IS IN OUR DNA

At the heart of every good community is a blend of arts and culture. From public art installations and live music to cinema events and access to Orlando's greatest artistic institutions, Lake Nona offers plenty of chances to kick back, relax, and be inspired by work from some of the most iconic artists of our times. In Lake Nona, arts and culture are truly part of our DNA.

As master planners, Tavistock Development Company recognizes the value the arts play in shaping a community. It's not just the hardware – buildings, roads, and homes – it's the software – community events, public art, and live entertainment – that truly activates a space and makes it memorable. And that's our goal, to engage people at a higher level so they leave the places we create with a sense of belonging.

Tavistock's thoughtful planning has made Lake Nona an innovative community known for doing things differently and doing them better. Prioritizing art ensures unique, memorable experiences for people in Lake Nona.

The arts are also an important part of achieving Lake Nona's mission to inspire human potential. The wellbeing of residents, employees, and visitors is a priority that's illustrated in everything we do from hosting a longitudinal health study to the way we design neighborhoods. Studies have shown the arts make valuable contributions to health and wellbeing, so it's another factor in planning the community. And when people engage with art, it also stimulates learning.

The priority is to find the best artists to bring the spaces to life and to incorporate not only different artists but different art forms from sculptures, murals, live performance and music to digital art with projection-mapping.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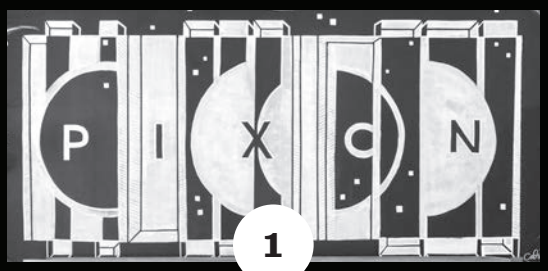


1

Pixon Chalk Board Mural

Carissa Bloemeke may be a local graphic designer by day, but by night she is a painter and a muralist, and those talents are why she was commissioned to create a full-size chalkboard wall mural at the Pixon Apartment lobby. Bloemeke wanted to create a mural that created a unique and different space.

2

Glass House

Situated in Laureate Park near Canvas Restaurant & Market is *Glass House*, a stunning work of installation art conceived and constructed by Brooklyn-based artist Tom Fruin. It utilizes reclaimed materials and pulls cues from sustainable urban design and American folk art, all while eliciting the spiritual qualities of stained glass.

3

Beacon and *Code Wall*

At the heart of Lake Nona's Town Center stands *The Beacon* and *Code Wall* by Lake Nona resident and public artist JERFE. *The Beacon* is a six-story landmark that comes to life at night with a visual experience of video, music and interactive elements. Alongside stands *Code Wall*, an installation of specialized dichroic glass with imagery and messages written in binary code.

4

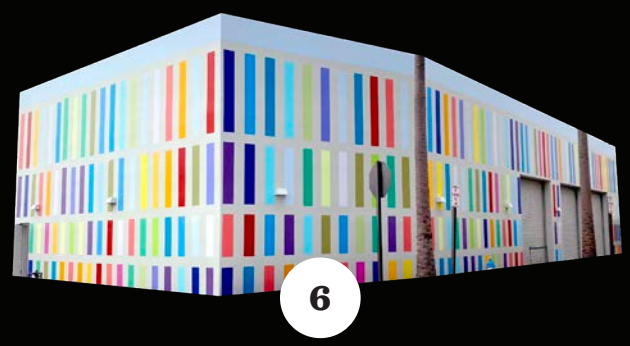
Pixon Exterior Mural – *Equinox*

When Lake Nona sought an artist in 2018 for this project, Cecilia Lueza's winning entry certainly caught our eye. "For this piece, I wanted to incorporate that Florida vibe and also capture the dynamics of everyday life and create a sensation of movement with shapes and color," said Cecilia.

5

Disco Dog Sculpture

The 35-foot tall, 3,100-pound stainless steel sculpture was designed by local Lake Nona artist JEFRE. The sculpture was inspired by Lake Nona, with the fractal, reflective surface replicating the water/waves of the community's namesake – Lake Nona. The sculpture is meant to welcome residents and guests as they enter Town Center.



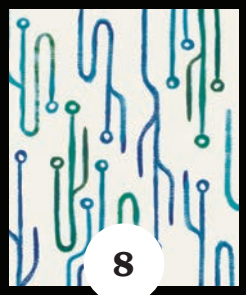
6

Chiller Plant Mural – *Prismatic*

The mural's cascade of color transforms the utilitarian chiller plant into a instagram-worthy artistic display. The mural designer, Carissa Bloemeke, was inspired by a deconstructed prism. The picture-perfect *Prismatic* mural plays off of the visual where interacting light creates a spectrum of different colors.

Pixon Ceiling Mural

Columbian graffiti artist LeDania was inspired by Lake Nona itself for the ceiling art found inside Pixon's main lobby. She wanted to create a feeling of looking at a reflection of Lake Nona and the sky for her mural.



LeAD 5G Artwork

Printed wall art designed by Carissa Bloemeke in the 5G Accelerator co-working space. The art is inspired by circuit board patterns found in technology, and geometric patterns taken from acceleration graphs.

Global Angel Wings Project

Colette Miller created the Global Angel Wings Project in 2012, in the streets of Los Angeles, the "City of Angels." They were painted to remind humanity that we are the angels of this earth. Colette has painted wings globally and right here in Lake Nona Town Center.

Pixon Fitness Room – Murals

Hand-painted and vinyl-printed murals designed by Carissa Bloemeke add color to the fitness room of Pixon Apartments. The murals are meant to add energy to the room and motivate those who are utilizing the amenity.

Nature Sculptures

Created in Argentina, the sculptures were all made from re-used materials in the region. Measuring 10-feet high and each weighing in at 600-700 pounds, the artist Vanessa Mazza was inspired by the nature and wildlife native to her home in southern Argentina.

Fusion

Fusion, is a sculpture by Lake Nona public artist JERFE. The piece is located on the exterior lounge of Chroma Modern Bar + Kitchen, which harnesses its inspiration from the restaurant's colorful small plate menu and serves as an artistic extension of *The Beacon* and *Code Wall*. **LN.**


USTA
NATIONAL
CAMPUS

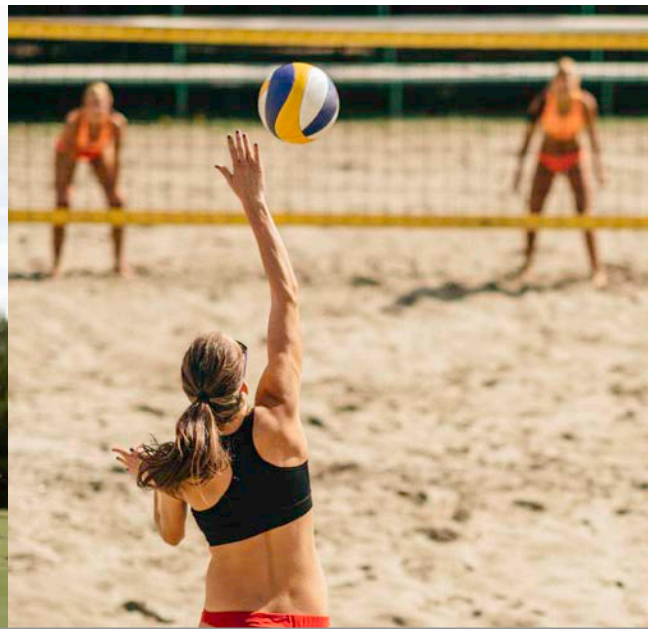
Lake Nona is Built for World-Class Athletes

It's no surprise considering the year-round warm weather, sunshine and the world-class training facilities we have in our community

ONSITE TRAINING FACILITIES INCLUDE:

LAKE NONA GOLF & COUNTRY CLUB
LAKE NONA PERFORMANCE CLUB
NONA ADVENTURE PARK
PHIL DALHAUSSER BEACH VOLLEYBALL ACADEMY
USTA NATIONAL CAMPUS
USTA-FL & USPTA
XL SOCCER

Lake Nona also offers places for amateur athletes and sports enthusiasts to hone their skills and achieve peak performance through access to community gyms, memberships to a wide-range of fitness offerings and miles of public-use trails.



learn more

Lake Nona Information Center
Located inside
Canvas Market at:

13615 Sachs Avenue
Orlando, FL 32827
E-mail: info@lakenona.com
Phone: 407.888.6500

let's be friends

@LearnLakeNona

APPENDIX - E
FAU TECH RUNWAY

The Palm Beach Post

BOYNTON BEACH

Boynton Beach signs deal with FAU to bring startup business incubator hub to City Hall

Jorge Milian Palm Beach Post

Published 7:00 a.m. ET Jul. 30, 2021

BOYNTON BEACH — Florida Atlantic University and the city of Boynton Beach have formed a partnership with the aim of producing homegrown entrepreneurs and businesses.

FAU founded Tech Runway in 2014 to provide mentoring, networking, investor access and other programs designed to assist startup companies. It has signed a lease for a 1,850-square foot space inside City Hall to develop a business incubator.

Since its inception, Tech Runway has helped launch 117 companies that have generated $278 million in revenue and created 642 jobs, according to FAU.

More Boynton news: Boynton rejects developer's $350 million downtown project pitch

Biking in Boynton: Bicyclists' group wants warning signage on Lyons Road, but county calls that 'a bad idea'

"I'm almost speechless," said Commissioner Ty Penserga, who earned a master's degree in integrative biology from FAU. "It's a full-circle moment for me. I went to FAU for many years and it changed my life. (Tech Runway is) going to do that for so many more people."

The commission voted 4-0 to approve the lease.

Tech Runway has helped birth several economic success stories, including Fort Lauderdale-based ShipMonk, which provides companies with inventory management tools. The business was started by FAU student Jan Bednar in 2014 out of his dorm room.

Bednar designed his business plan with consultants at Runway Tech and the company has grown exponentially, generating $140 million in revenue during 2020. It also employs more than 1,000 people.

Jessica Beaver, Tech Runway's associate director, said the incubator space in City Hall is expected to be in operation by Oct. 1. Applications, which must include a business plan, won't be accepted until January. Information about the application process will be made available on the Tech Runway website.

The program has its headquarters in a 28,000-square foot building next to the runway at Boca Executive Airport – hence the name – and works with 25 to 30 budding entrepreneurs annually, Beaver said. The year-long program includes a 16-week entrepreneur "boot camp."

Tech Runway does not hold equity in any business it helps to develop.

"These are not our businesses," Beaver said. "All we do is provide the resources and support for them to continue building their businesses. We just hold their hands and say, 'Here are all these amazing resources.' "

The biggest hurdle for startups, Beaver said, is access to capital. A good idea is only that until an investor is willing to make it a reality.

"When you have somebody that has a prototype and is looking to raise funds, that's difficult," Beaver said. "But that's where we come in ."

The space being used by Tech Runway was set aside by the city commission in September 2019 during construction of the new City Hall.

"We have a lot of vacant retail locations that we want to find tenants for," Mayor Steven Grant said last week.

FAU will pay $1,800 monthly to lease the first-floor space from Boynton Beach. If the lease is renewed, FAU will pay an additional 3% monthly per renewal period, according to the agreement.

The city commission voted unanimously on July 20 to award $50,000 grant to Tech Runway for programming at the City Hall facility.

jmilian@pbpost.com

@caneswatch

APPENDIX - F
CITY OF NORTH MIAMI
MUNI-CODE

Article 4. – Zoning Districts:

Sec. 4-302. - Planned development districts: PD-1, PD-2 and PD-3.

A. Purpose and applicability. The purpose of the above-listed planned development districts is to provide a means of:

1. Promoting greater innovation and creativity in the development of land.

2. Ensuring that the location of mixed-use development outside of the NRO is appropriate and compatible with adjacent land uses in accordance with the goals, policies and objectives of the comprehensive plan.

3. To promote a more desirable community environment through approval as a rezoning and the issuance of a conditional use permit.

4. A planned development district shall not be approved in an R-1 or R-2 district.

B. Development standards. The city council may approve a planned development subject to compliance with the development criteria and minimum development standards set out in this section.

1. Uses permitted:

Accessory uses, incidental, subordinate or related to any of the below uses.

Active and passive parks and open space;

Adult living facilities (ALF);

Community facilities;

Educational facilities;

Hospitals and/or medical facilities;

Hotels;

Recreation/entertainment indoor and outdoor;

Nightclubs;

Office;

Public uses;

Recording and TV/radio/film;

Religious institutions;

Residential;

Restaurants;

Research and technology;

Retail sales and service;

Service station as an accessory use;

Vehicle sales/displays and vehicle service (only within a PD greater than thirty (30) acres in size);

Mixed-use—Any combination of three (3) or more permitted uses, one of which must be residential.

2. Minimum development standards. Any parcel of land for which a planned development is proposed must conform to the following minimum standards:

a. Minimum site area. The minimum site area required for a planned development shall be not less than two (2) acres.

b. Configuration of land. The parcel of land for which the application is made for a planned development shall be a contiguous unified parcel with sufficient width and depth to accommodate the proposed use. The minimum average width and or depth for any planned development shall be one hundred (100) feet.

c. Density. The density requirements shall be in accordance with the provisions of the applicable land use classifications in the comprehensive plan as follows:

Maximum density (without bonuses under the provisions below):

PD-1: 25 du/acre;

PD-2: 40 du/acre;

PD-3: 45 du/acre;

Hotels: for parcels less than fifty (50) acres, not exceeding double the number of permitted dwelling units with at least ten (10) percent of the floor area to be office, retail or residential.

Other uses: density consistent with comprehensive plan land use category.

d. Bonus density for mixed-use (outside the NRO): additional density may be granted up to fifteen (15) dwelling units per acre through conditional use approval.

e. Height:

PD-1: fifty-five (55) feet;

PD-2: seventy-five (75) feet;*

PD-3: one hundred ten (110) feet;

Other uses: refer to comprehensive plan land use category.

* Exception: The property formerly referred to as the Munisport or Biscayne Landing parcel and now known as Sole Mia, which is bounded to the north by NE 151st Street, to the south by NE 137th Street, to the east by Bay Vista Boulevard, and to the west by Biscayne Boulevard, shall be permitted up

to 450 feet of building height above the parking pedestal. In such instance, the height of the parking pedestal shall be set as part of the conditional use permit.

f. Mixed uses. Mixed uses within a planned development shall be a compatible and complementary combination of office, hotel, multifamily and retail or any three (3) or more combination of permitted uses (one of which must be residential) which shall be oriented to the needs of the district in which the development is located.

g. Open space. The minimum open space required for a planned development shall be not less than twenty (20) percent of the parcel proposed for development.

h. Design requirements. All buildings within a planned development shall conform to the following:

i. The design requirements in article 5, division 8 of these LDRs;

ii. Architectural relief and elements (e.g., windows, cornice lines, etc.) shall be provided on all sides of buildings visible to the public;

iii. Facades in excess of one hundred fifty (150) feet in length shall incorporate design features such as: staggering of the facade, different window treatments and use of architectural elements such as vertical features; and

iv. Parking garages shall include architectural treatments compatible with the principal use and comply with the parking requirements of these LDRs.

i. Perimeter and transition. Any part of the perimeter of a planned development which fronts on an existing street or open space shall be so designed as to complement and harmonize with adjacent land uses with respect to scale, density, setback, bulk, height, and screening. Height and setbacks for properties that are adjacent and/or abutting land in the R-1 and R-2 districts shall comply with the height/setback requirements for multifamily and nonresidential development which are adjacent and/or abutting such land in the R-1 and R-2 districts, as provided in these LDRs..

j. Minimum street frontage; building site requirement, number of buildings per site, lot coverage and all setbacks. There shall be no specified minimum requirements for street frontage, building sites, number of buildings or lot coverage within the development.

k. Building frontage. Nothing in this section shall be construed as prohibiting a building in a planned development from fronting on a private street when such buildings are shown to have adequate access in a manner which is consistent with the purposes and objectives of these regulations and such private street has been reviewed by the planning commission and approved by the city council.

l. Accessory uses and structures. Uses and structures which are customarily accessory and clearly incidental to permitted uses and structures are permitted in a planned development. Any use permissible as a principal use may be permitted as an accessory use, subject to limitations and requirements applying to the principal use.

m. Signs. The number, size, character, location and orientation of signs and lighting for signs for a planned development shall be governed by a comprehensive sign program for the project or the portions thereof seeking, and as part of, a conditional use permit.

n. Refuse and service areas. Refuse and service areas for a planned development shall be designed, located, landscaped and screened and the manner and timing of refuse collection and deliveries, shipment or other service activities so arranged as to minimize impact on adjacent or nearby properties or adjoining public ways, and to not impede circulation patterns.

o. Ownership of planned development. All land included within a planned development shall be under contract or owned by the applicant requesting approval of such development, whether that applicant be an individual, partnership or corporation, or groups of individuals, partnerships or corporations. The applicant shall present proof of the unified control of the entire area within the proposed planned development or, provide a declaration of restrictive covenants or covenant in lieu or an agreement stating that if the owner(s) or its successor or assigns proceeds with the proposed development they will:

Develop the property in accordance with:

i. The final development plan approved by the city council.

ii. Regulations existing when the Planned Development Ordinance is adopted.

iii. Such other conditions or modifications as may be attached to the approval of the conditional use permit for the construction of such planned development.

p. Provide agreements and declarations of restrictive covenants acceptable to the city council for completion of the development in accordance with the final development plan as well as for the continuing operation and maintenance of such areas, functions and facilities as are not to be provided, operated or maintained at general public expense and which bind the successors and assigns in title to any commitments made under the provisions of the approved planned development.

q. Easements. The city council may, as a condition of planned development approval, require that suitable areas for easements be set aside, dedicated and/or improved for the installation of public utilities and purposes which include, but shall not be limited to water, gas, telephone, electric power, sewer, drainage, public access, ingress, egress, and other public purposes which may be deemed necessary by the city council.

r. Installation of utilities. All utilities within a planned development including but not limited to telephone, electrical systems and television cables shall be installed underground.

s. Other development standards, such as lot dimensions, setbacks, distances between buildings, open space and construction phasing shall be determined by the city council, upon recommendation of the planning commission, with due regard for the standards in subsection C. below, the surrounding areas, sound planning principles, and the public health, safety and welfare.

t. Modification or alteration. The development standards hereof may be modified or altered by the city manager if it is determined that the granting of the modification or alteration furthers the purpose and applicability of the planned development by promoting greater creativity, flexibility and innovation in the development of the land involved. Only minor modifications or alterations may be adjusted under this subsection, pursuant to the standards used in sections 3-206 (substantial compliance determinations) and 3-409 (conditional use approval).

C. Required findings. The planning commission shall recommend to the city council the approval, approval with modifications, or denial of the plan for the proposed planned development. Such recommendation shall include not only conclusions but also findings of fact related to the specific proposal and shall set forth with particularity in what respects the proposal would or would not be in the public interest. These findings shall include, but shall not be limited to the following:

1. In what respects the proposed plan is or is not consistent with the stated purpose and intent of the planned development regulations and the comprehensive plan.

2. The extent to which the proposed plan departs from the zoning and subdivision regulations otherwise applicable to the subject property including, but not limited to, density, size, area, bulk and use, and the reasons why such departures are or are not deemed to be in the public interest.

3. The extent to which the proposed plan meets the requirements and standards of the planned development regulations.

4. The physical design of the proposed planned development and the manner in which said design does or does not make adequate provision for public services, provide adequate control over vehicular traffic, provide for and protect designated common open areas, and further the amenities of light and air, recreation and visual enjoyment.

5. The proposed planned development is consistent with the applicable standards of these LDRs;

6. The character, location and size of the land proposed to be designated is appropriate for planned development; and

7. The conditions of development approval assure that the future use of the property will be compatible with existing and future land uses on adjacent properties.

D. Application requirements. In addition to application requirements provided by administrative regulation, the following plans and specifications shall be required to be submitted with an application for approval of a planned development district and shall be reviewed and approved pursuant to the applicable provisions of these LDRs:

1. A reproducible plot plan drawn to scale of not less than one (1) inch equals twenty (20) feet, containing the following data:

a. Name and address of the applicant and of all persons owning any or all of the property proposed to be used.

b. Location of property involved in the form of a vicinity diagram.

c. Legal description of property.

d. All proposed facilities and/or uses.

e. The property dimensions.

f. Topography.

g. All buildings and structures and their locations, elevations, sizes, heights and proposed uses.

h. Location and design of recreation areas.

i. Yards and spaces between buildings.

j. Walls and fences and their location, height and materials.

k. Landscaping, including location, type, and proposed disposition of existing trees.

l. Offstreet parking, including the location, number of stalls, dimensions of the parking facility, and internal circulation system.

m. Access, pedestrian, vehicular, and service, points of ingress and egress, and driveway locations and dimensions.

2. Landscape and irrigation plans. A detailed, landscaping plan indicating the type and size of trees, shrubs, ground cover, and other horticulture, as per the landscaping requirements of these LDRs, shall be submitted along with a detailed irrigation plan showing the location, size, and method of irrigation facilities.

3. Phasing plans. A progress plan delineating the various development phases, if more than one (1), and specifying a reasonable time allocation for each phase shall be submitted to and approved by the city council, pursuant to a recommendation of the planning commission. The total area of open space and/or recreation facilities provided in each phase shall, at a minimum, be in a similar proportion as in the entire development.

4. Impact analysis:

a. A cost-benefit feasibility study by an independent, qualified economist indicating community needs and/or benefits of the proposed development.

b. A school impact study by an independent, qualified person or firm or school district staff indicating the effect of the proposed development upon the public school system.

c. A traffic impact study prepared by a licensed traffic engineer, showing the impact of the proposed development on the surrounding area, the traffic potential to be generated by the development, the adequacy or inadequacy of existing streets to safely carry the predicted traffic loads, necessary changes in the street system or design caused by the development, projected costs of such improvements which may not be borne by the developer.

d. A utility impact study including the impact of the proposed development and needed public and private services including, but not limited to, water, sanitation, fire protection, and drainage.

5. Bonding or financial guarantee. Prior to the issuance of a building permit, the person or firm proposing the development shall deposit with the department of community planning and development a cash bond, surety bond, or time-deposit bond in an amount equal to one hundred ten (110) percent of the estimated cost of any and all improvements which may be required within dedicated rights-of-way and/or public facility easements to insure the placing and funding thereof.

(Ord. No. 1278, § 1(exh. 1), 4-28-09; Ord. No. 1322, § 1, 10-25-11; Ord. No. 1328, § 1, 2-14-12; Ord. No. 1347, § 1, 1-22-13; Ord. No. 1442, § 1(exh. 1), 9-10-19)

Editor's note— Ord. No. 1328, § 1, adopted February 14, 2012, enacted provisions intended for use as subsection B.2.n. Inasmuch as there are already provisions so designated, and at the discretion of the editor, said provisions have been redesignated as subsection B.2.t.

Sec. 4-304. - Public use (PU) district.

A. Purpose. The purpose of the PU district is to allow the development of publicly owned or used lands in an efficient, innovative, and flexible way in order to maximize the benefit to the public of the use of the lands designated for public use.

B. Uses permitted. Subject to obtaining a conditional use permit in accordance with the applicable provisions of these LDRs, the following uses are permitted in the public use district:

1. Government use.
2. Docks and marinas.
3. Parks and preservation lands.
4. Public facilities.
5. Uses accessory to the permitted uses.
6. Community facilities.
7. Educational facilities.

(Ord. No. 1278, § 1(exh. 1), 4-28-09; Ord. No. 1296, § 1, 5-25-10)

Sec. 4-305. - Neighborhood redevelopment overlay (NRO) district.

A. Purpose. The purpose of the NRO is to provide for the redevelopment of the urban core of the city through regulations and incentives that are designed to achieve the redevelopment, economic development, housing choice, and multi-modal transportation objectives and policies of the comprehensive plan, while protecting important residential areas of the city.

B. Effect of overlay. The development standards of the underlying zoning districts shall govern except to the extent any provision of this NRO district conflicts with the provisions of an underlying zoning district, and in such event the provisions of this NRO district shall control.

C. Uses.

1. In addition to the uses permitted in the underlying zoning districts, the following uses are permitted in the NRO district:

NEIGHBORHOOD REDEVELOPMENT OVERLAY DISTRICT

Uses Permitted in Addition to Uses Permitted in Underlying Zoning District		
Permitted Uses	Entire District	Major Corridor (PCD)
Residential	X	X
Mixed-Use	X	X
Retail Sales and Service		X
Accessory Uses	X	
Community Facilities		X
Educational Facilities		X
Hotels		X

2. Prohibited uses:

Automobile service uses;

Adult entertainment business;

Drive throughs.

D. Development standards.

1. Transition standards for development within the NRO and residential land use category in the comprehensive plan shall be as set forth herein. These transitional standards are in to all other applicable development standards set forth in Sections 4-306, 5-802 and 5-803 of these LDRs for developments located along the city's major corridors within the PCD.

2. An application for development approval within the NRO district may be allocated units and commercial square footage from the available pool provided that the application conforms in other respects to the provisions of the NRO district, the density for the proposed development shall not exceed the permitted density in the underlying district unless it qualifies for a density bonus under the provisions set forth herein, and subject to a conditional use permit approval by the city council and DRC site plan approval.

3. Density bonus. Additional density may be granted through conditional use approval. The community planning and development director shall track the number of dwelling units approved through use of the density pool established in 4-205, and report annually thereon.

NEIGHBORHOOD REDEVELOPMENT OVERLAY DISTRICT	
Maximum Density With Bonuses (Dwelling Units Per Acre)	
Not Located on a Major Corridor	Frontage Along a Major Corridor (PCD)
90 du/ac	100-125 du/ac; Subject to Sec. 4-306 (D)

DENSITY WHICH IS GREATER THAN PERMITTED BY UNDERLYING ZONING DISTRICT ONLY BY BONUS APPROVED AS A CONDITIONAL USE

4. Height.

Height	Permitted as of Right	With Bonus (TOD, Brownfields, Green Building)
	ninety (90) feet	+ twenty (20) feet
TRANSITIONAL STANDARDS		
Setback	1. Structures with a height of greater than thirty-five (35) feet proposed to be developed on parcels of land which are adjacent to existing single-family dwellings shall set back twenty-five (25) feet from the property line.2. No surface parking lot shall be located within seven and one-half (7½) feet of any property line. 3. Additionally, any development along NE 123rd Street shall have a minimum setback of 35 feet and a maximum height of 55 feet.	

5. Height bonus along major corridors

HEIGHT BONUS PROVISIONS*			
	Designed to Achieve LEED Certified	Designed to Achieve LEED Silver	Designed to Achieve LEED Gold or greater
Height Bonus with #25 du/ac density bonus	20 feet	25 feet	30 feet
Height Bonus with > 25 du/ac density bonus	30 feet	35 feet	40 feet
Height Bonus with 15% affordable/workforce units	20 feet	30 feet	40 feet

*Portions of a building above thirty-five (35) feet shall be set back an additional one (1) foot for every two (2) feet of height above thirty-five (35) feet.

7. Lot coverage and open space:

a. Maximum eighty (80) percent lot coverage and a minimum district-wide open space of twenty (20) percent.

b. Minimum on-site open space in the event the district-wide open space is less than twenty (20) percent: twenty (20) percent.

8. Setbacks. In addition to the required setbacks in the underlying zoning district, if the property is adjacent to an existing single-family dwelling, the minimum setback for multifamily structures shall be twenty-five (25) feet and parking areas shall be seven and one-half (7.5) feet.

9. Corridor standards. Parks, plazas, pedestrian access, civic and cultural activities and amenities shall be encouraged along major corridors in the NRO district.

(Ord. No. 1278, § 1(exh. 1); Ord. No. 1442, § 1(exh. 1), 9-10-19)

Sec. 4-306. – Planned Corridor Overlay District (PCD).

A. Purpose. The purpose of the PCD is to encourage a compact, high-intensity mix of residential, commercial, employment, and civic-institutional uses to support transit use, reduce single-occupancy vehicle use, increase pedestrian activity and improve access and mobility.

B. Effect of overlay. The development standards of the underlying zoning districts shall govern except to the extent any provision of this PCD district conflicts with the provisions of such underlying zoning district, in which event the provisions of this NRO district shall control. Furthermore, the PCD district shall take precedence over any other overlay district.

C. General location. As identified on the zoning map, the PCD is applied to the following major corridors: State Road 7/NW 7th Avenue, NE 6th Avenue, Biscayne Boulevard, West Dixie Highway and NE 125th Street (as depicted on the zoning map).

D. Standards. The permitted uses, density and intensity of uses within the various corridors are governed by the underlying land use designations of the subject property; notwithstanding the foregoing, parcels within the PCD are subject to the following:

1. State Road 7/NW 7th Avenue.

a. Height: Up to 200 feet on the east side of the corridor, including parking levels and compatible building transitions and setbacks. On west side: maximum 55'.

b. Mixed-use is allowed along the corridor with a permitted density of up to 125 du/acre, including floating units. Allocation is subject to the availability of floating units, and pursuant to a conditional use permit.

c. Maximum lot coverage: 80%

d. Development within the area bounded by NW 119th Street to the south and NW 135th Street to the north shall be subject to the design guidelines established for the Chinatown Cultural Arts and Innovation District Master Plan.

2. NE 6th Avenue.

a. Height: 110 feet, including parking levels and compatible building transitions and setbacks.

b. Density: 100 du/acre, subject to the availability of floating units. Such floating units require a conditional use permit.

c. Maximum lot coverage: 80%

3. Biscayne Boulevard.

a. Height: 110 feet, including parking levels and compatible building transitions and setbacks, with an available bonus of forty (40) feet. (Please note that the east side of Biscayne Boulevard commercial corridor beginning at NE 123rd Street north to NE 135th Street, is NOT included in the PCD and, pursuant to article 4, division 2, Section 4-302(B)(1) of these LDRs, all development fronting this segment of the Biscayne Boulevard corridor shall be limited to a maximum height of 45 feet).

b. Density: Up to 125 du/acre (limited to the west side), including floating units, subject to availability of floating units. Such floating units require a conditional use permit.

c. Land use: Mixed-use (3 or more uses, one of which must be residential).

d. Maximum lot coverage: 80%.

4. West Dixie Highway.

a. Height: 110 feet, including parking levels and compatible building transitions and setbacks.

b. Density: Up to 100 du/acre, including floating units. Such floating units require a conditional use permit.

c. Land use: Mixed-use (3 or more uses; one of which must be residential).

d. Maximum lot coverage: 80%.

5. NE 125th Street.

a. Height: 110 feet within the NRO, including parking levels and compatible building transitions and setbacks.

b. Density: Up to 100 du/acre, including floating units. Such floating units require a conditional use permit.

c. Land use: Mixed-use (3 or more uses; one of which must be residential).

d. Maximum lot coverage: 80%.

E. Transitions and setback.

1. Structures with a height of greater than thirty-five (35) feet proposed to be developed on parcels of land which are adjacent to existing single-family dwellings shall set back twenty-five (25) feet from the adjacent property line.

2. Portions of a building above thirty-five (35) feet shall set back an additional one (1) foot for every two (2) feet of height above thirty-five (35) feet.

3. No surface parking lot shall be located within seven and one-half (7½) feet of any property line.

(Ord. No. 1440, § 1, 6-25-19)

Sec. 4-308- Regional activity center (RAC).

A. Purpose. The purpose of the RAC is to encourage and promote large-scale development and redevelopment as well as small parcel infill development and redevelopment that facilitate a balanced mix of land uses by providing maximum flexibility for development and redevelopment activities.

B. General location. The RAC totaling approximately one thousand seven hundred thirty-nine (1,739) acres, is generally bound by Biscayne Bay to the east, NE 163rd Street to the north, Biscayne Boulevard to the west, and NE 135th Street to the south, excluding property not located within the city limits of North Miami. The boundaries of the proposed regional activity center also include the area west of Biscayne Boulevard generally bound by 151st Street to the north, NE 18th Avenue to the west, FEC rail corridor to the east and NE 137th Street and NE 140th Street to the south (as depicted on the City's official Zoning Map).

C. Permitted uses. The permitted uses and density and intensity of uses within the RAC shall be governed by the underlying zoning districts of the subject property. All future development within the regional activity center shall be compact, high intensity, high-density multi-use development designated as appropriate for intensive growth by the city and may include: residential; commercial; office; cultural and community facilities; educational facilities; recreational and entertainment facilities; hotels or motels; transportation facilities; utilities; research and development uses; health care services and appropriate industrial activities.

D. Development limits. The RAC is approved for the following development limits consistent with F.S. § 380.06(2):

5,000 Residential units;

400 Hotel rooms;

1043 acres Oleta State Park;

1,500,000 sq. ft., Industrial;

1,050,000 sq. ft., Office;

1,500,000 sq. ft., Commercial;

1,776 students (K—8) School use;

1,200 students (9—12) School use; and

8,199 University students—Florida International University.

Sec. 4-309- Special development and transit-oriented development overlay (SDTOD).

A. Purpose. The primary purpose of the SDTOD is to accommodate compact, high-intensity, high-density mixed-use development and redevelopment featuring an attractive, intensive concentration of housing, employment, shopping, and enjoyment.

B. A residential pool of 2,000 floating dwelling units is available for use within the SDTOD, as established within the RAC agreement.

C. Applicability. The development standards of the underlying zoning districts shall govern except to the extent any provision of the SDTOD district conflicts with the provisions of an underlying zoning district, and in such event, the provisions of the SDTOD district shall control.

D. Boundaries. The boundaries of the SDTOD as depicted on the official zoning map.

E. Permitted Uses.

1. All the uses allowed in the underlying zoning districts, wherein the property lies. The one-acre maximum size for uses in the M-1 – Industrial district shall not be applicable within the SDTOD.

2. Residential

3. Commercial

4. Retail sales and service

5. Medical office

6. Specialty educational facilities

7. Child and adult day care centers

8. Hotels or similar lodging.

F. Development standards.

1. Height. The permitted height shall not exceed 200 feet, inclusive of parking.

2. Density limitation. Up to 150 du/acre (inclusive of floating units), subject to the availability of floating units. Density and intensity limitations, approved uses, and any additional requirements shall be set forth in the Conditional Use Permit.

3. Minimum lot size: For the purposes of development, a minimum lot size of 10,000 sq. ft. shall be required.

4. Dwelling unit size. Minimum five hundred (500) sq. ft.

5. Lot coverage. Maximum eighty (80) percent lot coverage.

(Ord. No. 1327, § 1, 2-14-12; Ord. No. 1442, § 1(exh. 1), 9-10-19)

Article 5. – Development Standards

DIVISION 14. - PARKING AND LOADING

Sec. 5-1401. - General criteria.

A. Purpose and intent. The intent of this division is to ensure adequate and appropriately located off-street parking and loading, to avoid undue congestion on streets, to avoid unnecessary conflicts between vehicles and pedestrians, to preserve and enhance pedestrian activity areas within the city, and to facilitate vehicular access from public rights-of-way to off-street parking facilities.

B. General criteria. In all districts there shall be provided at the time any development is commenced, off-street parking spaces in accordance with the requirements set forth in this division.

C. Dimensional requirements.

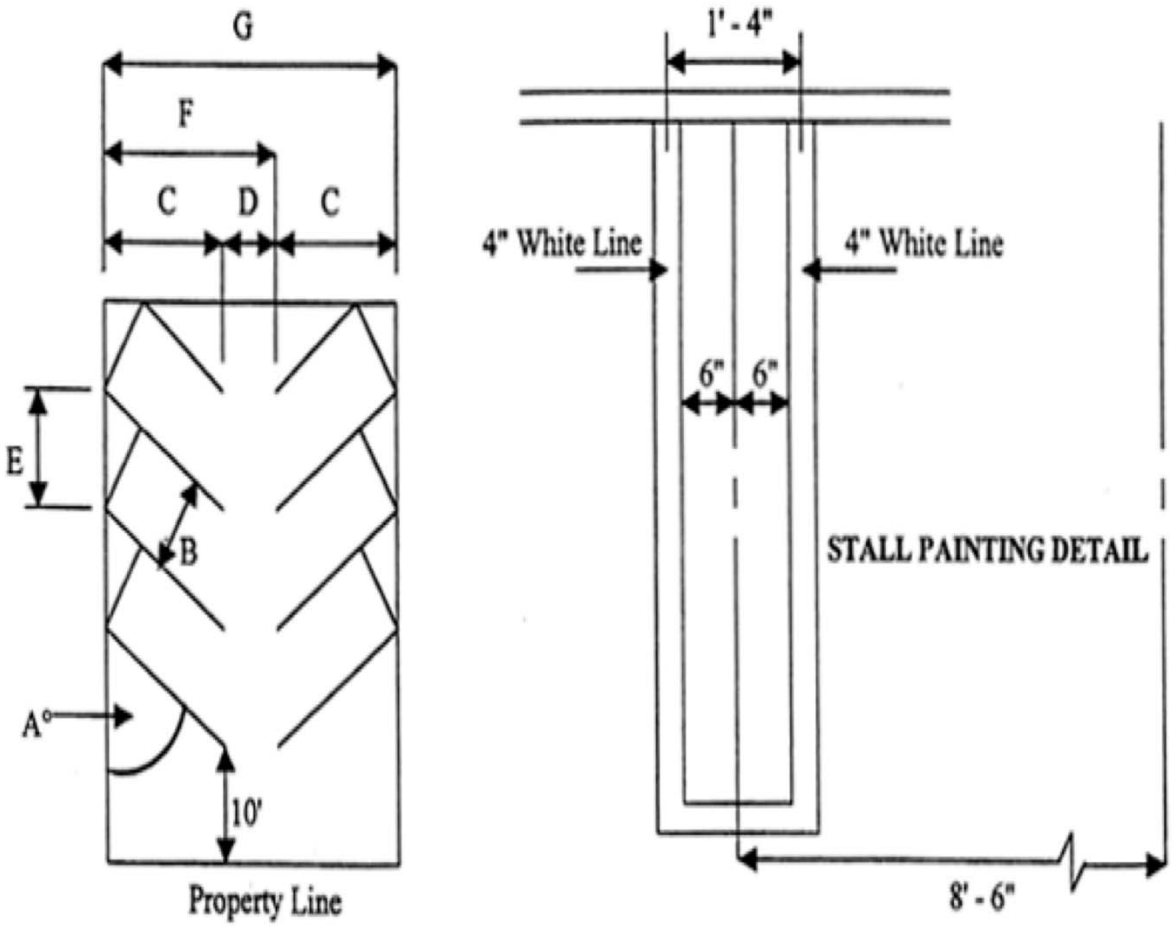
1. All off-street parking spaces shall be 8.5 feet in width and 18 feet in depth, unless modified in the table below based upon the angle at which the parking spaces intersect the drive aisle.

2. A minimum 25 feet spacing shall be required between the edge of pavement and an intersecting drive aisle or off-street parking space.

3. Dimensions for parking aisles and parking spaces for various angles of parking shall be as provided in figure 1 in this section. Two-way directional movement requires a minimum of 24 feet of wide aisle width regardless of parking angle and dimensions.

General Parking Dimensions						
A	B	C	D	E	F	G
Parking Angle	Stall Width	Stall Depth	Aisle Width	Curb Length	Half Bay	Full Bay
	8'6"	8'6"	12'0"	22'	20'6"	29'0"
30	8'6"	16'4"	12'0"	17'0"	28'4"	44'8"
40	8'6"	18'1"	12'0"	13'3"	30'1"	48'2"
45	8'6"	18'9"	13'0"	12'0"	31'9"	50'6"
50	8'6"	19'3"	15'0"	11'1"	34'3"	53'6"
60	8'6"	19'10"	18'0"	9'10"	37'10"	57'8"
70	8'6"	19'10"	20'4"	9'0"	40'2"	60'0"
75	8'6"	19'7"	20'10"	8'10"	40'5"	60'0"
80	8'6"	19'2"	21'8"	8'8"	40'10"	60'0"
90	8'6"	18'0"	24'0"	8'6"	42'0"	60'0"

4. Tandem and valet parking dimensions. Where tandem and valet parking is provided towards required off-street parking or as additional parking, such parking areas shall conform to the dimensional standards set forth in the figure below. Except that the tandem parking stalls may be stacked no more than two spaces deep.



D. Number of parking spaces required. Except as provided in sections 5-1403 and 5-1404, the number of off-street parking spaces required shall be as set forth in the off-street parking schedule in section 5-1402.

E. Construction standards, markings and signage.

1. All parking areas shall be paved per requirements of the city public works department. It shall be a violation of this chapter to park on any unpaved areas as described in this division.

2. Markings and signage. Traffic control signs and pavement markings shall be used as necessary to ensure safe and efficient traffic operations within all parking and loading areas. Required off-street parking spaces shall be delineated by four-inch white double striped lines. All signs shall comply with the Manual of Uniform Traffic Control Devices Federal Highway Administration, United States Department of Transportation, 1978, as adopted by the state department of transportation, as revised.

3. Curbs, wheel-stops, or bollards: Precast concrete wheel-stops, or curbing shall be provided for all angled parking spaces that abut landscaped areas, pedestrian areas, buildings, or property lines, such that cars are curbed at sixteen and one-half (16.5) feet. The balance of the required depth of the parking spaces between the wheel stop or curb and the sidewalk shall be clear of obstructions. All landscaped areas in or adjacent to parking areas or other vehicular use areas shall be provided with type D curbing,

or extruded curbing in combination with wheel stops, to restrict the destruction of the landscaped areas by vehicles. Bollards may be provided in lieu of wheel-stops or curbing, upon a determination by the DRC committee. Adequate scuppers and/or weep holes shall be provided to permit proper drainage, as required by the city

F. Storm drainage for parking and loading spaces. Off-street parking and loading spaces, for other than single-family residences and duplexes, shall be provided with drainage systems adequately designed and maintained as required by the following:

1. To prevent the accumulation of water from normal rainfall; and

2. To prevent the runoff of rainfall onto neighborhood property at rates greater than would result if the site were undeveloped. Drainage systems shall be designed in accordance with standards set forth in the city's public works manual and meeting the approval of the public works department.

3. Maintenance and good repair. All required off-street parking areas shall be maintained in good repair and shall be kept in a reasonably clean and sanitary condition free from rodents, insects and vermin.

4. Maximum front yard coverage for single-family residences. No single-family residential driveways or parking areas shall be paved more than sixty (60) percent of the front yard.

G. Parking area and lot screening. All parking areas shall contain adequate screening, as required by the city's landscaping regulations in article 5, division 12.

H. Location.

1. Off-street parking areas shall be located on the same lot, parcel or premises as the use to be served or on a parcel of land within six hundred (600) feet, provided there is a unity of title, or covenant in lieu of unity of title, between the parcel being served and the parcel on which such off-street parking is located, or provided that a parking agreement, in conformance with the provisions of section 5-1403, which ensures the availability of parking has met with the approval of the city manager and city attorney before being recorded in the public records of Miami-Dade County.

2. Parking in open space areas prohibited. Parking in areas for open space, landscaped areas, and lawns shall be prohibited.

I. Materials. Driveways and parking areas shall be composed of asphalt, pavers, permeable structured grass, gravel or concrete and not concrete strips.

1. Concrete strip driveways existing at the time of adoption of these LDRs for single-family dwellings shall be allowed to remain in perpetuity, provided that they are properly maintained.

2. Gravel parking surfaces shall be built with a permanent perimeter border consisting of suitable material. The border shall be a minimum of four (4) inches below the surface, with the width of the border being sixteen (16) inches immediately adjacent to the road perimeter, and four (4) inches along the entire length of both edges of the parking surface. Gravel driveways shall be level with the top of the adjacent sidewalk and street with slope downhill, away, so that gravel will not spread to these surfaces. To facilitate percolation over time and control weeds, use of a geotextile fabric as an underlayment is

recommended. The community planning and development department will determine suitable border materials.

*Gravel material exception: Florida crushed limestone shall be permitted as long as the rock sizes are no larger than #78 stone/nominal size 1/2" diameter (reference Florida Department of Transportation Standard Specification Section 901-1 Aggregate).

J. Access. All driveways to parking lots shall be designed in accordance with the following:

1. Except as provided for corner lots or in subsection 3. hereof, driveways shall be setback from the side property line at least five (5) feet.

2. Except as provided for corner lots, an administrative variance may be obtained for a setback from the side property line of two and one-half (2.5) feet provided that the driveway is composed of pervious materials.

3. No driveway shall be located closer than fifteen (15) feet to the corner, or as measured in accordance with standards of the public works department.

4. Adjacent nonresidential properties shall provide a cross access drive and pedestrian access to allow circulation between sites wherever feasible.

5. All driveways shall be constructed in accordance with the engineering standards of the public works department.

K. Configuration of parking and loading ingress and egress.

1. Ingress to and egress from parking and loading spaces shall be provided in either of the following ways:

a. Ingress and egress from parking and loading spaces shall be provided by means of clearly defined drives which lead from public rights-of-way to clearly defined maneuvering lanes which in turn provide access to individual parking or loading spaces. Configurations which require backing directly onto a street, excluding alleys, from a parking or loading space are prohibited except as provided in section 5-1408(B). There shall be a minimum of ten feet separation between all access drives. The separation shall be measured along the curb line.

b. Ingress and egress from parking stalls may be provided directly from public alleys. If existing alley width does not comply with minimum aisle requirements, additional parking space aisle or setbacks shall be required as indicated in subsection C of this section.

2. Common vehicular access points.

a. Applicability. The community planning and development director, in conjunction with the recommendation of the development review committee, may require the provision of common vehicular access points between abutting lots or tracts when all of the following criteria are met:

(1) The proposed use is nonresidential.

(2) The lot or tract has frontage on a street classified as an arterial or collector in the traffic circulation plan element of the comprehensive development master plan.

(3) The provision of common vehicular access points and related common access ways will help mitigate future adverse transportation impact of the proposed use upon traffic safety and vehicular operating capacity of the major thoroughfare in question.

(4) The existing or anticipated land uses adjacent to the lot or tract in question are generally of a similar or compatible character to the proposed use of the lot or tract in question.

(5) The provision of common vehicular access points between lots or tracts is not impractical due to the configuration of existing buildings, structures or other related circumstances.

3. Design of common vehicular access points. When common vehicular access points are required, the following design criteria shall apply:

a. Common vehicular access points shall provide two-way traffic circulation to accommodate a 12-foot-wide access way in each direction.

b. Common vehicular access points should be located between the parcel line with frontage on the major thoroughfare and the required front yard building setback or base building line, whichever is greater.

c. Stub-outs and other design features shall be provided to the parcel line in question in order to tie together on-site vehicular traffic circulation of abutting properties.

d. Off-street parking, common vehicular access ways and related facilities shall be arranged in a manner that coordinates on-site vehicular circulation between abutting lots and tracts.

4. Submittal of draft common vehicular access point agreement. When a common vehicular access point agreement is required, a draft copy of such agreement, easement or other similar instrument shall be submitted with a proposed site plan or a proposed tentative plat, whichever is applicable.

5. Recording and evidence of common vehicular access point agreement. All common vehicular access point agreements, easements or other similar legal instruments required by the provisions of this schedule shall be recorded in the public records of Miami-Dade County. A notarized copy of such recorded agreement, easement or instrument shall be provided to the community planning and development department prior to the issuance of a building permit or certificate of completion.

6. Identification of common vehicular access point agreements on official zoning map. Upon receipt of evidence of common vehicular access point agreement, the community planning and development department shall cause such agreement to be identified on the properties party to the agreement.

7. Temporary vehicular access points. When the lot in question is developed prior to an abutting lot, a temporary vehicular access point on a major thoroughfare may be approved provided, however, that a condition of approval of such temporary vehicular access point shall be removal of same when development of the abutting lot or tract provides common vehicular access and a coordinated system of on-site traffic circulation for both premises. The community planning and development director shall notify the owner of record of the lot in question by certified mail as to when the temporary vehicular access point shall be removed and any applicable conditions for its

removal. The owner shall be responsible for all costs involved in removing the temporary vehicular access point.

L. Interior drives or aisles as specified above in this section, interior drives or aisles shall be a minimum of twelve (12) feet for one-way directional movement and a minimum of twenty-four (24) feet for two-way directional movement, regardless of parking angles, in order to serve the arrangement of parking spaces.

M. Renovation or change of use. In the event a building is substantially renovated or a use is changed so that there is a substantial change in the intensity of use, additional parking shall be provided in accordance with the terms of this division to the maximum extent practical. A substantial change in the intensity of use shall be construed to be a twenty-five (25) percent increase in required parking and a substantial increase in retail and pedestrian activity.

N. Reduction in parking requirements.

1. Preferential parking is encouraged to promote sustainable practices and encourage a reduction in the number of vehicles needed to transport individuals to destinations. Buildings may dedicate ten (10) percent of their parking spaces to these modes of transportation which may include:

a. Hybrid vehicles;

b. Van pools;

c. Car pools.

2. In the event such preferential parking is provided, a ten (10) percent reduction in required parking may be allowed.

3. Exchanging vehicle parking spaces for bicycle facilities is encouraged to promote cleaner, more sustainable energy saving trips and is required pursuant to subsection 5-803G. Buildings may substitute bicycle accommodations for vehicle spaces on a five-to-one basis or two-to-one for motorcycle spaces.

4. In no instance shall the number of vehicle parking spaces provided be reduced pursuant to this subsection, or the TDM provisions in section 5-702 by more than fifteen (15) percent of the requirements of this division.

(Ord. No. 1278, § 1(exh. 1), 4-28-09)

Sec. 5-1402. - Schedule of required parking.

USE	MINIMUM PARKING REQUIREMENT
Accessory dwelling	One (1) parking space.
Adult entertainment businesses	See "Retail."

USE	MINIMUM PARKING REQUIREMENT
Adult day care	One (1) space per three hundred seventy-five (375) s.f. of floor area.
Adult living facility	One (1) parking space per bedroom.
Auto service station	See "Retail."
Banquet	See "Community facilities."
Bar, lounge or tavern	One (1) space for every three hundred fifty (350) s.f. of gross floor area.
Beauty, barber shop and nail salon	1/300 s.f. (retail).
Catering kitchen	See "Light industrial."
Check cashing store	See "Retail."
Childcare centers	One (1) space for two hundred (200) s.f. of gross floor area.
Community facilities	1/200 s.f.
Community residential homes	One (1) per each 2 beds plus 1 per each 2 employees
Convention centers	One (1) parking space for each five (5) spectator seats, or one (1) parking space for each two hundred (200) s.f. of gross floor area, whichever is greater.
Country club	One (1) space per every four (4) members.
Day spa	One (1) parking space for each four hundred (400) s.f. of gross floor area.
Dry cleaning drop-off and pick-up	One (1) parking space per four hundred (400) s.f. of gross floor area.
Dry cleaning establishment (retail and plant)	One (1) parking space per four hundred (400) s.f. of gross floor area, plus one (1) per six hundred (600) s.f. of plant area.
Dry cleaning plant	One (1) per six hundred (600) s.f. of gross floor area.
Educational facilities	The greater of one (1) space per two hundred (200) s.f. of floor area.
Elderly Housing	One (1) space per dwelling unit (available only if 100% of the residents are 55 and over, as guaranteed through a deed restriction)

USE	MINIMUM PARKING REQUIREMENT
Family day care home	One (1) parking space per five hundred (500) s.f. of floor area.
Film studios	One (1) per six hundred (600) s.f. of gross floor area.
Fitness center	One (1) parking space per three hundred (300) s.f. of gross floor area.
Funeral homes	One (1) parking space for each one hundred (100) s.f. of chapel and/or parlor area.
Government uses	One (1) parking space for each three hundred (300) s.f. of gross floor area.
Gun shops	See "Retail."
Hospitals	Two (2) parking spaces for each bed.
Hotels	One (1) parking space for each guest room, cabin or rental unit, plus 1 (one) space per each one hundred (100) s.f. of banquet, assembly, meeting, and restaurant seating area.
Institutional uses	One (1) parking space for each four hundred (400) s.f. of gross floor area.
Light industrial and manufacturing	One (1) parking space per each three hundred (300) gross s.f. of office area, and showroom or retail space, if any, plus one (1) space per one thousand (1,000) s.f. of all other floor area.
Marinas	One (1) per eight (8) dry racks and one (1) per two (2) wet slips, plus such parking as may be required for accessory uses.
Mechanical car washing (stand-alone)	Four (4) nonstacking parking spaces plus stacking areas not obstructing vehicles ingressing or egressing the site.
Medical	One (1) parking space for each three hundred (300) s.f. of gross floor area.
Mixed use	See section 5-1403.
Movie theaters	One (1) parking space for each four (4) fixed seats.
Museum	One (1) space for every three hundred (300) s.f. of gross floor area devoted to office or retail space, plus one (1) space for every three hundred (300) s.f. of gross floor area.
New car rental/vehicle rental	One (1) space per three hundred (300) s.f. of gross floor area, plus

USE	MINIMUM PARKING REQUIREMENT
	one (1) per rental vehicle.
Nightclubs	Five (5) parking spaces plus one (1) parking customer space for each fifty (50) s.f. of floor area of customer service area.
Nursing and convalescent homes	One (1) parking space per bedroom.
Offices	One (1) parking space for each three hundred (300) s.f. of gross floor area.
Radio or TV stations	One (1) parking space per each six hundred (600) gross s.f. of office area.
Recreation, indoor	For bowling alleys, two (2) parking spaces for each bowling lane. For other indoor recreation uses, one (1) space per three hundred (300) s.f. of floor area
Recycling machines	No spaces required.
Religious institutions	One (1) space for one hundred (100) s.f. of gross floor area.
Research and technology uses	One (1) per three hundred (300) s.f. office floor area plus one (1) space per one thousand (1,000) s.f. of all other floor area.
Residential: single-family	Two (2) spaces per dwelling unit.
Residential: multifamily	One and one-half (1.50) spaces per dwelling unit plus five (5) percent of total required parking for guest parking.
Restaurants; restaurants, fast-food (with indoor dining)	One (1) space for each one hundred fifty (150) s.f. of gross floor area. No additional parking required for outdoor dining.
Retail sales and services	One (1) parking space for each three hundred (300) s.f. of gross floor area.
Schools, elementary	See "State requirements for educational facilities (Florida State Board of Education 2008)."
Schools, junior and senior high	See "State requirements for educational facilities (Florida State Board of Education 2008)."
Schools, special and technical	One (1) for each two hundred (200) s.f. of gross floor area.
Self-service laundry facilities	One (1) space per three (3) washers plus one (1) space.
Self-storage facilities	One (1) parking space per five thousand (5,000) s.f. of gross floor area, for the first twenty thousand (20,000) square feet

USE	MINIMUM PARKING REQUIREMENT
	of building; one (1) parking space per ten thousand (10,000) square feet (or fraction thereof) of building area thereafter. One (1) parking space per four hundred (400) square feet of gross office area (or fraction thereof) shall also be provided.
Sound recording studios	One (1) space for each six hundred (600) s.f. of gross floor area.
Vehicle rental	One (1) space per three hundred (300) s.f. office floor area plus one (1) space for each vehicle to be rented.
Vehicle sales/displays	One (1) space per three hundred (300) s.f. office and customer floor area, plus one (1) space per seven hundred (700) s.f. showroom floor area, plus one (1) space per five hundred (500) s.f. of all other floor area.
Vehicle sales/displays, major	One (1) parking space per each three hundred (300) gross s.f. of office and customer floor area, plus one (1) parking space for each one thousand (1,000) s.f. of remaining gross building area.
Vehicle service, major	One (1) space per three hundred (300) s.f. office and customer floor area, plus one (1) space per seven hundred (700) s.f. of all other floor area.
Veterinary clinics, animal boarding and grooming	One (1) space per three hundred (300) s.f. of floor area.
Warehouses	One (1) space per three hundred (300) s.f. of office floor area, plus one (1) space per one thousand five hundred (1,500) s.f. of all other floor area.

(Ord. No. 1278, § 1(exh. 1), 4-28-09)

Sec. 5-1403. - Shared parking.

A. General. Shared parking occurs when one or more required parking spaces are shared by more than one use. Shared parking may be proposed in conjunction with development approval and shall comply with the methodologies and standards set forth herein. Single-family residential. Single-family residential uses shall not be eligible for shared parking.

B. Methodology. The determination of the required number of parking spaces for a specific use under an approved shared parking program shall be based upon the minimum required parking spaces set forth in section 5-1402. The methodology for calculating the required parking for a use under a shared parking program shall be as follows:

1. Multiply the minimum parking requirement for each individual use, as provided in section 5-1402 by the appropriate percentage in this section for each of the five designated time periods.

2. Add the resulting sum for each of the five vertical columns in the table.

C. Minimum requirement. The minimum requirement for shared parking is the highest sum among the five columns resulting from the calculation in subsection (b)(1) of this section.

D. Shared parking shall not result in a reduction of more than 25 percent from the minimum parking required without shared parking.

E. Parking spaces that are reserved for use by specified individuals, classes of individuals or specified businesses shall not be counted toward meeting shared parking requirements.

F. Reserved parking for the disabled shall not be counted towards meeting shared parking requirements.

G. Shared parking agreement. The owner or owners of record of a property for which shared parking is requested shall be responsible for preparing a written agreement between the owners of the properties sharing parking, indicating the terms under which the shared parking shall be used. The agreement shall be approved by the city attorney and the community planning and development department, and shall be recorded in the county official records. The owners of record shall update the shared parking agreement to address any change in the uses identified in the agreement which would cause an increase in peak parking demand, or a finding of any other related change in conditions by the city. The modified agreement shall be subject to the review and approval of the city attorney and the community planning and development department.

H. Percent Demand for Parking by Use and Time of Day.

	Night	**Weekday**		**Weekend**	
Uses	12:00 a.m.— 7:00 a.m.	7:00 a.m.— 6:00 p.m.	6:00 p.m.— 12:00 a.m.	7:00 a.m.— 6:00 p.m.	6:00 p.m.— 12:00 a.m.
Residential	100%	60%	90%	80%	90%
Office/Industrial	5%	100%	10%	10%	5%
Commercial/Retail	5%	70%	90%	100%	70%
Hotel	80%	55%	100%	50%	100%
Restaurant	10%	50%	100%	50%	100%
Entertainment	10%	40%	100%	70%	100%
Places of Public Assembly	50%	40%	50%	100%	100%
All Others	100%	100%	100%	100%	100%

Source: Shared Parking, Urban Land Institute

I. Other methodologies for the calculation of shared parking requirements. In lieu of using the table in this section, the minimum total number of required parking spaces may be determined using other acceptable methodologies, as reviewed and approved by the city.

J. All shared parking agreement applications shall be accompanied by an application fee sufficient to cover all costs associated with the review and processing of such application. The amount of the application fee and cost recovery shall be as set forth in the fee schedule adopted by resolution of the City Council, as per article 3, division 2, section 3-202 of these LDRs.

APPENDIX - G
THE RISE OF INNOVATION DISTRICTS

The Rise of Innovation Districts: A New Geography of Innovation in America

Bruce Katz and Julie Wagner

"The trend is to nurture living, breathing communities rather than sterile compounds of research silos."

Introducing Innovation Districts

As the United States slowly emerges from the Great Recession, a remarkable shift is occurring in the spatial geography of innovation.

For the past 50 years, the landscape of innovation has been dominated by places like Silicon Valley—suburban corridors of spatially isolated corporate campuses, accessible only by car, with little emphasis on the quality of life or on integrating work, housing, and recreation.

A new complementary urban model is now emerging, giving rise to what we and others are calling "innovation districts." These districts, by our definition, are geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators.[1] They are also physically compact, transit-accessible, and technically-wired and offer mixed-use housing, office, and retail.

Innovation districts are the manifestation of mega-trends altering the location preferences of people and firms and, in the process, re-conceiving the very link between economy shaping, place making and social networking.[2]

In recent years, a rising number of innovative firms and talented workers are choosing to congregate and co-locate in compact, amenity-rich enclaves in the cores of central cities. Rather than building on green-field sites, marquee companies in knowledge-intensive sectors are locating key facilities close to other firms, research labs, and universities so that they can share ideas and practice "open innovation."

Instead of inventing on their own in real or metaphorical garages, an array of entrepreneurs are starting their companies in collaborative spaces, where they can mingle with other entrepreneurs and have efficient access to everything from legal advice to sophisticated lab equipment. Rather than submitting to long commutes and daily congestion, a growing share of metropolitan residents are choosing to work and live in places that are walkable, bike-able, and connected by transit and technology.

Led by an eclectic group of institutions and leaders, innovation districts are emerging in dozens of cities and metropolitan areas in the United States and abroad and already reflect distinctive typologies and levels of formal planning. Globally, Barcelona, Berlin, London, Medellin, Montreal, Seoul, Stockholm and Toronto contain examples of evolving districts. In the United States, districts are emerging near anchor institutions in the downtowns and midtowns of cities like Atlanta, Baltimore, Buffalo, Cambridge, Cleveland, Detroit, Houston, Philadelphia, Pittsburgh, St. Louis, and San Diego. They are developing in Boston, Brooklyn, Chicago, Portland, Providence, San Francisco and Seattle where underutilized areas (particularly older industrial areas) are being re-imagined and remade. Still others are taking shape in the transformation of traditional exurban science parks like Research Triangle Park in Raleigh-Durham, which are scrambling to meet demand for more urbanized, vibrant work and living environments.

Innovation districts represent a radical departure from traditional economic development. Unlike customary urban revitalization efforts that have emphasized the commercial aspects of development (e.g., housing, retail, sports stadiums), innovation districts help their city and metropolis move up the value chain of global competitiveness by growing the firms, networks, and traded sectors that drive

broad-based prosperity. Instead of building isolated science parks, innovation districts focus extensively on creating a dynamic physical realm that strengthens proximity and knowledge spillovers. Rather than focus on discrete industries, innovation districts represent an intentional effort to create new products, technologies and market solutions through the convergence of disparate sectors and specializations (e.g., information technology and bioscience, energy, or education).

Innovation districts are still an early trend that, because of their multi-dimensional nature, has yet to receive a systematic analysis across the United States and other countries. Yet we believe that they have the unique potential during this pivotal post-recession period to spur productive, inclusive, and sustainable economic development.

Innovation districts help address three of the main challenges of our time: sluggish growth, national austerity and local fiscal challenges, rising social inequality, and extensive sprawl and continued environmental degradation.

They do so by providing a strong foundation for the commercialization of ideas and the creation and expansion of firms and jobs via proximity and collaboration. They are a vehicle for both revenue growth as well as the more efficient use of existing infrastructure. They offer the prospect of expanding employment and educational opportunities for disadvantaged populations given that many districts are close to low- and moderate-income neighborhoods. And, at a time of inefficient land use, they present the potential for denser residential and employment patterns, the leveraging of mass transit, and the repopulation of urban cores.

The purpose of this paper is to capture this emerging trend, explore the large forces and local practices and practitioners that are driving it and provide initial guidance to U.S. city and metropolitan leaders on how best to recognize and extend the growth of their own innovation districts, building on the distinctive assets and potential of their economies.

The next section of this paper defines innovation districts and offers a typology of places where they are developing. Section III then explains why they matter (namely their role in addressing a range of economic, social and environmental challenges our country now faces) while Section IV describes the profound market, demographic, technological, and cultural forces that are propelling this new spatial geography of innovation. Sections V and VI analyze the multiple assets of innovation districts, and provide real-world guidance and insights for cities trying to start or extend this model in their own communities. The paper concludes by exploring the implications of the innovation district trend for large private companies and institutional investors, federal and state government, and the broader field of urban practitioners.

Defining Districts

Innovation is when new or improved ideas, products, services, technologies, or processes create new market demand or cutting-edge solutions to economic, social and environmental challenges.

Innovation districts constitute the ultimate mash up of entrepreneurs and educational institutions, start-ups and schools, mixed-use development and medical innovations, bike-sharing and bankable investments—all connected by transit, powered by clean energy, wired for digital technology, and fueled by caffeine.

They embrace those very attributes of urbanism—what Saskia Sassen calls "cityness"—that were denigrated and often destroyed in the 20th century: complexity, density, diversity of people and cultures, and a layering of the old and the new. As Business Week observed in June 2009, "The trend is to nurture living, breathing communities rather than sterile remote, compounds of research silos."[3]

Given the vast distinctions in regional economies, the form and function of innovation districts differ markedly across the United States. Yet all innovation districts contain *economic, physical, and networking assets*. When these three assets combine with a supportive, risk-taking culture they create an *innovation ecosystem*—a synergistic relationship between people, firms, and place (the physical geography of the district) that facilitates idea generation and accelerates commercialization.[4]

Most innovation districts adhere to one of three general models.[5]

The "anchor plus" model, primarily found in the downtowns and mid-towns of central cities, is where large scale mixed-use development is centered around major anchor institutions and a rich base of related firms, entrepreneurs and spin-off companies involved in the commercialization of innovation. "Anchor plus" is best exemplified by Kendall Square in Cambridge (and the explosion of growth around

MIT and other nearby institutions like Mass General Hospital), Philadelphia's University City (anchored by The University of Pennsylvania, Drexel University and the University City Science Center), and St. Louis (flanked by Washington University, Saint Louis University, and Barnes Jewish Hospital). Other emerging districts can be found in the Greater Oakland neighborhood of Pittsburgh (around Carnegie Mellon University and the University of Pittsburgh Medical Center), Midtown Atlanta (around Georgia Tech University), downtown and midtown Detroit (around Quicken Loans, the Henry Ford Health System and Wayne State University) and the Texas Medical Center in Houston, Texas.

The "re-imagined urban areas" model, often found near or along historic waterfronts, is where industrial or warehouse districts are undergoing a physical and economic transformation to chart a new path of innovative growth. This change is powered, in part, by transit access, a historic building stock, and their proximity to downtowns in high rent cities, which is then supplemented with advanced research institutions and anchor companies. The model is exemplified by the remarkable regeneration underway in Boston's South Waterfront, San Francisco's Mission Bay, Seattle's South Lake Union area, and the Brooklyn Navy Yard. The ambitious plans for the Cornell-Technion Campus on Roosevelt Island in New York City and Hunters Point in San Francisco also hold great promise. Many of these areas draw from the experiences of 22@Barcelona, a self-proclaimed innovation district that involved the complete re-make of an older industrial area in the city core.[6]

The third model, "urbanized science park," commonly found in suburban and exurban areas, is where traditionally isolated, sprawling areas of innovation are urbanizing through increased density and an infusion of new activities (including retail and restaurants) that are mixed as opposed to separated. North Carolina's Research Triangle Park, perhaps the 20th century's most iconic research and development campus, is the strongest validation of this model. In November, 2012, after several years of review and outreach, RTP announced a new 50-year master plan to urbanize the quintessential exurban science park, recognizing that its isolated car-dependent environment is no longer optimal for spurring innovation and attracting younger talent. The master plan calls for a greater concentration of buildings and amenities, including the creation of a vibrant central district, the addition of up to 1,400 multi-family housing units, retail, and the possible construction of a light rail transit line to connect the park with the larger Raleigh-Durham region, including the universities.[7] Other science parks actively engaged in urbanization efforts include the University Research Park at the University of Wisconsin-Madison, the University of Virginia Research Park in Charlottesville and the University of Arizona Tech Park in Tucson.[8]

Unlike convention centers or suburban malls, innovation districts are not cookie cutter developments; rather, they leverage distinct economic strengths in each metropolitan area. Districts vary not only by type but also in size, from 200 acres in St. Louis to 1000 acres in Boston. They have different avenues for growth, with some leading with new fields like "tech/information" (including the burgeoning "app economy"), others leading with life sciences (with clear niches in such fields as nano-technology,

WHO DELIVERS INNOVATION DISTRICTS

The list of institutions and individuals that are driving the growth of innovation districts is as varied as the economic composition of districts themselves. The following list provides a sample of the leaders at the vanguard of this trend in the United States and abroad:

- ***Mayors and local governments***, such as former Mayor Tom Menino of Boston, former Mayor Joan Clos of Barcelona, and the Stockholm city government.
- ***Major real estate developers and major land owners***, such as Vulcan Real Estate in Seattle's South Lake Union and the Brooklyn Navy Yard.
- ***Managers of research campuses***, such as the Research Triangle Park Foundation in Research Triangle Park and the Texas Medical Center in Houston.
- ***Anchor companies***, such as Quicken Loans in Detroit, Comcast in Philadelphia, and Amazon in Seattle's South Lake Union.
- ***Advanced research institutions***, such as Washington University in St. Louis, Carnegie Mellon in Pittsburgh, Drexel University in Philadelphia, and MIT in Cambridge.
- ***Advanced medical campuses***, such as the Henry Ford Health System in Detroit and the University of Pittsburgh Medical Center in Pittsburgh.
- ***Philanthropic investors***, such as the New Economy Initiative and the Kresge Foundation in Detroit and the former Danforth Foundation in St. Louis.
- ***Incubators, accelerators, and other economic cultivators***, such as Barcelona Activa in Barcelona, the Cambridge Innovation Center in Cambridge, and the BioGenerator in St. Louis.
- ***Social networking programmers***, such as Venture Café Foundation in Boston and Cambridge and High Tech Campus Eindhoven.

imaging, and robotics), and others still leading with highly creative industries, such as industrial design, media, and architecture. Further, they vary in their urban form and density, the historic presence of transit (one hundred years in the case of Kendall Square, one year in the case of the Texas Medical Center), the presence of housing and retail, and the extent of collaboration with local schools and community organizations. Finally, they are distinctive in their level of geographic and institutional formality, where some, like Boston, are officially designated and branded, while others, like Kendall Square, are growing more organically in response to market forces. This intense variation in innovation districts requires practitioners to assess assets and liabilities with clear-eyed objectivity, so that growth strategies can be realistic and customized.

Why Innovation Districts Matter

Metropolitan areas in the United States and other mature economies face outsized challenges in the aftermath of the Great Recession. At the most basic level, U.S. cities and metropolitan areas need more and better jobs. According to the March 2014 Brookings Metro Monitor, the number of jobs in 61 of the 100 largest U.S. metro areas are still lower than their pre-recession peak; incredibly, job levels in 23 metros are more than 5 percent below their pre-recession peak figures.[9] At the same time, the number of people living in poverty and near poverty has grown precipitously in the largest 100 U.S. metros—from 48 million in 2000 to 66 million in 2012—due not only to the recession but broader trends around wage stagnation and economic restructuring.[10] Beyond these economic and social demands, cities are on the front lines of addressing enormous fiscal and environmental challenges given federal gridlock and the absence of leadership in many states.

In the face of these challenges, cities and metropolitan areas are experimenting with new approaches to economic development and sustainable development that focus on growing jobs in productive, innovative, and traded sectors of the economy while concurrently equipping residents with the skills—particularly STEM (science, technology, engineering and math) skills —they need to compete for and succeed in these jobs.[11] These new approaches try to build on the distinctive assets and advantages of disparate places rather than merely pursuing heavily subsidized consumption-oriented strategies (e.g., building the next sports stadium, convention center, or performing arts facility) that yield low quality jobs or aspiring to unrealistic economic goals ("becoming the next Silicon Valley").

Innovation districts are a key part of the new wave of local economic development and advance several critical objectives.

First, innovation districts further the ability of cities and metropolitan areas to grow jobs in ways that both align with disruptive forces in the economy and leverage their distinct economic position. Innovation districts enable companies, entrepreneurs, workers, researchers and investors to work across disparate sectors and institutions to commercialize ideas and co-invent and co-produce new discoveries for the market. They foster innovation across industries by concentrating people with different knowledge and expertise in dense urbanized areas; experts in technology, for example, work closely with experts in bioscience, finance, education, and energy. Innovation districts are, in essence, the vanguard of a new "convergence economy" which is galvanizing the growth of more competitive firms and higher quality jobs and spurring expansion in supportive professional and commercial service sectors.

Second, innovation districts can specifically empower entrepreneurs as a key vehicle for economic growth and job creation. Studies show the important role that entrepreneurs and start-up companies play in urban and metropolitan job growth and innovation districts can support this trend in several ways. The rise of collaborative facilities and spaces can, for instance, reduce overhead costs by offering below rate, low risk work spaces and providing technical spaces where exorbitantly expensive technologies are shared. At the same time, imaginative programming and networking can support idea generation and efficiently link young firms to mentors, advisors with specialized expertise, and potential investors.

Third, innovation districts can grow better and more accessible jobs at a time of rising poverty and social inequality. A substantial number of emerging innovation districts across the United States are close to low- and moderate-income neighborhoods, offering the prospect of expanding

employment and educational opportunities for disadvantaged populations. Leaders in cutting edge innovation districts are already dedicating resources to revitalize neighborhoods directly through investments in affordable housing, education, infrastructure and improved internet connectivity, and indirectly via enhanced tax revenues. Leaders in these districts are particularly focused on increasing labor market participation of local residents through training for jobs in both the STEM sector as well as retail and service firms.

Fourth, innovation districts can reduce carbon emissions and drive denser residential and employment patterns at a time of growing concern with environmentally unsustainable development. Innovation districts are potential engines for sustainable development since they embrace residential and employment density via the strategic use of transit, historic buildings, traditional street grids, and existing infrastructure. Some districts are going further by using renewable energy as their primary power source and by transforming their buildings, streets, and parks into living labs to test cutting edge sustainable projects in concert with technology firms and entrepreneurs.

Finally, innovation districts can help cities and metropolitan areas raise revenues and repair their balance sheets at a time when federal resources are diminishing and many state governments are adrift. Municipal governments generally rely on property, business, and sales taxes for revenue. Innovation districts can generate revenues through increased economic activity, rising housing values and increased demand for goods and services. Increased revenues can then be used to make necessary investments in infrastructure, public safety, affordable housing, local schools, and other necessary services. At time when federal resources are shifting to entitlement programs (e.g., Social Security) and many states are otherwise focused, these types of investments disproportionately fall on local governments.

Why Now—The Evolution of Innovation

The early rise of innovation districts could constitute the next phase of what one observer has called the "architecture of technology."[12] This architecture was once represented by industrial districts, and later by suburban science parks, both of which were products of the distinctive mix of demographic preferences, cultural norms, and economic imperatives of their times. Similarly, the growth of innovation districts is reflective of forces that are radically altering the requirements and preferences of people and firms that are today engaged in technology driven activities. These shifts are forging new links between economy-shaping, place-making, and network building that were not evident in early models.

A. Industrial Districts to Science Parks

In the 19th century and early 20th century, industrial districts—areas with high concentrations of manufacturing enterprises commonly engaging in similar or complimentary work—emerged in cities like Manchester, Milan, and Stuttgart in Europe and Baltimore, Cleveland, Detroit, New York, and Philadelphia in the United States. In the United States, these districts straddled the temporal boundary between the early mercantile city and turn-of-the-century industrial metropolis, a period marked by new types and organizational forms of manufacturing activity, innovations in energy and transportation, and rapid urbanization.[13] Many cities in fact had multiple districts, which varied by product type, methods of production, power source, and labor force composition.[14] Such a clustering of like activities facilitated the supply of materials and parts from one firm to another, and also attracted a large and fluid supply of workers, many of whom lived in the surrounding communities and walked to work. Enmeshed in the urban fabric, these "sub-city" areas thus provided not only a high density of employment opportunities, but essential neighborhood services and social amenities.[15]

As the 20th century moved forward, the nature of manufacturing activity changed and eventually dispersed—first within regions, and eventually across the globe—and by the mid-1900s production in U.S. and European cities had sharply declined. The foundations of modern technology laid during the preceding decades had, however, enabled the advent of a new era of invention and innovation in science, communications, and information—as well as the rapid suburbanization of housing and commercial activity.

In the United States, technological advancement and geographic dispersion together helped drive the creation of innovative enclaves variably referred to as science parks or research parks. Beginning in the 1950s, collaborations of universities, private developers, and government designed and built these clusters of labs and firms with the aim of increasing the commercialization of research and attracting entrepreneurially-oriented scientists from industry and academia.[16] The model originated with the Stanford Research Park—in what is now Silicon Valley—and was then expanded to include the development of Research Triangle Park in Raleigh Durham, and later the innovation corridors outside Boston, Philadelphia, and Washington D.C. Unlike urban industrial districts, these suburban parks were built as spatially isolated corporate campuses accessible only by car, mirroring the patterns of residential and commercial growth that dominated the post war landscape. They also reflected a research culture and patenting policies that encouraged secrecy. As such, they were generally closed innovation systems in which firms and scientists carefully guarded their ideas, and where interactions between them were limited.

B. A New Geography of Innovation

Innovation districts maintain elements of these earlier models but embody a new interplay of form and function that the modern innovation economy demands, and in turn supports. Like their predecessors, these districts grow out of a powerful set of economic, cultural, and demographic forces that are reshaping both how and where people live and work.

The emergence of innovation districts has been observed by a number of scholars and practitioners, many of whom have offered initial theories for their development. Research led by Thomas Hutton in over seven global cities found a rise of new industrial clusters within the inner city to "constitute important aspects of the spatiality of the New Economy," making four classifications of specialized production.[17] A research team at MIT's Department of Urban Studies and Planning likewise identified discrete geographic clusters of creative industries, life sciences, and applied sciences within large-scale real estate development projects. Defined as "New Century City Developments," these innovative clusters are "driven by inter-organization and cross-industry collaboration, open systems for R&D, and workers who have the aptitudes and skills required by the networked, knowledge economy."[18]

George Bugliarello of Polytechnic University in New York observed the emergence of "urban knowledge parks," concluding that these urban parks develop around a knowledge institution in a city, provide public space or spaces for community activities, and possess high levels of density."[19] In September, 2013, the American Institute of Architects released a report on Innovation Districts, describing them as "creative, energy-laden ecosystems" that are emerging world-wide.[20]

Richard Florida has provided important validation for the new geography of innovation. His recent mapping of venture capital activity by ZIP codes and area codes, rather than more expansive metro areas, shows that "high tech development, startup activity, and venture investment have recently begun to shift to urban centers and also to close-in, mixed-use, transit-oriented, walkable suburbs."[21]

These observations—and ours—recognize a trend that is both multi-dimensional and hyper-local, one reason why market dynamics on the ground have outpaced uniform labeling or analysis. Quantitative assessments, therefore, are still a work in progress. Innovation districts in Boston and St. Louis, for example, are assiduously documenting district-level growth, although not against broader city and metropolitan trends or other cities with similar economic starting points.[22] Similarly, studies in New York, Pittsburgh, and San Francisco have documented the growth of leading tech sectors at the city rather than innovation district scale.[23] While the analytics supporting this trend mature, Brookings and a growing number of practitioners are turning to broader economic and demographic research to understand the forces driving this new spatial geography of innovation.

1. The evolution of a knowledge and technology driven economy is altering the value and function of density and proximity.

In the past several decades, the U.S. economy has become increasingly reliant on knowledge and innovation. Today, approximately 20 percent of all U.S. jobs are in science, technology, engineering, or math (STEM) related occupations—a share that has doubled since the Industrial Revolution.[24] These occupations can be found in a wide range of fields including the production of advanced goods like pharmaceuticals, medical devices, motor vehicles and aerospace as well as the provision of advanced

services like software, data processing, among many others.[25]

As the role of these innovative industries and occupations has grown in size and importance, so too, then, has the value of density and agglomeration. The benefits of clustering that produced industrial districts, and then science parks, are intensifying in ways that we are just beginning to understand. A growing body of research shows that employment density not only eases resource, goods, and labor sharing, but also enhances innovation. This happens by enabling a more seamless transfer of knowledge within and across firms, workers, and supporting institutions—in turn facilitating the creation and exchange of new ideas that fuel even greater economic activity and growth. A recent study by the British government captures this latter point well:

> "While the marginal cost of transmitting information across geographical space has fallen significantly, the marginal cost of transmitting knowledge still rises with distance …. Therefore, the knowledge spillover benefits of clustering in cities can be large for high-value, knowledge intensive sectors."[26]

The proximity effect is significant. Recent research conducted by Gerald Carlino and Robert Hunt found the clustering of R&D labs to be by far the "most significant" at very small spatial scales, such as distances of about one-quarter of a mile. They also discovered the clustering effect to quickly dissipate with distance, concluding knowledge spillovers to be "highly localized."[27] Isaac Kohane and several colleagues at Harvard Medical School found that even working in the same building on an academic medical campus makes a difference for scientific breakthroughs; "Otherwise, it's really out of sight, out of mind."[28]

Density also matters when it comes to workers. The large number of employers within an urban area allows workers to change jobs more easily, giving them both greater flexibility and stability than employees in non-urban locales. This concentration of employment, which economists refer to as "labor market pooling," also contributes to labor productivity.[29] One seminal study found that doubling employment density increases average productivity by around 6 percent.[30]

This general research on proximity and density takes on new meaning in what one observer has called the "age of convergence." In biosciences, digital and biological technologies are co-mingling, opening entirely new possibilities for innovation breakthroughs to be commercialized.[31] A recent San Francisco analysis coined the term "tech/information" industries to reflect "the convergence between technology and content."[32] The spatial implications of this hybridization of industry are profound.

> "[Tech/information] companies thrive in urban environments, where they can connect with other industries, drawing on the culture and diversity of the city. By contrast, the previous generation of tech companies thrived with their headquarters located in suburban areas, located mainly near other tech companies. *There was no possibility of cross-industry diversity.*" [Emphasis added][33]

Recent analysis in New York similarly found tech industries to be less focused on building new technologies but rather "applying technology to traditional industries like advertising, media, fashion, finance, and health care."[34] These shifts reinforce and reinterpret notions of proximity and density.

> The early days of technology growth was driven by semiconductors and computer hardware, products that depended on a deep roster of engineering talent and required large amounts of physical space to develop. … In contrast, today's growth is being fueled by the Internet and smart phones, and the creation of new ways of taking advantage of these now widely used platforms to deliver content, sell products, deliver services, play games and simplify life for individuals and businesses. … [In other words], today's technology revolution is much less about creating the infrastructure and plumbing for the Internet, but about applying technology to traditional industries.[35]

To be sure, physical proximity alone doesn't guarantee greater collaboration and idea exchange, nor is it necessarily even required. Silicon Valley, while a huge regional agglomeration of innovative activity, is the quintessential low-density, suburban model of physical development—yet its strength and success is defined by a pervading culture of openness and network building. But urbanization—and

the physical proximity that comes with it—does appear to both grow from, and in turn help smooth, the development of "horizontal" relationships both within and between large firms, smaller subcontractors, vendors, and, importantly, talent. The move to create denser enclaves of innovation thus appears to be a critical shift for communities that are not as "wired" for collaboration as Silicon Valley.

2. An economy increasingly oriented toward open innovation is changing both where firms locate and how buildings and larger districts—from research labs to collaborative spaces to mixed-use developments—are designed.

As the knowledge and technology driven economy grows, it is also becoming increasingly characterized by what Henry Chesbrough and others call "open innovation." Chesbrough describes this as a process whereby companies and firms more openly generate new ideas and bring them to market by nimbly drawing on both internal and external sources. Under this new modus operandi, external sources can generate the ideas that are then commercialized internally by a firm, while internal ideas can be commercialized by external start-up companies and entrepreneurs. In other words, as Chesbrough observes, "The boundary between a firm and its surrounding environment is more porous, enabling innovation to move easily between the two."[36]

What was once a phenomenon for highly specialized fields, the imperative to collaborate has expanded to a broader group of knowledge-intensive sectors, including such science- and technology-heavy fields as chemicals, biotechnology, telecommunications, and semiconductors. McKinsey & Company, for example, has noticed a move from internal R&D labs to new "multichannel R&D models," which involve partnerships with "academic centers, partners, competitors, customers, venture capital funds, and startups."[37]

The rise of smaller companies engaged in research and development has also contributed to the growing movement toward open innovation. A field once dominated exclusively by large corporations, research labs and universities has become increasingly stratified, prompting greater collaborations between firms of disparate sizes to develop and advance innovations. A number of factors contributed to the proliferation of smaller R&D companies, namely the downsizing of larger companies, the passage of the Bayh-Dole Act (which enables university and individual researchers to own their federally-funded research, sparking a new entrepreneurial mind set), and the growth of venture capital funding, from very little funding in 1970 to nearly $100 billion in 2000.[38]

The result is that in today's economic landscape, no one company can master all the knowledge it needs, so companies rely on a network of industry collaborators.[39] This, in turn, has led to a shift in where companies and support organizations locate. A recent article, for example, on the growth of Pfizer, Novartis, and other major pharmaceutical companies in Cambridge noted the following:

> "Pharmaceutical companies traditionally preferred suburban enclaves where they could protect their intellectual property in more secluded settings and meet their employees' needs. But in recent years, as the costs of drug development have soared and R&D pipelines slowed, pharmaceutical companies have looked elsewhere for innovation. Much of that novelty is now coming from biotechnology firms and major research universities like MIT and Harvard, just two subway stops away."[40]

The more open, collaborative nature of the knowledge economy has also altered the design inside and outside the walls of the singular company. A recent *New York Times* piece on the "monuments of tech" refers to this trend as the "aesthetic of disruption"—design which embodies change, flexibility, and openness while at the same time displays the unique character and ethos of the individual company.[41]

The early, highly-recognizable model for open and highly networked workplaces is the newspaper newsroom, but these principles have been implemented in places ranging from former New York City Mayor Michael Bloomberg's "bullpen" in New York City Hall to the campuses of Silicon Valley technology firms. Facebook and Google, for example, have embraced "hackable buildings," with open floor plans that can be easily reconfigured to create dense, collaborative spaces for new teams and projects.[42]

Beyond office spaces and individual buildings, the planning and design shifts described above have extended to the public and private realm. When Henderson, NV-based Zappos, the online retail shoe giant, was looking for a new headquarters in 2010, CEO Tony Hsieh decided to create a more dynamic

workplace, with the goal of increasing interaction and collaboration among its workers. That inspired for Hsieh a move toward open floor plans and the provision of greater amenities within the office. More than that, it also led him to embed the new headquarters building (and 2,000 Zappos workers) in Las Vegas' old City Hall, and launch the $350 million Downtown Project to catalyze growth of a dense, multi-use, and walkable environment. "The idea," Hsieh said, "went from 'let's build a campus' to 'let's build a city.'"[43]

In short, the phenomenon of open innovation is changing over time: expanding into new industries, altering the design of office spaces, reshaping the relationship between buildings, and now occurring at the district scale. Similar to open innovation between firms, innovation districts are experiencing the breakdown of traditional boundaries, making the process of innovation more porous between the public and private realms. Ideas, for instance, can be brainstormed in wired, public spaces, advanced in shared work spaces, prototyped in private technology labs, and tested on public streets.

3. Shifting demographic and household dynamics are fueling demand for more walkable neighborhoods where housing, work, and amenities intermix.

Recent data show that cities and metropolitan areas are increasing in population faster than the rest of the country, with the largest growth seen in large urban areas. From 2012 to 2013, large metropolitan areas with over 1 million people grew twice as fast as smaller metropolitan areas with populations under 250,000, while nonmetropolitan/micropolitan regions saw a collective decline.[44] Brookings' demographer William Frey believes that this trend is likely to continue, while the future of non-urban America is far less certain.[45]

Within many large metropolitan areas, the trend becomes more acute as one examines areas in greater proximity to commercial downtowns. The country's 10 largest "live-work" downtowns, as examined by the Philadelphia Center City District for the International Downtown Association, grew 77 percent faster than the country as a whole, and nine of the 10 downtowns increased in population faster from 2000 to 2010 than zones within a half-mile or mile of downtown.[46]

What's driving this revival in cities and their cores?

America's family structure has been altered by the simultaneous aging of the population and the tendency of young adults to delay marriage and have fewer children. As a result, the prototypical family of the suburban era—a married couple with school age children—now represents just under 20 percent of American households, down from 24.1 percent in 2000 and 40.3 percent in 1970.[47] This trend is only expected to accelerate in coming decades. As Arthur C. Nelson documents in his provocative book, *Reshaping Metropolitan America*, "Between 2010 and 2030, households with children will account for about 13 percent of the total change in households; households without children will represent the rest."[48]

This demographic tumult is sparking a palpable shift in consumer—and worker—preferences toward more urban-oriented environments. Research has documented, for example, that 70 percent of Americans place a high priority on walkability, and similar majorities prioritize proximity to health care, entertainment, recreation, work and school, and social contacts.[49] Older Americans are increasingly seeking smaller homes and apartments, as well as places with easy access to medical services, shopping, and other daily necessities. Meanwhile, middle-aged couples, whose children have "left the nest," show greater receptivity to urban neighborhoods, cultural amenities, and shorter commutes.[50]

These preferences are particularly prevalent among the millennial generation (Generation Y)—whose young and educated members form the core of our innovation workforce. For many of these young people, especially those that have delayed childrearing, "quality of life" is increasingly understood to mean proximity to urban amenities such as restaurants, retail, cultural, and social venues.[51] This is evidenced in residential choices of this cohort. According to Joseph Cortright, between 2000 and 2009, the number of 25- to 34-year olds with college degrees living in neighborhoods near the central business districts in the nation's 51 largest metropolitan areas increased by 26 percent, double the growth rate of college educated young adults in the rest of the metropolitan area.[52]

Data from the Urban Land Institute reveals that 63 percent of millennials plan to move in the next five years, and 40 percent of them indicate a preference for living in medium or large cities (compared to only 28 percent of Americans as a whole). Within urban areas, living in close proximity to shopping, dining, and work is preferred by 62 percent of this demographic, along with 60 percent of both singles

and renters.[53] A recent *New York Times* article underscored how these shifts in demographics are challenging the New York City housing supply, noting that "there are more single households, thanks to the young urban migration and the silver tsunami, that gathering wave of urban-minded retirees."[54]

Collectively, these three shifts—a converging knowledge economy, more open innovation ecosystems, and changing demographics—are stirring new demands for density, proximity, collaboration, and walkability, and in so doing are re-working the spatial geography of innovation. With concerted effort, the rise of innovation districts holds the potential to bring numerous benefits to the cities and regions in which they are located, and to the people who live and work there.

Deconstructing Districts

The potential for innovation districts to drive innovative, inclusive, and sustainable growth requires us to understand what drives them and makes them productive and prosperous. Unlike segregated business or residential districts that have for decades populated most cities and suburbs, or even the activity centers that more recently have sprung up around public transit stations, innovation districts uniquely contain three categories of assets: *economic assets, physical assets, and networking assets.*[55]

- **Economic assets** are the firms, institutions and organizations that drive, cultivate or support an innovation-rich environment.
- **Physical assets** are the public and privately-owned spaces—buildings, open spaces, streets and other infrastructure—designed and organized to stimulate new and higher levels of connectivity, collaboration, and innovation.
- **Networking assets** are the relationships between actors—such as between individuals, firms, and institutions—that have the potential to generate, sharpen, and/or accelerate the advancement of ideas.

The relative strength of these assets in different communities varies considerably. In some places, districts are emerging from a cluster of strong economic assets but lack important physical assets and are initiating a planning process to comprehensively redesign the physical realm. In other cases, districts possess a strong set of physical assets with only a handful of economic assets and networks to build upon.[56]

Innovation districts reach their potential when all three types of assets, combined with a supportive, risk-taking culture, are fully developed, creating an *innovation ecosystem*. As described earlier, an innovation ecosystem is a synergistic relationship between people, firms, and place (the physical geography of the district) that facilitates idea generation and accelerates commercialization.

Both research and interviews suggest that a supportive risk taking culture consistently undergirds highly productive innovation areas. This means, most unconventionally, embracing failure by making risky investments in people, firms, and development projects. It means breaking down the traditional, vertical hierarchies and valuing a diversity of talent, from 20- and 30-year olds to the more experienced leadership class. It means changing conventional rules still found in many inward-focused research institutions and organizations to encourage spin-offs, allow greater idea sharing across firms, and share spaces and technologies. It also means taking the long view and not expecting short-term returns or rewards as innovation processes commonly require consecutive failures before any breakthroughs can be achieved.

In describing these assets it is important to recognize that a number of them may appear to be conventional, if not strikingly rudimentary. While many assets described here have been integral to existing urban economic development efforts, they are being re-engineered to support the innovative, traded sectors that drive metropolitan economies. Research universities, for example, are by definition teaching institutions with research departments. A small, but growing, subset of these universities are now valuing commercialization as a primary objective and are successfully advancing innovations into the market. Moving well beyond their tech transfer offices, these universities are investing resources in accelerators, encouraging and supporting spin-offs, and developing adjacent land to concentrate future economic growth. Many more research universities have not yet expanded their mission to embrace commercialization fully, demonstrating a growth opportunity for these universities and the areas surrounding them.

A. Economic Assets

Economic assets can be separated into three categories: innovation drivers, innovation cultivators, and neighborhood-building amenities.

Innovation drivers are the research and medical institutions, the large firms, SMEs, start-ups, and entrepreneurs focused on developing cutting-edge technologies, products, and services for the market. Due to regional variations in industry strengths, each district is comprised of a unique mix of innovation drivers, contributing significantly to their distinctiveness. The research described below reveals important insights for districts building and assembling these assets.

First, a subset of industries—sensitive to the economic, demographic, and cultural trends described above—distinguishes innovation districts from other models and largely explains their preference for compact, urban-oriented enclaves. These industries are:

- High-value, research-oriented sectors such as applied sciences (from life and material sciences to energy technology to nanotechnology) and the burgeoning "app economy."[57]
- Highly creative fields such as industrial design, graphic arts, media, architecture, and a growing hybrid of industries that merge tech with creative and applied design fields.[58]
- Highly specialized, small batch manufacturing such as advanced textile production and small artisan-oriented manufacturing.[59]

Large advanced manufacturing facilities are not located within urban innovation districts. These facilities require substantial building or land footprints and require easy access to major highways. This includes fabrication plants, OEMs (original equipment manufacturers) and large suppliers.

Second, the role of universities deserves special consideration given their effects on the local and metropolitan economy, including their role in driving innovation activity at the district scale. Anselin, Varga, and Acs, for example, sought to reconcile conflicting research findings on the role of universities and the local economy, drawing on larger and more geographically precise data sets. Their research found a "positive and significant relationship between university research and innovation activity," both directly, as well as indirectly through its impact on private sector R&D.[60] Further, Hausman, in analyzing Census data around universities after the passage of the Bayh-Dole Act in 1980 (an act allowing universities and other researchers the ability to commercialize research funded by federal dollars), found both long-term employment and worker income to rise "in industries more closely related to local university innovative strengths."[61] In short, universities are particularly helpful drivers for growing districts; for this reason, many districts that did not originally include universities (such as the "re-imagined urban areas" model) have convinced universities to build satellite campuses.

Third, entrepreneurs are another asset worth highlighting. While Edward Glaeser's research convincingly affirms the role of entrepreneurs in driving city employment growth, interviews with practitioners reveal that entrepreneurs are equally valued at the district-scale.[62] All innovation districts aspire to support entrepreneurs. Boston's innovation district, for example, includes an "innovation component" for new office and retail developments, where 15 percent of the space is earmarked for entrepreneurs and start-ups.[63]

Fourth, while many districts are focused on the cultivation of entrepreneurs, they alone cannot be a growth strategy for districts. Research conducted by Agrawal, Cockburn, Galasso, and others found that a mixing of firms creates the optimal environment for innovation. Larger laboratories, for example, may stimulate spin-offs considered irrelevant to the lab's overall business objectives, while smaller labs can create demand for specialized services that lower the entry costs for others in the market.[64]

Innovation cultivators are the companies, organizations, or groups that support the growth of individuals, firms, and their ideas. They include incubators, accelerators, proof-of-concept centers, tech transfer offices, shared working spaces (with programs to support idea and firm development), and local high schools, job training firms, and community colleges advancing specific skill sets for the innovation-driven economy. In a small number of districts, legal counsel, patent attorneys, and venture capital firms are scrubbing project concepts to identify their value in moving forward. The rise of technology-driven industries in general is creating demand for supportive industries that employ highly-educated workers, such as advanced business services.[65]

The aggregation of innovation cultivators in districts distinguishes them from standard business and research parks. While cities and suburban areas have cultivators sprinkled across their landscape, district leaders are assembling a critical mass of cultivators within a discrete geographic area. Equally

important, district leaders are "planning for the continuum" by building a range of cultivators to support entrepreneurs and start-ups at each stage of development, keeping them in the district as they mature. There appears to be a tipping point, however, when too many cultivators become counterproductive. "Too many incubators run the risk of spoon-feeding entrepreneurs too much. They need to work hard at achieving success," shared Ylva Williams of the Stockholm Science City Foundation.[66]

Neighborhood-building amenities provide important services to residents and workers in the district. This includes medical offices, grocery stores, restaurants, coffee bars, small hotels, and local retail (such as bookstores, clothing stores, and sports shops). In his analysis of the "new economy" clusters in the urban core, which include innovation-oriented clusters, Thomas Hutton found restaurants, coffee shops, and bars to "reflect not only contemporary urban consumption patterns but also a distinctive 'geography of amenity,' which complements the intensive social interactions of the new economy."[68]

Amenities activate district streets and public spaces, inviting a mix of people to shop, browse, and mingle. Many cities understand this well, and have heavily invested in corridor or neighborhood revitalization initiatives, often providing tax relief and other incentives for local businesses. District strategies build off these efforts, seeking to not only create a critical mass of amenities but to encourage a compelling design of storefronts and signage.

B. Physical Assets

There are three categories of physical assets, all of which are uniquely applied in each district: physical assets in the public realm, physical assets in the private realm, and physical assets that knit the district together and/or tie it to the broader metro area. Similar to economic assets, physical assets are in the process of being re-imagined to advance an innovation imperative—a process that is transforming the physical landscape into a laboratory of creativity, ingenuity, and invention. Experts in the fields of urban design, architecture, landscape architecture, and planning are experimenting with new concepts that facilitate collaboration and connectivity. This story of testing, trying and evolving was observed by MIT researchers, who in their global work on "New Century Cities" found districts to be "messy, with activities and uses all mixed up and things in a constant state of adjustment and change."[69]

Physical assets in the public realm are the spaces accessible to the public, such as parks, plazas, and streets that become locales of energy and activity.

In innovation districts, public places are created or re-configured to be digitally-accessible (with high speed internet, wireless networks, computers, and digital displays embedded into spaces) and to encourage networking (where spaces encourage "people to crash into one another").[70] "Digital places," as defined by MIT's New Century Cities work, are the culmination of ambient technology, digital systems, and the physical form, creating venues for training and education, cultural events, and entertainment.[71]

Streets can also be transformed into living labs to flexibly test new innovations. In Boston, Barcelona, Eindhoven, Helsinki, and Seoul, streetscapes and public spaces are testing new innovations in street lighting, waste collection, traffic management solutions, and new digital technologies. Living labs are what 22@Barcelona calls "open innovation at the city-scale."[72]

The re-make of physical assets extend far beyond technology-infused places however, as the design and programming of public spaces is equally valued. Small-scale parks and plazas programmed with concerts, innovation expositions, and eateries give reason for people to congregate and mix. District leaders are designing and programming such spaces strategically across their districts in an effort to facilitate the building of networks.

Physical assets in the private realm are privately-owned buildings and spaces that stimulate innovation in new and creative ways. Building from a solid base of traditional assets, such as mixed-income housing, neighborhood-serving retail, and research and office complexes, new assets are designed to support the innovation-driven demographic. Office developments, for example, are increasingly configured with flex work spaces, lab spaces, and smaller, more affordable areas for start-ups.

Micro-housing is another example of a new physical asset. These units offer smaller private spaces (typically 300 to 600 square feet) and access to larger public spaces such as co-working spaces, entertainment spaces, and common eating areas. Often marketed for migrating workers in innovation sectors, local residents, and younger single workers, micro-housing is now found in the districts

of Boston, Barcelona, and Philadelphia (under construction). St. Louis is also planning micro-housing units in their district.

Physical assets that knit the district together and/or tie it to the broader metro area are specific investments aimed to eliminate barriers that hinder relationship-building and connectivity.

Practitioner interviews suggest there is considerable work to be done within districts, particularly in linking anchor institutions (commonly oriented within their own campuses) with the rest of the district. For some districts, knitting together the physical fabric requires remaking the campuses of advanced research institutions to remove fences, walls and other barriers and replace them with connecting elements such as bike paths, sidewalks, pedestrian-oriented streets and activated public spaces. For other districts, strengthening connections requires changes at a much larger-scale, such as entirely re-structuring large areas with smaller, more walkable blocks and pedestrian-scale streets.

Strategies to strengthen connectivity between the district and the broader metro aim to ensure innovation districts do not become islands unto themselves. Investments in infrastructure, such as broadband, transit, bike, and pedestrian paths are natural connectors to be considered. Extending broadband into adjacent, often low-income neighborhoods, for instance, is a valuable strategy in reducing the digital divide. Investments in public transportation—including the Silver Line in Boston, the Red Line in Houston, the future M-1 in Detroit—have been essential, for instance, in increasing accessibility between districts and their surrounding metro areas.

C. Networking Assets

The inclusion of networking as its own asset category is supported by a growing body of research that reveals how networks are increasingly valuable and prolific within innovation-driven economic clusters. Scholars cite numerous advantages of networks: they are important sources of new or critical information for new discoveries; they encourage experimentation and are a testing ground for ideas; they help firms acquire resources; they strengthen trust and collaboration within and across sectors; and they help firms enter new markets including global markets.[73]

The most famous success story of networking is Silicon Valley, where dense social networks were found to drive both experimentation and entrepreneurship. In her analysis of Silicon Valley, Saxenian observed, "Companies compete intensely while at the same time learning from one another about changing markets and technologies through informal communication and collaborative practices." She argues that while proximity—in this case, a regional agglomeration—contributes to the development of dense networks, a collaborative culture appears to play a more significant role.[74]

While countless numbers of science parks and tech parks were built on the hopes that Silicon Valley could be easily copied, Bert-Jan Woertman, an enthusiastic connector and creative communicator for High Tech Campus Eindhoven, reflects that "Networks cannot be copied nor can they be easily established."[75] A recent *Harvard Business Review* article similarly presented the difficulties in establishing networks, finding that even start-ups and their parent companies "cannot leave knowledge spillovers to chance."[76]

Districts attempting to cultivate networks are driven by experimentation, creativity, and even a sociological understanding of how networks function. A leading scholar on networks, Granovetter, differentiates networks as either having "strong ties" or "weak ties," which are determined by factors such as the frequency of contact, the emotional intensity of the relationship, and the reciprocity of commitments between the actors.[77]

Strong ties occur between people or firms with a working or professional history, higher levels of trust, willing to share more detailed information, and more apt to participate in joint problem solving. Weak ties occur between people or firms working within a different economic cluster or context where there is infrequent contact. Weak ties provide access to new information, even novel industry information, new contacts, and new information on business leads that are outside of existing networks.[78] While it may seem obvious that a dense network of strong ties is the optimal condition for a highly innovation-driven environment, research indicates that both strong ties and weak ties are fundamental to firm success.[79] Two primary categories of networking assets emerge from this research:

Networking assets that build strong ties focus on strengthening relationships within similar fields. These types of assets include: "tech regulars" (such as Eindhoven's Tech Regulars, where "techies" discuss problems or advances in their work as a collective), workshops and training sessions for

specific fields or technicians (daily activities along Boston's waterfront), cluster-specific meetings (22@Barcelona), industry-specific conferences and monthly meetings (found in several districts), and industry-specific blogs for local firms and entrepreneurs.

Networking assets that build weak ties focus on building new, often cross-sector, relationships. Examples include: networking breakfasts (such as 22@Barcelona's breakfast where experts and star innovators offer new insights in their fields followed by open time to network), innovation centers (such as Boston's newly constructed 12,000 square foot District Hall), hack-a-thons across industry clusters such as life sciences and tech (Stockholm), tech-jam start-up classes (found in Boston), and even the choreographed open spaces between highly programmed buildings (St. Louis). In this last example, St Louis will be clustering five innovation centers, with the purpose of generating "collision points" between smart people.[80]

Reflections from Practitioners

As innovation districts take hold, the real challenge is how each community marshals resources in a deliberate and customized way to capitalize on advantages and realize the promise of productive, inclusive, and sustainable growth. To that end, this section summarizes reflections from practitioners spearheading efforts to drive and develop districts. We found their experiences to vary considerably, in part due to the types of local actors, the level of resources at their disposal, and the distinct economic, physical, and networking challenges they set out to address. Even with these and other variations at play, practitioners for the most part offered similar reflections from their work so far.

This section is not meant to be a how-to guide for future districts but is instead intended to illustrate how these practitioners have come to understand and organize the complexities inherent in their work. It draws from interviews with practitioners and researchers working in leading edge innovation districts including University City in Philadelphia, Cortex in St. Louis, Kendall Square in Cambridge, the South Boston Waterfront, downtown and midtown in Detroit, South Lake Union in Seattle, the Texas Medical Center in Houston, 22@Barcelona, two innovation districts in Stockholm (Stockholm Life and Kista Science City), and Eindhoven in the Netherlands.[81]

We have consolidated their reflections into the following five strategies, each of which will be discussed in turn:

- Build a collaborative leadership network
- Set a vision for growth
- Pursue talent and technology
- Enhance access to capital
- Promote inclusive growth

1. Build a collaborative leadership network

A collaborative leadership network is a collection of leaders from key institutions, firms, and sectors who regularly and formally cooperate on the design, delivery, marketing, and governance of the district. Practitioners reflected that to bring innovation to scale—i.e. beyond the boundaries of individual organizations and firms—has required leaders from disparate institutions to encourage idea sharing across researchers, firms, universities, and supportive organizations. Likewise, physically remaking a place in the service of innovative growth and expanding employment and educational opportunities for low-income residents has required leaders to think and act in a multi-dimensional fashion, across multiple sectors and communities.

Practitioners in the field underscored the importance of a focused and organized leadership network to super-charge innovation, reshape places, build a culture of trust and collaboration, and steward networks. Interviews identified three key and, in some cases overlapping, models of leadership:

An important share of innovation district leaders found the Triple Helix model of governance to be foundational to their success.[82] The Triple Helix consists of structured interactions between industry, research universities, and government. Collectively, they design long-range visions and create new

vehicles for innovation, such as research centers and incubators. In the case of 22@Barcelona, St. Louis, Kista Science City (Sweden), and Eindhoven (Netherlands), the Triple Helix model established a clear organizational model of collaboration from the start. Further, Eindhoven and St. Louis are finding real success in a leadership model that includes a powerful development agency to execute strategies.

Practitioners also cited the valuable role of one person, a team of people, or designated entity serving as a "catalyst," an "integrator, or a "facilitator" throughout the process. This was found to be true even in cases using the Triple Helix model. Integrators or facilitators were found to stitch together disparate efforts, help conflicted leaders reach consensus, and simply kept the process moving along. In St. Louis, Bill Danforth, chancellor emeritus of Washington University, founded the BioSTL Coalition, a regional organization championing the bioscience cluster, which brought together city and regional leaders to forge a vision for growth and innovation.[83] In other places like Houston, Research Triangle, and Philadelphia, the powers and activities of an existing entity are rediscovered or reconfigured to fit the new purpose.[84] In Seattle, Vulcan Real Estate has played a critical role in including local community groups in discussions around the design and location of housing, infrastructure and amenities.

Finally, and of particular importance in the United States, practitioners cited the instrumental role mayors can play in catalyzing the formation and evolution of innovation districts—a role that will likely grow over time. Former Seattle Mayor Greg Nickels played a critical role in the growth of South Lake Union, making key infrastructure decisions around transit, roads, and energy. Former Boston Mayor Tom Menino's successful effort more recently to designate the South Boston Waterfront as an innovation district and steer its redevelopment in collaboration with a broad network of stakeholders is now being studied by mayors in cities as diverse as Albuquerque, Austin, Chattanooga, Detroit, and Pittsburgh as they seek to build on their strengths.

2. Set a vision for growth

A vision for growth provides actionable guidance for how an innovation district should grow and develop in the short-, medium- and long-term along economic, physical, and social dimensions. 22@ Barcelona, for example, envisioned and articulated in forward-looking documents, a "new model of a compact city," replete with innovation activities, green spaces, advanced industries, a strong industrial heritage, subsidized housing, a new mobility model, and revitalized public spaces.[85] St. Louis and Stockholm Life also devoted the necessary time and resources to develop a highly visual, long-term vision for their districts. Beyond these examples, most practitioners cited the importance of developing a vision to leverage their distinctive strengths—economic clusters, leading local and regional institutions and companies, physical location and design advantages, and other cultural attributes. Innovation districts that may share the same physical geography (e.g., a downtown or waterfront setting) or similar institutional platforms (e.g., an advanced research institution or medical campus) can have radically different opportunities for growth.[86]

Clarify your competitive advantage

Given the distinctive starting points and strengths of disparate places, many district leaders grounded their visions in evidence, developed through the accumulation of relevant data and information, and accompanied by smart analysis, experience and intuition. Some places conducted analyses to guide areas of industry and entrepreneurial growth. Others instead used a bottom-up process driven by entrepreneurs to identify new and emerging areas of growth.

Many practitioners in the United States explained how detailed analysis helped define which clusters and/or research areas to advance. In the early stages of St. Louis' conceptual planning, for instance, Battelle was hired to conduct a thorough analysis of the region's industry clusters in life and plant science. The diagnostic included several areas of study: an assessment of the region's economic strengths (evaluating their range of strengths within life sciences); a benchmarking exercise (against leading and comparable regions); and a SWOT analysis (a quantitative and qualitative analysis of strengths, weaknesses, opportunities, and threats). This work was an important precursor to the formulation of specific plant and life science strategies for St. Louis to consider.[87]

As the St. Louis example demonstrates, a city's or metropolitan area's distinctive economic strengths helped orient actors to the clusters that have the best chance of success rather than rely on a government's attempt to pick industry winners. In fact, St. Louis' strength in plant and life sciences,

Philadelphia's strength in health, computing and informatics, and energy, and Eindhoven's strength in precision machinery are the very clusters promoted in their innovation districts. As these places have evolved, new, emerging clusters grew out of R&D and smart commercialization or through surprising synergies between two or more clusters, creating an even more dynamic network of clusters.

Other practitioners have applied a more bottoms-up approach to identify new and emerging areas of growth. Through a methodology known as "smart specialization," Stockholm and Eindhoven encourage entrepreneurs and other economic actors to enter into a process of "entrepreneurial discovery" to collectively determine new innovation projects or new areas of R&D. Rooted in open innovation, firms and entrepreneurs meet in structured settings to brainstorm, analyze, and ultimately test new ideas. Importantly, this approach aims to move the broader collective of firms into new and emerging areas.[88]

Ylva Williams of the Stockholm Science City Foundation described their intricate process of supporting entrepreneurs, larger companies, universities, and health care providers to collectively identify new market opportunities. One successful example is the convergence between Stockholm's strong sectors of life science, tech and ICT sectors (which also builds bridges between the city's two main innovation districts: Stockholm Life and Kista Science City). In an effort to develop new digital health products and services, entrepreneurs, companies, and other public organizations developed the following process:

- **Ideation workshop.** Patients, healthcare providers, companies and entrepreneurs define challenges or problems and subsequently develop potential solutions. If desired, participants can form teams around a possible solution.
- **HealthHack.** A 48-hour workshop where teams of experts from tech/ICT and life sciences work together to find solutions to the ideas generated in the ideation workshop. Products in this phase range from sketches and prototypes to software ideas.
- **Design workshop.** With the support of sector experts, the teams refine and design their prototypes developed during HealthHack.
- **Pitch workshop.** The teams receive training in how to make successful pitches.
- **Digital Health Days.** The best teams are selected to give a pitch presentation during the international meeting and the audience will vote for the best team.[89]

Smart specialization, such as this above process, aims to "identify new product segments and further strengthen our competitive advantage," said Williams. Perhaps somewhat similar in philosophy, some U.S. districts, including Boston's innovation district, have opted to be silent on clusters, arguing that the selection process derive from entrepreneurs and the market itself.

Imagine a new mix of institutional assets

Practitioners have come to understand that a future vision of a particular district does not begin and end with an assessment of its existing institutional assets. They are keenly aware of the growing trend of leading edge technology and pharmaceutical companies, private and public universities, and even medical campuses to move advanced research and other critical assets to those locations that generate the largest return on investment for the firm or institution. From this understanding, district leaders have become more deliberate in their efforts to lure major innovation assets to their sites (i.e., to "un-anchor anchors") or to form new institutions whole cloth."

The innovation district in downtown Detroit was catalyzed by the decision of Quicken Loans to move its headquarters from suburban to downtown Detroit. Boston's successful enticement to Babson College and the Fraunhofer Institute to open outposts on the South Boston waterfront is another example of this trend as is the University of Washington's decision to locate an advanced medical research campus in Seattle's South Lake Union. Stockholm's largest technical university, KTH, opened a technical branch within Kista Science City. Lastly, 22@Barcelona successfully lured numerous universities to locate within their district, creating a new gravitational pull in the region and a new location for students, researchers and entrepreneurs to innovate jointly.

Re-imagine your physical landscape

Successful practitioners routinely spoke of the need to transform the physical landscape of their districts to create the favored attributes of complexity, density, and mixed uses and activities. This has been particularly challenging in places that bear the indelible markings of 20th century development.

Heavy infrastructure—highways and exposed railroad tracks—often divide natural districts. Euclidian zoning, originally intended to protect health and safety, segregated uses and isolated housing, office, commercial, and manufacturing activities from each other.[90]

A number of innovation districts have therefore required variances from antiquated land use and zoning ordinances and, in some cases, radical changes to existing infrastructure.

In the "anchor plus" model, practitioners have re-drawn existing lines—tearing down walls, fences and other, even more substantial, barriers between anchor institutions and others, creating new mixed-use neighborhoods, making and creating new public spaces, and activating streets to draw people together, and re-designing corridors to make them more pedestrian-friendly. In both Kendall Square near MIT and St. Louis' Cortex district, city governments (or their designated agents) revised land use conventions and zoning ordinances to affect this change. One Stockholm innovation district, Stockholm Life, is in the process of covering over (also known as "decking") two highways that divide their anchor institutions and firms. In doing so, they will have space to build 5,000 units of housing, laboratories, several schools, and open space, effectively stitching the district together.[91]

Practitioners involved in re-imagining urban areas have also undertaken (or benefitted from) pronounced changes to the physical infrastructure. 22@Barcelona, for example, was built on the remains of a 494-acre industrial area, scarred and separated from the rest of the city by railroad tracks. Through extensive public planning and investment, 22@Barcelona buried these tracks, increased access via a new public tram, designed walkable streets, and created new public spaces and housing.[92] Boston's innovation district was enhanced by the Big Dig, the removal (and submerging) of elevated highways that separated the south waterfront from the rest of the city. Equally important, construction of Boston's third harbor tunnel markedly increased the level of access to the innovation district for both cars and transit.[93]

In the few cases of the "urbanized science park," re-imagining land use is the precursor to realizing any aims of urbanization—density, a mixing of uses, and a concentration of activities. This counters the original design of science and research parks, as exemplified by North Carolina's Research Triangle Park, which were intended to ensure seclusion, isolation, and the protection of intellectual property, often on their own "research estates," as the RTP Master Plan puts it.[94] Today, an outsized portion of RTP's master plan focuses on its physical redevelopment: specific urban nodes allowing greater density and amenities, the development of a vibrant central district with more retail, and building up to 1,400 multifamily housing units.

Innovation districts relied on a variety of planning tools as they engaged in this work. 22@Barcelona, Cortex in St. Louis, and Cambridge (MA), for example, developed master plans to address the complexity in physically redeveloping their districts. Under existing state statute, the city of St. Louis designated Cortex West Redevelopment Corporation the master developer of the innovation district. Cortex is also responsible for master planning, oversees development, issues tax abatements, and may use eminent domain. MIT experts in their global work on innovation districts found tremendous success using strategic visions, which are more nimble in scope than traditional master plans. Boston, instead, developed design guidelines and development standards to guide changes incrementally as new developments come on-line.

Lastly, a number of district leaders spoke of efforts to physically brand their area in effort to create a clear, undeniable experience when people enter a district. Dennis Frenchman from MIT describes branding as "narrative design" where the physical landscape is enhanced "so they more clearly communicate a particular set of images and stories."[95] District branding has included the strategic use of urban design elements (such as building massing, street design, public spaces, materials, and plantings); gateway development (where entrances into the district are pronounced or marked in some unique way); communicative digital displays, lighting, signage and banners (all carrying the district logo) along key corridors, at district gateways, and in public spaces.

3. Pursue talent and technology

Talent and technology appear to be the twin drivers of innovation in these districts. Talent commonly refers to those workers with the specialized education and skills necessary to generate new discoveries, commercialize ideas, design new products or production methods (or tinker with existing ones), and manage, brand, and package the ultimate result for the marketplace. Technology refers to the

tools, machines, infrastructure, and systems that help talented workers engineer industrial breakthroughs, disentangle big data and complex problems, and facilitate the production processes that follow. Both fields of work, practitioners shared, have required systematic planning and execution.

Dedicate efforts to attract, retain and grow talent

Practitioners argue that their ability to attract, retain, and grow talent plays a valuable role in differentiating seemingly identical clusters across U.S. and global cities and regions. Similar to businesses and leaders at the regional- and city-scale, district leaders have developed their own campaigns to lure individuals trained or educated in specific niches and specializations.

Practitioners explained that efforts to attract talent—which includes organized outreach programs, marketing campaigns, and highly tailored scouting techniques—largely target highly educated and skilled workers from other parts of the country, if not other global regions. Barcelona's aim to become a global hub of innovation required both a local and global workforce, driving efforts to target international professionals as stimulants for local economic activity.[96] Eindhoven, in their drive to be the "smartest region in the world," found this necessitated a pooling of talent from across Europe and around the globe.[97] South Lake Union's most successful attraction strategy was to entice Amazon to move to the area. As one entrepreneur said: "We love being next to Amazon" They are to South Lake Union and Seattle what Microsoft was to Redmond and the Eastside in the 1990s. They attract a lot of talent. Talent begets talent."[98]

Efforts to retain talent were found to be similarly critical. Years of growing and assembling a strong pool of talent can quickly lead to paralyzing setbacks with the loss of key researchers and faculty. Eindhoven, for example, has dedicated staff focused on talent retention, offering a pipeline of support including cultivating dual career opportunities, and cultural training for international workers on "how to deal with the Dutch."[99] The retention of recent university graduates is equally important, a renewing source of human capital.

Growing talent, while the most time- and resource-intensive of these three categories, is described by practitioners as the very heart of a district's core mission. On one hand, growing talent means growing entrepreneurial capacity and catalyzing start-ups and spin-offs dedicated to commercializing ideas. All practitioners interviewed underscored the extent to which they designed programs, and even often constructed new buildings, to support the growth process of entrepreneurs. "It's all about programming: choreographing 'spontaneous' opportunities for smart people to interact with each other. This is what separates us from traditional science parks," shared Dennis Lower of Cortex in St. Louis.[100] On another level, growing talent means developing a feeder system of STEM workers with the general and customized skills necessary for participation in innovative sectors. Recent work and experiences will be highlighted in the section on promoting inclusive growth.

Seamlessly integrate technologies into the landscape

Practitioners emphasized that technology plays two roles across the district landscape.

First, advanced technology provides the platform upon which innovation is conceptualized, advanced in R&D, and developed during prototyping and product formulation. Specializations such as artificial intelligence, next-generation genomics, and software development, rely heavily on advanced technologies, such as robotics, nanotechnology, and sophisticated computer systems.

The extent to which technologies now drive advancements in science and other fields is what propels districts to invest in technology enhanced facilities. A 2012 survey of university research parks in North America—one example of the "anchor plus" typology—reveals that 75 percent of these districts now contain specialized laboratory facilities.[101] Innovation districts in Cambridge, St. Louis, and Eindhoven have found real success in sharing many of these cost-prohibitive technologies with firms and entrepreneurs through shared workspaces, shared laboratories, and technology centers. As Johannes Fruehauf, the head of Lab Central in Cambridge says, researchers should focus on "perfecting their science" rather than making substantial capital expenditures and assuming large early risks and liabilities.[102]

Second, practitioners have observed the salutary effect of embedding technology in standard public infrastructure to create a platform for innovation. Installations of fiber optics to create a high quality internet environment are now considered an investment in "the basics." St. Louis, for instance,

is making substantial upgrades in internet connectivity by adding fiber to the existing sub-street infrastructure, further enhancing the computing power around big data and the potential for the commercialization of innovation.[103] 22@Barcelona constructed separate tunnels to lay fiber to ensure that upgrades to the system would be easier to meet growing demand.[104] As described in the section describing physical assets, some districts are attempting to reduce the digital divide by extending fiber optics into adjacent, often low-income, neighborhoods. In their global work, MIT researchers focused on New Century Cities observed real growth in the development of digital systems (display and interactive communication systems designed into objects such as bus stop walls and café table tops) and digital places (the nexus of technology, the physical form, and activity creating new ways to teach/train and to entertain). These digital models are particularly pronounced in newer cities and districts in Asia (such as Seoul's Digital Media City) and the United Arab Emirates (Masdar City in Abu Dhabi).[105]

4. Promote inclusive growth

Promoting inclusive growth means using innovation districts as a platform to regenerate adjoining distressed neighborhoods as well as creating educational, employment, and other opportunities for low-income residents of the city.

Given broader trends around economic restructuring, anemic job growth, and wage stagnation, many cities and metropolitan areas have experienced substantial increases in the number of people living in poverty and near poverty over the past decade. As described below, innovation districts offer multiple opportunities for neighborhood revitalization, quality employment, and poverty alleviation. Pursuing these opportunities will lessen the tensions between innovative and inclusive growth, which have emerged in many communities.

Pursue comprehensive neighborhood revitalization

As a recent survey of urban-oriented research parks highlights, 45 percent of these parks are adjacent to, or located within, distressed communities.[106] For this very reason, anchor institutions, like the University of Pennsylvania and Drexel University are pursuing the regeneration of adjoining neighborhoods through multiple strategies to improve public safety, provide quality education, enhance digital literacy and connectivity and expand affordable housing and retail opportunities.

As one practitioner explained, quality public schools are central to this multi-layered effort. To that end, several innovation districts are placing their considerable academic, real estate, and tech talent in the service of broader education reforms. This includes creating or adopting area schools, such as STEM charter schools or magnet schools, developing STEM-oriented curriculum, offering teaching assistance, and providing internship opportunities. In Philadelphia, for example, a consortium of institutions led by Drexel University is working with the city to create a K-8 school near its campus in an underserved neighborhood. The middle school program will be created and overseen by such esteemed institutions as the Science Leadership Academy high school in partnership with the Franklin Institute and the Academy of Natural Sciences of Drexel University. The development of the larger site would include a commercial component to yield capital dollars to help fund this school.[107]

Increase labor market participation

Innovation districts are likely to grow jobs in multiple sectors such as housing, construction, medical, tech, services, and retail. The districts, therefore, offer ample opportunities to connect residents in high unemployment areas (particularly young residents) to occupations that require disparate sets of skills and work experience. Practitioners noted the need to be purposeful in hiring, training, and supporting local talent, with the ultimate goal of giving low-income workers economically-mobile career paths with family-sustaining wages. Further, by redirecting capital and jobs back into urban cores and urbanizing suburban parks, jobs become increasingly accessible, particularly by transit.

A number of practitioners emphasized the potential for equipping workers with the skills they need to participate in the innovation economy. Tom Andersson of Kista Science City in Stockholm, explained how they view this as their responsibility "in addressing the competence issue for the long-term."[108] One strategy a few practitioners are applying is to focus on the many innovation jobs (e.g., lab technicians) that require customized technical training in high schools or community colleges, rather than a four-year or advanced college degree. In fact, in mature science and research parks, the conventional

wisdom is that 40 percent of the jobs require high school diplomas or associate degrees, 40 percent require bachelor degrees, and only 20 percent require masters and Ph.Ds.[109] This dovetails with Brookings research, which found that half of all STEM occupations are available to workers without a four-year college degree, arguing for an expanded definition of talent.[110] The St. Louis and Barcelona districts are particularly focused on this potential, experimenting with school-to-work programs, apprenticeships that teach career-building skills and on-the-job training programs.

The challenges associated with linking low income residents to innovation-oriented jobs should not be underestimated given vast educational disparities. In Philadelphia, district leaders are also looking to connect area residents to job opportunities in the secondary and tertiary sectors (e.g., services, retail) that the innovation district catalyzes.[111]

Stimulate local entrepreneurship

Innovation districts, finally, also offer rich opportunities for local entrepreneurial growth. In some cases, specific programs have been designed to grow or support entrepreneurs from pools of less educated residents and workers. The district in Medellin, Colombia, for example, is growing talent through its fabrication lab (known as Fablab), cultivating innovations developed by people living in informal settlements.[112] Free to the public, the Fablab offers state-of-the-art high technology equipment, including the latest in 3-D, digital production.[113] Drexel University and other area anchors in Philadelphia are pursuing entrepreneurial opportunities presented through local procurement.[114] As shown by a recent report released by the Philadelphia city controller, purchases made by anchor institutions form a substantial potential market for local firms.[115] These anchors are now coordinating efforts to hire local (including minority-, and women-owned) businesses to provide these products and services—essentially creating their own local supply chain. As Lucy Kerman of Drexel observed, "Local businesses tend to hire locally so anchors can effectively partner with local businesses, creating new jobs and new opportunities."[116]

5. Ensure Access to Capital

Capital is a necessary ingredient to fuel district growth and expansion. Financing in many forms and from a variety of sources is needed to support basic science and applied research; the commercialization of innovation; entrepreneurial start-ups and expansion (including business incubators and accelerators); urban residential, industrial, and commercial real estate (including new collaborative spaces); place-based infrastructure (e.g., energy, utilities, broadband, and transportation); education and training facilities; and intermediaries to steward the innovation ecosystem. A district-wide integrated strategy, as opposed to compartmentalized efforts, enhances the likelihood that different sources of capital will value the potential of this new form of development, ultimately supporting different kinds of firms, institutions, and activities.

Redeploy and leverage local capital

Many practitioners understand the importance of garnering local capital from disparate public, private, and civic sources to spur innovation district growth, particularly in the early stages. The provision of local capital, particularly at-risk capital, is a market validator and shows that local investors are willing to back the effort. To accomplish these goals, practitioners have been intently focused on redirecting local resources to new innovative purposes and smartly leveraging these resources so that they have full impact.

Practitioners point to early signs that the mixing and leveraging of different sources of local capital is already underway. City governments, for example, are smartly redirecting scarce public resources in ways that garner large private and civic investments. In St. Louis, the city government is using tax increment financing to support infrastructure improvements. The city has also designated Cortex as the master developer for the area, delegating an ample suite of redevelopment powers including the right to exercise eminent domain, abate taxes, and enter into parcel agreements with developers; those decisions have likewise leveraged hundreds of millions of dollars in private and civic sector investment.[117] In 2003, for example, the Danforth Foundation announced that St. Louis-based plant and life sciences would be a predominant focus of its grant-making.[118] In tandem with the McDonnell Foundation and private corporations, the Danforth Foundation led efforts to establish

the BioGenerator, a sophisticated accelerator with a non-profit seed fund. In the last five years, the BioGenerator helped close the funding gaps challenging many local startups, aiding in the successful launch of over 40 new life science enterprises. Further, this accelerator set its eyes on drawing national and regional capital, with its parent organization BioSTL hiring a dedicated person to increase access to national VCs, angel investors, and others.[119]

Local institutional capital is also being unlocked to spur urban regeneration. MIT, for example, has used its extensive land holdings in Cambridge to spur the development of research, entrepreneurial, commercial, office and residential space.[120] In Detroit, meanwhile, philanthropic investments have been a main catalytic force. The Kresge Foundation alone recently committed $150 million over five years to implement the recommendations and strategies outlined in the Detroit Future City report, doubling down on the investments it has already made along the riverfront, in M1 Rail, in the planning for the Detroit Future City effort, and as part of both the New Economy Initiative and Living Cities.[121] These investments have provided a platform for large-scale federal investments (via FHA, DOT, SBA, HUD, and other sources) as well as other state and private sector commitments.

Provide a roadmap for broader private, civic and public sector investment

Practitioners understand that innovation districts will only reach their full potential when companies and investors outside the city and metropolis either decide to locate facilities in the district or otherwise deploy capital. Practitioners recognize further that innovation districts, by providing both a geographic, economic, and entrepreneurial focus, can bring together, in a disciplined and market-oriented way, the disparate elements required to accelerate city regeneration and metropolitan growth.

The practical implications of these insights: innovation districts must make a compelling case for investment and even create special investment vehicles tailored to disparate kinds of activities. Some innovation districts are experimenting in this regard as an avenue to raise capital. The emerging innovation district in Detroit, for example, is considering an investment prospectus that presents the vision and goals of the district, shows the market momentum to date (including a profile of major investors and investments), and describes current and future market opportunities. The prospectus would both make a general case for investment in the district but also target discrete classes of investors and institutions (real estate developers, equity investors, large firms, venture capital, and others).

The Detroit investment prospectus would cleverly build upon existing activities that have already attracted disparate kinds of investors to distinct opportunities. Invest Detroit, for example, has established a series of funds (e.g., a Predevelopment Loan Fund, an Urban Retail Fund, a Lower Woodward Housing Fund, a New Markets Tax Credit Fund) that try to match the expectations of private and civic investors with the financing needs of small- and medium-sized firms that serve different market functions in the downtown and midtown area.[122] It is expected that the Detroit investment prospectus and the subsequent hosting of investor forums would educate the investment community about the market momentum in the innovation district and attract more capital to the specialized funds administered by an institution with a proven track record.

Scaling Innovation Districts

The rise of innovation districts—in all three typologies—has, to date, been a local phenomenon. Mayors and corporate, university, and philanthropic leaders, local developers, and intermediaries have largely driven their growth and development in most cities. A few national and global institutions have established a presence, with capital and facilities, in the leading edge districts, but most major companies and institutional investors have yet to acknowledge or adapt to this trend. The federal government has been an important but silent investor. With a few notable exceptions, states have largely acted without focus or purpose. To date, networks of innovation district practitioners and leaders remain nascent and isolated.

If current trends are any indication, innovation districts will continue to grow in size and scale, fuelled by market and demographic dynamics, open innovation, local leadership, and the place based investments of large anchor institutions. But if innovation districts are to realize their full potential across the country, then asset-rich companies, civic entities and financial institutions—with expertise

honed from global experience—need to invest at scale. Higher levels of government also need to act with more predictability and purpose.

A. Scaling Private and Civic Investment

As described previously, local institutions and investors have, to date, played the primary role in powering growth and innovation district development forward, leveraging local institutional assets and sharpening their case for broader investment. A few institutions of national scope—tech giants like Microsoft and Google, big pharmaceutical companies like Pfizer and Novartis, large urban development firms like Forest City Enterprises and life science focused real estate investment trusts like Alexandria Equities—have spotted the emerging trend and moved facilities and capital to the leading edge innovation districts. But, for the most part, large national and global institutions have not participated at scale.

Several things are necessary if that is to happen.

First, innovation districts need to be recognized as a separate sub-metropolitan/sub-urban geography worthy of focused data collection and analysis by companies that follow urban real estate and innovation trends.

Markets are created when risks and returns are made transparent, so that investors can invest in an informed way. Tracking economic trends in innovation districts (e.g., residential growth, real estate value appreciation, business formation and growth, tech transfer activity) will give investors the confidence to enter the market at scale. Companies that invest in innovative firms and start-ups will look at a broader set of cities and metropolitan areas for their investments. Companies with expertise in delivering mixed-use development and urban-oriented retail (e.g., Post Properties, Whole Foods) will see innovation districts as fertile geography for their products and services and locate accordingly. Firms that either provide innovative products and services (or provide legal, accounting, marketing, and other advice to such firms) will shift locations as well.[123]

Given the potential for job creation in the districts, philanthropies, corporate as well as civic, will see the wisdom of supporting efforts to make innovation more inclusive. And given the entrepreneurial spirit of these new communities, demand for crowd-funding for creative and community projects will grow exponentially. Innovation districts represent, in short, a form of market creation, which will grow in size and scale as data and analytics are sharpened, first mover firms show decent returns on their initial investments and standards and models for more routinized investment are established.

Second, and more aspirational, innovation districts ultimately need to be treated as a unified asset class that recognizes the synergistic effect of disparate investments that strengthen and reinforce each other's value, rather than as a collection of separate and unrelated investments. This is a major challenge to the status quo. Financial institutions, governmental agencies, and philanthropies compartmentalize all aspects of financing (equity investments, debt lending, and grant making just to name a few) even though the focus of these investments (e.g., housing, infrastructure, small business) are physically located in small geographies and interact in a way that enhances value for each of the disparate elements.

Innovation districts, by contrast, offer a possible vehicle for "thinking horizontally across industries and sectors" and overcoming the propensity of investments in cities to come from fragmented sources in "vertical silos."[124] As innovation districts evolve, the hope is that this insight will spur new financial innovations and unleash new flows of capital. Large commercial banks might establish special initiatives to bring spatial coherence to their current array of aspatial products and financing vehicles. Other large financial institutions might invest directly in firms and intermediaries at the cutting edge of design, execution, and management of this new development form (Blackstone's investment in the mixed use developer Eden Communities is an early example of this kind of capital shift). The end result of this: an ample supply of early stage venture capital and commercial lending becomes available in innovation districts to support the building and expansion of innovation-related firms, reinforced by real estate, small business, and community lending to create the housing and mixed-use buildings these firms and their workforce need to thrive.

B. Smart Feds, Smart States

The federal government and states, to date, have not intentionally driven the rise of innovation districts and, for the most part, have not even been cognizant of the trend. Their active engagement and involvement could accelerate the growth of districts, provided it respects the organic and differentiated nature of this nascent trend. They have three important roles to play: spurring innovation and entrepreneurial growth, financing land and infrastructure improvements, and boosting human capital.

Spurring Innovation and Entrepreneurial Growth

It is simply impossible to imagine the late 20th century rise of "cities of knowledge" in Silicon Valley, the Research Triangle, or the Boston megalopolis without recognizing the foundational role played by federal investments in basic and applied science and state investments in public universities.[125] The federal and state governments, in short, have provided the institutional platform for innovation, the base for the generation and commercialization of ideas and the creation and expansion of companies.[126]

The federal and state governments do, however, play disparate roles. For example, the federal government dominates in research funding, with federal actual outlays for R&D in FY 2011 of $125.7 billion, compared to state (and local) governments which account for only 1 percent of national R&D expenditures, with $3.8 billion in 2011, most of which is for academic R&D at colleges and universities.[127] The federal government also supports the start-up, expansion, and trading activity of firms through the lending activity of the Small Business Administration and the Export-Import Bank. The states, by contrast, are major direct investors in public universities, advanced research aligned with state economic clusters and competitive advantages, and tax and spending investments in sophisticated building and equipment.

The general message to both the federal and state governments is to stay the course and continue to provide consistent platform funding and support for innovation. At a time of increasing fiscal austerity, maintaining the status quo would be victory enough. Yet there are several more targeted roles that the federal government and particularly the states should consider.

- ***The smart location of advanced research institutions:*** Given the shifting spatial geography of innovation, the federal government and states should consider locating new or existing advanced research facilities (or providing incentives for the location of such facilities) in innovation districts. The federal government achieved this when it located the first National Manufacturing Innovation Institute, focused on additive manufacturing, in the downtown of Youngstown, Ohio, close to the existing base of small and medium-size manufacturing firms.[128] The state of California achieved this when it located the Institute for Regenerative Medicine in the Mission Bay district of San Francisco.[129] As described earlier, the shifting of public university advanced research facilities to innovation districts (e.g., the location of UW Medicine in the South Lake Union district of Seattle) has become a recognized trend. In the next decade, states in particular would be wise to rethink the location of the research arms of institutions of higher learning to spur market creation and radically increase the return on state investment during a period of fiscal challenges.
- ***Targeted research funding:*** As federal funds for advanced research become scarcer, states would be wise to dedicate focused capital to advanced research efforts that builds on their special sector niches and competitive advantages. A recent Brookings paper noted the increased use of ballot box referendums for these purposes in California, Massachusetts, New Jersey, New York, and Texas.[130]
- ***Catalytic funding:*** States are often involved in particular tax and spending transactions that help grow the institutional platform for innovation in cities and metropolitan areas. The state of New York, for example, recently allocated $45 million to Buffalo to facilitate the expansion of the Columbus, Ohio-based Edison Welding Institute, one of the most advanced shared infrastructure facilities in the United States.[131] The state of Massachusetts, meanwhile, recently made a $5 million grant to facilitate the building of the LabCentral facility in Cambridge.[132] These kinds of targeted investments for capital projects complement the more routine funding that is available for basic science and applied research and, if located in strategic places, can promote synergy and rapid commercialization.

Financing/Regulating Land and Infrastructure

The federal government and states have traditionally played a large role in the financing and regulation of the physical realm of cities. To varied degrees, both levels of higher government make direct or indirect investments in transit, roads, other infrastructure, parks, housing, and other capital improvements. States also determine building codes and standards of construction, establish how tax delinquent properties can be foreclosed, and dictate the ground rules for using eminent domain.

As with innovation funding, federal and state funding for major physical assets have been unreliable in recent years, either due to revenue shortfalls in dedicated funds (e.g., the federal Highway Trust Fund) or partisan gridlock (e.g., the failure to reauthorize federal transportation laws on a timely basis). Thus, the first order of business is to make funding more reliable and predictable, and more flexible so that cities and metropolitan areas can apply the funding to the special needs of innovation districts.

But, several other focused engagements should be considered.

- ***Smart removal of infrastructure barriers:*** Many innovation districts, particularly those located near waterfronts and downtowns, still bear the scars of mid-20th century freeway construction that often divided communities and disrupted the organic street grid and connectivity of urban places. The removal and reconstruction of such infrastructure provides a means to spur innovative markets. The rise of the innovation district in the Boston Waterfront is, in many respects, a consequence of the Big Dig project to tear down and bury key highways, thereby re-connecting the waterfront to the broader city and metropolis. Similar efforts are underway in cities as diverse as Akron, Detroit, and Syracuse and will have enormous impact on investment and jobs once concluded.
- ***Smart use of tax incentives***: Innovation districts often house properties of historic value, which, if renovated and repurposed, could be a critical component of a district's brand and growth. They also tend to contain land parcels that are still contaminated by prior industrial use and require remediation that costs more than market value can bear. Targeted tax incentives for historic preservation, brownfield remediation, and land assembly have a high return on investment when applied in emerging innovation districts and should be encouraged and expanded. The Cortex district in St. Louis has already taken smart advantage of Missouri tax incentives and is a model in this regard.[133]
- ***Smart mortgage standards:*** Innovation districts thrive when housing, retail, and small-scale innovative activities are co-designed and co-located near transit stops and anchor institutions. In the past, federal government sponsored entities and other federal and state agencies disfavored such mixed- use developments, setting a platform instead for large scale financing of single family homes. As housing reforms take hold in the aftermath of the Great Recession, sensible standards around mixed-use development and multifamily housing would benefit the smart, fiscally prudent growth of innovation districts.

Boosting Human Capital

The federal government and states heavily influence the delivery of basic education and skills training in cities and metropolitan areas. The U.S. Department of Education spent some $68 billion in FY 2011, on both K-12 and higher education, plus another $29 billion in tax expenditures related to education. States spent $261 billion of their own funds for the same purpose, while local governments spent nearly $600 billion on education.[134] Relatedly, the U.S. Department of Labor spent $9.7 billion on employment and training programs in FY 2011.[135]

Innovation districts benefit when these large scale federal and state resources are applied in a way that can be customized to their special education and skills needs. To this end, several models are worth considering:

- **Apprenticeship Carolina** helps South Carolina firms in a handful of key industry clusters establish apprenticeship programs that provide effective on-the-job training opportunities for prospective employees. It is based out of the South Carolina Technical College System. Consultants from Apprenticeship Carolina provide assistance throughout the development process, working with firms to create apprenticeships that meet the requirements of the national Registered Apprenticeship system.[136]

- **Oregon's Career Pathways** initiative is focused on increasing the number of Oregonians with post-secondary certificates and degrees to prepare them for employment for jobs requiring more than a high school diploma but less than a Bachelor's degree. It is offered through the state's 17 community colleges and is designed to provide "stackable credentials" of academic certificates (12-44 credits) that can lead either to immediate employment or to the next academic credential within the career pathway, potentially leading to an associate's degree. At Portland Community College, the Career Pathways initiative includes courses and certificates in fields such as accounting, manufacturing, and medical coding.[137]
- **New York State Pathways in Technology Early College High School** (NYS P-TECH) initiative is an effort to prepare thousands of disadvantaged students for jobs in such sectors as technology, manufacturing, healthcare and finance. The model is a six year, "9-14" program that combines high school, college, and career training and involves close partnerships with core industries.[138]

The Path Forward

The potential for innovation district growth in the United States is exceptionally strong. Virtually every major city in the United States has an "anchor plus" play given the confluence of a strong central business district (mostly for the congregation of government and corporate headquarters, entertainment venues, and cultural functions), a strong midtown area (where advanced research institutions and medical campuses tend to concentrate), and a state-of-the-art transit corridor connecting the two.

Many cities and older suburban communities are also making progress on "re-imagined urban areas," repositioning underutilized sections of their community through investments in infrastructure (or infrastructure removal), brownfield remediation, waterfront reclamation, and transit-oriented development.

Lastly, a handful of "urbanized science parks" (and their adjacent suburban communities) are clustering development, encouraging density, and creating spaces to allow individuals and firms to network openly.

The rise of innovation districts seem perfectly aligned with the disruptive dynamics of our era: "crowd sourced rather than close sourced, entrepreneurial rather than bureaucratic, networked rather than hierarchical."[139] They also intensify the very essence of cities: an aggregation of talented, driven people assembled in close quarters, who exchange ideas and knowledge in what urban historian Sir Peter Hall calls a "dynamic process of innovation, imitation, and improvement."[140]

Innovation districts, in short, represent a clear path forward for cities and metropolitan areas. Local decision makers—elected officials and heads of large and small companies, local universities, philanthropies, community colleges, neighborhood councils and business chambers—would be wise to unleash them. Global companies and capital would be smart to embrace them. States and federal government should support and accelerate them. The result: a step toward building a stronger, more sustainable and more inclusive economy in the early decades of this young century.

Endnotes

1. Anchor institutions are research universities and research-oriented medical hospitals with extensive R&D.

2. Select excerpts in this and future sections came from the recent book, *The Metropolitan Revolution: How Cities and Metros are Fixing our Broken Politics and Economy,* Innovation Districts chapter, co-authored by Bruce Katz and Jennifer Bradley.

3. Pete Engardio, "Research Parks for the Knowledge Economy," *Bloomberg Businessweek*, June 1, 2009.

4. The term 'innovation ecosystem' is commonly defined and described in technology and business development magazines, newspapers, and on blogs. Brookings developed this expanded definition to incorporate a more extensive list of variables observed to contribute to the innovation ecosystem at the district scale.

5. Our observations are based on extensive interviews with practitioners and leaders on-the-ground, visits to more than a dozen districts in both the United States and Europe, reviews of other scholarly research on this trend and specific fields of study (such as the growing field of networking and the changing nature of physical planning), and a roundtable discussion held at the Brookings Institution in April 2013 with nationally-recognized urban development experts.

6. To learn more about 22@Barcelona, refer to the website: www.22barcelona.com. Another source was co-authored by the CEO of 22@Barcelona, Josep Miquel Pique'. Refer to Montserrat Pareja-Eastaway and Josep Miquel Pique', "Urban Regeneration and the Creative Knowledge Economy: the Case of 22@ in Barcelona," *Journal of Urban Regeneration and Renewal* 4 (4) (2011): 1-9.

7. Research Triangle Foundation of North Carolina, "Research Triangle Park: Master Plan" (2011).

8. Brookings research, supported by supplemental research by Wexford Science and Technology, identified three other "urbanized science park" examples: University Research Park at the University of Wisconsin-Madison, available at www.universityresearchpark.org/property/urp2/ (April 11, 2014); the University of Virginia Research Park, available at www.uvaresearchpark.com/the-park/park-map/ (April 11 2014); and the University of Arizona Tech, available at www.techparks.arizona.edu/parks/ua-tech-park/planning-development (April 11, 2014).

9. Mark Muro and Alec Friedhoff, "Metropolitan Jobs Recovery? Not Yet." Brookings, *The Avenue*, April 2014.

10. Brookings analysis of Census data.

11. For more, see Bruce Katz and Jennifer Bradley, *The Metropolitan Revolution: How Cities and Metros are Fixing our Broken Politics and Economy* (Washington: Brookings, 2014).

12. Lydia DePillis, "Dinosaur Makeover: Can Research Triangle Park Pull Itself Out of the 1950s?" *New Republic,* October 12, 2012. Available at www.newrepublic.com/article/108527/can-research-triangle-park-pull-itself-out-1950s (April 19, 2014).

13. Edward K. Muller and Paul A. Groves, "The Emergence of Industrial Districts in Mid-Nineteenth Century Baltimore" *Geographical Review* 69 (2) (1979): 159-178.

14. Ibid.

15. Ibid.

16. Asa Lindholm Dahlstrand and Helen Lawton Smith, "Science Parks and Economic Development." In Prasada Reddy, ed., *Globalization Of Technology: Issues In Technology Transfer And Technological Capability Building* (UNESCO-EOLSS).

17. Thomas Hutton, "The New Economy of the Inner City," *Cities* 21 (2)(2004): 89-108, p. 90.

18. Michael Jaroff, Dennis Frenchman, Francisca Rojas, "New Century City Developments Creating Extraordinary Value" (Cambridge: Massachusetts Institute of Technology, 2009).

19. George Bugliarello, "Urban Knowledge Parks Knowledge Cities and Urban Sustainability," *International Journal Technology Management* 28 (3) (2004): 388-394.

20. American Institute of Architects, "Cities as a Lab: The Innovation Economy" (2013), p. 2.

21. Richard Florida, "Startup City: The Urban Shift in Venture Capital and High Technology" (Toronto: Martin Prosperity Institute, 2014).

22. Personal communication from Dennis Lower, President and CEO of Cortex, April 16, 2014. See also, Innovation District Boston, "Boston's Innovation District: 3 years and counting," February 13 2013, available at, http://www.innovationdistrict.org/wp-content/uploads/2013/03/

InnovationDistrict_NewJobsReport-_2013-03-01_FINAL2_contact.pdf ;

23. Recent economic analysis conducted in the cities of Pittsburgh, New York and San Francisco gives further evidence to this shift into the urban landscape. For New York, the report was written by the Center for an Urban Future, "New Tech City" (2012). For Pittsburgh, the paper was written by Ernst & Young LLP and Innovation Works, Inc. "Building Momentum: Investing in Pittsburgh's Technology Sector" (2014). For San Francisco, the report was written by South Mountain Economics, LLC "A Balanced and Growing Economy: How San Francisco is Making the Transition to a Digital City" (2014).

24. Jonathan Rothwell, "The Hidden STEM Economy" (Washington: Brookings Institution, 2013).

25. Mark Muro, Kenan Fikri, and Scott Andes, "Powering Advanced Industries State by State" (Washington: Brookings Institution, 2014).

26. Her Majesty's Treasury and the Office of the Deputy Prime Minister, "Devolving Decision Making: Meeting the Regional Economic Challenge; The Importance of Cities to Regional Growth" (London: Office of the Deputy Prime Minister, 2006).

27. Gerald Carlino and Robert Hunt, "The Agglomeration of R&D Labs" (Philadelphia: Federal Reserve Bank of Philadelphia, 2012). Carlino's work is part of a much broader base of literature that exists pertaining to proximity and innovation. Stuart Rosenthal and William Strange, for example, have found that the intellectual spillovers that drive innovation and employment drop off dramatically as firms and people move further apart. Refer to Stuart S. Rosenthal and William C. Strange, "Evidence on the Nature and Sources of Agglomeration Economies," in *Handbook of Urban and Regional Economics*, edited by J. V. Henderson and J. F. Thisse (New York: Elsevier, 2004).

28. Kyungjoon Lee and others, "Does Collocation Inform the Impact of Collaboration?," *PLoS One* 5 (12) (2010), available at www.plosone.org/article/info:doi/10.1371/journal.pone.0014279 (April 10, 2014). Also refer to Katie DuBoff, "Close Proximity Leads to Better Science," Harvard Medical School at hms.harvard.edu/news/close-proximity-leads-better-science-12-15-10 (April 11, 2014).

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32. South Mountain Economics, LLC, "A Balanced and Growing Economy: How San Francisco is Making the Transition to a Digital City" (2014), p. 4.

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34. Center for an Urban Future, "New Tech City" (2012), p. 9

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39. The increased emphasis on collaboration may even extend to the important interplay of innovation and production as the economy evolves and 3-D printing and other disruptive technology accelerate prototyping and enable small-scale and customized manufacturing. The first National Manufacturing Innovation Institute, which focused on additive manufacturing, is located in the downtown of Youngstown, Ohio, close to the existing base of small and medium-size manufacturing firms. The midtown Detroit location of the watch- and bicycle-making firm Shinola, close to the College for Creative Studies (known for industrial design), is further evidence of this trend.

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Prosperity for America's Cities," (Washington: Coalition of Urban Serving Universities, 2010). Research has also found a high correlation between the nation's leading biotech clusters and the strength (e.g., medical research capacity, NIH grants, PhD graduates) of local universities. Refer to Joseph Cortright and Heike Mayer, "Signs of Life: The Growth of Biotechnology Centers in the United States" (Washington: Brookings, 2002).

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51. Richard Florida, *The Rise of the Creative Class And How It's Transforming Work, Leisure and Everyday Life* (New York: Basic Books, 2002).

52. Joseph Cortright, "Young and the Restless 2011" (Washington: CEO for Cities, 2011).

53. Urban Land Institute, "America in 2013" (2014).

54. Michael Kimmelman, "Building a Better City" *New York Times*, October 16, 2013. For shift in housing/location preferences for a particular metro, see Kinder Houston Area Study, conducted by Kinder Institute for Urban Research at Rice University.

55. During our research, some innovation districts were found to organize their assets into two categories: hard factors and soft factors. Hard factors are defined colloquially as the "hard stuff," such as the infrastructure and the physical structure of buildings that create the compact, urban form. Soft factors are the "soft stuff," such as firms, people, and the important connections between them. We broke these two factors apart into economic, physical, and networking assets to enunciate the range of disciplines at play.

56. In this paper, assets are neatly bucketed under one of these three categories although several important assets can actually fit under more than one category. Shared workspace provides the best illustration of this interchangeability. While clearly a physical asset, it is also an economic asset (as economic activity is generated there), and a networking asset (as networking with adjacent start-ups often occurs there).

57. Two sources are contributing to this observation. For the first, refer to William Hoffman, "The Shifting Currents of Bioscience Innovation," *Global Policy* 5 (1) (2014): 76-8. For the second, refer to South Mountain Economics, LLC., "Where the Jobs Are: the App Economy" (2012).

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66. Personal communications from Ylva Williams, Chief Executive Officer, Stockholm Science City Foundation, April 2, 2014.

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71. Ibid.

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80. Personal communications from Dennis Lower, President and CEO, Cortex, October 3, 2013.

81. Eindhoven is not an innovation district, it is a regional economic cluster dedicated to advancing innovation-oriented sectors. Eindhoven was still used as a case given their emphasis on open innovation, entrepreneurial and small firm development, and networking.

82. Professor Etzkowitz, previously with Newcastle University in the UK, developed the Triple Helix after observing that innovation has shifted from a "hands off" linear model of innovation, which is an internal process within and among firms, to an "assisted" model of innovation that involves a coalition of three types of actors: industry, university and government. Its foundation was built on groundbreaking laws, such as the US Bayh-Dole Act of 1980 that permits universities, small businesses or non-profit institutions to pursue ownership of an invention funded by federal R&D dollars. This opened up the viability of universities transforming from a pure teaching institution to one of research and ultimately entrepreneurialism, an important shift that led to the Triple Helix. Sweden, developed a similar policy called "Teachers Exemption," which allows teachers/professors to own the right to their own patentable inventions even if they are made during working hours.

83. Personal communications from Donn Rubin, President & CEO, BioSTL, March 24, 2014.

84. In Houston, for example, the Texas Medical Center had for decades the primary purpose of managing the parking and facilities of the nation's most extensive medical campus. In recent years, under new leadership, the Center has expanded its role to include promoting collaboration on data and research across key member institutions.

85. Ajuntament de Barcelona, "22@Barcelona, the Innovation District," presentation to the Brookings Institution, 2011.

86. The ecosystem and physical landscape that developed in Cambridge (around MIT), for example, is quite distinct when compared to what developed in San Francisco (around the California Institute for Regenerative Medicine) in Seattle (around the University of Washington) or in Houston (around the Texas Medical Center). Each of these innovation districts, however, is deeply enmeshed in life sciences and the bio-medical field.

87. Technology Partnership Practice, Battelle Memorial Institute, "Plant and Life Sciences for St. Louis: The Technology Gateway for the 21st Century" (2000).

88. Dominique Foray and Xabier Goenaga, "The Goals of Smart Specialisation," Policy Brief Series 01/2013 (European Commission, 2013).

89. Personal communications from Ylva Williams, Chief Executive Officer, Stockholm Science City Foundation, April 11, 2014. For more information on this event, which will take place in August 2014, refer to www.digitalhealthdays.se (April 14, 2014).

90. Citing the case of Village of Euclid v Amber Reality Co, 272 U.S. 365 (1926).

91. Personal communications from Ylva Williams, Chief Executive Officer, Stockholm Science City Foundation, April 2, 2014.

92. Significantly, Philadelphia is contemplating a similar transformative intervention around 30th Street Station, a stone's throw from Drexel University and the powerful development along Market Street.

93. Personal communications from Dennis Frenchman, Leventhal Professor of Urban Design and Planning, MIT, March 21, 2014.

94. Research Triangle Foundation of North Carolina, "Research Triangle Park: Master Plan," p.11.

95. Cathy Stanton, *The Lowell Experiment: Public History in a Post Industrial City* (Massachusetts: University of Massachusetts Press, 2006).

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97. Yvonne van Hest, Manager, International Labour Market Development, Brainport Development, Presentation "Talent Attraction and Retention in the Brainport Eindhoven Region (NL)".

98. Sasha Pasulka, "A Glympse of the future in Seattle's South Lake Union" *Geek Wire*, April 20, 2012. Refer to www.geekwire.com/2012/glympse-future-seattles-south-lake-union/ (April 17 2014).

99. Yvonne van Hest, Manager, "Talent Attraction and Retention in the Brainport Eindhoven Region (NL)".

100. Personal communications from Dennis Lower, President and CEO, Cortex, October 3, 2013.

101. Battelle Technology Partnership Practice, "Driving Regional Innovation and Growth: The 2012 Survey of North American University Research Parks" (2013).

102. Personal communications from Johannes Fruehauf, founder of LabCentral, Cambridge, MA, December 16, 2013

103. Personal communications from Dennis Lower, President and CEO, Cortex, March 15, 2014.

104. Personal communications from Josep Pique', CEO of 22@Barcelona, 22@Barcelona, March 27, 2013.

105. Jaroff, Frenchman, and Rojas, "New Century City Developments Creating Extraordinary Value."

106. Battelle Technology Partnership Practice, "Driving Regional Innovation and Growth: The 2012 Survey of North American University Research Parks".

107. Drexel Now, "Drexel and Key Partners Receive Grant in Support of New Public Schools in West Philadelphia," September 25, 2012; and Solomon Leach, "SRC approves the sale of eight school properties for $38 million," *Philly.com*, March 21, 2014.

108. Personal communications from Thomas Anderson, CEO, The Electrum Foundation and Kista Science City, April 2, 2014.

109. Personal communications from Dennis Lower, President and CEO, Cortex, October 3, 2013.

110. Johnathan Rothwell, "The Hidden Stem Economy" (Washington: Brookings Institution, 2013).

111. Personal communications from Lucy Kerman, Vice Provost, University and Community Partnerships of Drexel University, February 5, 2014.

112. The OECD defines informal settlements as "areas where groups of housing units have been constructed on land that the occupants have no legal claim to, or occupy illegally."

113. Personal communications from Jenni Young, Carlo Ratti Associati, Srl, October 16, 2013.

114. Personal communications from Lucy Kerman, Vice Provost, University and Community Partnerships of Drexel University, February 5, 2014.

115. City of Philadelphia, Office of the Controller, "Survey of the Current and Potential Impact of Local Procurement by Philadelphia Anchor Institutions" (2014).

116. Personal communications from Lucy Kerman, Vice Provost, University and Community Partnerships of Drexel University, February 5, 2014.

117. Cortex, "The History of Cortex: a Transformative Community Partnership" (2013).

118. "Danforth Foundation Shifts Focus, Cuts Staff," available at www.philanthropynewsdigest.org/news/danforth-foundation-shifts-focus-cuts-staff (April 19, 2014).

119. Personal communications from Donn Rubin, President & CEO, BioSTL, March 24, 2014.

120. Brock Parker, "Kendall Sq. zoning revamped," *Boston Globe*, April 9, 2013.

121. John Gallagher, "Kresge Foundation pledges $150 million toward Detroit Future City plan" *Detroit Free Press*, January 9, 2013.

122. For more on InvestDetroit's managed funds, refer to www.investdetroit.com/managed-funds/ (April 15, 2014).

123. Some innovation district service companies are likely to initiate in one district and then expand to others. The Cambridge Innovation Center, a technology and life sciences business incubator that has helped launch over 1,200 companies near MIT since 1999, recently announced that it will expand its operations and start-up support services in Baltimore and St. Louis. See Michael B. Farrell, "Cambridge Innovation Center branches out: Kendall-based operation looks beyond Massachusetts," *Boston.com*, February 17, 2013. University Park at MIT, for example, is now a model for other Forest City developments including the Science + Technology Park at Johns Hopkins in East Baltimore, the Translational Research Lab at the University of Pennsylvania in Philadelphia and the Colorado Science + Technology Park adjacent to the Fitzsimons Life Science District in Aurora, Colorado. Refer to www.forestcity.net/properties/work/science_technology (January 2013).

124. Interview with Alicia Glen at www8.gsb.columbia.edu/realestate/newsn/2408#.U0_qIX-9KK0; see also www.bus.miami.edu/faculty-and-research/conferences-and-seminars/re2014/papers/asset-class.html

125. The phrase "cities of knowledge" comes from Margaret Pugh O'Mara's excellent book of the same name. Her book is a careful exposition of the role of the federal government in creating Silicon Valley, and of the efforts of other places to create their own comparable centers of knowledge and economic development.

126. Margaret Pugh O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley* (Princeton: Princeton University Press, 2005).

127. National Science Foundation, "Science and Engineering Indicators, 2014," available at www.nsf.gov/statistics/seind14/index.cfm/chapter-4/c4s1.htm#s3 (April 19, 2014).

128. For more, see The White House Office of the Press Secretary, "We Can't Wait: Obama Administration Announces New Public-Private Partnership," August 16, 2012. See also, Mark Muro and Scott Andes, "Kludging Out Progress: The Case of Manufacturing Hubs," Brookings, *The Avenue*, March 2014.

129. "Mayor Newsom Unveils San Francisco's Stem Cell Headquarters Package," March 17, 2005, at www.sfmayor.org/ftp/archive/209.126.225.7/archives/PressRoom_NewsReleases_2005_31124/index.html (April 19, 2014).

130. Jessica Lee, Muro and Katz, "Using Ballot Measures to Drive Economic Investment in States and Metropolitan Areas" (Washington: Brookings Institution, 2013).

131. Matt Glynn, "Buffalo Niagara Advanced Manufacturing Institute announced for downtown Buffalo" *Buffalo News*, February 27, 2014.

132. Refer to the Massachusetts Life Sciences Center, Capital Program found at www.masslifesciences.com/programs/capital/ (April 15, 2014).

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134. Department of Education expenditures via "Education Department Budget History Tables—1980-2014," available at www2.ed.gov/about/overview/budget/history/edhistory.pdf (April 18, 2014); Education tax expenditure data via Joint Committee on Taxation, "Estimates of Federal Tax Expenditures, FY2011-2015," available at, www.jct.gov/publications.html?func=startdown&id=4385 (April 18, 2014); State and local education expenditures via U.S. Census Bureau, "State and Local Government Finances Summary, 2011," available at, www2.census.gov/govs/local/summary_report.pdf (April 18, 2014).

135. See United States Department of Labor, "Summary of Discretionary Funds—fiscal years 2004-2013," available at, www.dol.gov/dol/budget/2013/chart.htm (April 18, 2014).

136. See Apprenticeship Carolina website at www.apprenticeshipcarolina.com/ (April 18, 2014).

137. See Portland Community College Career Pathways Program website at www.pcc.edu/career/pathways/ (April 18, 2014).

138. Office of Governor Andrew M. Cuomo, "Governor Cuomo Announces Public-Private Partnerships to Prepare More Than 6,000 Students for High-Skill Jobs," August 28, 2013. Available at www.governor.ny.gov/press/08282013Students-for-High-Skill-Jobs

139. Bruce Katz and Jennifer Bradley, *The Metropolitan Revolution*, p. 6.

140. Peter Hall, *Cities in Civilization: Culture, Innovation, and Urban Order* (London: Phoenix Giant, 1999).

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BROOKINGS

APPENDIX - H
BIOARTOGRAPHY

BIOARTOGRAPHY
UNIVERSITY OF MICHIGAN

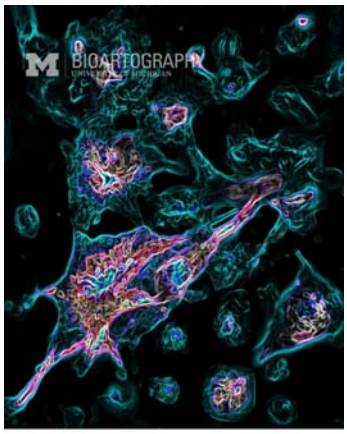
The Art in Science

All Products
Newest Images
BioArtography Scarves
BioArtography Note Cards
Adrenal Gland
Airway
Bacteria
Basic Cell Biology
Basic Science
Bioengineering
Bioinformatics / Math
Blood Vessels
Bone
Brain / Nervous System
Cancer
Dental
Diseases / Deformities
Ear
Embryogenesis
Esophagus
Eye
Fat
Female Reproductive System
Fruitfly Models
Heart
Intestine / Gut
Kidney

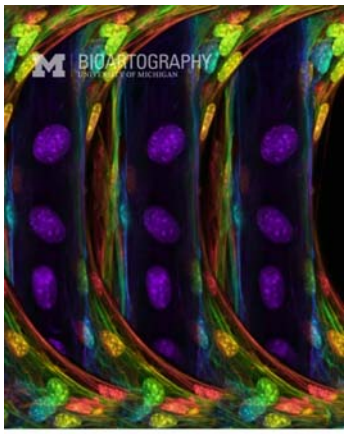
Home — Newest Images

Newest Images

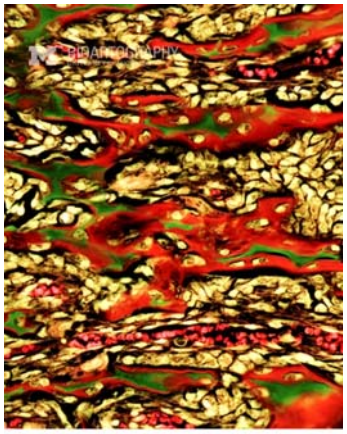
Arranging FAT



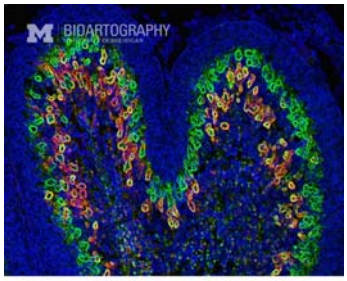
Captured Chaos



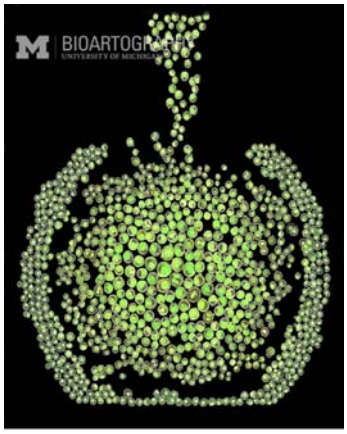
Cellular Micro-jewelry



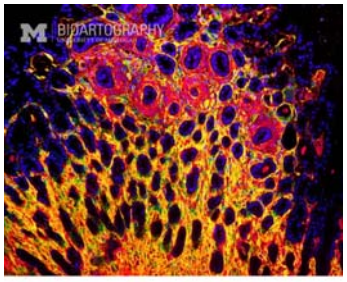
Deep in My Bones



Dormant Heroes

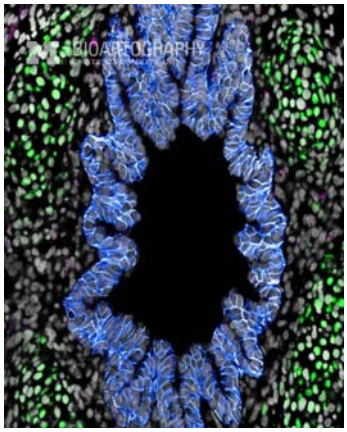


Family Tree



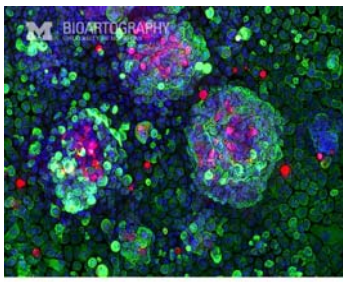
Fire in the Belly

Garden of Villi

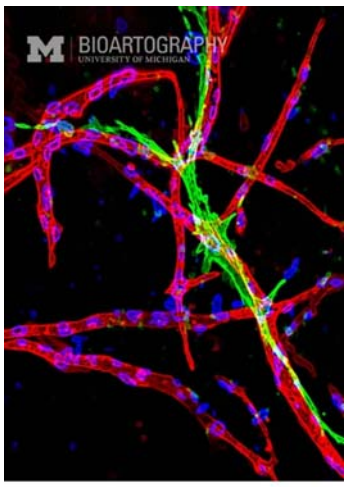


Liver
Lung
Male Reproductive System
Mammary
Miscellaneous
Muscle
Pancreas
Pituitary Gland
Plant Models
Sea Urchin Models
Skate Model
Skin
Stomach
Tongue
Zebrafish Model
Friends of BioArt
Custom Metallic Framed Images

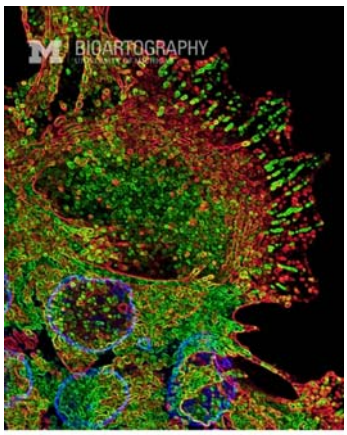
Give Me Air



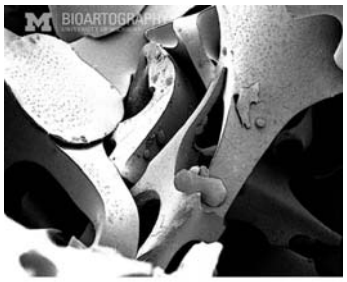
Hair Today, Gone Tomorrow



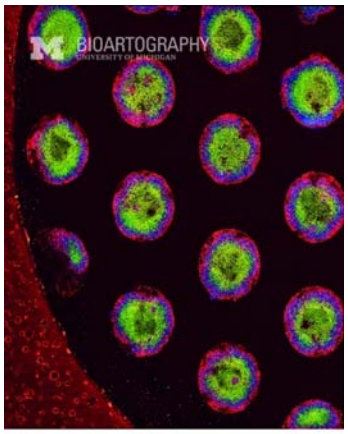
Healing Crosstalk



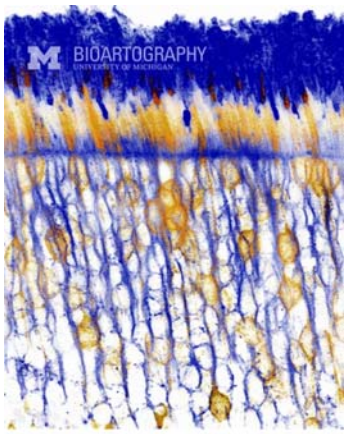
Into the Breach



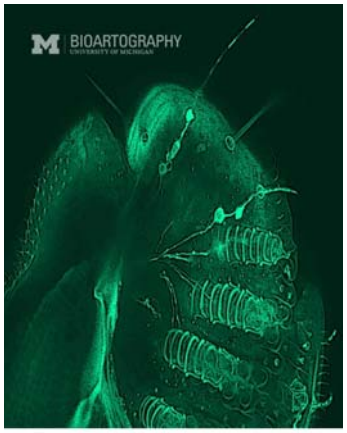
Molding Cell Identity



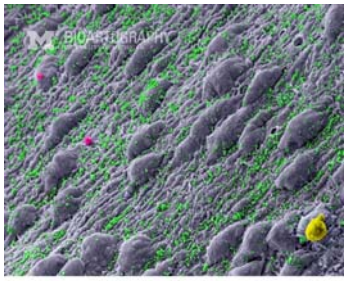
Patterning Fates



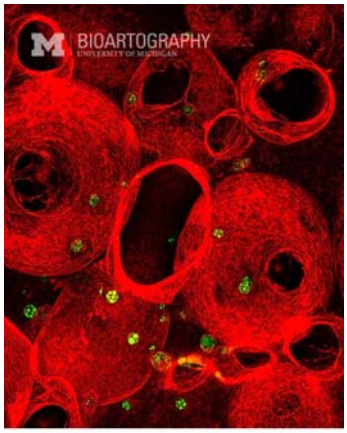
Seeing the Light



SWEET!



Thrombic Circus



Ultrasound Affect