City Lab Program Proposal

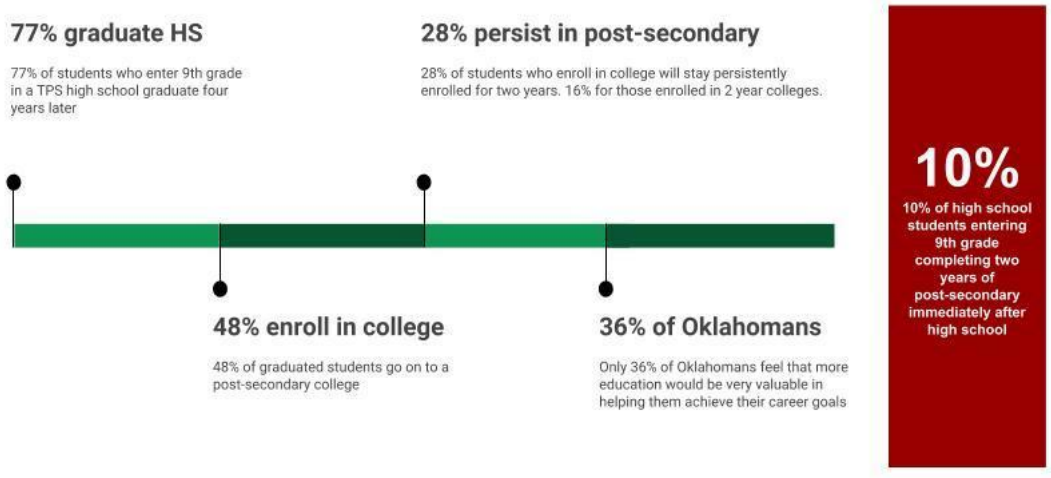
Introduction

The Tulsa Public Schools Design Lab team spent the spring of 2018 engaging in 601 hours of face-to-face time with 1120 youth, educators, and community members; conducted 85 empathy interviews with high school youth; held 56 focus groups; and surveyed 4139 youth, educators, and community about the high school experience. We reviewed 1500 high school transcripts; took 8 national site visits; and met with national experts including experts in brain science. The data collected suggests that the world has changed more quickly than our education system has kept pace. The knowledge, skills, and dispositions students will need to be successful in the future expand beyond traditional standards.

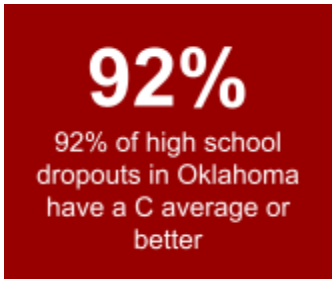
By 2025, data indicates as much as 70% of Oklahoma jobs will require training and education beyond high school. The average college graduate has $37,172 in student loan debt, totaling $1.52 trillion nationally. Currently, only 10% of high school freshmen make it through two years of post-secondary education. Without some sort of post-secondary education, Tulsans are faced with lower wage levels, fewer career options, and higher participation in government supported programs.[1].

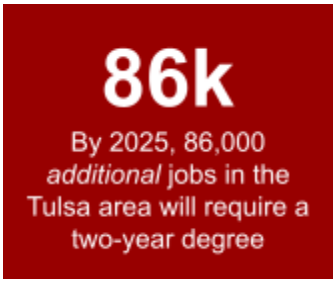
An educated workforce is essential to Tulsa's ability to attract new business investments. An educated workforce allows Tulsa to be competitive in the labor market and is critical to a thriving and successful community. By 2025, data indicates that there will be a gap of 86,000 additional jobs in the Tulsa region due to workers lacking the proper educational requirement - specifically a technical or a two-year degree.

While the data cited above can be unsettling, Tulsa Public Schools has the opportunity to directly impact the workforce and economy in Tulsa through its student population. In addition, high school students show interest in educational experiences that align with 21st century needs. The relevancy of their education matters to them. 100% of youth in Tulsa Public Schools' high school focus groups desire learning experiences that are more aligned with life readiness after high school.



[1] This data has been collected through multiple sources, including Tulsa Public Schools data dashboards, Impact Tulsa, School by Design, and the Oklahoma State Department of Education. It represents students in the graduating classes between 2014 and 2017. In some cases data collection is limited to sample groups, so it should be considered directionally accurate, but not precise for any single TPS graduating class.





In an effort to address the needs of TPS students in light of workforce trends, Tulsa Public Schools has partnered with Tulsa Community College to develop City Lab- the next generation of college and life-readiness learning experiences informed by adolescent brain science and augmented by the promising, high-value field of STEM education and cross-disciplinary soft skill development strategies.

City Lab is an out of school time opportunity for TPS students that delivers a best-in-class adolescent developmental curriculum designed to help high school students prepare for the challenges of college and young adult life. Through the use of 21st century skill development, City Lab provides students a foundation for employment and life readiness.

City Lab Overview

Mission Statement- Engaged students lead better lives

Vision- City Lab envisions students that...

- Utilize user-centered design thinking with an emphasis on STEM content to both identify problems and propose solutions
- Exhibit knowledge of STEM career opportunities and pathways to achieve meaningful employment
- Demonstrate exceptional leadership and collaborative fluency
- Exercise agency in their own life long educational journey
- Value and are valued by their communities

Program Goals-

- Students will demonstrate an understanding of the connection between academic success and future employment opportunities
- Students will use projects and user-centered design thinking in combination with STEM content to build empathy and other soft skills, increasing students' social-emotional investment in their community
- By involving community partners in the learning experience, students will be made aware of the value placed on their ideas, and the extent to which they are valued by their communities

- Students who have successfully completed a City Lab session become City Lab mentors to younger students entering the City Lab program
- Export (make explicit) successes that can be replicated throughout the District or that can inform high school redesign efforts

Core Competencies-

A. Expand learning into local communities
B. Problem identification in local communities and beyond
C. Facilitate solution ideation utilizing user-centered design thinking
D. Model presentation and explanation of proposed solution(s)

Rationale/ Theoretical Framework for City Lab

The foundation of City Lab's curriculum and program structure is based on occupational and educational data, adolescent brain research, education literature, and the educational and professional experiences of our partners. The framework for our approach is centered around our core competencies and goals.

Why use a design thinking framework that makes intentional connections to STEM?

According to the U.S. Bureau of Labor Statistics, careers in Science, Technology, Engineering, and Mathematics are projected to increase 3.8% more than non-STEM occupations between 2018 and 2028. Our team has decided to focus on user-centered design thinking in correlation with STEM content lessons in order to address these occupational trends and to expose students to a more rigourous way of thinking. We believe that combining user-centered design thinking and STEM concept lessons leads to increased student empathy, engagement, innovation, and creativity in problem solving. By using design thinking in the context of challenges and solutions faced by fellow community members, our participants will see the interdisciplinary nature of real world issues and be better able to connect STEM concepts to everyday life. City Lab will enable students to experience learning as a positive, dynamic, and interactive experience outside of rote facts and static textbooks. When user-centered design is used in STEM education practices, it allows students to engage learning in a way that is fun, practical, and points to the valuable skills students already possess that apply directly to success in STEM careers. We believe this acknowledgement of existing skills will lead to an increased sense of belonging and self-confidence.

"In the 21st century, scientific and technological innovations have become increasingly important as we face the benefits and challenges of both globalization and a knowledge-based economy. To succeed in this new information-based and highly technological society, all students need to develop their capabilities in STEM to levels much beyond what was considered acceptable in the past. A particular need exists for an increased emphasis on technology and engineering at all levels in our Nation's education system."

- National Science Foundation

How does our framework plan to develop career skills?

Students don't just participate in City Lab, students' work at City Lab and as such, they will receive a stipend for their work (contingent on attendance). By separating the City Lab program

from the notion of *school* and aligning it with *job readiness* we hope to increase student buy-in and give them job experience that bolsters their confidence to make audacious career, college, and life decisions. City Lab explicitly teaches skills that are crucial to finding employment in the 21st century. Examples of areas we will emphasize include creative problem solving, critical inquiry, group collaboration, social skills, technology skills, and presentation skills. In addition, City Lab will teach project management skills including change, risk, and time management as well as iteration and improvement cycles. As the City Lab program grows, City Lab alumni will be influential peer coaches and mentors to younger students entering the program. This will allow students an opportunity to further build leadership and social skills.

How does our framework foster community engagement?

City Lab sessions will be held at community-based, school separated locations. This will expose students to facilities and resources available to them in their communities and discourage participants from thinking of themselves and their cohorts as *students* but instead to think of themselves as *professionals*.

City Lab participants will work on projects that require engagement with fellow community members. This will include project related site visits, interviewing members of the public, and other activities that bring students into contact with a diverse range of community resources and people.

Subject matter experts will also be brought in from various local organizations to expound upon career opportunities and community resources, further engaging students in networking with community members.

Program Design

City Lab will host three cohorts of students per year. This will consist of a one week program during spring break and two separate two week sessions during summer break. Sessions will include four hours of instruction per day for a total of 1680 hours of experiential learning each year. Food will be provided for each student in attendance. Stipends will be tied to attendance. Additional incentives will be provided for students returning to the City Lab program as mentors.

The curriculum for each session will be structured around three components

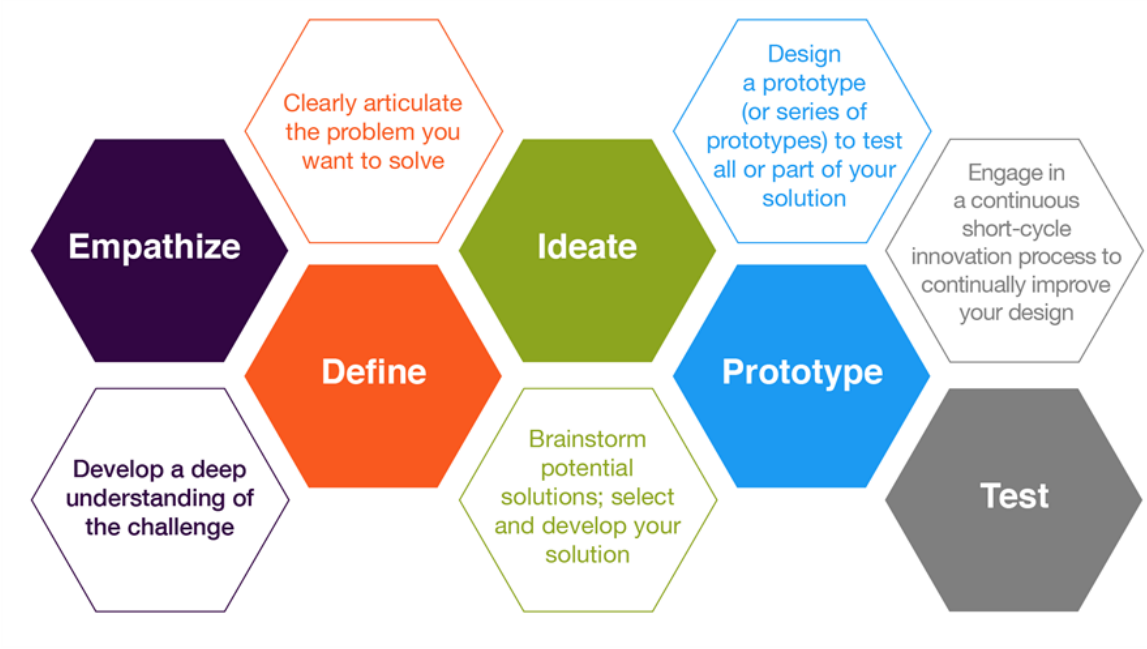
1) relationship building

2) design thinking

3) STEM activities

Relationship building activities will be infused throughout each spring break and summer session with particular emphasis on the first few days of each session. Each day will start and end with some form of relationship building exercise to encourage feelings of belonging and connectedness among participants.

Instruction, practice, and implementation of design thinking practices will be the core component of the City Lab schedule and curriculum. Each session will take students through the design thinking process within the context of their chosen problem. This will include each step in the diagram below.



STEM content will be embedded throughout each session through interactive, hands-on activities. The nature and content of the activities will vary based on the design problem selected. Community partners and subject matter experts will be utilized to deliver content and make explicit connections between real world career opportunities and the activities presented.

Logic Model

City Lab LM

Scaling

Proposed Three Year Scaling of City Lab				
Year	Total Number of Participants	Approximate Number of Students (per Session)	Staffing Needs (per session)	Location Needs
1	50	16-17	3-5	One room (min)
2	80	26-27	4-6	One room (min)
3	150	50	5-10	Two room (min)

Evaluation Plan

Program goals will be measured and evaluated in a number of ways. A self-evaluative pre and post survey will be given to each participant at the beginning and end of each City Lab session. This survey will include questions to measure participants social-emotional skills, awareness of community resources, knowledge of career opportunities, and other measures of success. Along with the post-survey, City Lab will also have students provide anonymous input on program effectiveness and their experiences within the program through an additional exit survey. In addition to survey data, City Lab will keep track of student data including return rate and measures of academic success.

Evaluation Plan Aligned with Goals	
Goal	*Evaluation Plan*
Students will demonstrate an understanding of the connection between academic success and future employment opportunities	Measured by pre and post survey (include item numbers)
Use projects and user-centered design thinking in combination with STEM content to build empathy and other soft skills, increasing students' social-emotional investment in their community	Measured by pre and post survey (include item numbers)
By involving community partners in the learning experience, students will be made aware of the value placed on their ideas, and the extent to which they are valued by their communities	Measured by pre and post survey (include item numbers)
Students who have successfully completed a City Lab session become City Lab mentors to younger students entering the City Lab program	Measured by data collected by City Lab team members (City Lab Data)
Export (make explicit) successes that can be replicated throughout the District or that can inform high school redesign efforts	Measured by data collected by City Lab team members (City Lab Data) and pre and post survey data

Management Plan

Core Staff-

Aaron Wilson, STEM Program Manager- Tulsa Community College

Andrea Castaneda, Chief Innovation Officer- Tulsa Public Schools

Bracken Klar, Director of Community Engagement- Tulsa Public Schools

Erin Buchanan, STEM Program Coordinator- Tulsa Community College

Community Partners-

City Lab will utilize a variety of community partners for the delivery of programming. Each curriculum component requires a unique perspective and as such we will utilize many different partner organizations.

The relationship building components of our curriculum are delivered by City Year Americorps members serving Tulsa Public Schools. City Year is an education nonprofit organization dedicated to helping students and schools succeed through developing their social, emotional, and academic skills. City Year members go through an extensive leadership development training program that focuses on communication, team collaboration and leadership, successful relationship development, problem solving and decision making, as well as civic knowledge and fluency in education practice and reform. Members of this program have developed a valuable skill set that makes them particularly well positioned to model and teach healthy relationship practices and other social emotional skills to participants of City Lab.

The design thinking and STEM activity components of our curriculum are delivered by subject-matter experts within the community. Currently, we have a working relationship with the Tulsa Regional STEM Alliance to implement activities and provide curriculum guidance. TRSA's mission is to "build broad, deep and innovative STEM pathways for all students to access high-impact careers." TRSA staff members are able to provide City Lab leadership and participants with much needed expertise within the STEM fields and to connect them directly to resources and content that emphasize the diverse and interdisciplinary nature of STEM careers in the 21st century.

City Lab has also partnered with a variety of community organizations and individuals to help facilitate the problem-based learning components of our programming. The pilot program of City Lab in the Spring of 2019 partnered with the Tulsa City Parks Department. Spring break 2020 partners include XYZ retirement community, and XYZ tech company.

Potential partners for future years of City Lab include the Tulsa City-County Library, Tulsa Artist Fellowship, Arts & Humanities Council for Tulsa (ahha), Techlahoma, Code for Tulsa, 36 Degrees North, Holberton School, the Tulsa Air and Space Museum, the Tulsa Zoo, and many others.

Funding-

The funding for the first three years of the City Lab program has been provided by the American Electric Power Foundation through the Credits Count program. The AEP Credits Count grant was awarded to Tulsa Community College Foundation to support Tulsa Community College and Tulsa Public Schools with the goal of providing underserved student populations in Tulsa with programming that exposes them to STEM career opportunities, and increases the academic readiness of high school students for college level coursework.

Target Schools/Students-

Tulsa Public School High Schools

Due to grant specifications special focus will be placed on Will Rogers College High, Nathan Hale High School, Central High School, East Central High School.

Supplemental Materials

A. Three Year Budget-

City Lab Budget

B. Spring 2020 Details-

City Lab Spring 2020 Timeline

Facilitation Guide (with owners)

Works Cited

"Chicago and Tulsa Mayors Talk AI and Investment in Technology and Talent of the Future." *Talent Economy*, 7 May, 2018. https://www.chieflearningofficer.com/2018/05/07/chicago-tulsa-mayors-talk-ai-investment-technology-talent-future/

"Design Thinking." *Design Thinking*, Illinois Center for Innovation in Teaching and Learning, https://citl.illinois.edu/paradigms/design-thinking

"Discovery Summary." Tulsa Public Schools Reimagine High School Project. 2Revolutions, LLC., Jan-Jun 2018.

"Employment in STEM Occupations." U.S. Bureau of Labor Statistics, U.S., 4 Sept. 2019, www.bls.gov/emp/tables/stem-employment.htm

"National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System." National Science Foundation, 11 Oct. 2007. https://www.nsf.gov/pubs/2007/nsb07114/nsb07114.pdf

Partner Organization Information

City Year- https://www.cityyear.org/

Tulsa Regional STEM Alliance https://tulsastem.org/

Appendix A - City Lab Summer Virtual Delivery Beta Proposal

Summary

The City Lab Summer virtual session will allow students to participate in an educational employment program and overcome the uncertainty surrounding the 2020 COVID-19 pandemic. We will challenge students with opportunities to leverage their unique knowledge and experiences of the current community health crisis and utilize their talents and abilities to impact their communities and improve outcomes. We will task City Lab students with producing a deliverable to help those transitioning to distance learning. This could incorporate a range of challenges facing youth in a public health crisis, such as food insecurity, connection to support services, access to technology, time management, or increased familial obligations**.** Additionally, we will connect current issues to future career opportunities by utilizing project-based, STEM-focused, student-led curriculum.

During this two week program, students will be introduced to the issues and concepts necessary to understand the role of community health through hands-on projects and activities. Students will quickly apply this learning by narrowing their focus to a specific problem and ideating possible solutions. By the end of the second week, students will have prototyped and tested their solutions. Students will present their proposals to a panel of community experts and leaders.

Goal Alignment	
Goal	**City Lab facet**
Students will demonstrate an understanding of the connection between academic success and future employment opportunities	Completion of STEM activities ensures student success in problem identification, creative problem solving, and the solution presentation facets of City Lab. Guest speakers will be brought in to engage students in real life employment opportunities related to the community health challenges being explored and further connect academic learning to career preparation.
Students will use projects and user-centered design thinking in combination with STEM content to build empathy and other soft skills, increasing students' social-emotional investment in their community	Our summer program plan is project focused, allowing students to engage in a robust design process. Students will be building social-emotional skills by participating in empathy interviews, user-centered design thinking, group work, and investing in their communities through

	direct engagement with relevant and timely issues of public health affecting their communities.
By involving community partners in the learning experience, students will be made aware of the value placed on their ideas, and the extent to which they are valued by their communities	Creating a community health, COVID-19 theme allows direct engagement with the students' communities and the problems faced by the students themselves and the communities in which they live. City Year will help students conduct empathy interviews and apply the information gained from those interviews to propose a solution to the problems presented. TRSA will provide project based, foundational knowledge for students to build from as they engage in the creative problem solving facet.
Students who have successfully completed a City Lab session become City Lab mentors to younger students entering the City Lab program	By completing a virtual summer session we will be building our potential alumni-mentor cohort to assist in future City Lab sessions.
Export (make explicit) successes that can be replicated throughout the District or that can inform high school redesign efforts	Piloting a virtual summer employment program allows TPS to glean valuable programmatic information about the nature of web-based learning in out-of-school learning opportunities that can be applied to future programs and initiatives.

Risk Assessment

Attendance

Students will be paid $200 for their work. In addition, an extra reward of $50 will be given to any student with 100% participation. Students will be contacted by staff with reminders of session dates and times and attend an orientation to increase student buy-in. Meetings will be held with AEP target school teachers for feedback on student attendance.

Student disengagement with material

Our curriculum will focus on producing relevant content that is easily applicable to everyday life, and focuses on group collaboration. Students will spend no more than 30-40 minutes sitting at their computers listening to direct instruction, instead they will participate in activities and projects that deliver content in an interactive way. This includes STEM activities, facilitated group work, online games, and virtual group activities. Meetings will be held with AEP target school teachers and with Design Lab Tacher Coaches to surface successes and struggles.

Student disengagement with each other

Community building between students will be facilitated by all staff involved with a particular emphasis on small group learning. City Lab team members will lead daily virtual relationship building activities, and establish daily routines that build community with all students. In addition, each City Lab team member will be assigned to a student small group and will be responsible for encouraging communication, monitoring interactions, and building team camaraderie. Students will be put into groups based on their self-identified strengths (collected through pre-survey) to ensure that each group has the best possible chance for success.

Access to technology
AEP Credits Count Grant funds will provide students with laptops and hotspots in order to ensure equal access to technology needs.

Access to supplies
All supplies necessary will be purchased by Credits Count staff prior to program start. Packages will be delivered to student houses at the beginning of each week that contain all the materials necessary for students to complete weekly activities. In addition, staff will be available to deliver emergency supplies as needed throughout the week.

Household environment
While we cannot ensure that every student household will provide a quiet atmosphere conducive to student learning and engagement, we will train our staff members on how to respond to common issues experienced in virtual learning environments and work to build a set of student-led norms to follow to mitigate problem emergence.

Unknown risks
City Lab staff will contact local teachers that have first-hand experience with online learning to seek guidance on any additional risks that might occur during programming.

Student profile
Due to increased difficulties expected to arise in maintaining a virtual environment that accounts for the risks above, we will alter our student profile to place an additional emphasis on students who have demonstrated a history of good attendance with virtual learning and show a willingness to expend extra effort towards communication and engagement when participating on online platforms.