



CORTEX INNOVATION DISTRICT

A MODEL FOR ANCHOR-LED,
INCLUSIVE INNOVATION

KATZ & BLACK



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Drexel University Nowak Metro Finance Lab

The Nowak Metro Finance Lab was formed by Drexel University in July 2018. It is focused on helping cities find new ways to “finance the inclusive city” by making sustained investments in innovation, infrastructure, affordable housing, quality places, and the schooling and skilling of children and young adults. It is situated within the Drexel’s Lindy Institute of Urban Innovation.



Cortex Innovation Community

Cortex is both a geographic district and a non-profit. The Cortex Innovation Community was developed as a 200 acre innovation district located four miles from downtown St. Louis in the city’s Central West End. The master developer for the district is a 501(C)(3) non-profit called Cortex that oversees the development of the Cortex Innovation Community. The nonprofit is led by a board comprised of the five St. Louis anchor institutions who founded Cortex—Washington University in St. Louis, BJC HealthCare, Saint Louis University, Missouri Botanical Garden and the University of Missouri—St. Louis.



The Global Institute on Innovation Districts (GIID)

The Global Institute on Innovation Districts was established by a group of influential leaders—researchers, policymakers and practitioners—active in the growth and advancement of innovation districts. GIID provides in-depth research, analysis, and consultation on innovation districts around the globe. Innovation districts are small, walkable areas where anchor institutions, firms, labs, and other actors collaborate as a collective to increase their competitive potential. This shared commitment to “collaborate to compete” is one of the defining characteristics of innovation districts that the Global Institute on Innovation Districts advance.



Accelerator for America

Accelerator for America is a non-profit organization created by Los Angeles Mayor Eric Garcetti in November 2017. It seeks to provide strategic support to the best local initiatives to strengthen people’s economic security, specifically those initiatives that connect people with existing jobs, create new opportunities and foster infrastructure development.

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About the Authors

Bruce Katz is the inaugural director of the Nowak Metro Finance Lab at Drexel University and the co-author (with Jeremy Nowak) of *The New Localism: How Cities Can Thrive in the Age of Populism*. Bruce also leads New Localism Advisors, whose mission is to help cities design, finance and deliver transformative initiatives that promote inclusive and sustainable growth, in addition to serving as a Partner in the Accelerator for America. In all these roles, he regularly advises global, national, state, regional and municipal leaders on public reforms and private innovations that advance the well-being of metropolitan areas and their countries.

For more information please visit www.drexel.edu/nowak-lab.

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For more information visit www.may8consulting.com

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*Cover Photo: Aerial view of the Cortex Innovation Community campus
Credit: DCM*

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PREFACE

Editor's Note: The research for this City Case was executed before the COVID pandemic struck, so a preface has been added to frame the work within the context of the public health and economic crisis and reflect Cortex' initial response. As we publish in January 2021, the pandemic still presents great uncertainty, but the authors believe this research is highly relevant as cities seek models to build back better and unleash their innovation potential toward inclusive growth.

As Drexel releases this case study on the Cortex Innovation Community, COVID-19 and the subsequent economic downturn continue to pose a significant threat to the resiliency of small businesses across the country and the institutions that serve them. Drexel asked Sam Fiorello (Cortex's first new CEO in ten years) and Cortex board member Ken Olliff (Saint Louis University's Vice President of Research) how they believe the pandemic is impacting Cortex and what critical initial steps Cortex is taking to ensure its long-term viability.

Sam Fiorello stepped into the position of Cortex CEO on March 30, 2020 one week after Missouri issued a Stay at Home order to prevent the spread of COVID-19, and he is confident that the Cortex Innovation Community is resilient and will find its way forward. Since March, Cortex has fallen into a two to three million dollar deficit as companies within the district became unable to pay building assessment fees and rents, parking income disappeared and the State of Missouri eliminated its annual half million dollars of funding to support Cortex business incubator Center for Emerging Technologies (CET). In the early days of the pandemic, Fiorello said "all of us are trying to figure out quickly where cracks

in the dam are and find tape and putty to close those up". Saint Louis University's Vice President of Research and Partnerships Ken Olliff who serves on the Cortex board acknowledged, "so long as the virus is a threat, Cortex will be hobbled. Its value proposition is all about bringing people together in person." So what actions has Cortex taken as Missouri reopens for business?

MAKE SHARED SPACES SAFE

Cortex and partner Cambridge Innovation Center St. Louis (CIC) that manages most of the coworking space in the district have come together to remodel the physical space. Together they are coordinating safety measures including the potential installation of no touch doors and antimicrobial grips on door handles. CIC has created a safety that includes fewer people in shared spaces, more private offices, and symptom self-checking and their spaces reopened on June 1, 2020.¹ Venture Café, which in pre-COVID19 times held a weekly in-person meetup that drew between 400–500 people, has gone virtual for it's Thursday Gathering and added additional weekday online programming. The in-person Gathering is not expected to return until 2021.

*Photo: Alcami Corporation facility at 4260 Forest Park Avenue
Credit: Alcami Corp.*

CONTINUE MAKING INVESTMENTS IN PLACE AND PEOPLE

Fiorello is confident that demand for new lab and office space within the district will continue to be high because locating in Cortex helps companies perform better. Olliff agrees, predicting that Cortex will appeal to even more companies as many seek to compress their real estate footprint and adopt a hybrid of remote and office work. Cortex has a solid line of credit and access to capital and it is determined to continue to create new development projects and amenities in the district. All real estate construction projects within the district are proceeding on schedule including a new \$616 million Washington University Neuroscience facility. Aloft Hotel completed a brand new hotel in the District in April 2020 and opened to the public on June 8, 2020 and has begun receiving travelers. And Wexford Science and Technology LLC is moving ahead with construction on a \$115 million, 320,000 square foot office building at 4210 Duncan Avenue.

LEVERAGE CURRENT ENHANCED NEED FOR INNOVATIONS IN FIELDS SUCH AS REMOTE HEALTH, TRACEABILITY AND DRUG MANUFACTURING

Fiorello believes that the COVID-19 pandemic highlighted the value proposition of Cortex. Certainly as innovation district expert Julie Wagner explains “this pandemic has illustrated the imperative for, and power of,

challenge-based research to forge new alliances and a new wave of innovation charged to solve world-impacting challenges.” Some Cortex companies in the telemedicine, contact tracing or drug manufacturing fields are seeing greater demand for their products or services and obtaining new grants and clients. On May 8, 2020 the National Institutes of Health announced its latest round of grants and the majority of the 25 largest award recipients in the St. Louis region are located in Cortex. That said SLU’s Ken Olliff says there has been a severe reduction in all non-COVID-19 related clinical trials at a time when the need to address inequities in health care testing and treatment are laid bare. Cortex is looking at how to support businesses that lost momentum as the city shut down and bring pitch competitions and potential investors to their entrepreneurs while continuing virtual educational classes and programming.

CREATE MORE OPPORTUNITIES FOR ENTREPRENEURS OF COLOR

Fiorello says the greatest challenge to Cortex is ensuring that Cortex becomes more equitable and inclusive as a result of this crisis, rather than less so. He explains that too often St. Louis leaders view innovators as individuals with an advanced education offering new high tech services or products to a global market. In this moment, Fiorello contends Cortex needs to reorient its focus to support a more inclusive group of local innovators who do not have advanced university degrees but are dedicated to solving concrete

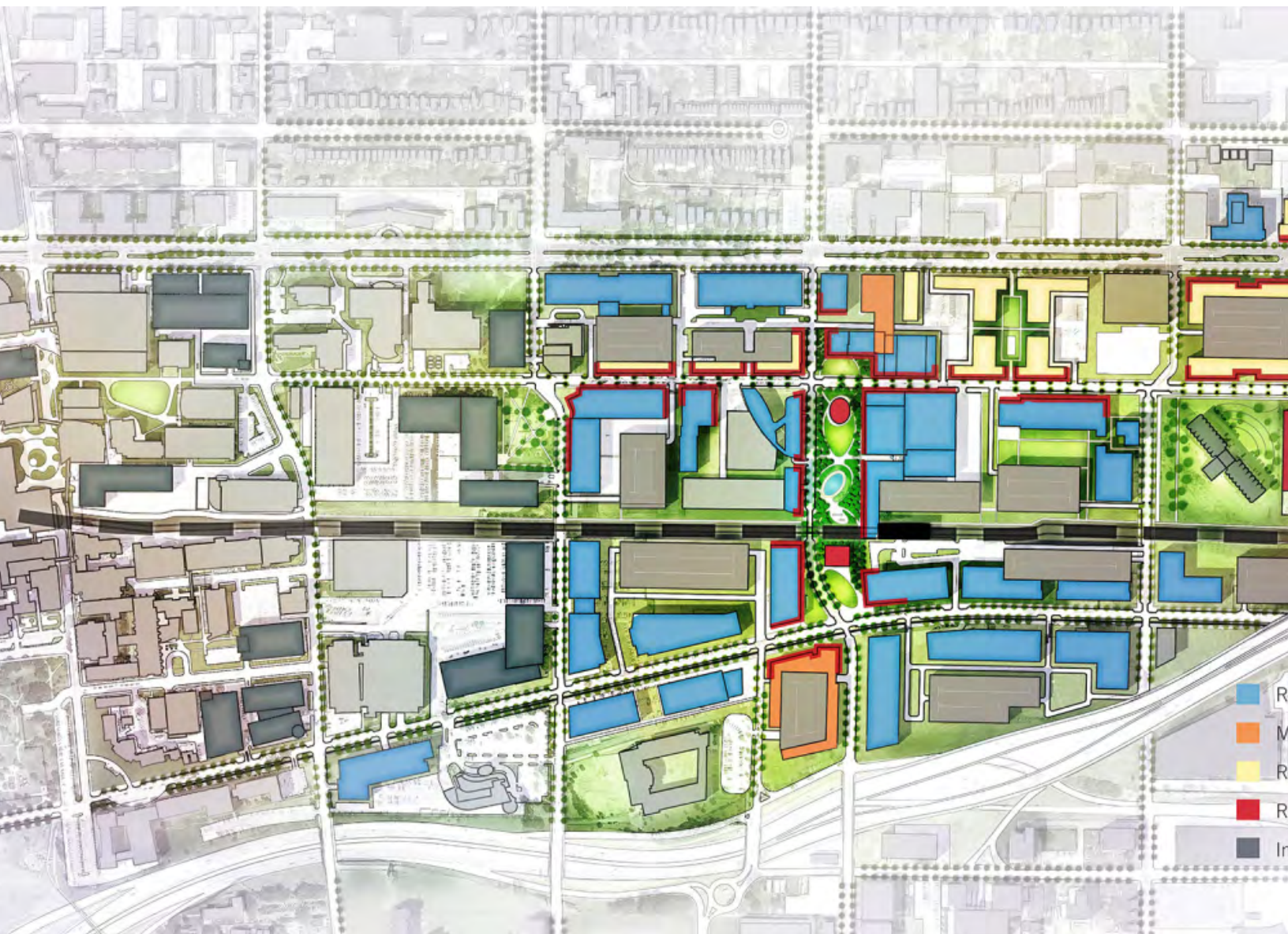
challenges in their community from accessing inventories of food and supplies to normalizing health and safety precautions at community centers. Cortex can assist innovators to define and meet local challenges while creating a personal path to economic mobility and achieving greater long-term equity.

STREAMLINE CORTEX GOVERNANCE FOR INCREASED AGILITY

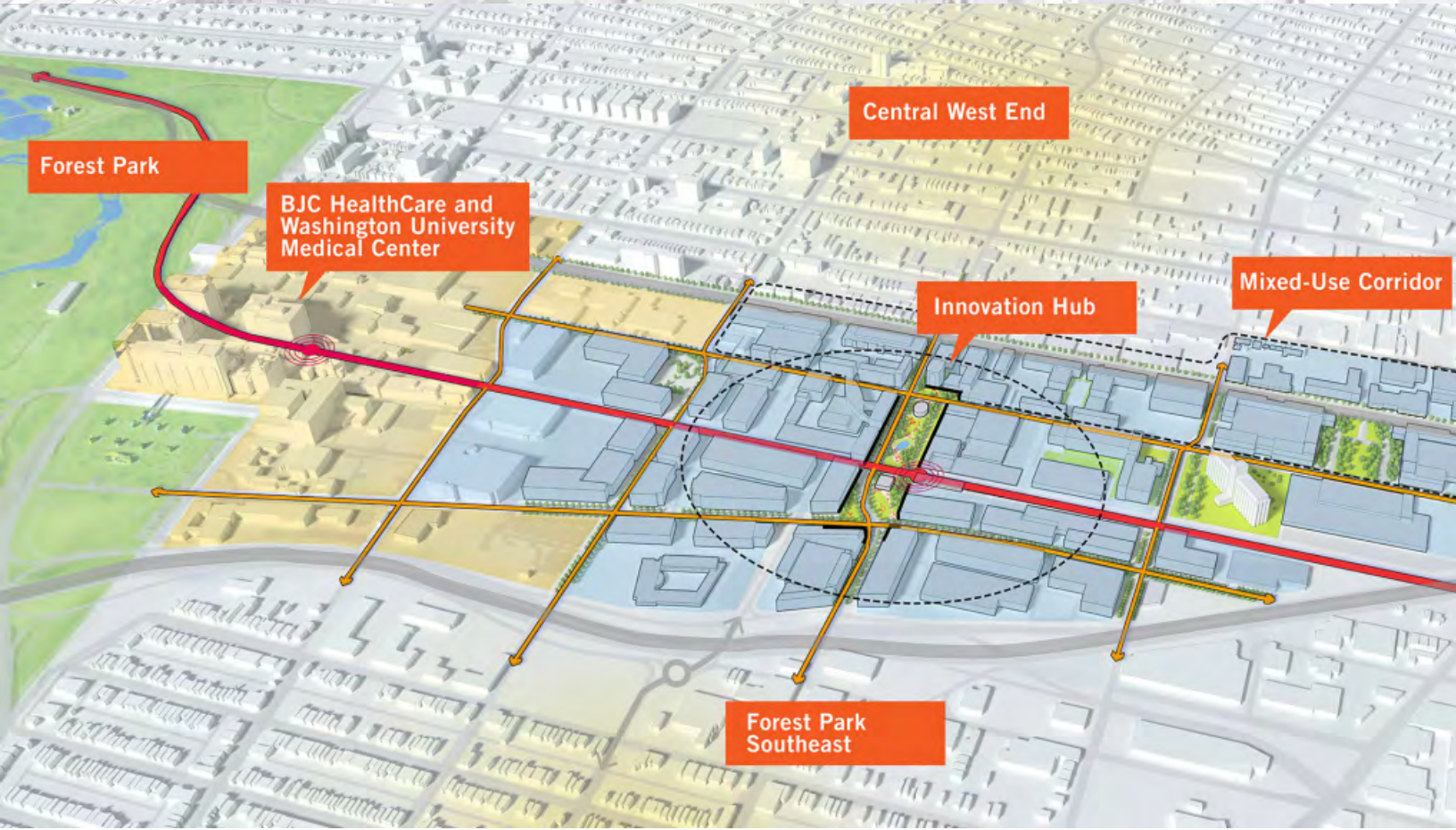
Fiorello is streamlining Board meetings to ensure Cortex can be swift and agile as it confronts the need for regular changes to its procedures and priorities. Cortex founding board members are all addressing significant economic losses as students stay away from campus and patients forego health care at the very time when strong leadership is most needed. Cortex is working to make it easier for board members to swiftly respond to new challenges even when meeting virtually.

*Photo: SQ1 Program entrepreneur training session
Credit: Jen Korman Photography*





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Forest Park

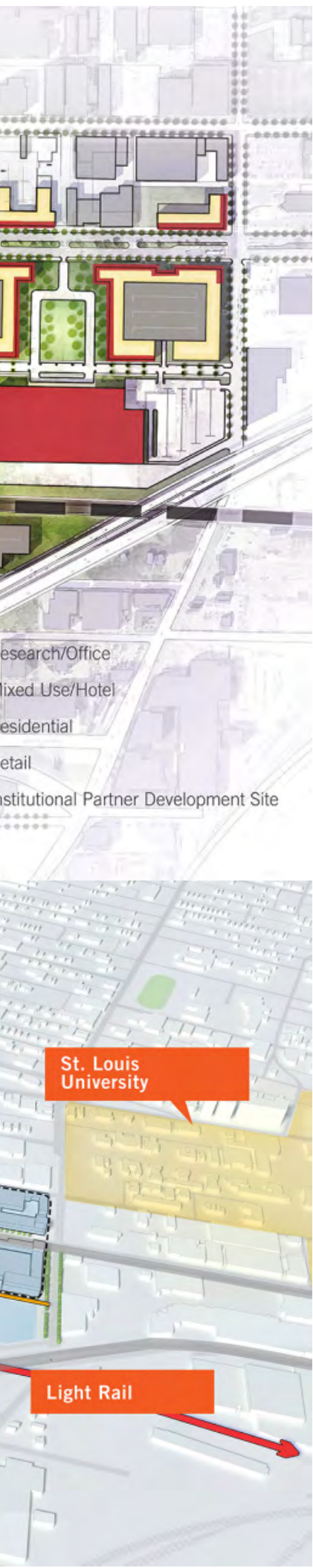
BJC HealthCare and Washington University Medical Center

Central West End

Innovation Hub

Mixed-Use Corridor

Forest Park Southeast



EXECUTIVE SUMMARY

The Cortex Innovation Community, located in the Central West End of St. Louis, is ranked as one of the top five innovation districts in the world. Founded in 2002 and built within a blighted 200-acre former industrial area, the district generated \$2.1 billion in economic output for the St. Louis region in 2018. In February 2020, almost 6,000 employees worked in Cortex. This City Case details how Cortex originated, how it has evolved, and what its impact has been on the St. Louis economy. This City Case reflects on Cortex at a time of extraordinary transition. The COVID-19 crisis has threatened the viability and growth of small business and startups across the country and St. Louis is no exception. Dennis Lower who led the growth of Cortex over the past decade retired in March 2020 and a new Executive Director, Sam Fiorello, was hired just after most programming and operations within Cortex went virtual. Finally, Cortex's astonishing growth and appeal has left little developable land within the district for additional projects—an impressive challenge to have, but one that Cortex leaders must contend with and is currently addressing in a strategic planning process.

WHAT IS CORTEX?

Cortex is both a geographic district and a non-profit. The Cortex Innovation Community was developed as a 200 acre innovation district located

four miles from downtown St. Louis in the city's Central West End. The master developer for the district is a 501(C)(3) non-profit called Cortex that oversees the development of the Cortex Innovation Community. The nonprofit is led by a board comprised of the five St. Louis anchor institutions who founded Cortex—Washington University in St. Louis, BJC HealthCare, Saint Louis University, Missouri Botanical Garden and the University of Missouri-St. Louis. In 2002, four of the anchor institutions pledged \$29 million in equity to acquire land for the new district. This patient capital, along with powers granted by city government that include eminent domain and land use control, allowed Cortex to strategically buy limited properties within the district while defining the future use of every parcel. The nonprofit's primary focus is on district-wide curation, placemaking and supporting innovators with the programming they need. Lab space, greenspace, event space, and co-working space creates innovation through what long-term director Dennis Lower calls "serendipitous collisions" of smart people and new ideas.

WHAT IMPACT HAS CORTEX HAD?

The development of Cortex is now a global success story of a booming tech hub created from scratch in a former industrial area of a weak market city.

The operational purchases of Cortex and its 369 company tenants generated over \$1 billion dollars in direct impact for the St. Louis region in 2018. When you look at the indirect and induced economic ripple effects of spending by employees working within the District, that number doubles. In 2018 Cortex generated \$69.6 million in state and local tax revenues for the year. This is particularly noteworthy given that Cortex is a Tax Increment Financing District authorized to use future tax revenue resulting from new development in the district to finance redevelopment projects or infrastructure investments. Cortex has used \$110 million of the maximum authorized \$167.7 million in city tax dollars to support infrastructure and real estate projects to date. As the 23-year TIF expires and property values continue to increase, Cortex is projected to generate over \$476 million in new tax revenue over the next thirty years. Since 1998, Cortex has constructed over 2 million square feet of development with investment exceeding \$700 million. At the time of this analysis the Cortex district included 369 companies with over 5780 employees.

WHY WAS CORTEX FORMED?

Cortex was formed in 2002 to create new economic growth for St. Louis after the city had lost 65% of its population and the majority of its Fortune 500 companies since 1950, when it was then the eight largest city in the United States. The goal was to stop farming business ideas out to other cities because St. Louis lacked the facilities and capital to support entrepreneurs and start-up companies. Life sciences was the region's strongest industry cluster and a 2000 study

forecasted that the St. Louis region could become a top ten global innovation life sciences hub if it facilitated research and collaboration opportunities among industry and academic institutions in the plant and biotechnology sectors. By creating state of the art facilities that co-locate research assets, supporting commercialization of university research and offering abundant startup capital and support, St. Louis sought to keep its talent pool and incubate new companies locally to drive economic growth.

HAS THE CORTEX MODEL CREATED LONG-TERM INCLUSIVE GROWTH?

Cortex has proved that St. Louis can build a strong new district to inject needed jobs and revenues into a struggling city. Cortex has had three goals since its formation, one of which is to create inclusive growth or as the goal was articulated in 2017, to become "the most racially, ethnically and gender inclusive district in the country." Cortex is bordered by anchor institutions and stable, relatively affluent neighborhoods. As a result, Cortex focused its goal for equity and inclusion on steps it could take to create opportunities within its borders to address the historic lack of women and people of color within technology enterprises. In 2002, its goal was focused on requiring participation by minority and women-owned construction businesses on real estate projects. Over time, those goals have expanded to include programming and training for entrepreneurs of color, education of young people of color in technology and increasing diversity on the board. The current and former CEOs both believe there is a great deal more work to support innovators from disadvantaged communities in

St. Louis who experience limited opportunities due to severe economic, educational and racial disparities. Cortex Chairman Hank Webber states that Cortex is going to continue to actively pursue new partnerships, policies and programs to create a district where the benefits of new company formation, capital investment, job creation, and wealth generation extend to all.

WHY IS THE CORTEX MODEL IMPORTANT TO EXPLORE?

The Drexel University Nowak Finance Lab seeks to help practitioners to better understand the types of innovation in leadership, financing and collaboration that can regenerate our disinvested cities and neighborhoods. St. Louis created an advanced technology hub and job center on former industrial land by combining private local capital and government powers and importing effective partners with the expertise to create and manage spaces appealing to innovators. The Cortex model offers important lessons on how anchor institutions can create economic growth through the building of a dynamic mixed-use innovation district centered on advanced technologies.





THE CORTEX MODEL: KEY ENABLING FEATURES

DURABLE, TRANSPARENT GOALS

From 2002 to the present Cortex leadership has pursued three consistent goals.

- Generate new jobs for St. Louis
- Generate new tax revenue for St. Louis
- Become a racially, ethnically and gender inclusive district

PATIENT LOCAL CAPITAL

Four local anchor institutions invested \$29 million into a land acquisition fund to build a life sciences research hub with an agile thirty-year vision.

USE OF TRADITIONAL GOVERNMENT POWERS

In 2006, St. Louis named Cortex master developer and gave the nonprofit the power to use eminent domain, issue tax abatements, and define land uses. In 2013, the city designated Cortex as a tax increment financing district, as well.

LEVERAGE MARKET STRENGTHS

Cortex began as an intentional effort to leverage St. Louis' life sciences and biomedical industry cluster to create entrepreneurship opportunities.

SUSTAINABLE COLLABORATION

A respected, trusted, local leader convened civic and business leaders around a common vision for the future and formed a high-power coalition that is still together 18 years later.

TARGETED GEOGRAPHY

Cortex focused efforts on a 200-acre redevelopment area located between the city's key anchor institutions.

INNOVATIVE FINANCING

Cortex created bespoke deals pulling together the capital, equity, subsidies and tenant commitments needed for each unique project using the acquisition fund and Tax Increment Financing (TIF) funds as its base.

EXPERIENCED PARTNERS

While Cortex was an inherently local play, leadership imported Wexford Science & Technology and the Cambridge Innovation Center (CIC) to inject experience, capital and proven programmatic practices into Cortex and to advance its preexisting strength in biomedical research.

Photo: SQ1 Program entrepreneur training session

Credit: Jen Korman Photography



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HOW CORTEX GOT STARTED

Cortex was founded as the Center for Research and Entrepreneurial Exchange² in 2002 at a time when St. Louis needed a win. After 1950, St. Louis' population plummeted, dropping 65%—from 856,796 in 1950 to 302,838 in 2020.³ Fortune 500 companies that were a mainstay of the St. Louis economy began to leave as well. In 1980, St. Louis was home to the headquarters of 23 Fortune 500 companies; as of 2020 only eight remained.⁴ The Central West Neighborhood in which Cortex would be formed had strong anchor institutions that remained vibrant, but the neighborhood had lost one-third of its population from 1970 to 1990.⁵ As St. Louis philanthropist and BioSTL Board Chairman John McDonnell tells it, “we were pretty down that we were becoming a second rate place and a number of us felt we needed to do something to bring St. Louis into the 21st Century. There had not been a lot of entrepreneurship in the city because we had giant companies and people would get out of college and go work for those companies. We needed to start new companies and industries.”⁶ St. Louis needed a more entrepreneurial future.

In 2001, Dr. Bill Danforth, former Chancellor of Washington University pursued a vision for an entrepreneurial St. Louis. Danforth, a highly respected civic leader, commissioned a report by the Battelle Technology Partnership on the region's

market strengths in 2000 to better understand how to advance new company creation in the region. The study found that life sciences was the region's strongest industry cluster and forecasted the St. Louis region's ability to become a top ten global innovation life sciences hub if it facilitated research and collaboration opportunities among industry and academic institutions in the plant and biotechnology sectors.⁷ Danforth established a coalition of business, civic, and academic leaders in 2002, initially called the Coalition for Plant and Life Sciences (Coalition) and today named BioSTL, to advance the region's life sciences strength. Former St. Louis Mayor Slay explains that Dr. Danforth was a strong figure “who had a tremendous amount of credibility and resources that could pull the civic and business community together with an overall vision to help make it happen.”⁸ Eighteen years after its formation, the coalition continues to push forward initiatives to advance the region's biotech and plant sciences sector.

In 2002, Coalition leaders adopted a goal to create a life sciences research park to grow entrepreneurial activity in the region. As part of a learning tour, St. Louis Coalition leaders visited Cambridge Massachusetts and had an epiphany. The treasurer at the Massachusetts Institute of Technology toured them through the adjacent Kendall Square, a revitalized one square mile of vibrant mixed-use development

with an explosion of biotechnology and IT companies, plus space for new housing, restaurants, shopping, and recreation. The tour focused on the substantial investment MIT made—over \$600 million representing about 15 percent of its endowment—to create this technology district full of start-ups and growing businesses who sought proximity to MIT and its talent. St. Louis leaders were told that within five years MIT earned over a 9% return on its investment and created a destination innovation economy. Donn Rubin who staffed the Coalition in its early years and is now CEO and Founding President of BioSTL recalls saying to his fellow leaders, “if they can do it, Washington University ought to be able to do it too” and “the university shouldn't be doing it alone; there should be partners in this project.”⁹ After the trip to MIT, Coalition founder Bill Danforth researched Washington University's endowment investments and found that a very small portion was being spent locally. Danforth made a pitch to Washington University Chancellor Mark Wrighton who had previously served as Provost at MIT to invest some of the university endowment into a life sciences district based on the MIT model. Wrighton agreed to put \$15 million of equity into a fund if other anchors stepped up and similarly invested.¹⁰

Danforth convened a landmark breakfast meeting with the heads of Washington University, BJC HealthCare,

*Photo: Murmuration celebration outside of @4240 Duncan
Credit: Cortex Staff*

If we can continue our unselfish entrepreneurial spirit and ability to share visions and work cooperatively toward important goals, I foresee a great future for us all.

Bill Danforth, Cortex Founder ¹¹

The University of Missouri-St. Louis, Saint Louis University, and the Missouri Botanical Garden, as well as the City of St. Louis Mayor, to achieve private and public support for a life sciences research park. Former Mayor Francis Slay recalls, “This meeting was not a usual thing. It was a rarity. In fact, I don’t remember another meeting that had such a big idea and brought so many people into the room that laid out a plan from different sectors to implement a big idea together.”¹² At the meeting Danforth explained to the assembled leaders that good innovations and entrepreneurs are farming business ideas out to other cities because we do not have the facilities or capital to support them.¹³ By creating state of the art facilities, supporting commercialization of university research and offering abundant startup capital and support, St. Louis could retain its talent pool and incubate new companies locally to drive economic growth. Danforth made a pitch for funding at this meeting and raised \$170,000 to finance a feasibility study and to vet potential locations to establish a life science district. The Coalition formed three key committees and Danforth recruited distinguished retired corporate leaders to head each committee. The committees were Capital Formation, Facilities and Federal Policy. Danforth recruited John Dubinsky, a respected lender, to head Facilities and

John McDonnell, recently retired Chairman of McDonnell Douglas, to head Capital Formation. These were men with extraordinary professional skill sets and extensive networks who “retired” from their companies and volunteered their time to lead. Each man then recruited the help of other top business professionals in their fields. Dubinsky led the effort to find an appropriate site and to define the type of facilities needed to expand life sciences jobs and tech transfer within the city. The Dubinsky-led Facilities Committee noted two major gaps in St. Louis’ ability to nurture and grow life sciences companies: incubator space and post-incubator graduation space. “If we are going to be successful, we need to create a place for companies to work their magic.”¹⁴ He faced a chicken or egg quandary, “a visible pipeline of life sciences companies would give developers the confidence to do speculative development; but without a visible supply of facilities and wet lab space, it is difficult to attract and develop that visible pipeline of companies.”¹⁵

An outdated, underperforming 200-acre industrial area located between the founding institutions became the site for the Cortex research park. Founding leaders explored five possible sites across the St. Louis region for the research park and decided upon a once vibrant, former industrial area located

four miles from downtown St. Louis that had once produced the nation’s first Studebaker cars and AT&T princess phones. There were only fifteen viable businesses remaining. The location was identified as a potential location for a high-tech center years ago as part of a failed city effort called Technopolis. “Cortex didn’t fall out of the sky” said Dick Fleming, former President & CEO of the St. Louis Regional Chamber & Growth Association. City leaders had discussed the economic potential for revitalizing this area for more than a decade. The area had the potential to physically link a unique concentration of the region’s primary life sciences academic and research institutions. The 200-acre area was located within a single census tract and a single aldermanic ward that was led by a supportive alderman named Joe Roddy. The location was located in the heart of the city’s Central West End that is bordered by a very desirable residential neighborhood, an advantage for attracting commercial tenants who would like to live near to their workplace.¹⁶ This area also had a strong entrepreneurial foundation as it was the home for the Center for Emerging Technologies (CET), a state-designated innovation center founded in 1998 by company and job creation expert Marcia Mellitz and the University of Missouri St. Louis President Blanche Touhill. CET provided incubator space for startup

RETURN ON INVESTMENT FOR WASHINGTON UNIVERSITY AND SAINT LOUIS UNIVERSITY

companies with specialized needs such as dry and wet lab space in two buildings within the largely empty district. CET would later agree to become a subsidiary of Cortex after the Great Recession hit the small organization hard and it needed help to pay its debts.

Five anchor institutions pledged \$29 million in equity to acquire land for the new district. With a location selected and Washington University's \$15 million commitment in hand, Danforth asked each of the key area anchor institutions to contribute to a land acquisition fund. The University of Missouri St Louis (UMSL) invested \$4 million, while Saint Louis University and BJC HealthCare contributed another \$5 million each. The anchors paid \$5.4 million in equity directly into the fund and the rest remained in the form of firm bankable equity commitments with no contingencies payable over 5 years with the exception of UMSL whose contributions would be payable over 10 years. Blanche Touhill, the Chancellor of UMSL at the time, contributed their portion of the fund from operating expenses because she believed it was just that critical for UMSL to participate in this historic effort.¹⁷ The institutions saw the fund as an investment for which they expected a return, but also an opportunity to do something meaningful for the city of St. Louis. "Talented people invested in Cortex out of institutional self-interest – it was good for their institution, but it was a lot more than that. Cortex became a civic responsibility – doing something bigger than your institution – a form of enlightened self-interest"

explains current Cortex Board Chairman Hank Webber.¹⁸ Use of the \$29 million fund was restricted to land acquisition and to provide collateral balance for developers to construct new facilities. The money was placed into an LLC landholding subsidiary that was deemed a non-profit by the IRS because all of its shareholders/founding investors were nonprofits.¹⁹ Each of the founding institutions were given seats on the board to control the direction of Cortex. Bill Danforth and Donn Rubin also approached St. Louis corporations and asked if they would help to fund operations. While they received many "no's", Rubin explains that about 25% of companies like Enterprise Rent a Car, Energizer, Edward Jones said yes and together they donated \$3.5 million dollars to run the initial phase of Cortex.²⁰

In 2002, Cortex was established as a non-profit and the Cortex Board defined three clear goals that guided the nonprofit's work for the next eighteen years. While Cortex's approaches and tactics changed over time, its three goals remained the same: to create new revenues for St. Louis, to create new jobs in St. Louis and to promote inclusive growth. The first two it has achieved. The latter goal of a diverse, equitable and inclusive space for innovation continues to be actively pursued today and is discussed in detail on page _____. The focus of the Cortex goals was deliberately positioned to achieve economic development progress, rather than scientific progress. Dubinsky explains that when he worked with Danforth to finance Cortex operations, they

The one-time investment these two bordering St. Louis universities made to to the \$29 million acquisition fund remains in use by Cortex still today. Washington University and SLU have increased their physical presence within Cortex over time. SLU grew their presence from a single office for their director of Office of Technology Management in 2015 to 500 square feet of space for their Research Innovation Group in 2017 to 7,700 square foot COLLAB space it shares with Washington University's McKelvey School of Engineering in 2019. SLU's Ken Olliff explains that SLU's commitment in Cortex allowed it to raise its profile in research and innovation and be positioned SLU "in the middle of the action" while allowing staff and students to enjoy "water cooler" conversations with neighbors like Boeing X, Accenture and Microsoft.²¹ Cortex Board Chair and Washington University executive vice chancellor and chief administrative officer Hank Webber lists the many ways the investment benefited Washington University:²²

- Improved the local environment which helped with the recruitment of students, faculty and staff
- Established new source of employment and entrepreneurial and start-up opportunities for students and graduates
- Created venues and opportunities for social interaction among university community
- Improved surrounding neighborhood and physical campus area
- Strengthened academic programs
- Improved the retention of graduates within the St. Louis area
- Improved the ability for faculty to start companies
- Demonstrated the universities' commitment to meet the needs of society and improve the economic condition of the City



noted that there was little money for bioscience but there were substantial loan, grant and tax credit opportunities for economic development that commercialized biotechnology research to create investment and jobs in St. Louis.

At its founding, the Cortex board was made up of four permanent founding members, two regular members and a maximum of seven ex-officio members.

The Board did not include elected officials although they could serve as ex-officio members. Permanent founding members of the board are the four institutions that contributed the \$29 million to the land acquisition fund—Washington University, BJC HealthCare, Saint Louis University, and the U of Missouri-St. Louis. Each founding member institution was represented by two directors. Cortex founders made a commitment to have high-level executives like the President of SLU, Chancellor of Washington University, President of the University of Missouri-St. Louis, and President of BJC actively participate in, and in most cases Chair, every committee. This allowed Cortex to act swiftly and to be nimble—senior decision-makers were at every table and meeting. In addition to the permanent member institutional directors, at-large directors represented the Missouri Botanical Garden, St. Louis Regional Commerce and Growth Association, the Coalition for Plant and Life Sciences, and other civic leaders, including Bill Danforth, the visionary who convened the Coalition that would result in Cortex. Every member of the Board has an equal vote. Ex-officio members included the Mayor and the Alderman for the

17th Ward Joe Roddy. In 2018, Cortex added six new board positions to diversify the board based upon race, gender, age, and representation of corporations and startups. The change gave one additional seat to each of the permanent members and added two more at large members with a specific guideline that the positions be used to make the board more inclusive. Today the Cortex board has 12 founding member voting directors from the four founder institutions, 10 at-large voting directors from select community organizations and corporations, 5 non-voting Directors (ex-officio), plus non-voting invited guests (individuals from founding member organizations who have specific areas of expertise).

Board committees include the Executive, Audit, Finance, Real Estate and Planning, Governance, Inclusion and Program. Committees include board members as well as individuals with relevant expertise from the community. The Executive Committee reviews all committee recommendations before they are brought to the full board. The full board meets four times per year and the committees meet four to eight times per year. The Executive Committee meets every three to four weeks.

In 2003, the Cortex Board began to acquire land inviting real estate developers and life sciences companies to build on the assembled land without success. The Board began buying properties with vacant buildings and assembling developable parcels. In a “politically necessary” move to “get institutions comfortable” according to John Dubinsky, the founding members were given a

first right of refusal for properties near to their institution. Dubinsky and the board did not want to engage in a bidding war with its own board members.²³ The initial goal was for the nonprofit to acquire 45 acres of ground at an average cost of \$15 per square foot at a total cost of \$60 million. Carrying the properties, demolition and environmental abatement was estimated at an additional \$60 million.²⁴ Yet once Cortex assembled and cleared shovel ready land, real estate developers and companies did not find sufficient incentive to invest in the district. As Mary Campbell, then with Bank of America and currently the associate vice chancellor for real estate at Washington University explained, our first view was that “we will market the hell out of it. If we tee it up, they will come. But no one showed up to the party.”²⁵ Board Chairman John Dubinsky concurs that “our goal was to never own lots of buildings but to run political interference, create vision and solve problems but now we decided to pivot and develop the first Cortex building and prove the market”.²⁶

In 2005, Cortex received its first state funding in the form of \$12 million in state tax credits.²⁷ The Cortex Board successfully obtained tax credits based on the argument that “if we don’t build it, they will leave” referring to the life sciences innovators who will leave Missouri to commercialize their ideas due to a lack of facilities, support and capital.²⁸ The Missouri Development Finance Board (MDFB) approved \$12 million in transferable tax credits to Cortex that would be activated by bricks and mortar projects over a five-year period. Since Cortex

*Photo: Cortex Commons construction, view from @4240
Credit: Cortex Staff*

was going to construct its first building, Cortex was the sensible recipient for the tax credits, but CET and BioGenerator, two regional nonprofits incubating and accelerating advanced technology companies were also intended beneficiaries. Cortex received \$7 million, BioGenerator received \$3 million and CET received \$2 million in credits. The three nonprofits jointly had to raise \$24 million in private sector contributions to use the tax credits over five years. Philanthropic investors would receive \$500,000 in tax credits for every million dollars they invested. Commerce Bancshares agreed to purchase any unused credits from the donors for \$.92 per dollar.

In 2005, Cortex built a state of the art \$36 million building called Cortex I to prove the market. The Board, led by Chairman John Dubinsky, decided that to activate the newly formed innovation district, the nonprofit needed to construct the first building on spec in St. Louis in twenty years. This plan involved a higher level of investment than the entire acquisition fund and a great deal more risk. John Dubinsky recruited respected real estate developer Lewis Levey, chairman of Enhanced Value Strategies Inc., and these two professionals managed the construction of Cortex I, a modern new building in just a year. Financing for this project had to be innovative because the nonprofit had no track record and insufficient collateral. The capital stack and tenant commitments responsible for making Cortex I happen are discussed in detail on page ___. Built at a cost of \$36 million this building included expensive specialized wet lab space. Its anchor tenant was

Stereotaxis, a company incubated at CET that was ready to expand. Cortex I was “the initial bow wave” according to John McDonnell and it was reasonably rented up.²⁹ Washington University provided loan guarantees and committed to leasing up to 25% of the space in the building to make it financially viable. This was the first of many times that Washington University would step up and lease space to support a project. By 2017 Washington University had rented over 110,000 square feet of space at market terms within Cortex in order to catalyze private investment.

In 2006, St. Louis authorized Cortex to use traditional government powers of eminent domain, land use approval and tax abatement throughout the district.

The city granted Cortex West Redevelopment Corporation, a Cortex subsidiary, the status of master developer of the district under Missouri statute Chapter 353.³⁰ Chapter 353 gave the nonprofit Cortex the power to use eminent domain, issue tax abatements, and define land use and design through individual Parcel Development Agreements.³¹ Zoning within the 200-acre district was largely industrial and remained unchanged. Because eminent domain was a Chapter 353 power, the district was carefully defined so that the redevelopment area included only a few residential properties. Cortex leaders felt this was politically important due to sensitivity around property takings. Having authority to use these powers if required allowed Cortex to implement the district redevelopment plan without purchasing all of the land upfront. As a result, Cortex had “the

power to buy as we go; we didn’t have to tie our limited funds all up in land acquisition, rather we could preserve cash instead of banking land,” says Dennis Lower. Lower acknowledged that “having the power of eminent domain means that you have considerable power.” But Lower says that Cortex has used it sparingly and seeks to “negotiate with owners rather than engage condemnation lawyers whenever we can.”³² There were only about 15 businesses operating in the district when Cortex was named master developer. Some were generational businesses. One continues to function as a grain terminal at 4040 Duncan Avenue and its siloes hold wheat that it buys from local farmers. According to John Dubinsky, Cortex typically paid higher than market value for land and covered relocation costs for active businesses. There were a handful of adversarial acquisitions, explains Dennis Lower, to assemble the Ikea site, but Cortex also used eminent domain in a friendly manner to quiet title where a public entity like the city or Missouri Department of Transportation owned the land and a taking of the property provided needed assurances that there were no competing ownership claims. To this day Cortex owns little land within the district it manages and curates. Instead Cortex methodically enters into a Parcel Development Agreement for every new project with a detailed list of requirements for developers. No one can put a sign on a building or obtain a building permit without Cortex’s sign-off according to Otis Williams, executive director of the St. Louis Development Corporation. In addition “353 meant they didn’t have to fight the political debate



Cortex Commons Construction View from @4240 Duncan

with elected officials at every turn.”³³ The tax abatement power allowed Cortex to abate up to 25 years of tax increases – 100% of taxes during the first ten years and approximately 50% for the remaining 15 years depending on the project’s need for subsidy. Cortex used the tax abatement power two times – for its first two buildings - Cortex 1 and the Dupont Building. Later in 2013, as described below, Cortex applied to become a tax increment financing district so it could capture tax increases to redirect tax revenue to finance district infrastructure improvements, in addition to developers. It first used TIF financing for the @4240 Duncan building.

In 2008, Solae, a joint venture between Dupont and Bunge, built the second Cortex building as a multi-story, single-tenant soybean research building for its world headquarters.³⁴ Mayor Slay assisted in negotiating the deal which included the city dropping DuPont as a defendant in a lawsuit against several corporate entities.³⁵ The building was positive for the district, but it also convinced the Cortex board that the district needed more multi-tenant buildings to grow local companies and bring together talent to co-invent and co-produce new products. The goal was to create opportunities

for interactions between tenants and knowledge spillovers. To do that it needed to focus on the needs of the entrepreneur and expand Cortex’s mission beyond just offering land or facilities, like a business park would do, to include programming and startup support. The goal became to create a welcoming place to nurture entrepreneurs. According to John McDonnell, “it took us a few years to realize we had to start with the entrepreneur” rather than the real estate.

WHAT IS

- » We are the largest campus in the Southeast Region
- » We are building a 200-acre mixed-use entrepreneurial community
- » We are intentionally diverse: gender, age, race, culture, multi-tech sectors



HOW CORTEX WORKS

In 2010, Cortex made a key change in its strategy and found its path forward. Cortex hired professional staff and transformed its mission from building a siloed life sciences research park to building a dynamic, mixed-use, innovation district centered on advanced technologies where smart people come together to develop ideas and build companies. Every technology sector was invited and cross-sector interactions were encouraged. New partners were brought in to provide programming and event opportunities. Cortex added places to work, dine and hang out, including the construction of a hotel, a 3.5-acre park, The Commons, and a light-rail commuter station at the district's center. By 2018, Cortex was ranked one of the top five urban innovation districts in the world and national companies like Boeing and Microsoft were placing innovation operations at Cortex.³⁶ In 2014, Washington University brought their Office of Technology Transfer to the district to provide a gateway opportunity for companies to mingle with the university @4240. Saint Louis University brought its Office of Technology Transfer to Cortex in 2017. Washington University also moved its Cyber Security Program to Cortex and announced in March 2020 its plan to build a 600,000 square foot neurosciences research facility in the district to dramatically increase its research and development presence within Cortex. The anchors' decision not to move the majority of its academic research and development assets to Cortex distinguishes this effort from MIT which moved significant

research labs to Kendall Square and adopted more aggressive commercialization policies to fuel technology transfer success.³⁷ Six key decisions made during this second phase of Cortex's evolution starting in 2010 that were critical in setting Cortex on its successful course:

1. Hired experienced professional staff;
2. Created detailed master plan for a mixed-use, multi-sector innovation district;
3. Recruited nationally-recognized private developer and programming partners;
4. Became a city TIF district;
5. Created a revenue stream to support operations; and
6. Built and programmed interesting, cool places to support the growth process of entrepreneurs and provided space for startup companies to grow.

First, in 2010 Cortex hired its initial full-time director and professional staff. After acknowledging that Cortex could not realize its vision at speed with exclusively volunteer part-time management, the board interviewed and hired Dennis Lower to direct Cortex. Lower had been leading the Biomedical Research Foundation of Northwest Louisiana's Shreveport innovation district and had also served as Executive Director for the University Heights Science Park in Newark, New Jersey. Though Lower was not searching for a new job he agreed to visit St. Louis and offer his advice. Lower recommended to the board that they pivot and change their

approach from its single focus on biomedical technologies to a multi-sector, mixed-use innovation district that offered the exciting benefits of an urban workplace. Lower explained, "it's not about buildings, it's about building an innovation community. Buildings are essential but not sufficient."³⁸ As the first President and CEO, Lower committed to protecting the reputation of the founding institutions and the Cortex brand, and to do everything in his power to avoid another capital call from the founders. The board members told Lower that the \$29 million fund is Cortex's bank and you are responsible for ensuring liquidity. As Mike Bozovich, Cortex's CFO explains "We don't care about profits. We just care about cash flows. We can make money, we can lose money, we just can't run out of money."³⁹

Second, Lower initiated a planning and visioning process that resulted in a detailed master plan for a mixed-use, multi-sector district with an innovation and technology focus. The plan called for an innovation community with residential, retail and greenspace amenities on site to create an engaging location to work, live, play, and learn. The master plan identified the intersection of Duncan and Boyle streets as the district's "main and main", the center of the critical mass of buildings and amenities that would help the district to thrive sustainably. The plan envisioned places for "convergence" where educated talent pools in multiple sectors intersect to create innovation. The plan also sought to create a car

*Photo: International visitors to Cortex
Credit: Cortex Staff*



Once the district started to take shape and there was recognition it was real and not just one wet lab building waiting for tenants, but a well-organized effort taking shape, people started getting excited about it. It became a magnet for other development and investment. Cortex got a lot of people looking at St. Louis in a whole different way.



Mayor Slay



optional district with transit access and bike and pedestrian trails. The adoption of the detailed master plan ended Cortex's startup phase focused on creating a critical mass of individual buildings and started its acceleration phase focused on district-wide curation, placemaking and supporting innovators with the programming they need. Lab space, greenspace, event space, and co-working space resulted in what Dennis Lower calls "serendipitous collisions" of smart people and new ideas.

The Cortex District is being planned as a knowledge community, a lively setting for work, play and living. It will encompass far more than laboratories and offices for research. In contrast to past models of research parks as an isolated suburban enclave, a knowledge community is designed to become an urban neighborhood full of 24/7 activity. Housing, retail, hotels, open spaces and public amenities are all part of the development to attract young entrepreneurs and small companies in addition to seasoned scientists, corporate executives and local residents

Master Plan 2012

Third, Cortex recruited national partners Wexford Science and Technology and Cambridge Innovation Center (CIC). Lower had previously worked with Wexford, and in 2011 engaged them in conversations about developing within Cortex. Wexford is an experienced real estate investment and development company that focuses on the specialized facility needs of universities and university related research parks and innovation districts. Wexford had been working with

the Danforth Plant Science Center so they had already committed to investing in St. Louis. Wexford also had solid access to capital and "could be creative with real estate financing to make it work even when the math wasn't there" according to Mary Campbell at Washington University.⁴⁰ At the time Wexford came on board there were only two buildings in place—Cortex 1 and Dupont/Solae—and Dennis Lower had been on board as President & CEO for less than one year. Wexford immediately stepped up to help fund the new mixed-use Master Plan and work with Cortex to acquire the former AT&T building located at 4240 Duncan to be rehabilitated using state and federal historic tax credits, among other sources of funding. Cortex Board Chairman Hank Webber explains that "Cortex was lucky finding Wexford as a partner. Wexford put up capital to do these buildings, recruited tenants and put together financing deals. They have a great marketing team and they are extremely long-term investors. They believe in creating value over a long period of time." Dan Cramer, President and Chief Operating Officer for Wexford similarly asserted that Cortex was a good fit for Wexford "because it was the bar in between the two weights of the barbell that connected Washington University, BJC and SLU".⁴¹

Cortex and Wexford next recruited Cambridge Innovation Center (CIC), a company that helped fuel the success of the Kendall Square district adjacent to MIT that inspired the Cortex model. CIC chose St. Louis as its second location where it could bring its mix of diverse workspaces, programming and events to foster innovation.⁴² CIC established two Cortex co-working office and lab space locations within Cortex: the 4240 Duncan building renamed by Wexford as @4240, and the CET building renamed

CIC@CET. Entrepreneurs and companies could sign short-term membership agreements with CIC ranging in cost from \$200 per month for co-working space to \$1,200 per month for a two-person office, and spaces that could support up to 30 people. CIC membership includes access to flexible space, conference rooms with writable walls and advanced audio-visual equipment, phone booths, concierge services, printing/copying facilities, stocked kitchens and even a podcast recording studio hidden behind bookshelves. CIC also offered event spaces and shared and private wet lab spaces. In 2018, CIC St. Louis opened a third location at 4220 Duncan, another building developed by Wexford. CIC brought Venture Café to St. Louis as well. Venture Café, a non-profit founded by CIC, provides programming and networking for entrepreneurs. "Innovative programming is the life blood of the District," explains Lower. Venture Café events bring in hundreds of participants every week and finances all of its own programming and operations. As of February 2020, Venture Café was averaging over 400 attendees and at least ten diverse breakout sessions each week at its Thursday Gatherings held in 4240 Duncan. In March, Venture Café St. Louis and other Venture Café cities went virtual in response to COVID-19. They also recently added Monday–Wednesday one hour talks online called Venture Hours that are led by proven entrepreneurs and experts in a particular field.

Fourth, Cortex was approved as a Tax Increment Financing (TIF) District. In 2013, the Cortex district was approved by the St. Louis Tax Increment Financing Commission for a \$167.7 million TIF.⁴³ TIFs use anticipated future tax revenue resulting from new development to finance redevelopment projects or infrastructure investments.

*Photo: BioGenerator/BioSTL team meeting
Credit: BioSTL Staff*



@4220 Open House, Credit to Cortex Staff

The City of St. Louis's General Fund Revenue is comprised of ten sources of taxes and fees including property tax, sales tax, payroll tax and earnings tax detailed in the chart below. While the city receives the "base" amount of tax revenue before redevelopment investments, the TIF allowed Cortex to capture 100% of the added increment of the property tax and 50% of the added increment of sales, utility, and local payroll and earning taxes to pay bonds and reimburse investors for real estate and area-wide infrastructure projects. All other taxes generated by the district, including the personal property tax and the commercial surcharge tax, were distributed to taxing jurisdictions in full. "St. Louis' ability to bring in TIF dollars was more extraordinary than any other place in country with a soft market and was critical to support buildings and infrastructure," asserts Dan Cramer of Wexford. The maximum TIF time period is 23 years. To take the greatest advantage of the TIF timeframe, the district was broken up into

11 Redevelopment Project Areas (RPA's) where each RPA could be activated separately to start the 23-year clock once a major project was approved. Otis Williams, executive director of the St. Louis Development Corporation, explained that such a large TIF was rare in the city and while the city set the maximum amount for the TIF at \$167.7 million, government did not guarantee the TIF.⁴⁴ If the development didn't generate the estimated amount of taxes, then the developer was not paid back the full amount. Requiring the developer to take on the risk "cuts through all developer hype and promises regarding job creation and tax revenue that will be generated and creates honesty at the table," says Lower.⁴⁵

The St. Louis City Branch of the NAACP initially planned to oppose the TIF over concerns that Cortex had failed to meet minority participation goals for construction on early buildings. A meeting between Dennis Lower and Dr. Adolphus M Pruitt, President of the St. Louis Chapter

of the NAACP, convinced Dr. Pruitt that they could work together to achieve minority participation goals for future projects. Pruitt stated that his confidence in Lower was justified and that minority and women contractor participation on Cortex projects met or exceeded all goals.⁴⁶

In 2014 and 2017, Cortex monetized a portion of the TIF with bond issues using future TIF collections as collateral. In 2014, Cortex issued its first \$13 million bond issue on the unrated bond market to provide immediate access to capital, bridging the time between the need and when the TIF generates streams of income.⁴⁷ The principal and interest payments derived from the bond issue were pledged to the payment of debt service on the Series 2014 bonds.⁴⁸ Cortex also signed an agreement in 2014 with the

Industrial Development Authority issuing the bonds, which also restricted future tax abatements.⁴⁹ Cortex performed its second bond issue in 2017 for \$22.7 million to

once again monetize a portion of future TIF tax collections. Two key conditions of the second bond issue were that TIF dollars would be used to pay off a \$12 million loan on the 4260 Forest Park Avenue building and that Cortex would pay back the principle on the first series of bonds before paying the principal on the second series of bonds. Proceeds from both bonds were used for public infrastructure and to advance the mission priorities of the district.

As of January 2020, Cortex has activated six out of the eleven RPAs. The year 2024 (10 years after the initial RPA was activated) is the final date for any remaining RPAs to be activated for specific development projects or those RPAs will disappear. Cortex has used \$110 million of the \$167.7 million maximum TIF dollars. The remaining \$57 million can be used for infrastructure improvements and developer incentives according to Dennis Lower. However, Cortex has been throttling back on developer incentives since the district has accelerated its growth. Lower indicates that current expectations are that proceeds for the next bond issue in 2022 or 2023 will be allocated for additional streetscapes on Sarah and Duncan streets, equity for additional garages, and support for residential development. Proceeds from previous bond issuances were used for street and sidewalk reconstruction, undergrounding utilities, debt repayment associated with land acquisition, and seeding a number of district innovation centers.

In 2013, Cortex negotiated a deal to establish an IKEA store in the district, with the store's grand opening in 2015. Attracting IKEA, a destination retail company with a culture of innovation, was

By 2018, Cortex Included Multiple Industry Sectors and Company Types Employment by Key Cortex Sectors and Company Types ⁵⁰

Cortex Industry Sector/Company Type	Current Employment
Innovation Centers and Cortex Operations Staff	108
Other Non-Profit (including BJC)	1,086
Software/IT/Media Development	948
Higher Education	813
Management Consulting/Other Business Support Firms	752
Insurance, Financial, and Real Estate Firms	555
Bioscience R&D	521
Retail, Restaurants, and Other Amenities	448
Food Processing R&D	328
Scientific/Engineering/Environmental Consultants	87
Individual Entrepreneurs in Coworking Space NEC*	87
Government Agencies	47
Total	5,780

a significant coup for the city and Cortex. In 2015, the state of Missouri approved using a portion of its anticipated IKEA sales tax for two additional district projects. The state project-specific "SuperTIF" funding was used to attract a makerspace tenant to a new Cortex building, 4260 Forest Park Avenue (one of the three emblematic projects discussed on page 38), and to acquire land for the first Cortex parking structure. The Missouri SuperTIF redirected up to 50% of the net new state sales tax revenue (general revenue portion only; excluding dedicated taxes) for these projects. The total value of the SuperTIF derived from a bond issue was \$17.5 million.

Fifth, Cortex adopted a revenue model where building assessments, rents and management fees support operations. The Board determined early on that it would charge an annual building assessment fee for every building—new and rehabbed. Every building owner pays a tiered assessment regardless of whether the owner is a profit, non-profit or a founding member. In many ways, Cortex operates similarly to a Business Improvement District charging a fee based on the rentable square footage of a building in return for providing district services. As Dennis Lower explained however,



"KOREAN BBQ"

**ABAD-
29KCA**

“Cortex is more than a Business Improvement District (BID). We do have a square footage assessment and the money supports our efforts to market and develop the district; it is our job to create and maintain the environment and to directly develop projects when needed.” Residential, retail and office space pay different fee rates. In 2020, assessments are expected to provide \$1.2 million for Cortex operations. As Mike Sullivan stated, it is assessments that “keep the lights on, allow us to cut the grass and present amazing programs for the community.”⁵¹ While assessments alone are not currently sufficient to pay for all district and operating costs, new buildings projected to come online within the next few years are expected to turn Cortex cash positive.

In addition to building assessments, Cortex owns and receives rent from the 4260 Forest Park Avenue building, ground leases for several parcels (with annual escalators), and a 677 car structured garage. Finally, Cortex receives a modest management fee for managing SLLC, the subsidiary “bank” in which the founders \$29 million resides.

Sixth, throughout the district Cortex and its partners built interesting, cool places and provided exciting programming to support the growth process of entrepreneurs. Cortex is an exciting and unique hub of innovation activity as the result of careful curation. Cortex’s staff works hard to achieve a balance of established corporations, startups, academic research institutions and business support services. Programming is offered regularly and varies from how to refine a business model to learning the latest in cyber-security. Large events at

Innovation Hall or small events in a myriad of other spaces offer opportunities for the community to get together and welcome new people and ideas. In fact, Venture Café prides itself on attracting almost 20% of individuals new to Cortex with each weekly Thursday event. Buildings are customized for maximum interaction. For example, when Boeing Ventures, Boeing’s venture fund, moved to 4240 Duncan Avenue, a \$53 million LEED certified building developed by Wexford, Wexford added a stairway to the second floor CIC space that would make it easier for Boeing Venture’s employees to interact with other Cortex tenants over lunch or while working. Just down the street at 4340 Duncan Avenue, BioGenerator is investing millions in new biotech start-ups attracting 87% of the life sciences investment in the city.⁵² Cortex has provided millions of dollars in below-market rate rents and grants to renovate space for incubator graduates of BioGenerator, CET and other critical partners to allow them to stay within the district. In 2020, Cortex is the curator it sought to be at its founding, building new opportunities and momentum with each new tenant, building, program and amenity.

*Photo: Food Truck lunch at the Commons
Credit: Cortex Staff*



VENTURE CAFE
Carlos Suarez (116)

VENTURE CAFE
Choma Likeje (4)

VENTURE CAFE
Chigorie Obiokwe (9)

EQUITY, DIVERSITY AND INCLUSION AT CORTEX

Equity, inclusion and diversity have been goals for the Cortex district since its founding in 2002. The initial focus of inclusion centered around soliciting minority and women-led general contractor and subcontractor firms for the construction or rehabilitation of buildings, a definition of workforce participation fairly common for cities at the time. Cortex has achieved that goal surpassing participation rates required by government.⁵³ By 2008, St. Louis NAACP was pushing Cortex to expand the definition of inclusion with a report finding that “in the commercialization of technology in the region there has been virtually no representation of African Americans” and groups that are organized to promote the commercialization of research and innovation “have zero African American representation even though they have received public support from both city and state to organize.”⁵⁴ In 2017 the Cortex board again expanded the Cortex inclusion goal to become “the most racially, ethnically and gender inclusive district in the country.”⁵⁵ Further, Cortex Chairman Hank Webber explains, Cortex seeks to create a district where the benefits of new company formation, capital investment, job creation, and wealth generation extend to all. This section seeks to better understand how successful Cortex has been in achieving enhanced equity and inclusion within its borders while recognizing that it has had little impact on inequities

at the city and regional level. John McDonnell stated that “equity was one of Cortex’s three goals since its inception yet its “hard to articulate how it improved equity for the city or county. . . . Cortex has not changed the racial divide. Cortex is a great asset in the Central Corridor but what are we doing for the Northside?”

Cortex has taken six key steps to promote equity and inclusiveness within the district:

1. Achieved high minority and women owned company participation in district construction projects
2. Increased diversity on the board
3. Promoted inclusive access to district programming and events
4. Contributed to efforts to train and engage young people of color in STEM and technology
5. Funding training for entrepreneurs
6. Partnered with Washington University to ensure access to affordable lab space

Cortex has excelled in achieving high minority and women owned company participation in district construction projects. Projects funded with St. Louis TIF proceeds are subject to both business enterprise and workforce (boots on the ground) inclusion

goals of 25% and 5% for minority and women owned companies, 25 percent of labor hours to be performed by minorities, 5 percent by women, 20% by city residents, and 15 percent by apprentices participating in approved programs. Cortex has had considerable success in meeting these goals, and devised a transparent dashboard that shares those results with the public. In addition, Cortex created a \$10 million contractor loan fund with Stifel Bank, Cortex’s primary lender, to provide capital to minority and women owned contractors to improve their ability to expand their capacity. Investors in the loan fund include Cortex founders BJC, Washington University and Saint Louis University, as well as other regional corporations.

Cortex expanded its board membership in 2018 to increase inclusion in its governance structure.

Cortex added six new seats to its board with the explicit goal of increasing the diversity of board representation based on race, ethnicity, gender and age on the advice of the Board Inclusion Committee established in 2017. In addition, Cortex staff are required to attend diversity and equity multi-day workshops and in 2020 Cortex plans to hire a Vice President of Equity and Inclusion to continue addressing inclusiveness in a systemic and intentional way.⁵⁶

*Photo: Venture Cafe St. Louis Thursday Gathering
Credit: Cortex Staff*

Cortex leaders seek to maximize inclusive access and engagement to all district offerings bringing diverse entrepreneurs and thinkers to the district. Cortex, through its own programming and that of district partners, has worked to address the historic lack of women and people of color in technology enterprises. Cortex funds Square One (SQ1), a training program designed to provide support to early-stage and first-time business owners in the bioscience, IT and consumer/manufactured product sectors. SQ1 offers two training options. SQ1 Ignite is a 4-week program offered twice each year to help entrepreneurs quickly validate the feasibility of their business model and identify the crucial next steps in launching their business. SQ1 Boot Camp is an in-depth 10-week, 50-hour program that combines formal instruction with hands-on learning, networking and mentoring. Participants work on specific deliverables such as a business model canvas, financial statements, pitch-deck, 2-minute elevator pitch and planning checklist. According to Cortex, for the five year period from 2014–2019, 47% of SQ1 entrepreneurs were people of color and 48% were women.⁵⁷ Venture Café’s weekly Gathering educational breakout sessions average 40% people of color and 50% women or non-gender conforming individuals leading or co-leading the sessions. In 2019, Cortex and CIC provided free space for WEPOWER’s Elevate/Elevar, a new Black/Latinx incubator founded by a Square One graduate. The first cohort of 10 entrepreneurs was

selected and began in Q1 2020. Dr. Pruitt of the NAACP, however, cautions that it may take years for a significant number of black-owned biotech and other high-tech startup companies to form within the district. Thus far Pruitt notes there is “no measurement of innovative blackness emerging.”⁵⁸

Cortex is actively involved in initiatives to create a pipeline of qualified young people from historically disadvantaged groups with STEM and technology skills.

Cortex partnered with other civic leaders and the St. Louis Public School District to create the Collegiate School for Medicine and Bioscience (CSMB) magnet high school. Approximately 65% of the 270 student school are people of color and 85% come from the city. Launched in 2013, CSMB was just ranked 8th in Missouri by US News and World Report’s Best High Schools in America. The school is embedded in Saint Louis University’s medical campus. In addition to the medical sciences, CSMB also supports environmental, IT and plant science instruction. In 2018, Cortex also partnered with 3rd Degree Glass Factory, an artisan glass blowing makerspace, and St. Louis childrens STEM museum, The Magic House, to bring a STEM-focused maker space to Delmar Boulevard, a historic racial demarcation line in St. Louis. Most of the equipment in MADE (Makers-Artists-Designers-Entrepreneurs) including computers, 3-D printers, laser printers, welding machinery, wood and metal working machinery and textile

machinery was donated by Cortex. MADE for Kids, sponsored by The Magic House and located above the first floor adult makerspace, introduces elementary children to the creative, educational, hands-on world of making. Cortex provided scholarship funding to the Magic House for urban school children with limited financial means to participate in MADE for Kids workshops.

In 2019, Cortex sponsored a diverse cohort of students to participate in LaunchCode’s LC101 course. Launchcode is a national nonprofit offering free coding training and job placement opportunities to St. Louis residents. LaunchCode was founded in 2013 by Square’s Jim McKelvey who had experienced the lack of St. Louis talent to staff a new tech business firsthand while trying to build a development shop for his new company Square. Jim moved Square to California for access to skilled workers but started LaunchCode to train new tech talent in St. Louis. Importantly, Square returned to St. Louis and currently employees over 500 workers in Cortex. When enrolling students for the Cortex sponsored LC101, LaunchCode focused on increasing applicants who self-identify as Black or African-American, women, people of color, people from low-to-moderate income households and people without 4-year college degrees. The Cortex sponsored cohort had 93 course graduates, 20% identified as African-American, 52.7% female, and 44% lacked a Bachelors degree.⁵⁹

Cortex has provided us with a location where companies are willing to invest and locate or otherwise they would not be in the city.

Otis Williams, Executive Director of the St. Louis Development Corporation



Kinesis celebration at Cortex, Credit to Venture Cafe St. Louis

Cortex has made great strides towards becoming more transit, bike and pedestrian friendly since 2012 when the mixed-use master plan called for a car-optional district.

Access to Cortex was very car-dependent in its early years. While Cortex was built along a half mile of a pre-existing light rail line, the MetroLink, that runs from St. Louis International Airport to Downtown St. Louis and to the Scott Airforce Base, in Shiloh, IL, there was no stop within the district. Servicable sidewalks, bike lanes and trails were virtually non-existent. Cortex has worked with partners to create new bike, walking and transit options to and from the district. Metro, the public agency managing the region's transit, built the city's first new stop on the region's light rail mass transit system in over a decade in the heart of the Cortex district in 2018. Cortex helped to secure a federal Transportation Investment Generating Economic Recovery (TIGER) Grant for \$10.3 million and matched it with another \$2.1 million to construct the new station and create the first section of a bike trail that will connect the new station to the regional Great Rivers Greenway network, a planned 20-mile urban trail network.⁶⁰ In February 2020, there are 700 riders on an average day who take MetroLink to Cortex. Many users, however, continue to travel to Cortex by car and parking has become a major issue. Lenders require an adequate number of parking spaces to approve loans for real estate development. Cortex has built one new parking structure with 677 cars and has plans for a second 915 car garage. Parking fees will cover capital and servicing costs. To ensure that these structures will serve more than utilitarian purpose, Cortex launched an international competition and selected an artist to create a public art installation on the façade of the garage.

Cortex has partnered with Washington University and BioGenerator to ensure affordable lab space is available for all potential tenants. Cortex rental prices are rising quickly due to high demand and threaten to price some entrepreneurs out of the district. Dan Cramer at Wexford states that Cortex still presents a great value proposition because where a “location can help make a company do better, perform better, they are not as sensitive to rent. Rent is a small component of their balance sheet.” While this may be true of established companies, for startups, initial rents are critical. To keep Cortex lab rents affordable, Washington University agreed to renovate a vacant district building—4340 Duncan Avenue—for BioGenerator to expand and for its graduates who need space to grow. Originally built in the 1930s for the St. Louis Post-Dispatch newspaper, the University used Federal and State historic tax credits, New Market Tax Credits, and Cortex TIF funding to make the lab space affordable, which allows growing, early-stage bioscience startup companies to remain within the Cortex district.



*Photo: MetroLink Ribbon Cutting
Credit: BiState Development Agency*

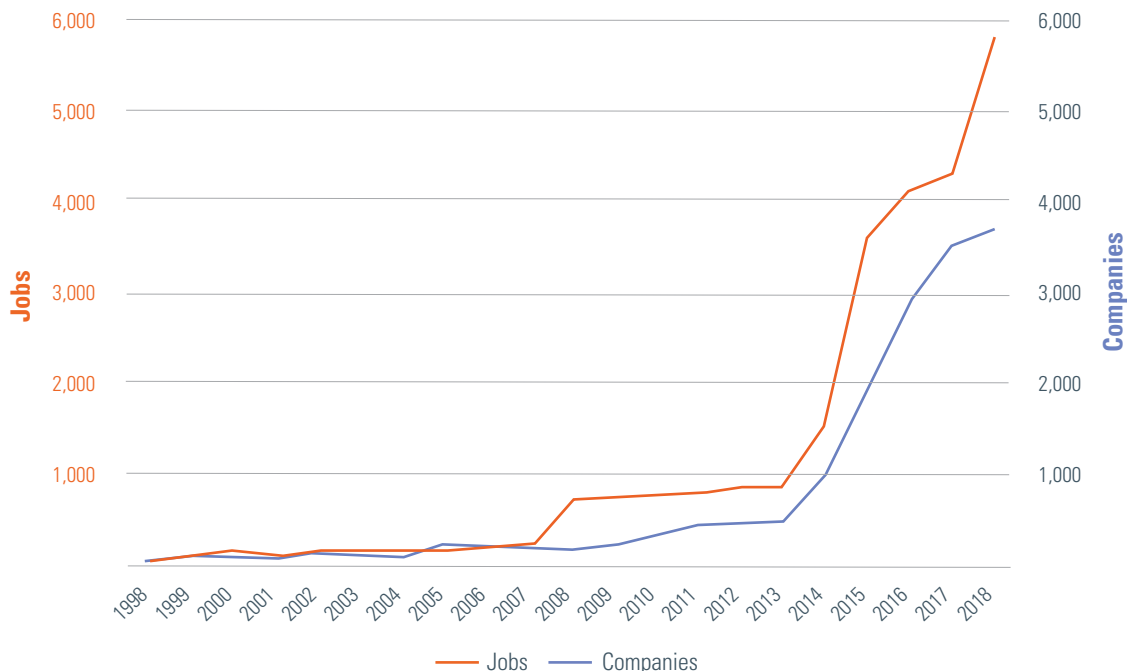
ECONOMIC IMPACT OF CORTEX

In May 2019, Cortex released “Innovation by Design: The Regional Impact of the Cortex Community” prepared by TEconomy Partners LLC to document the impact the district has had on tax revenues, jobs and equity, its three longstanding goals.⁶¹ The report showed Cortex to be a regional economic engine generating a total economic impact of \$2.1 billion across the St. Louis metro in 2018. In 2018 Cortex generated \$69.6 million in total state and local tax revenues for the year. In February 2020 the Cortex district included 413 corporates, startups, academic units, and business service support entities with almost 6,000 employees.⁶²

Since 1998, Cortex has constructed over 2 million square feet of development with investment exceeding \$700 million.⁶³ Cortex today includes 19 buildings, a light rail station, and innovation divisions for several national technology companies. From 2012 to 2020 Cortex has grown at a fast pace adding a historically preserved building in @4240 Duncan in 2012, BJC@The Commons in 2013 and Ikea in 2015. The Commons greenspace and Cortex Metro Station in 2016 and 2018 respectively represent two high-value shared amenities for the district. Two new tech buildings, 4360 Forest Park Avenue and 4220 Duncan Avenue, were added

in 2017 and 2018, and a second historic rehab, 4340 Duncan Avenue, was added in 2019. More buildings and amenities are in the pipeline, including the district’s first hotel by Aloft, which just opened to the public in June 2020. A 345,000 square foot, \$230 million urban market and entertainment venue called the City Foundry STL will be located immediately to the east of Cortex. Wexford has broken ground on 4210 Duncan, a new 325,000 square foot tech building, and Washington University begun construction on a 600,000 square foot, Neuroscience Research Building within the District that is scheduled to open in 2023.

Figure 4. Growth in Companies and Employment at Cortex



Source: TEconomy Partners analysis of Cortex employment data.

In addition to development within the Cortex boundaries, there are numerous new projects in the surrounding Central West End and Forest Park Southeast neighborhoods, including townhomes, breweries, office buildings, and apartment lofts. Cortex estimates the total planned and completed development in adjacent neighborhoods since 2014 to be approximately \$950 million.⁶⁴

Cortex experienced “hockey stick” growth after it achieved critical mass. The chart below shows what Dennis Lower calls Cortex’s hockey stick growth pattern. John McDonnell exclaimed in a recent interview “It is successful. It is successful beyond what I could have envisioned. I was not as attuned

to the power of achieving critical mass—once it gets to a certain point, everyone wants to be there.” Board members and staff describe Cortex as a place that innovators feel they need to be or they will miss out. Given the number of large recognized firms such as Boeing, Centene, DuPont, Aon, Microsoft, General Dynamics IT, Booz Allen Hamilton, and Accenture who have located operations in Cortex, it seems that they are right. The addition of established corporates followed the intentional Cortex strategy and focus on supporting and growing entrepreneurial startup companies. **From 2014 to 2018 Cortex generated almost \$41 million in 5-year net new tax revenues.** The chart below details the breakdown between

the base amount of property tax revenue and net new tax revenue resulting from new development. This chart includes the percent of increased tax revenue that was not captured by the Cortex TIF district.

Projected net new tax revenue the next thirty years, after all currently proposed redevelopment, is \$474.6 million. Cortex will bring far more in tax dollars than the roughly \$167 million it will capture to reinvest in the district as part of its TIF status.

In 2018 alone, companies in the district directly created 5,780 jobs that pay \$450 million in wages and benefits. In addition, companies created almost 3,000 indirect jobs and induced 4,477 more

Taxing Jurisdiction	5- Year Total	5-Year Base Before Dev	5-Year Net New Tax Revenues
State of Missouri	\$32,000,000	\$10,980,000	\$21,020,000
St. Louis City	\$13,450,000	\$4,540,000	\$8,910,000
Community College	\$390,000	\$170,000	\$220,000
MSD	\$230,000	\$80,000	\$150,000
St. Louis City Schools	\$11,080,000	\$4,040,000	\$7,040,000
St. Louis Zoo/Museum District	\$500,000	\$220,000	\$280,000
St. Louis Public Library	\$1,000,000	\$440,000	\$560,000
Sheltered Workshop	\$270,000	\$120,000	\$150,000
Community Mental Health	\$160,000	\$70,000	\$90,000
Community Children’s Service Fund	\$340,000	\$150,000	\$190,000
Senior Services	\$63,000	\$3,000	\$60,000
Metro Parks	\$550,000	\$ -	\$550,000
MetroLink	\$1,460,000	\$ -	\$1,460,000
Cumulative Total	\$61,493,000	\$20,813,000	\$40,680,000

Taxing Jurisdiction	2014-2018 5-Year	2019-2023 10-Year	2024-2028 15-Year	2029-2033 20-Year	2034-2038 25-Year	2039-2043 30-Year
State of Missouri	\$32,000,000	\$65,620,000	\$84,520,000	\$104,480,000	\$125,650,000	\$148,090,000
St. Louis City	\$13,450,000	\$39,350,000	\$78,510,000	\$121,510,000	\$170,790,000	\$232,430,000
Community College	\$390,000	\$870,000	\$1,400,000	\$1,960,000	\$2,840,000	\$4,730,000
MSD	\$230,000	\$860,000	\$2,040,000	\$3,060,000	\$3,840,000	\$4,570,000
St. Louis City Schools	\$11,080,000	\$27,390,000	\$49,810,000	\$71,760,000	\$105,010,000	\$164,250,000
St. Louis Zoo/ Museum District	\$500,000	\$1,080,000	\$1,710,000	\$2,380,000	\$3,460,000	\$5,820,000
St. Louis Public Library	\$1,000,000	\$2,090,000	\$3,200,000	\$4,410,000	\$6,440,000	\$11,060,000
Sheltered Work-shop	\$270,000	\$630,000	\$1,060,000	\$1,500,000	\$2,160,000	\$3,530,000
Community Mental Health	\$160,000	\$160,000	\$420,000	\$750,000	\$1,070,000	\$1,530,000
Community Children's Service Fund	\$340,000	\$770,000	\$1,260,000	\$1,770,000	\$2,570,000	\$4,260,000
Senior Services	\$63,000	\$493,000	\$1,233,000	\$1,893,000	\$2,603,000	\$3,373,000
Metro Parks	\$550,000	\$1,410,000	\$2,380,000	\$3,400,000	\$4,480,000	\$5,610,000
MetroLink	\$1,460,000	\$3,740,000	\$6,330,000	\$9,050,000	\$11,910,000	\$14,920,000
Cumulative Tax Total	\$61,493,000	\$144,723,000	\$234,203,000	\$328,243,000	\$443,283,000	\$605,063,000
Tax Base Before Redevelopment	\$20,813,000	\$42,418,424	\$64,184,000	\$86,114,000	\$108,204,000	\$130,474,000
Net New Taxes After Redevelopment	\$40,680,000	\$102,304,576	\$170,019,000	\$242,129,000	\$335,079,000	\$474,589,000

jobs in the surrounding area. Most jobs within Cortex are connected to non-profit education and health care, government, and industrial sectors ranging from bioscience to aerospace, information technology to food products. In addition, there are nearly 300 employees of IKEA and more than 100 restaurant jobs. The largest employer in the district in 2019 was BJC HealthCare, one of the founders.

The operational purchases of Cortex and its 369 company tenants generated over \$1 billion dollars in direct impact for the

Direct Employment	5,780
Indirect Employment – jobs created by district businesses and nonprofits that provide supplies or services to Cortex	2,895
Induced Employment – jobs created by district and supplier employees spending their money in the regional economy	4,477
Total Employment	13,152

Direct Output (2018)	\$1.02 Billion
Indirect Output (2018) – spending by regional operations of their business with Cortex-based operations	0.47 Billion
Induced Output (2018) – spending by personnel servicing Cortex based economic activity	0.64 Billion
Total Output 2018	\$2.13 Billion



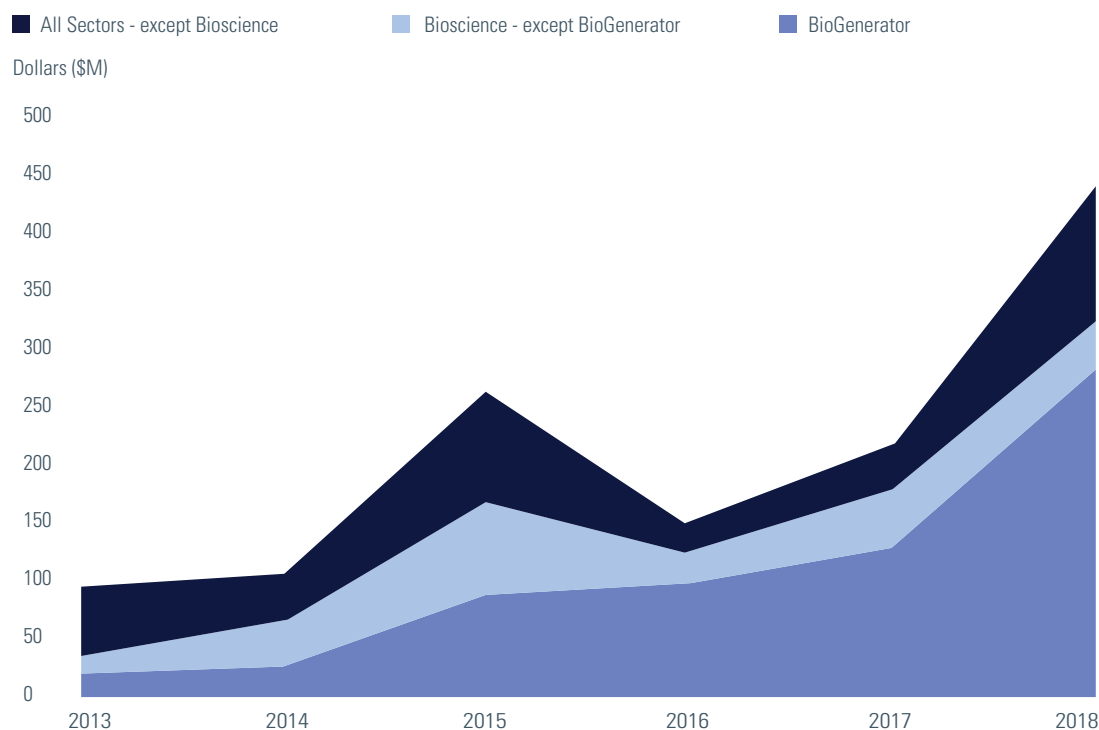
VENTURE CAFÉ

Connecting innovators to make things happen



ST. LOUIS

Capital Invested in All St. Louis Startups From 2013-2018



St. Louis region in 2018. When you look at the indirect and induced economic ripple effects of spending by employees working within the District, that number doubles according to an analysis by TEconomy Partners.

Property values have increased dramatically in Cortex as a result of burgeoning growth. From 2014-2018 the Cortex zip code achieved the highest growth in property values of any zip code in the St. Louis metropolitan statistical area rising 49.4%. As a result, the Cortex average tax revenue per acre is \$64,602 or 2.6 times the city's average tax revenue per acre of \$24,815. While property tax increases currently are diverted to the TIF fund for 23 years from the activation of that part of the Cortex district, those increased values will in time be a huge asset for the city.

58 Cortex tenant companies raised over \$392 million in investment capital. Cortex and in particular BioSTL's accelerator BioGenerator have increased the amount of venture capital supporting new startup companies, drawing from 113 active investor organizations. In 2018, the life sciences made up 74% of all St. Louis startup investments and BioGenerator companies attracted 87% of that life sciences investment.

Cortex has opened up new opportunities for St. Louis to compete for new national technology opportunities. The development of Cortex demonstrated that the weak St. Louis market could regenerate at scale with private patient capital, sufficient government subsidy and traditional government powers. Cortex is now a global success story of a booming tech

hub created from scratch in the middle of a weak market city. In 2016, St. Louis won an extraordinary competition to be the location where the new \$1.7 billion western headquarters of the National Geospatial-Intelligence Agency will be built. This new hub being constructed in North St. Louis builds on another strong industry cluster in the region and is taking many moves from the Cortex playbook. St. Louis leaders unanimously asserted that without Cortex, this new investment in the city would never have happened.

*Photo: Venture Cafe St. Louis Thursday Gathering
Credit: Cortex Staff*



BioSTL Lab at 4340 Duncan, Credit to Cortex Staff



4320 Forest Park Ave, Cortex 1, Credit to Cortex Staff

THREE EMBLEMATIC PROJECTS

Cortex has creatively financed each of its real estate development projects as a “bespoke deal” according to Cortex Board Chair Hank Webber. In this section we look at how Cortex funded (1) Cortex I, its initial building to prove the market, (2) The Commons, its seminal greenspace and (3) 4260 Forest Park, a 2016 office and lab facility.

CORTEX I—COMMERCIAL BUILDING WITH OFFICES AND WET AND DRY LAB SPACE FOR STARTUP COMPANIES

Cost: \$35.5 million
Size: 177,000 square feet
Year Completed: 2006

CAPITAL STACK

First Mortgage Loan: \$25.6 million
New Market Tax Credits: \$ 7 million (7-year forgivable loan)
Federal Economic Development Administration Grant:⁶⁵ \$ 2.9 million

SIGNIFICANCE

- First building in the district that proved the market.
- Washington University made the first mortgage loan possible by agreeing to buy the building for \$25 million if Cortex failed to pay back the loan from Bank of America and by moving research grant support employees into the building to fill the need for a credit tenant.
- Building is LEED CS v1.0 Certified.
- Building was bought by Wexford 100% leased in 2012 to provide Cortex with liquidity.⁶⁶ The sale of Cortex I to Wexford allowed @4240 to be financed and meet a 50% pre-lease requirement. (Cortex I and @4240 were included in a single financing agreement. Since Cortex I was 100% leased and @4240 was 0% leased, together Bank of America was willing to view them as 50% leased)⁶⁷. Ownership of the land remains with Cortex who provided Wexford with a non-economic 65-year ground lease for \$1. In return Wexford agreed to put \$5 million of equity into the building in the form of retrofits needed by technology firm tenants, thus effectively prepaying the ground rent.
- The EDA grant required that the universities not lease more than 25% of the building for a 15-year period. When Wexford bought this building in 2012, the state agreed to amend this requirement to allow universities to lease up to 50% of the building but in return to extend this limitation to @4240 building as well as Cortex I.

Anchor Tenant: Stereotaxis—company that makes robotic products to improve clinical outcomes incubated at CET

Credit Tenant: Washington University



*Photo: Nighttime view of shade structure, Cortex Commons
Credit: Cortex Staff*

THE COMMONS—PARK AND COMMON AREA

Cost: \$12.9 million (\$20 million when include surrounding street improvements)

Size: 3.5 acres

Year Completed: 2015

CAPITAL STACK FOR THE COMMONS

Private donations: \$12.9 million from Wexford, BJC Healthcare, and John McDonnell

MDFB Tax credits: \$6.45 million in State of MO tax credits provided to donors in exchange for \$12.9 million of donations (tax credits are 50% of the donation amount)

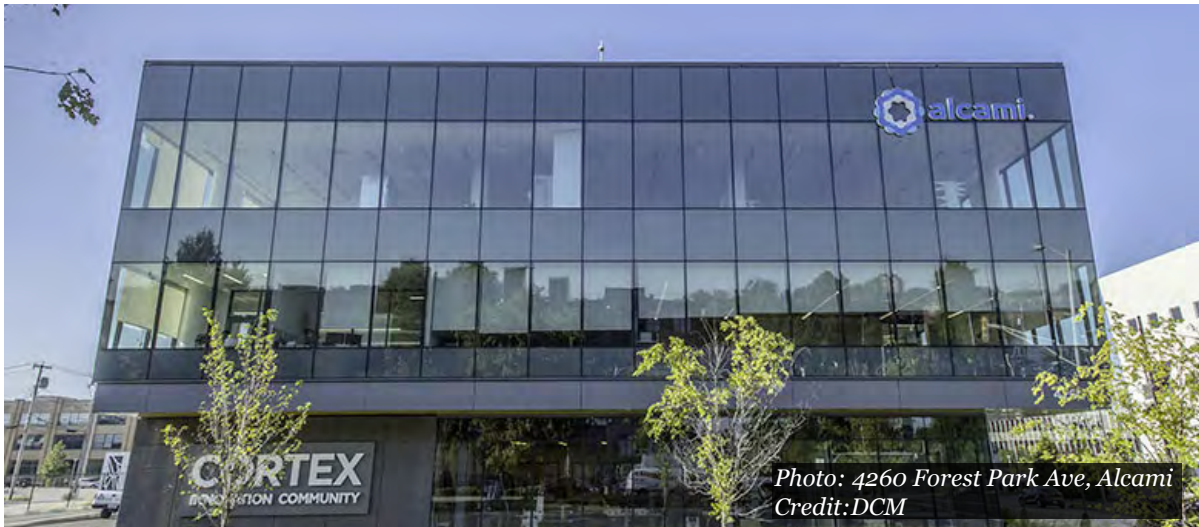
SIGNIFICANCE

- Park serves as an outdoor gathering space and the centerpiece for Cortex with a striking shade canopy.
- SLLC donated the land, a former parking lot for 4240 Duncan, as the site for The Commons.
- Wexford, BJC Healthcare, and John McDonnell donated \$12.9 million to construct the Commons in exchange for a 50% State of MO tax credit (\$6.45 million). The tax credits can be transferred (sold) to other parties with a tax liability if the donor cannot use them at approximately \$.90 on the dollar. The \$6.45 million credit minus the sales transaction cost resulted in \$5.8 million of savings to the donors for the \$12.9 million contribution for the Commons.
- Rain gardens and bioretention ponds within The Commons capture 90% of stormwater runoff.
- Outdoor programming includes vendor pop-up markets, music concerts, movies, food trucks and “Yoga on the Green”.



Daytime view of shade structure, Cortex Commons, Credit to Cortex Staff





*Photo: 4260 Forest Park Ave, Alcami
Credit: DCM*

4260 FOREST PARK AVENUE—COMMERCIAL BUILDING

Cost: \$34 million
 Size: 60,000 square feet
 Year Completed: 2016

CAPITAL STACK⁶⁸

NMTC:⁶⁹ \$3 million net proceeds derived from \$17.6 million in NMTC invested by three allocatees
 State CDBG: \$5 million
 Bridge Loan: \$21.5 million (paid back when monetized TIF)
 TIF Monetization \$14 million (TIF & SuperTIF dollars)
 Permanent Loan \$7.5 million

SIGNIFICANCE:

- First new construction building built for multiple tenants completed without any assistance from Washington University in the form of tenancy commitments or loan guarantees.⁷⁰
- Created Community Benefits Fund of \$500,000 to support the Makers, Artists, Designers, and Entrepreneurs (MADE), a community makerspace located at 5127 Delmar Blvd. It opened in 2018 following the closure of original project tenant TechShop. MADE also received the equipment purchased for TechShop. In addition, the \$500,000 fund pays for programming for the Magic House's City satellite location which opened in 2019 at the same location and provides educational opportunities for youth ages 4 to 14 in the form of standing exhibits and programs as well as year-round camps and workshops in robotics, ceramics, laser cutting, and more.⁷¹
- First restaurant in the Innovation District, Vicia, opened in this building in March 2017, and was a 2019 finalist for the James Beard Award. Vicia was named the #1 restaurant in St. Louis by the St. Louis Post-Dispatch in 2018 and 2019. The high performance of the restaurant has brought evening activity to the district.⁷²

Anchor Tenant: Alcami, pharmaceutical contract research organization (CRO)

Other Tenant: In addition to Vicia, TechShop, an open access maker space, opened in Cortex in August 2016 and went bankrupt shutting down all ten of its U.S. spaces in November 2017.⁷³ Cortex owned TechShop equipment and donated it to MADE. Subsequently, Square leased the space for its third location in Cortex.

Revenue Stream Created: Provides \$66,000 in assessments annually based upon rentable square footage in 2020, as well as net rent revenues that help support the Cortex operating budget.

*Photo: Murruration Festival playground at Cortex Commons
Credit: Cortex Staff*





CONCLUSION

Cortex has proven itself to be agile and resilient as it “doubled down” on strategies to create a node of high-tech strength within a weak market city. The economic fallout of COVID-19 will require Cortex to adapt once again to help startups and small businesses weather the storm and absorb the shocks of the crisis. Several months prior to Missouri issuing a Stay at Home order to prevent the spread of COVID-19, the Cortex Board was engaged in a Strategic Planning Process. The Board recognized that Cortex was an inflection point from one successful leader to the next, having emerged as an engine for thoughtful urban planning and an international model for innovation communities to revitalize older industrial cities. With success and scale comes new levels of complexity. The Strategic Plan will address continued growth and potential locations for that growth, opportunities for emerging markets to locate within Cortex, and how Cortex can help turn start-ups into mature, successful companies.

Implications from Covid-19 and the start of a new President & CEO presents the Board with new opportunities and threats to consider in a post-Covid world. Strategic planning is underway and will continue, slower than planned, due to in-person meeting restrictions but the Board is committed to continued growth and its three goals: 1) create and support new, tech-based or tech-supportive jobs; 2) generate new tax revenue for the City of St. Louis and essential services; and 3) maximize equity and inclusivity in all facets of our work.

The good news is that unlike so many small businesses across the country, Cortex and district startups are not alone in dealing with Covid-19. The district offers a network of supports to help its tenants endure uncertainty and perhaps even leverage the increased speed at which the world is digitally transforming industries and developing new vaccines and medical treatments.

*Photo: Cortex Commons North View
Credit: Cortex Staff*

APPENDIX A: ENDNOTES

- 1** CIC's Safety Plan for Re-Opening After Quarantine (May 5, 2020) <https://cic.com/blogpost/2020/5/5/cics-safety-plan-for-re-opening-after-quarantine>
- 2** The full name for Cortex was changed from Center for Research Technology and Entrepreneurial Exchange to Cortex Innovation Community in 2012.
- 3** U.S. Census
- 4** Veneta Rizvic and Erik Siemers, St. Louis' roster of Fortune 500 companies shrinks by one, while another firm edges closer, St. Louis Business Journal (May 20, 2020).
- 5** Todd Swanstrom, Hank Webber, and Molly Metzger, Rebound Neighborhoods in Older Industrial Cities: The Case of St. Louis (2015).
- 6** Interview with John McDonnell, Philanthropist and former Chairman of McDonnell Douglas, by Karen Black on March 4, 2020.
- 7** The Danforth Foundation and Civic Progress, a local business leadership group, funded the Regional Commerce and Growth Association (RCGA) to commission a report by Batelle Technology Partnership to identify distinctive industry clusters that could be leveraged to help the city rebuild its economy.
- 8** Interview with former St. Louis Mayor Francis Slay by Karen Black on January 23, 2020.
- 9** Interview with Donn Rubin, BioSTL and BioGenerator by Karen Black on January 29, 2020.
- 10** Interview with Mark Wrighton, Washington University Chancellor by Karen Black on February 7, 2020.
- 11** Preface by William Danforth to the book Renaissance: A History of the Central West End By: Candace O'Connor, 2017.
- 12** Interview with former St. Louis Mayor Francis Slay by Karen Black on January 23, 2020.
- 13** Interview with Donn Rubin by Karen Black on January 29, 2020.
- 14** Interview with John Dubinsky by Karen Black on January 27, 2020.
- 15** Cortex Board Minutes 9/3/2003.
- 16** In 2014 the American Planning Association named it as one of the Ten Great Neighborhoods in America.
- 17** Interview with Dr. Blanche Touhill, Chancellor Emeritus University of Missouri – St. Louis by Karen Black on January 29, 2020.
- 18** Interview with Henry S. Webber, Executive Vice Chancellor of Washington University and Cortex Chair by Karen Black on February 6, 2020.
- 19** Cortex Board ratified LLC as Acquisition Entity at Bd. Meeting on September 3, 2003.

- 20** Interview with Donn Rubin, BioSTL and BioGenerator by Karen Black on January 29, 2020 and Cortex Fact Sheet dated 2006 provided to Karen Black by Dennis Lower as an email attachment on 5/1/2020 that lists the key private contributors to Cortex as:
- Danforth Foundation
 - James S. McDonnell Foundation
 - John S. McDonnell
 - Monsanto Fund
 - Bunge North America
 - Energizer, Inc.
 - Enterprise Rent-A-Car
 - Commerce Bancshares, Inc.
 - William T. Kemper Foundation
 - Edward Jones
- 21** Email from Ken Olliff answering questions posed by Karen Black received on June 2, 2020.
- 22** Interview with Henry S. Webber, Executive Vice Chancellor of Washington University and Cortex Chair by Karen Black on February 6, 2020; PowerPoint by Henry S. Webber presented on April 10, 2017 titled “Anchor Institutions and Urban Development”.
- 23** Interview with John Dubinsky, former Cortex Chairman and founder by Karen Black on January 27, 2020
- 24** Cortex Board Minutes dated September 3, 2003.
- 25** Interview with Mary Campbell, associate vice chancellor for real estate at Washington University and formerly of Bank of America by Karen Black on February 5, 2020.
- 26** Interview with John Dubinsky, former Cortex Chairman and founder by Karen Black on January 27, 2020.
- 27** Tax credits are Missouri’s primary economic development tool as the fiscally conservative state is constrained by the Hancock amendment from raising taxes and spending The Hancock Amendment to the Missouri constitution was passed in 1980 and requires the state to refund money to taxpayers when revenues exceed a percentage based upon the personal income of Missourians.
- 28** Supplemental Memorandum to the Missouri Development Finance Board by Cortex dated Sept 2003.
- 29** Interview with John McDonnell, Philanthropist and former Chairman of McDonnell Douglas, by Karen Black on March 4, 2020.
- 30** The City approved the plan in 2006 and designated the Cortex 353 Corporation as the development of the Cortex 353 Redevelopment Area pursuant to a development agreement dated April 4, 2006 between Cortex and the city in accordance with Ordinance No. 66985 making Cortex West Redevelopment Corporation responsible for redevelopment, replanning, rehabilitation, and/or reconstruction of the Cortex West Redevelopment Area.
- 31** The state of Missouri eliminated eminent domain powers for 353 redevelopment areas designated after December 31, 2006. Mo. Rev. Stat. § 353.130
- 32** Interview with Dennis Lower by Karen Black on January 9, 2020.
- 33** Interview with Otis Williams, executive director of the St. Louis Development Corporation, by Karen Black on January 24, 2020.
- 34** Cortex negotiated a 15-year lease with the company before conveying the development rights to Clayco, which served as both the general contractor and developer of the project. The 175,000-square-foot project was completed in 2008 and soon after sold to Equity Capital Management for \$44 million.

- 35** Interview with former St. Louis Mayor Francis Slay by Karen Black on January 23, 2020. In 2012, DuPont bought out Bunge, and absorbed it into their Health and Nutrition division. Dupont Acquires Full Ownership of Solae, PR Newswire (May 1, 2012) In 2012. <https://www.prnewswire.com/news-releases/dupont-acquires-full-ownership-of-solae-149643445.html>
- 36** Bruce Katz and Julie Wagner, The Rise of Innovation Districts: A New Geography of Innovation in America, Metropolitan Policy Program at Brookings (May 2014) https://e24215cec6c97b637db6-9c0895f07c3474f6636f95b6bf3db172.ssl.cf1.rackcdn.com/content/metro-innovation-districts/~/_media/programs/metro/images/innovation/innovationdistricts1.pdf
- 37** Ross DeVol, Joe Lee, and Minoli Ratnatunga, Concept to Commercialization: The Best Universities for Technology Transfer (April 2017). <https://milkeninstitute.org/sites/default/files/reports-pdf/Concept2Commercialization-MR19-WEB.pdf>
- 38** Interview with Dennis Lower by Karen Black on January 9, 2020.
- 39** Interview with Mike Bozovich, Cortex’s Director of Finance by Karen Black on February 5, 2020.
- 40** Interview with Mary Campbell, associate vice chancellor for real estate at Washington University and formerly of Bank of America by Karen Black on February 5, 2020.
- 41** Interview with Dan Cramer, President and COO Wexford Technology, by Karen Black on February 14, 2020.
- 42** CIC Global Impact Report 2019 shorturl.at/iwzK1
- 43** Under the Real Property Tax Increment Allocation Redevelopment Act, Sections 99,800 to 99,865 of the Revised Statutes of Missouri, as amended (the “TIF Act”). The TIF district established in 2013 is essentially coterminous with the Chapter 353 Redevelopment Area established in 2006.
- 44** Interview with Otis Williams, executive director of the St. Louis Development Corporation, by Karen Black on January 24, 2020.
- 45** Interview with Dennis Lower by Karen Black on January 9, 2020.
- 46** Interview with Dr. Adolphus M. Pruitt, President of St. Louis NAACP by Karen Black on February 5, 2020.
- 47** The Series 2014 Bond Issue included \$4,350,000 at 3.75% interest due in 2031 and \$9,265,000 at 4.75% interest due in 2036. Tax Increment Financing Revenue Bonds (St. Louis Innovation District Project) Series 2014 issue Official Statement.
- 48** The bonds were issued by the Industrial Development Authority of the City of St. Louis. Tax Increment Financing Revenue Bonds (St. Louis Innovation District Project) Series 2014 issue Official Statement.
- 49** Tax Increment Financing Revenue Bonds (St. Louis Innovation District Project) Series 2014 issue Official Statement.
- 50** Innovation by Design: The Regional Impact of the Cortex Community, prepared by TEconomy Partners LLC (May 2019) https://www.researchgate.net/publication/339687933_INNOVATION_BY_DESIGNThe_Regional_Impact_of_the_Cortex_Innovation_Community
- 51** Interview with Mike Sullivan, Cortex COO and General Counsel, by Karen Black on April 16, 2020.
- 52** Interview with Donn Rubin, BioSTL and BioGenerator by Karen Black on January 29, 2020.
- 53** Interview with Dr. Adolphus M. Pruitt, President of St. Louis NAACP by Karen Black on February 5, 2020.
- 54** A Report on the Lack of Diversity in the St. Louis Region’s Biosciences Efforts, St. Louis Branch NAACP – Labor & Industry Committee (January 23, 2008).

- 55** Interview with Hank Webber, Executive Vice Chancellor of Washington University and Cortex Chair by Karen Black on February 6, 2020.
- 56** Interview with Áine O'Connor, Cortex Special Initiatives Lead, by Karen Black on February 7, 2020.
- 57** Cortex Innovation Community Impact Report: 2002-2018 Executive Summary.
- 58** Interview with Dr. Adolphus M. Pruitt, President of St. Louis NAACP by Karen Black on February 5, 2020.
- 59** Data provided by LaunchCode to Washington University shared with Drexel University by Jodie Lloyd in May 2020.
- 60** Tax Increment Financing Revenue Bonds (St. Louis Innovation District Project) Series 2014 issue Official Statement.
- 61** Interestingly, TEconomy is a consultancy that grew out of the Battelle Technology Partnership that initially identified life sciences as a critical industry cluster to leverage back in 2004. Innovation by Design: The Regional Impact of the Cortex Community, prepared by TEconomy Partners LLC (May 2019) https://www.researchgate.net/publication/339687933_INNOVATION_BY_DESIGNThe_Regional_Impact_of_the_Cortex_Innovation_Community
- 62** Quarterly internal Cortex census completed by Dennis Lower in February 2020 for the March Cortex Board meeting
- 63** Innovation by Design: The Regional Impact of the Cortex Community, prepared by TEconomy Partners LLC (May 2019) https://www.researchgate.net/publication/339687933_INNOVATION_BY_DESIGNThe_Regional_Impact_of_the_Cortex_Innovation_Community
- 64** Innovation by Design: The Regional Impact of the Cortex Community, prepared by TEconomy Partners LLC (May 2019) https://www.researchgate.net/publication/339687933_INNOVATION_BY_DESIGNThe_Regional_Impact_of_the_Cortex_Innovation_Community
- 65** U.S. Department of Commerce's Economic Development Administration (EDA).
- 66** The sale occurred after the seven-year forgiveness period for the NMTC loan was complete.
- 67** Interview with Mary Campbell, associate vice chancellor for real estate at Washington University and formerly of Bank of America by Karen Black on February 5, 2020.
- 68** Seven-year NMTC Analysis of 4260 Forest Park, LLC USBCDC Project #24367 (June 24, 2016).
- 69** New Markets Tax Credit funding pursuant to Section 45D of the Internal Revenue Code of 1986.
- 70** The Dupont building and BJC@The Commons building were built without any participation by Washington University.
- 71** New Markets Tax Credits Beneficiary Annual Community Benefits Report 2018.
- 72** New Markets Tax Credits Beneficiary Annual Community Benefits Report 2018.
- 73** Lisa Brown, TechShop opening in St. Louis a 'playground' for inventors, entrepreneurs, St. Louis Post-Dispatch (August 19, 2016) https://www.stltoday.com/business/local/techshop-opening-in-st-louis-a-playground-for-inventors-entrepreneurs/article_52cfc0e9-aa2f-5272-9769-537da404a914.html; Lisa Brown, TechShop shuts down, closes St. Louis studio, St. Louis Post-Dispatch (November 15, 2017) https://www.stltoday.com/business/local/techshop-shuts-down-closes-st-louis-studio/article_ofbc7d27-b968-5abd-914e-c9be4601bc64.html Interview with Mary Campbell, associate vice chancellor for real estate at Washington University and formerly of Bank of America by Karen Black on February 5, 2020.

APPENDIX B: TIMELINE

1998

Center for Emerging Technologies (CET), sponsored by the University of Missouri-St. Louis, is launched as the first State of Missouri Innovation Center within area that would become Cortex. It offered wet lab incubator space and support services to startup life sciences companies.

2000

Battelle Technology Partnership study provided a roadmap for leveraging regional assets and developing tools necessary to formally establish a regional technology hub that would focus on life sciences.



2002

Danforth raises money \$3.5 million from corporations for initial Cortex operating costs including legal fees.

2002

Danforth recruits seasoned corporate volunteer leaders including John Dubinsky to Chair Cortex and to lead land acquisition and facility development.

2002

Four of the five founders: Washington University, BJC HealthCare (BJC), University of Missouri-St. Louis (UMSL), and St. Louis University (SLU) contribute a total of \$29 million for land acquisition and to serve as collateral for loans.

2003

Cortex land acquisition efforts begin. BioGenerator nonprofit accelerator started by Coalition for Plant and Life Sciences.

2005

State of Missouri awards \$12 million in 50% tax credits, sufficient to raise \$24 million of donations.

2008

St. Louis NAACP report highlights lack of diversity in St. Louis region's biosciences efforts. Second building constructed within Cortex for soybean research company Solae, a joint venture of DuPont & Bunge. Cortex continues to acquire land.

2010

Cortex board hires Dennis Lower as first President & CEO to direct Cortex.

2005

Cortex develops first building—Cortex 1 at a cost of \$36 million. Minority business participation at 15.5% and women at 6.5% for Cortex 1.

2006

Cortex granted control of redevelopment area under Chapter 353 of the Missouri Statute designating Cortex as the Master Developer granting powers that include eminent domain and tax abatement, among others.

2001

Coalition for Plant and Life Sciences, now known as BioSTL, formed to facilitate development of the bioscience entrepreneurial ecosystem, facilitate transfer of technologies with commercial potential, develop VC funds, and ensure physical facilities are in place for young and mature firms.



2001

Cortex founders Washington University, BJC HealthCare (BJC), University of Missouri-St. Louis (UMSL), St. Louis University (SLU), and the Missouri Botanical Garden pass hat for \$170,000 to test potential of a life sciences research park.

2002

Cortex founded as Center for Research, Technology and Entrepreneurial Exchange (Cortex), a 501(c)3 non-profit.



2002

Leaders travel to Boston and are inspired by MIT's investment of \$600 million in Kendall Square neighborhood and its 9% return on investment.



2014

St. Louis Tax Increment Financing Commission approves \$167.7 million of TIF funding for Cortex. Cortex issues first bond with TIF as collateral. The Commons is built as critical open gathering and function space for the district. Boeing Ventures moves to @4240 Building.



2011

Cortex recruits Wexford Science & Technology and Cambridge Innovation Center (CIC) as district development partners. Coalition for Plant and Life Sciences is incorporated as BioSTL and BioGenerator incorporates and merges with BioSTL.

2012

New mixed-use master plan for Cortex completed. Name changed to Cortex Innovation Community.

2015

IKEA opens an \$80 million facility using \$32 million in TIF proceeds. State SuperTIF provides up to \$17 million of state sales tax commitment for additional district infrastructure and buildings. Square moves to @4240 Building

APPENDIX B: TIMELINE

2016

Cambridge Innovation Center opens in Building 4220. Cortex developed and owned 4260 Forest Park Avenue building completed.

2017

Second TIF bond issue

2020

Dennis Lower retired. Cortex hires Sam Fiorello as its second President and CEO. COVID-19 dramatically reduces district business operations, as many companies go virtual.

2020

Aloft Hotel opens in June 2020. Washington University School of Medicine announces and begins construction of a new 11-story, 609,000 square foot, \$616 million neuroscience research building in the Cortex district.

2018

Metrolink station opens as region's first new station in over a decade, together with an adjacent Great River Greenways pedestrian and bike trail.

2018

4220 Duncan Avenue building completed. Microsoft opens first Midwest HQ in 4220 Duncan Avenue building.

2019

4340 Duncan Avenue historic rehab opens as new home of the BioGenerator Accelerator Labs, BioSTL, and other graduating bioscience startups. Construction commences on 4210 Duncan Avenue, a 325,000 square foot technology building.

2018

Cortex builds, owns and operates first structured parking garage in Cortex. Venture Café operated Innovation Hall opens. Cortex board composition changed to accelerator diversity.