Innovation-Based Economic Development in **Tulsa, Oklahoma**

DAVID ZIPPER + ROBERT BOLE | JULY 2018

What's Inside

About This Case Study

T his case study provides an assessment of Tulsa's environment for fostering innovation-based economic development, along with a set of programmatic recommendations for city stakeholders. It focuses on the foundational building blocks that can help the city leverage its strengths and local assets to grow innovative businesses from within, rather than relying on corporate attraction, an often expensive and risky proposition.

The case study is intended to inform Tulsans about ways in which their city shows signs of being relatively more or less sophisticated than peers in the elements that contribute to growing innovative companies. Drawn from these observations, the case study concludes with a set of suggestions to catalyze local innovation-based growth.

It should be stressed that even an optimized economic development strategy represents only one facet of an overall approach to improve quality of life for residents. For example, education, public safety, and municipal finance are all essential—but are outside the scope of this analysis. Information in this study is drawn from research as well as interviews conducted in Tulsa by David Zipper and Robert Bole in May of 2018 at the invitation of Mayor G.T. Bynum.

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Executive Summary

T ulsa's leaders have devoted considerable attention and resources toward advancing innovation-based economic development in recent years, launching numerous incubators, hosting startup-oriented events, creating new neighborhood amenities, and collecting regular surveys about the health and needs of the city's entrepreneurial community. As a result there is more local enthusiasm for entrepreneurship across the corporate, philanthropic, and educational sectors than at any time in recent memory. The challenge now is to channel the energy so that more startups launch, that they have a greater likelihood of scaling, and that established corporations uncover new paths for continued growth. This next stage of Tulsa's economic development will require bringing structure to its many innovation assets, some of which are very new.

As a case in point, 36°N has quickly become a focal point for entrepreneurship, opening its doors only two years ago, and already reaches 6,000 people weekly through its newsletter while hosting hundreds of events per year. Many Tulsans see 36°N and their staff as connectors, linking entrepreneurs with resources across the city. Our conversations with 36°N staff and its supporters led us to see the organization at an inflection point reflecting Tulsa's entrepreneurial evolution: if it so chooses, the organization could shift from being a vibrant co-working space to a full-fledged incubator with programming designed to grow sophisticated, creative companies.

Tulsans take understandable pride in their eagerness to help one another and in the deep informal networks that connect the city's residents and businesses. While Tulsa's strong community ties are an obvious strength, their informality may make it harder for newcomers or residents from disadvantaged communities to access available resources. Formal connections between Tulsa's institutions—for example, regular "reverse pitch events" during which Tulsa's corporate leaders suggest problems that early-stage entrepreneurs could help them solve—could unlock new opportunities for corporate growth.

Tulsa's established corporations have historically viewed entrepreneurship as something to be applauded, but few have staked public positions or launched programs linking it with their own survival and growth. Similarly, ties between Tulsa's universities and both startup incubators and corporate research facilities have seldom grown deep. With the growing momentum and capacity of its local entrepreneurial community, it may be time to strengthen these ties.

While there are over 100 startups in Tulsa, very few have raised over $10 million in funding, gone public, or been acquired for significant sums of capital. That suggests that Tulsa's entrepreneurial community—though energetic—is not yet generating the kinds of companies that can sustain long-term economic growth.

Background

A small village along the Arkansas River in the 19th century, Tulsa grew rapidly after the city's first oil well was dug in 1901. Known in subsequent decades as the "Oil Capital of the World," the energy sector remains central to Tulsa's business community, with employers like Williams Companies, ONEOK, and Laredo Petroleum among Tulsa's largest. Aerospace, health care, and manufacturing are also critical components of the local economy, but all five of the Fortune 1000 companies headquartered in Tulsa are in the energy sector.[1]

A number of Tulsa's foundations have invested in local economic development efforts, including GKFF and Lobek Taylor's investment in 36°N and Lobeck Taylor's annual Tulsa State of Entrepreneurship report. The Tulsa Community Foundation had over $4 billion in assets in 2015 and was the second-largest community foundation in the United States after Silicon Valley. A number of Tulsa's foundations have invested in local economic development efforts, including GKFF's investment in 36°N and Lobeck Taylor's annual Tulsa State of Entrepreneurship report.

As one of the two major urban areas in Oklahoma, Tulsa has become embroiled in statewide funding battles over core services like education. A statewide teacher strike in April 2018 attracted national attention, much of it negative, and sparked concern about the loss of talent to neighboring states. Oklahoma currently spends less per pupil on education than every state other than Mississippi.[2] Current Mayor G.T. Bynum, a Republican, has advocated allowing the city to raise revenues itself without sacrificing an equal amount of state funding, as current law dictates.

The population of Tulsa, around 400,000 in a region just under a million, is relatively stable, though civic boosters worry about the skills of the local workforce. Only 34.8% of Tulsans had an associate's degree or bachelor's degree in 2016.[3]

There are visible signs of progress in Tulsa today, as a growing number of apartment buildings, restaurants and bars have brought activity to midtown areas that had historically grown quiet after dark. And many civic boosters are eagerly awaiting the grand opening later this year of A Gathering Place, a public park of nearly 100 acres that is a project of the George Kaiser Family Foundation (whose gift is the largest ever received by an American public park from a private funder).[4]

[1]http://fortune.com/fortune500/list/filtered?hqcity=Tulsa
[2]https://www.washingtonpost.com/news/local/wp/2015/06/02/the-states-that-spend-the-most-and-the-least-on-education-in-one-map/?utm_term=.98b1c14a945e
[3]http://www.growmetrotulsa.com/sites/default/files/TF%20Annual%20Report%202017_Web-BC-EDIT.pdf
[4]http://agatheringplacefortulsa.com/get-the-facts/

The Building Blocks of Innovation–Based Economic Development

I nnovation-based economic development refers to strategies that prepare communities to thrive in an economy where knowledge, technology, entrepreneurship, and innovation are positioned as driving forces of employer growth and job creation. At its core is a defined set of policies and programs at the local level that lead to the launch of more startups, a higher proportion of them scaling, and a faster rate of growth for larger employers.

Innovation-based strategies for growing a local economy contrast with those based on recruiting employers from elsewhere through marketing pitches, tax incentives, and site selection. Economic research has shown that recruitment-based economic development is of questionable value to cities due to the cost of incentives and potential for the relocating company to move again to another jurisdiction.[5]

The ten building blocks below represent foundational elements for innovation-based economic development. Together, they describe how the urban environment will be more or less conducive to fostering the growth of startups and larger businesses. While there may be disagreement about whether a city should, for example, focus on growing health care or manufacturing, the building blocks offer a basis for catalyzing internal business development in virtually any sector. Indeed, strong building blocks can act as enablers of a successful sector strategy.

Drawing from interviews, research, and experiences in other cities, Tulsa's relative sophistication in each metric (beginning, intermediate, or advanced) is specified below, along with a view toward the future. The determinants of sophistication are a mix of qualitative and quantitative factors that are summarized in the Appendix.
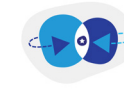
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[5]http://www.goodjobsfirst.org/sites/default/files/docs/pdf/smartskillsversusmindlessmegadeals.pdf

Corporate engagement around innovation

WHAT IT IS

A new product, an acquisition, or an improved operating process can strengthen a corporate bottom line—and lead to new hiring. Such innovations may come from internal R&D, from networking among corporate executives, or from a partnership with a university—to give just a few examples. Many companies see startups as a source of information about how industries are changing and how corporate strategy should change as a result. Startups themselves benefit from these interactions with corporations, gaining feedback and perhaps chances to pilot their products.

TULSA'S POSITION: INTERMEDIATE

Tulsa's corporate community has identified entrepreneurship as a priority for the future. Led by the Tulsa Regional Chamber, the Tulsa's Future strategic plan strives for an "innovative future" for the city's economy, with annual benchmarks including the number of startups and the number of new commercialization opportunities that the corporate community supports. The Chamber itself manages a local incubator, The Forge, and is an official partner of 36°N.

Tulsa's largest employers support these efforts through their Chamber involvement, but they themselves only occasionally engage directly with incubators or individual startups. Workshops or mentorship events connecting entrepreneurs and corporate executives are rare. When asked if their external engagement around innovation is driven by strategic self-interest
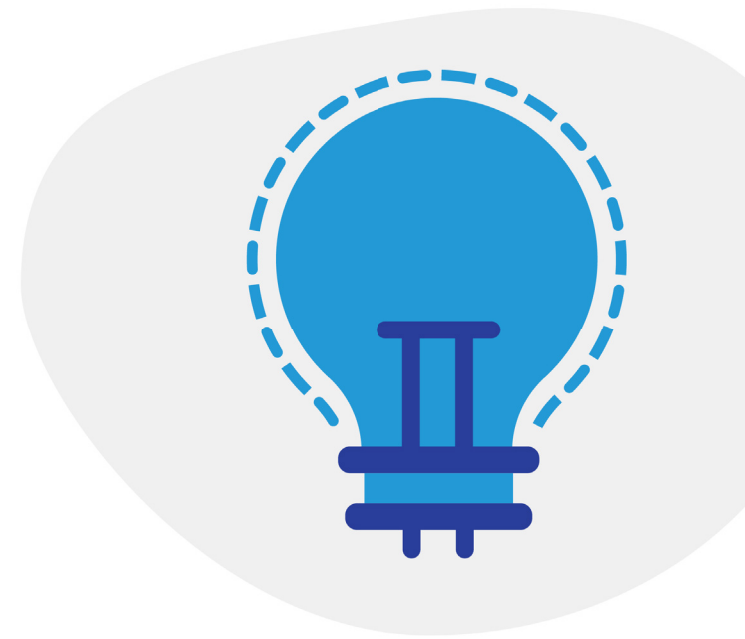
(i.e., to learn or develop new products) or by a desire to support the local community, almost everyone we met cited the latter. An exception is QuikTrip's partnership with Fab Lab Tulsa, which allows the company to save money and time by prototyping new products locally instead of in New York City.

Several years ago the Lobeck Taylor Foundation organized a "reverse pitch" event, in which a handful of Tulsa's energy companies presented problems to assembled entrepreneurs and students who might develop creative solutions. The event was seen as less than successful due to tepid corporate support. Planned follow-up events focused on other sectors like aerospace did not take place.

LOOKING AHEAD

Although Tulsa's corporate community is vocal about supporting entrepreneurship, engagement with actual entrepreneurs seems to remain at arm's length. As one corporate leader said during an interview, "We assume the Chamber is taking care of that for us." But having an organization serve as a go-between linking entrepreneurs and corporations can create unnecessary friction—and may prevent Tulsa's corporations for learning themselves about new ideas being developed in their own backyard.

Although numerous universities are partners of 36°N, it is striking that no corporations are. In a meeting with around a dozen corporate leaders, none had been asked to be a mentor to startups—though each person said they would gladly say yes if invited (among Tulsa's incubators only The Forge seems to have an official mentor program). The Chamber could encourage its corporate members to volunteer their expertise.

They could also launch other formal projects to support the local startup community. For example, Tulsa's corporations could see engagement with incubators as a talent recruitment tool, creating opportunities for young professionals to work with entrepreneurs and hone their public speaking skills. And they could potentially augment their R&D operations by revisiting the reverse pitch concept that was attempted several years ago (before 36°N existed, it should be noted). Many cities have hosted such events around the country, including Lincoln, Neb. and Milwaukee.[6]

[7] https://news.unl.edu/newsrooms/today/article/registration-open-for-reverse-pitch-event/8

Startups

WHAT IS IT

All net new American jobs in recent years have come from startups, rather than Fortune 500 companies.[7] Often developing software or hardware products, such startups are founded by a small team of people with a vision of scaling their products to build a thriving and expanding business. There is a strong case that restoring the economic dynamism of the United States and generating new good jobs rests on encouraging startups and building stronger startup hubs across the nation. A study by the Progressive Policy Institute points to the importance of entrepreneurship in lifting regional economies.[8]

TULSA'S POSITION: INTERMEDIATE

Tulsa's startup ecosystem has grown substantially in recent years, with a number of centers of gravity emerging. The Forge and 36°N alone assisted over 100 startups between 2016 and 2018, with other spaces like Fab Lab Tulsa, Kitchen 66, and Hemphill Create providing services as well 36°N's newsletter functions as an informal guidebook to innovation-supporting activities in the city, including numerous meetups and pitch events. Many entrepreneurs see Zac Carman, CEO of Consumer Affairs, as the most visible and credible spokesperson for their interests to city leaders in government and industry. He is joined by a small cadre of Tulsa-based CEOs who have received little (if any) external funding as they have grown their companies to dozens of employees and millions of dollars of revenue. These CEO's keep a relatively low local profile, even if they are capturing attention from outside investors.

However, there are relatively few local startups like Saltus that have raised over $500,000 in funding. The informal networks of startup events seem to primarily attract early-stage ventures, rather than more advanced startups that have begun to scale—and are more likely to be managed by mid-career professionals with family commitments that limit participation in evening activities. But these later-stage entrepreneurs can also benefit from connecting with one another to address common concerns like hiring and skills training and explore potential business partnerships. We we struck during one roundtable with several Tulsa-based entrepreneurs (who had collectively hired hundreds of workers) that none of them had met each other previously.

[8] http://www.routefifty.com/finance/2018/02/seeking-startups-heartland/145974/
[9] https://www.citylab.com/life/2017/04/can-startups-save-struggling-metros/521703/

LOOKING AHEAD

Tulsa's growing startup community seems more energetic than it is organized. In particular, there is a risk of uncoordinated or duplicative services offered by Tulsa's many co-working spaces and incubators. An apparent consensus among local startups claims that the entrepreneurial community needs more mentorship opportunities, but who will extend invitations to the limited pool of local experts? Mixed or redundant messaging can turn off potential startup supporters.

Tapping local mentors is an obvious opportunity, but there are only so many people—and so many skills—that can be tapped in a metro area of a million people. If local startups want to look beyond the region for assistance, they have relatively few channels to do so. As Tulsa's entrepreneurial community matures, it may make sense to engage with a company like TechStars or Union that provides connections to incubators and mentors nationally and even worldwide.

36°N does an excellent job publicizing the rich array of activities and programs open to Tulsa's startups. There are numerous events like Startup Series that bring together large numbers of entrepreneurs, but there is no single, high-profile event that draws people from across the state and beyond to learn about Tulsa's startups and engage with them. Such an activity could raise Tulsa's visibility s and potentially create business development and investor opportunities.

While established entrepreneurs are focused on the growth of their company, they posssess hard-won knowledge and experience. Companies like ConsumerAffairs, Medefy, Infinite Composites, TenStreet, iRecommend, and ZeroCard have leadership and staff that could provide valuable insights and mentors for entrepreneurs if tapped in a way that does not overburden their focus on their own bottomline.

Incubators and Maker Spaces

WHAT IT IS

Launching a startup is hard—doing it in isolation is harder still. Good incubators make the entrepreneurial process a little easier by providing mentors, classes, and shared resources that an entrepreneur would not otherwise be able to access. They also function as critical entry points for people who are thinking about taking the plunge into entrepreneurship, as well as those who want to support them.

TULSA'S POSITION: INTERMEDIATE

A remarkable number of incubators and maker spaces have opened in Tulsa over the last decade. 36°N is widely seen as the primary point of entry for aspiring or early-stage entrepreneurs, though there seems to be uncertainty whether it should be considered an incubator—providing value-add services to entrepreneurs—or coworking space open to anyone who can pay its fees. Roughly half of 36°N's members are currently startups. Universities including Oklahoma State University and the University of Oklahoma are partners, as is the Tulsa Regional Chamber.

There are a bevy of other incubators in Tulsa as well, including those focused on food (Kitchen 66), health innovation (OSU Center for Health Systems Innovation) and manufacturing (Hemphill Create), as well as FabLab Tulsa for makers. With support from the Chamber, The Forge provides mentors for the six startups based there at a time, while 36°N's Camp II and Mother Road Market offer physical space for startups that have outgrown an initial incubator.

The vibrancy of Tulsa's incubators is impressive for a city of its size, and the majority of them (The Forge, 36°N, Mother Road Market, Camp II) are at or near capacity. They are in the process of sorting out their respective roles, which can at times seem non-intuitive (i.e., it is hard to imagine entrepreneurs starting at 36°N, then progressing to The Forge for value-add services before returning to 36°N's Camp II when they need more space). Such growing pains are understandable given the relative newness of many of the incubators.

Despite all the activity within Tulsa's incubators, it is hard to tell how much they are helping member startups to scale. Many entrepreneurs we met cited the cheap cost of space and the "energy" of the incubators as reasons to be members, rather than the promise of mentors or business opportunities. Programming could be enhanced by tapping the considerable corporate expertise in Tulsa to offer office hours and member workshops. Active engagement of corporations in the incubators themselves—such as QuickTrip doing its prototyping at FabLab Tulsa—could simultaneously strengthen the incubators (by providing new revenue sources) while also enhancing the competitiveness of Tulsa's business community.

Almost every incubator leader we met expressed a desire to better coordinate services with their peers. As Dustin Curzon of 36°N said, "our relationships are positive, but not always effective." Reciprocity of membership—i.e., allowing a member of Hemphill Create to meet mentors at 36°N—could help (i.e., FabLab Tulsa could provide prototyping space for startups at other incubators that need it).

There are good informal relations among Tulsa's incubator managers, as there often are throughout the local community. As a theme through this case study, those informal relationships are at point where they need to be formalized. The Oklahoma Business Incubator Association is a good foundation, though their activities are largely focused at the state-level. Our recommendation is to structure formal, programmatic connections to draw incubators into a dedicated, inter-operable network.

A starting point for Tulsa could be to look at Northeast Ohio, where members of incubators in Akron, Youngstown, and Cleveland enjoy such reciprocal access to other facilities and programs. More formal partnerships across incubators could also reinforce the unique facilities that each one has or is developing (i.e. Kitchen 66's kitchen space or Hemphill's heavy manufacturing capacity), as well as their unique programming and mentors. Without coordination (or mergers, which several facility managers suggested) there is a risk that the relatively small community of local mentors and sponsors could receive duplicative requests for support. As neutral and supportive parties, Tulsa's foundations and the city's economic development office are well positioned to help align the various programs.
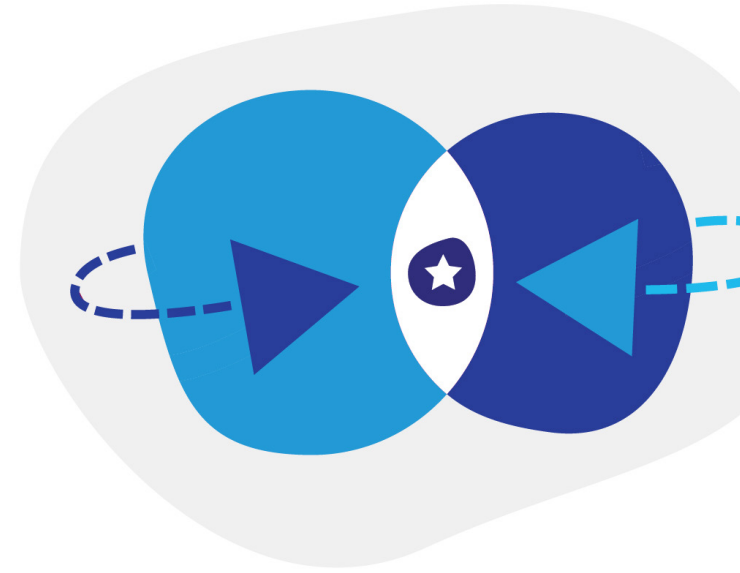
Creative Collisions

WHAT IT IS

Happenstance interactions can be a lifeblood for innovation. A chance conversation between a PhD student and a corporate researcher might nudge the company's R&D in a new direction; two strangers who meet at a health tech event might decide to launch a new business together. These kinds of unexpected collisions can take place at industry or entrepreneurial events, through community networks, and at convening places like bars and coffee shops. The more people are interacting with each other, the higher the likelihood of creative collisions — especially if activities are curated to introduce people with complementary interests.

TULSA'S POSITION: INTERMEDIATE

Hosting 350 events annually, 36°N is seen by many Tulsans as the place creative people are most likely to interact with others they could not otherwise have met. Some of its events are general, some focus on a demographic (i.e., women or young professionals), while others are oriented toward a particular sector or coding language, often with support from Techlohoma. When asked why they go to 36°N, the most frequent response we received was "to be around the buzz." Another major force for connecting people is Tulsa's Young Professionals or TYPros, which boasts a long history of engagement with a mix of corporate professionals and entrepreneurs. There is clearly a desire among Tulsans to be among creative minds and learn about innovations being developed around them. While meetups take place in many other locations as well, 36°N has a unique reach with its weekly newsletter sent to over 6,000 people.

Informal gatherings in Tulsa can take place in the growing clusters of bars, restaurants, and coffee shops in neighborhoods like the Arts District, Kendall Whittier, and the East Village, among others. Many longtime Tulsans commented that they were much more likely to go downtown for events or a meal than they would have in earlier decades, with much credit directed toward catalytic real estate developments by the George Kaiser Family Foundation. However, downtown Tulsa itself remains generally quiet after dark except for First Fridays that draw crowds of thousands.

[11]https://www.citylab.com/design/2015/12/the-historic-link-between-cities-and-innovation/422226/
[12]https://www.visitstockton.org/events/annual-events/

As much innovation-related activity as there is in Tulsa, there are relatively few prominent events that attract people who don't normally engage with entrepreneurs. Tulsa's Startup Weekend is a focal point for startups, but corporate and university leaders had limited awareness of it. Prominent tech gatherings can have a galvanizing effect on nascent innovation ecosystems. For instance, the Hackfort tech gathering in Boise piggybacks off of the city's longstanding cultural Treefort festival—and has become its own annual tradition.[9]

The line between music and art events and innovation-based ones is often blurry, and productive collisions can happen on either side of it. With a new Executive Director in place, the Downtown Coordinating Council could play a catalytic role attracting new activities to the city's downtown core, which in many cities becomes a focal point for creative activities and events (though not in Tulsa, at least not yet). Public officials and civic supporters should not overlook the power of creative events, artistic enclaves, and community engagement as enablers of entrepreneurial collisions. An example is Stock Market, a small arts-based events company in Stockton, California that has served as a catalyst for drawing together local artists, entrepreneurs, and young people to take part in meetups, evening socials, and mini-festivals.

Finally, it is important to ensure that not only affluent people are productively "colliding" with one another—especially as The Gathering Place, adjacent to neighborhoods that are already well off, is poised to become a top-tier public space. In Philadelphia, the city has strived for a balanced place-based innovation strategy by building job programs in innovation centers that are specifically oriented toward those historically excluded from economic growth.[10]

[9] https://www.treefortmusicfest.com/forts/hackfort/
[10] https://www.citylab.com/equity/2017/06/does-innovation-equal-gentrification/529839/

Investment

WHAT IT IS

Without funding, many otherwise promising startups will wither on the vine. Angel and seed funding helps new businesses launch, while venture capital and conventional financing can support late-stage startups that have shown initial success. Local angel networks can be particularly helpful to early stage entrepreneurs that have not yet shown enough traction to attract external venture capital. The availability of local capital can also nudge prospective entrepreneurs to launch their startups, confident that they have a chance to gain investment.

STOCKTON'S POSITION: BEGINNING

In contrast to the tremendous assets of Tulsa's philanthropic establishments, there are relatively few formal funding vehicles for local startups. The state-supported i2e venture fund is well known, but its reach is limited. Of the 15 investments i2e made in 2015, only one was based in Tulsa: Docvia, which received $35,000.[11] According to the 2016 Tulsa's Future Annual Report, Tulsa's startups raised less than a tenth of the amount of VC dollars per capita that startups in Oklahoma City did, around 1/20th of those in Kansas City, and less than 1/30th of those in Dallas.[12] No one we met could offer a compelling explanation for why Tulsa attracted so few VC dollars compared to its peers.

While VC investments are scarce in Tulsa, there are a number of funds like Mimosa Tree Ventures as well as affluent families investing independently in local ventures, generally writing checks in the five-figures to the low six-figures. But numerous entrepreneurs we met claimed that "Tulsa wealth" is relatively old, going several generations back and accustomed to more predictable returns from energy investments, leading to a more conservative approach toward technology investing than in coastal cities. It is unclear whether local funds that cut checks are prepared to provide follow-on investment for a breakout startup that needs Series B funding or beyond (and no one could recall a local startup attracting such substantial funding from an external VC).

[11] https://i2e.org/publication/annual-report-fy2017/
[12] https://tulsachamber.com/clientuploads/Publications/TF%20Annual%20Report%202017_Web-BC-EDIT.pdf

LOOKING AHEAD

There is often a chicken-and-egg tension between local startups and investors, as each group thinks the other bears responsibility for holding back the growth of a local entrepreneurial ecosystem. Strikingly for a city with so many incubators and startups, no one we spoke with cited availability of capital as a primary constraint on Tulsa's innovation-based growth. This may be because the startup ecosystem is relatively new, and few startups have grown to the scale where institutional capital at the Series A or B level is a viable option, let alone a need.

As more startups grow, Tulsa may consider capitalizing on its deep experience showcasing the city to site selectors to create a similarly VIP experience for out-of-state venture capitalists. One could imagine an annual event in which investors are flown into the city for 48 hours to have curated meetings with top-tier startups and experience the city. The event's success could be judged by the number of venture capital deals that occur as a result of connections made, as well as the overall amount of venture capital dollars invested in Tulsa's startups. With its deep experience hosting out of town groups, the Tulsa Regional Chamber would seem an ideal organization to organize such an event. However, at the moment there is unclear whether there are enough high-potential, scaling startups in Tulsa to warrant it.

Amenities

WHAT IT IS

If growth revolves around innovation, a city will need places where people can innovate—even if they do not realize that is what they are doing. Bars, restaurants, cultural events, and coffee shops become places where connections are forged, ideas are exchanged, and new relationships are built. Ideally these places are packed closely together and reachable without driving by car. Places that offer density of people and activities are more likely to attract younger, well-educated people who could find employment most anywhere—and can serve as the lifeblood of innovative ventures.[13]

TULSA'S POSITION: INTERMEDIATE

Over the last decade a number of dense neighborhoods have developed within Tulsa catering to young professionals with bars, restaurants, coffee shops, and event spaces. Neighborhoods near downtown, Cherry Street, Brookside and the Pearl District have become millennial hotspots, credited for attracting young university graduates who may have otherwise left the city. With an identity closely connected to the arts, Tulsa hosts numerous concerts and community events like Mayfest, the Blue Dome Arts Festival, Tulsa Tough and Hop Jam. A low cost of living remains a competitive asset compared to peer cities, with the average home costing under $170,000 and average rent under $1,000.[14]

However, downtown remains strikingly quiet after dark (occasional concerts notwithstanding). A number of bars and restaurants have opened in the last decade, but the area lacks a supermarket and is pockmarked with surface parking lots that diminish walkability. The construction industry in Tulsa is more familiar with single-family homes than the mixed use buildings that cater to young professionals, especially those without children. The emergence of new residential options— not just entertainment or cultural facilities—has been a catalyst of downtown redevelopment in many mid-sized cities across the country.[15]

By all accounts Midtown Tulsa / Cherry Street is a far more dynamic and attractive place today than it has been in decades. But activity is concentrated in neighborhoods that are difficult to navigate without a car. Although the city is flat, there are few bike lanes, an only recently launched bike share system, and a state law requiring bicyclists to stay on one side of street lanes where they risk being clipped by a car. The city

[13] https://www.citylab.com/life/2014/02/what-cities-really-need-attract-entrepreneurs-according-entrepreneurs/8349/
[14] https://www.zillow.com/tulsa-ok/home-values/
[15] https://www.citylab.com/life/2017/07/jobs-in-smaller-cities-private-sector-growth/535329/

is using proceeds from Oklahoma's first transit tax to invest in a Bus Rapid Transit called the Aero along Peoria Avenue, but it will not have dedicated lanes.

LOOKING AHEAD

A number of new multi-family buildings in Midtown cater to younger professionals, but it is currently difficult to travel among them without a car. In 2016 the Tulsa Regional Chamber and the Downtown Coordinating Council paid for urbanist Jeff Speck to assess downtown's walkability. His suggestions included a downtown zoning overlay and conversion of streets to become bi-directional, but they have yet to be enacted. The hiring of the new Executive Director of the Downtown Coordination Council could be a catalytic moment for the area, as business improvement districts have organized cultural activities contributing to the emergence of neighborhoods such as Capitol Riverfront in Washington, DC, and DUMBO in Brooklyn, New York.

The cost of converting downtown buildings to condos and apartments has been a hurdle to building the dense residential environment that could induce retailers to locate there (and perhaps grow the number of people relying on forms of transportation other than single-occupancy vehicles). The low vacancy rate downtown should help make some of these proposed projects financially viable. The City has allocated over $10 million toward stimulating private investment in downtown housing, but more may be needed for sufficient density in downtown and near-downtown neighborhoods to attract new retail, restaurants, and amenities.

Beyond Midtown, a number of neighborhoods are becoming vibrant places catering to young professionals, artists and entrepreneurs. Among them is the Pearl District with its mix of breweries, and the forthcoming Mother Road Market in the adjoining Route 66 area. The growth of these informal places create new opportunities to welcome a wider range of Tulsa residents, including those communities that may be disinclined to visit Midtown.

Finally, A Gathering Place will soon be an amenity unlike any other in Tulsa—or any other city. With a budget over $400 million, it will be the largest privately-financed park in the United States. As monumental as the park will be, it remains to be seen how it will be used—and by whom. It could provide a valuable amenity for young professionals and a magnet for artistic activities.
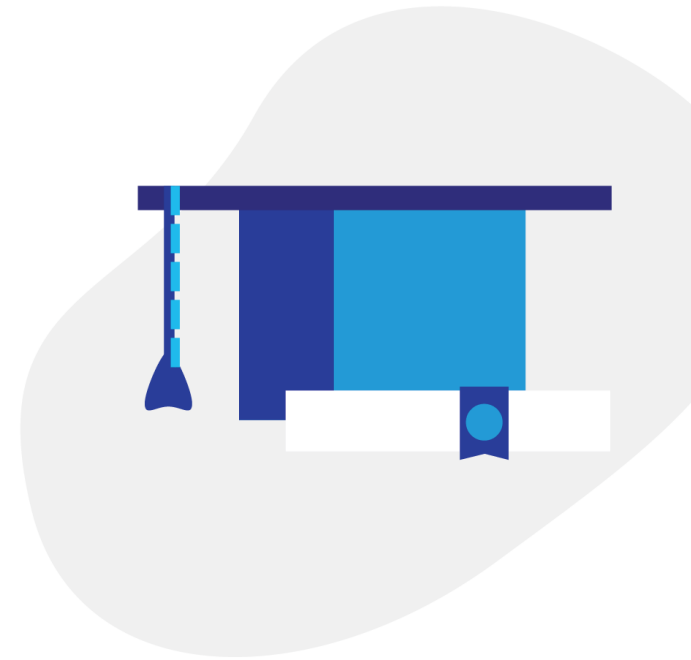
University Engagement

WHAT IT IS

While some universities operate in relative isolation of their surrounding communities, others act as connectors and catalysts for innovation, leveraging the expertise of their staff to solve civic problems and partner on corporate research projects. Graduates of higher education can provide critically needed talent for both new and established local employers, and faculty and students in universities are often central to local entrepreneurial communities. Universities with robust tech transfer programs can benefit financially from the ventures born from ideas shaped within their campuses.

TULSA'S POSITION: INTERMEDIATE

There are a significant number of colleges and universities in Tulsa, including University of Tulsa, University of Oklahoma Schusterman Center, University of Oklahoma-Tulsa, Langston, Oral Roberts, Tulsa Tech, and Tulsa Community College. Additionally, Rogers State University, Northeastern State University, and other smaller regional universities further add to the higher education landscape in the greater MSA. Currently, none of these institutions has an entrepreneurship center on campus that helps students and faculty convert ideas into a business, though Oklahoma State, the University of Oklahoma, and Tulsa Tech are official partners of 36°N and their students often participate in events. The partnerships consist of a small financial contribution to 36°N and an onsite office for school administrators to use.

Engagement between Tulsa's universities and corporations has been light, although a consortia of energy companies has conducted private research in partnership with the University of Tulsa. A number of cybersecurity companies like True Digital Security have spun out of the University of Tulsa's leading cyber program, but such entrepreneurial examples are scarce across other universities. Instead of catalyzing innovation, tech transfer at local universities is widely seen as slowing down the process of commercialization with administrative and legal bottlenecks.

LOOKING AHEAD

While Tulsa's universities do not house campus incubators in the way that Georgetown and Georgia Tech do, the enthusiasm that local university students have shown for 36°N indicates there clearly is a strong desire to engage with startups. While the light-touch affiliation with 36°N is helpful, universities could become deeper partners by sending faculty to serve as startup mentors in topics like finance and marketing or teach workshops. Universities and colleges could even act as early adopters for some of the ideas coming out of local incubators.

Investors, entrepreneurs, and faculty alike noted the relative dearth of startups and patents originating from Tulsa's universities and see the relative weakness of tech transfer programs as a problem. Some of the challenge may be at the state level, as Tulsa's Oklahoma State and the University of Oklahoma campuses operate within statewide systems. But many felt that the University of Tulsa is punching below its weight generating new business activity, especially given its nationally leading cybersecurity program. Notably, the University of Tulsa is not currently a partner of 36°N although a partnership is currently being finalized.

As a model, Tulsa can look to how the University of Minnesota has turned research into local business opportunities.[16] Its programs include pairing university researchers with local entrepreneurs and business leaders to develop ideas into commercially viable practices, allowing businesses to invest up-front into university-sponsored research, and tapping local business connections to help the university qualify for federal grants for commercialized research.

Philanthropies

WHAT IT IS

While an announced relocation of a corporation may yield immediate headlines (and a boost for political officials), innovation-based economic development will need time to yield benefits resulting from startups forming and growing or from larger companies becoming more competitive through R&D. The incentives of foundations with a local focus and a long-term horizon align well such an economic strategy. These foundations can play a unique role, identifying opportunities for grants or program-related investments that can benefit many innovation stakeholders who may not take action on their own.

TULSA'S POSITION: ADVANCED

The size of Tulsa's philanthropic resources is staggering for a city its size. The local community foundation manages over $4 billion in its endowment, more than any equivalent foundation in the country other than Silicon Valley.

A number of Tulsa's philanthropies have identified local innovation as a strategic priority. The Lobeck Taylor Family Foundation has a stated goal of catalyzing local entrepreneurship, and its strategic grants have included launching Kitchen 66, a food-focused incubator, and commissioning the annual

Tulsa State of Entrepreneurship report. Both Lobeck Taylor and the George Kaiser Family Foundation are official partners of 36°N, with the latter backing the mixed use development that houses it. Meanwhile, the Schusterman Foundation has supported numerous local STEM programs that improve the skills of the future workforce.

It is hard to to imagine how Tulsa's entrepreneurial ecosystem could have developed as rapidly without such strong backing from local philanthropies. Remarkably, the various foundations supporting innovation seem to partner well with one another; no one we met identified philanthropic overlap or competition as a critical concern.

LOOKING AHEAD

Given their largesse and active involvement in local economic development, Tulsa's philanthropies have a unique chance to bring structure and cohesion to the various incubators and coworking spaces that have quickly emerged in the city. They could also use their close ties to Tulsa's largest corporations to forge more strategic relationships between Tulsa's entrepreneurial and corporate communities, which to date have been relatively isolated. Indeed, the best way for Tulsa's foundations to fulfill their mission of supporting local entrepreneurship may be to empower the many groups that they work with—or fund—to become stronger allies. As a specific example, the Lobeck Taylor Foundation support for the a reverse pitch event focusing on the energy sector may be an idea worth revisiting now that 36°N could serve as a convening partner.

Beyond smart tactics, the financial assets of local philanthropies could themselves spark innovation-based growth. For comparison, the Greater Washington Community Foundation recently announced a Catalyst Fund, a grant program to support micro-enterprise development.[17] The Oregon Community Foundation has made a mix of grants and investments in entrepreneurship, including seed funding in the Oregon Angel Fund and the support of a virtual incubator program.[18] As mentioned earlier, it is not clear that a shortage of investment capital acts as a constraint on local startups' growth. But if the market cannot provide the investment capital that Tulsa's high-quality startups need, foundations could help by setting aside a small percentage of their endowments for seed capital—perhaps as co-investments with i2E.

Finally, Tulsa's philanthropy could work in closer association with the City and Chamber not only to catalyze the next phase of innovation-based entrepreneurial growth, but also to enable the testing and development of new products and services. The City of Tulsa itself can be a valuable testbed for new products, but the process for entrepreneurs to establish a pilot is now seen as burdensome. Small grants or investments from philanthropic sources, potentially from the City itself, could lead to faster assessment, adoption and iteration.

[17] https://www.thecommunityfoundation.org/news/catalyst-fund-new-grantees
[18] https://www.bizjournals.com/portland/news/2017/02/15/oregon-community-foundation-re-ups-entrepreneurial.html

Tech Training

WHAT IT IS

Beyond public schools and higher education, software training programs and tech internships play important roles preparing local residents—especially younger residents—to work in an economy whose evolution is increasingly powered by software and design. Companies like General Assembly provide intensive classes for adults pivoting into a career of software development, while coding classes and tech internships can nudge high school students toward future tech employment.

TULSA'S POSITION: INTERMEDIATE

In the last several years Coding Dojo and Railsbridge have begun offering tech training classes outside traditional two-and four-year institutions. Launched with support from ConsumerAffairs and the George Kaiser Family Foundation, the initial Coding Dojo class of 2017 was completely full; the latest class has expanded to two cohorts. It is too early to gauge their effectiveness, but based on conversations with local employers the consensus is that the new programs will reduce but not eliminate the shortage of tech-skilled workers, especially for the startups that cannot match the substantial salaries that Tulsa's energy companies can offer. As of writing, no citywide tech internship program exists to connect students and tech companies.

FabLab Tulsa is a different kind of tech training asset, hosting some 5,000 K-12 school students annually. For many, their exposure to the FabLab will be limited to a class visit but some will continue to workshops and independent projects.

LOOKING AHEAD

The Mine Tulsa noted in 2017 that there were over 4,500 unfilled coding jobs in Tulsa. If that is indeed the case, then the graduates of Coding Dojo and Railsbridge should find no shortage of employers seeking to recruit them. It would be valuable to track whether, when, and where graduates find employment (i.e, how many are placed in tech jobs that capitalize on their new skills, how many of those jobs are in Tulsa, and how long they stay in those roles). These programs are still very new, but early feedback is encouraging: all 23 students of Coding Dojo's first two classes found employment after graduating, prompting the program to train two cohorts simultaneously in June 2018. If placement rates for graduates remain high, the question becomes how to remove bottlenecks that prevent their continued expansion (i.e., shortage of teachers or lack of demand from prospective students).

Local Government

WHAT IS IT

Local government can enable business formation by making it easy for entrepreneurs to gain necessary licenses and permits, and also by acting as a disseminator of information for resources available across agencies. Many entrepreneurs value having a person or office they can contact with questions about navigating government. City leaders also can be vocal boosters for local entrepreneurs, providing validation of their products with pilot tests and media exposure with press quotes and mayoral visits.

TULSA'S POSITION: INTERMEDIATE

Mayor Bynum has been a champion of local startups and innovation, frequently visiting 36°N and even holding office hours there. Tulsa's entrepreneurial community feels confident of the mayor's support, and many expressed their gratitude.

However, city government has taken relatively few direct steps to catalyze innovation-based growth. The city hosted a luncheon during the 2017 Global Entrepreneurship Week titled "Demystifying City Hall," but no city staffer is directly responsible for supporting startups. There is no public program to help startups pilot their products, although the city is about to launch an online permitting system that should help entrepreneurs along with all other business managers. The city's relatively light formal engagement with entrepreneurs may be due to its small economic development staff—only four people—and a sense that entrepreneurship is managed by local foundations and the Chamber of Commerce, which receives $230,000 annually from the city.

It is also important to note the political tensions between the city of Tulsa and the state of Oklahoma, which has severely limited the city's ability to raise revenue for critical needs like education and infrastructure. Underfunding at the state level casts a number of shadows over the city's ability to drive innovation-based economic development, most notably through compromised education of the local workforce.

With Mayor Bynum focused on growing local companies, the city could be ready to play a more active role supporting innovation-based economic development. One obvious opportunity would be to act as a neutral third party bringing together local incubators—and the foundations that support them—to coordinate services and establish connected programs. Although the city's economic development staff is very small, the city could work with local foundations to create a "startup liaison" position to ensure entrepreneurs have a go-to resource. LinkedIn's Reid Hoffman provided support for such a role in the city of Newark.

Mayor Bynum could also use the power of his office to give valuable visibility and validation to nascent entrepreneurs. He could commit to meet personally with any startup that raises over a certain threshold of funding. His administration can utilize communications channels and social media to highlight entrepreneurial successes, and also deploy mentors to 36°N to help startups address questions with city regulations or policy. Having one person serve as a point person for entrepreneurs, as Seattle does, can make navigating city government seem less daunting.

Finally, adopting an open procurement strategy—which defines problems the city wants to solve, rather than specify a detailed solution—could invite more creative responses to RFP's, especially from local entrepreneurs. Entrepreneurs should be invited to be involved with the city's innovation initiatives, like the Mobility Innovation Team.

Bringing It All Together

T ulsa is in an enviable position compared with many mid-sized cities across the country. Its population is stable, numerous neighborhoods are being redeveloped, and generous benefactors have sponsored a host of civic investments, including what will soon be a stunningly lavish public park along the Arkansas River. The economy shows vulnerabilities with its dense concentration in the energy sector, but also strong potential in aerospace, cybersecurity, and food.

The Tulsa Regional Chamber plays a powerful role corralling local employers to pursue economic development, and it manages some services that are usually led by city hall elsewhere. Although the Chamber's Tulsa's Future reports cite growth of entrepreneurship and innovation as explicit goals, the numerical metrics that the Chamber prioritizes—$1.1 billion in capital investment and 12,500 jobs created over 5 years—may implicitly push the corporate community to prioritize business attraction over a "grow your own" approach toward economic development. It takes time before new businesses can scale to the point when they can hire dozens or hundreds of people in a year. But without them, a city has very limited paths to grow its economy.

A "win" from innovation-based economic development may not grab headlines in the way that an incentive-driven corporate relocation might—but it's almost certainly less expensive and may yield greater long-term benefits.[19] Tulsa's corporate community could easily engage Tulsa's entrepreneurial community in a way that strengthens both sides, such as organizing reverse pitch events or creating fellowship programs to connect entrepreneurs with young corporate professionals. Thanks in part to generous philanthropic support, Tulsa's community of incubators and startups is expanding rapidly, in tandem with a network of restaurants, bars, and event spaces. As Tulsa's startups mature, they should be woven into the city's corporate establishment and not placed to its side.

The corporate leaders we met expressed a willingness, even an eagerness, to mentor and support local entrepreneurs. Like many Tulsans, they take pride in responding to a request for assistance or opening their rolodex when asked. The informal networks that tie Tulsans together are clearly a civic asset. But they carry risk as well, as a newcomer to the city or a resident of a lower-income community may find them difficult to access. One young professional we met told us, "there are really five Tulsas—North, South, East, West, and Midtown—and they do not talk to each other."

Tulsa's startup community has matured to the point that it may be time to embrace the transparency and structure that formal relationships among innovation stakeholders can bring. Rather than rely on personal relationships to connect a startup with a local corporation that might pilot its product, there could be a rotating set of corporate office hours at 36°N that any local startup can sign up for. And Tulsa's numerous incubators could themselves stand to gain from a clear agreement about reciprocal membership (i.e., being part of Incubator A gives you access to programming at Incubator B), and perhaps from rules about how long a member startup can remain in a incubator before they are gently told it's time to move on. To date, The Forge has never forced

[19] https://www.nytimes.com/2018/06/08/upshot/why-cities-cant-stop-poaching-from-one-another.html

any member startup to leave in its 13 years of operation. It may be time for that to change.

36°N has quickly emerged as the central player in Tulsa's startup ecosystem, and as a point of entry for those wishing to get involved with local entrepreneurs. As valuable as its convening role is, 36°N offers relatively light programming and mentorship opportunities to mentors. The current leadership is wisely developing a strategy to expand such services. None of the established entrepreneurs or corporate leaders we met had been asked to be part of a mentor program—though all expressed a willingness to do so.

Local universities too have played a relatively tangential role with local startups and corporate R&D. Few corporate research partnerships exist, and cumbersome tech transfer programs are widely seen as being an obstacle to generating spinouts. The University of Tulsa's leading cyber program seems like a particularly unique and largely untapped resource to generate businesses of tomorrow.

One major challenge for innovation-based economic development will be very hard for Tulsa to solve on its own: the statewide underfunding of education, which culminated in a bruising teacher strike in early 2018. To quote the 2017 Tulsa State of Entrepreneurship

Report, "massive incentives, incubators, fund, and mentors cannot compete with our state's failing school system…[which] sets our state on a path to future destruction caused by an uneducated workforce." Indeed, the majority of the employers we met—both startups and established companies—cited hiring talent as the single biggest obstacle they face. Tulsa's new tech training programs are off to promising starts, but they cannot on their own solve the critical statewide questions around public education.

Compared with cities its size, Tulsa has remarkable advantages (its philanthropic community) as well as unique burdens (state underfunding of schools). The city's innovation ecosystem has benefited mightily from recent investments in incubators and programming, which are now starting to bear fruit as the city's incubators, led by 36°N, develop more comprehensive and coordinated services. As the community matures, it's now time to engage the corporations and universities that have thus far taken a relatively passive role in the city's burgeoning startup community. Deeper engagement can benefit both sides. With Mayor Bynum taking a personal interest in catalyzing local business growth, city hall itself can help bring Tulsa's rich assets into alignment to power its next phase of economic development.

Summary of Top Observations/Recommendations

- The many incubators based within Tulsa are linked by informal networks more than formal ones. While relations among them are friendly, there is a risk of duplicity in services and missed opportunities to support one another's members. All of them could benefit from a bigger mentor network and deeper member services.

- Tulsa's startup community has grown dramatically in the past decade, with multiple incubators launching along with numerous tech training programs and various meetups. However, the activity has not yet led to many scaling startups that have gone public, sold, or raised Series B funding (or beyond).

- Tulsa's corporate community has not often engaged with local startups by serving as mentors, piloting products, or articulating business needs that creative entrepreneurs might solve. Too often they have relied on the Tulsa Regional Chamber to manage such engagement on their behalf.

- The scale of Tulsa's philanthropic community and its explicit focus on supporting entrepreneurship make it a unique asset to innovation-based economic development

- Few companies have spun out of Tulsa's universities, and tech transfer programs are as likely to be seen as an inhibitor to new business formation as a catalyst.

- Numerous neighborhoods in Tulsa have been revitalized in recent years with mixed use buildings and places for professionals—especially young professionals—to congregate. But it is difficult to navigate the neighborhoods without a car, and downtown lacks both multi-unit housing and basic amenities like grocery stores.

- Startups have relatively few connections with corporate clients, mentors or investors outside of the Tulsa/Oklahoma City region, and few resources exist to help build them.

- The City of Tulsa's small economic development team has not had a clear strategy to support startups, but it may be time to create one.

Summary of Ratings

CORPORATE ENGAGEMENT: INTERMEDIATE
Established businesses are engaged in catalyzing innovation and spurring business formation. Tulsa's largest employers support these efforts through their Chamber involvement, but they themselves only occasionally engage directly with incubators or individual startups. .

START-UPS: INTERMEDIATE
There is a strong case that generating new good jobs rests on encouraging startups and building stronger startup hubs across the nation. Tulsa's startup ecosystem has grown substantially in recent years, with a number of centers of gravity emerging. But the growing startup community seems more energetic than it is organized. However, the informal networks of startup events seem to primarily attract early-stage ventures, rather than more advanced startups that have begun to scale.

INCUBATORS + MAKER-SPACES: INTERMEDIATE
A remarkable number of incubators and maker spaces have opened in Tulsa. There is a risk of uncoordinated or duplicative services offered by the many co-working spaces and incubators. The vibrancy of Tulsa's incubators is impressive for a city of its size, and growing pains are understandable given the relative newness of many of the incubators.
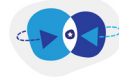
CREATIVE COLLISIONS: INTERMEDIATE
Happenstance interactions are a lifeblood for innovation. These kinds of unexpected collisions can take place at industry or entrepreneurial events, through community networks, and at convening places like bars and coffee shops. As much innovation-related activity as there is in Tulsa, there are relatively few prominent events that attract people who don't normally engage with entrepreneurs.

INVESTMENTS: BEGINNING
Without funding, many otherwise promising startups will wither on the vine. In contrast to the tremendous assets of Tulsa's philanthropic establishments, there are relatively few formal funding vehicles for local startups and many local funds lead a more conservative approach toward technology investing.

AMENITIES: INTERMEDIATE
If growth revolves around innovation, a city will need places where people can innovate, even if they do not realize that is what they are doing. Over the last decade, a number of neighborhoods in downtown, and more recently places like the Pearl District, have developed within Tulsa catering to young professionals with bars, restaurants, coffee shops, and event spaces where they can congregate.

UNIVERSITY ENGAGEMENT: INTERMEDIATE

As anchors of higher education, universities serve a critical role in catalyzing innovation-based economic development. There are a significant number of colleges and universities in Tulsa, although none of these institutions has an entrepreneurship center on campus that helps students and faculty convert ideas into a business, though some are official partners of 36°N and their students often participate in events.

PHILANTHROPY: ADVANCED

Foundations can play a unique role, identifying opportunities for grants or program-related investments that can benefit many innovation stakeholders who may not take action on their own. A number of Tulsa's philanthropies have identified local innovation as a strategic priority and have made strong investments and are key leaders in building the entrepreneur community.

TECH TRAINING: INTERMEDIATE

Beyond public schools and higher education, software training programs and tech internships play important roles in preparing local residents to work in an economy whose evolution is increasingly powered by software and design. In the last several years Coding Dojo and Railsbridge have begun offering tech training classes, though it is too early to gauge their effectiveness.

LOCAL GOVERNMENT: INTERMEDIATE

Local government can enable business formation by making it easy for entrepreneurs to gain necessary licenses and permits, and also by acting as a disseminator of information for resources available across agencies. Mayor Bynum has been a vocal champion of local startups and innovation, but the city government has taken relatively few direct steps to catalyze innovation-based growth.

About the Authors

David Zipper is a Fellow at the German Marshall Fund's Urban and Regional Policy Program. From 2013–17, Zipper was the managing director for Smart Cities and Mobility at 1776, a global entrepreneurial hub with over 1,300 member startups. As managing director, Zipper connected hundreds of entrepreneurs to urban leaders eager to deploy their solutions, and he closed millions of dollars in partnerships with cities and corporations worldwide. He continues to support 1776's mission by serving as a partner in the 1776 Venture Fund, where he oversees investments in smart cities and mobility startups. Zipper previously served as the director of Business Development and Strategy in Washington, DC. Zipper served as executive director of NYC Business Solutions in New York City under Mayor Michael Bloomberg. Zipper holds an MBA with highest honors from Harvard Business School, an MPhil in Land Economy (urban planning) from the University of Cambridge, and a BA with high honors from Swarthmore College. He has been selected as a Truman Scholar, Gates Scholar, and Lang Scholar.

Robert Bole is the General Manager, CityLab and Director of Global Strategy at The Atlantic, focused on assisting their growth in international markets. He has played similar roles at The New York Times and The Broadcasting Board of Governors, a federal agency that oversees five regional media networks. He is also a Senior Fellow for Public Diplomacy at the American Foreign Policy Council and a Board Member of Internews, a global NGO protecting and promoting a free and independent press. Robert Bole is the General Manager, CityLab and Director of Global Strategy at The Atlantic, focused on assisting their growth in international markets. He has played similar roles at The New York Times and The Broadcasting Board of Governors, a federal agency that oversees five regional media networks. He is also a Senior Fellow for Public Diplomacy at the American Foreign Policy Council and a Board Member of Internews, a global NGO protecting and promoting a free and independent press.

Building Blocks of Innovation–Based Economic Development

These are the basic building blocks of innovation-based economic development, along with the criteria for determining the level of a city's sophistication in each building block.

CORPORATE ENGAGEMENT

Beginning
1. Corporations concentrate R&D within their own offices
2. No corporate engagement with incubators
3. No structured relationships linking corporations with local universities

Intermediate
1. Corporate sponsorship of incubators, but limited programming for corporate staff there
2. Programs linking individual corporations to relevant university programs for R&D purposes

Advanced
1. Curated mentoring programs connecting entrepreneurs and corporate executives
2. Programs (often at incubators) that connect researchers at various local corporations to one another
3. Organized and value-added services to startups from local associations or chambers of commerce
4. Regular "switch pitch" events in which corporate leaders present challenges to groups of entrepreneurs who can offer suggested solutions

STARTUPS

Beginning
1. No well-known startup champion
2. No recent startup exits (i.e., sale of a startup to another company or going public)
3. No clear mechanism to communicate with other startups or publicize startup-oriented events within the city
4. Events for startups are very few, and lightly attended

Intermediate
1. Some informal and formal organized events for startups and local entrepreneurs
2. Informal newsletters, Slack channels, Facebook groups, etc., for local entrepreneurs
3. Occasional exits from local startups

Advanced
1. Regular activities and gatherings for startups, including those for particular sectors (health, gaming, etc.)
2. Very active online communities for entrepreneurs
3. Visible, well-attended annual event to showcase startups throughout the city
4. Presence of a well-regarded "startup champion" who has launched a very successful company and is engaged in the local ecosystem
5. Regular cadence of local startups successfully exiting

INCUBATORS AND MAKER SPACES

Beginning
1. No local shared workspace with programming specific to entrepreneurs
2. No active or sparsely attended networks of entrepreneurs or technology groups
3. No maker space open to the public, or to paying members

Intermediate
1. One or two shared workspaces open to entrepreneurs and others.
2. Weekly programming at the sites with mentors from local area
3. Limited corporate partnership
4. Limited (if any) engagement with local universities and other institutional research or anchor institutions

Advanced
1. At least one shared workspace specifically dedicated to entrepreneurs
2. Robust schedule of events that appeal to people of different backgrounds (entrepreneurs, corporate executives, investors, general public, etc.) and to curate connections among them
3. Regular visits from high-level investors and public/private leaders from outside the area
4. Programming for members to team the basics of launching a business
5. Daily meetings arranged between members and mentors
6. Data collected about members' growth
7. Widespread acknowledgment that an aspiring entrepreneur new to the area should visit the incubator first
8. Engagement that goes beyond sponsorship with major employers and the public sector
9. Robust social media presence

COLLISIONS

Beginning
1. R&D activities within corporations are siloed, as is university research
2. Hiring at corporations for creative roles generally done internally, or from people out of the area

Intermediate
1. Occasional programs like pitch events that bring together people from across employers and sectors
2. Job boards that help people learn about opportunities at nearby companies

Advanced
1. Ongoing mix of meetups for creatives with particular interests around a sector (i.e., energy innovation) or professional goal (i.e., prospective co-founders meeting one another) Ideally these are managed by a mix of various people, though there is a unified way to disseminate information
2. Events at an incubator or chamber that nudge seasoned corporate leaders to meet creatives they never otherwise would (i.e., switch pitches)

INVESTMENT

Beginning
1. No active angel networks
2. No local VC offices
3. No successful entrepreneurs reinvesting locally
4. No events that draw out-of-town VC's
5. Very few people with disposable income invest in startups

Intermediate
1. An angel network meets, but limited investment activity
2. There are institutional investors in the local area, but you have to know the right people to reach them

Advanced
1. Multiple angel networks compete with external networks (and each other) to invest in local startups
2. Pattern of successful entrepreneurs reinvesting money and know-how into new ventures
3. VC's regularly and publicly visit local entrepreneurs to explore venture opportunities
4. Regular pitch events attract current and prospective investors
5. Robust on-ramps for locals to make their first venture investments
6. Presence of a community venture fund

AMENITIES

Beginning
1. Lack of downtown activity after hours (bars, restaurants, entertainment)
2. Difficulty navigating the downtown core without a car

Intermediate
1. Limited hours of mass transit; bike lane network constrained
2. Downtown core with limited entertainment options
3. Presence of a business improvement district responsible for building amenities in downtown areas

Advanced
1. Robust bikeshare system in downtown core
2. Multiple neighborhoods offering affordable multifamily housing as well as proximity to grocery stores and entertainment districts
3. Well-used public transit system
4. Heavily used parks and public meeting places

UNIVERSITY ENGAGEMENT

Beginning
1. Universities have no incubators (and support no incubators off campus)
2. Universities have minimal tech transfer programs, and licensing revenue from investments is minimal
3. No R&D-based partnerships with local employers

Intermediate
1. Tech transfer programs exist, but are not heavily utilized by professors or graduate students
2. Incubator on campus that functions mainly as coworking space

Advanced
1. Programs bring researchers from different institutions together to further research and launch products leveraging departmental strengths
2. Robust R&D-based partnerships with universities and local employers
3. Graduate students and professors have programs (and potentially a space) to collaborate with startups, corporate R&D, and like-minded people at other schools
4. Universities invest—along with the city and employers—in local neighborhoods of innovative activity (like Kendall Square in Cambridge)
5. Programs designed to compel students and faculty to live in the city

TECH TRAINING

Beginning
1. Outside of universities, colleges, and high schools, no local classes to train residents in programming and software development

Intermediate
1. Availability of some programming classes at a local community college or a private company.
2. Informal links between major employers and programming classes lead to graduates occasionally being hired
3. Residents have choices of providers for particular programs

Advanced
1. Multiple providers offering classes in computer programming as well as related topics like design
2. Well-attended local hiring fairs for program graduates
3. Transparent data available about placement and retention rates for program graduates.

LOCAL GOVERNMENT

Beginning

1. No clear "front door" for startups to ask questions of city government or understand municipal purchasing programs
2. Cumbersome procurement rules that drive away prospective vendors, especially small businesses
3. Government leaders (including the mayor) cannot identify the biggest or fastest growing startups in their city
4. No personal connection between most city startups and city officials
5. Lack of entrepreneur development on mayor's economic development agenda

Intermediate

1. Identification of a government representative to serve as a liaison to startups but unclear what clout or capacity the person has
2. Effort by city to publicize procurements and familiarize the process to local startups
3. Clear articulation of development of the innovation ecosystem and entrepreneurial development in mayor's goals and policies
4. Occasional visits from city officials to top startups and pitch events
5. City press offices responsive to requests for publicity around milestones like a funding round, new product, etc.
6. Regular conversations between city leadership and entrepreneur community on governmental challenges and health of the local entrepreneurial community
7. Personal outreach from senior city officials to every local startup that raises capital or exits

Advanced

1. Empowered person/office to handle inquiries from startups wishing to work with the city
2. Needs-based procurement
3. Easy-to-follow registration and regulatory information online regarding permitting and startup registration
4. Transparent standards guide city officials' approach to engaging with startups that want to work with the city, including streamlined process for piloting
5. Active engagement of entrepreneur community in thinking strategically about governmental challenges and innovative solutions
6. City officials proactively introduce local startups to corporate leaders, others who might partner with them
7. City officials proactively provide quotes and tweets to help local startups build credibility
8. Mayor publicly promotes the city at strategic private events—not necessarily tech events like SXSW—that reflect the city's core strengths around innovation

CITYLAB INSIGHTS

ROBERT BOLE

RBOLE@CITYLAB.COM

202.266.7348

CITYLAB