Forge

@A&M-Central Texas

A Blended Innovation Community Plan

December 2022

Perkins&Will

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1. Introduction

Project Background
Context of the research park

Forge @A&M-Central Texas
Future system of knowledge economy in the region and growth potentials

The story of the Forge at Texas A&M-Central Texas in Killeen is one of local and regional academic, industry and government cooperation. It is bolstered by the state and federal resources of the Texas A&M University System and the U.S. Department of Defense.

In 2021, Texas A&M University (A&M-Central Texas) was the recipient of a grant from the Office of Local Defense Community Cooperation of the Department of Defense to fund a study that lays the groundwork for the creation of a university research park to be located on its campus in Killeen. Administered in collaboration with the Fort Hood Regional Economic Development Corporation, the leadership team engaged a consulting team led by global design and strategy firm Perkins&Will.

This report describes the background, opportunity, and innovation ecosystem strategy that lays the foundation of a new blended knowledge community: Forge @ A&M-Central Texas.

Project Background

A&M-Central Texas and the Texas A&M University System

A member of the Texas A&M University System (TAMUS), A&M-Central Texas sits at the edge of the City of Killeen and at the border of Fort Hood. The 672 acres upon which the campus sits were donated to TAMUS by the U.S. Army in 2009; since the donation was made, three buildings and approximately 300,000 square feet of academic, research, and student life space has been constructed on the site.

Among one of the largest university systems in the country, TAMUS offers an extraordinary collection of programmatic assets that provide an opportunity to help shape the innovation ecosystem in Killeen. The system is comprised of 11 university components and eight state agencies. TAMUS also comprises the innovative RELLIS campus, including the Bush Combat Development Complex, which fosters strong research and technology partnerships between academia, industry, and defense.

A&M-Central Texas is unique among state and other TAMUS universities in that it is exclusively an upper-level institution, serving graduate, third, and fourth-year students through collaborations with regional community colleges to offer quality continuing education with an emphasis on access and affordability.

The university currently serves more than 2,200 students with an average age of 34 both graduate and undergraduate, roughly 40% of whom are affiliated with the U.S. Army as active-duty service members, veterans, or military dependents. This strong connection to Fort Hood is a major driver of enrollment and an asset the university will continue to leverage as it grows.

While serving this unique student body with its many academic and degree offerings, A&M-Central Texas has been expanding its STEM research initiatives with investment in equipment and space to support more researchers in different areas including those aligning with the defense industry areas of interest such as cybersecurity.

U.S. Army at Fort Hood

The Killeen region is already a major contributor to both the Central Texas and statewide economics. It is home to Fort Hood, one of the largest military installations in the nation. Covering over 340 square miles, Fort Hood is also the major employer and economic driver for the City of Killeen and is the largest single-site employer in the state of Texas. The Fort Hood-related population annually contributes approximately $30 billion to the Texas economy, and roughly one in three residents in the tri-county area where Fort Hood is anchored are directly impacted by the defense industry.

U.S. Army Test and Evaluation Command (ATEC), which provides testing for all branches of the military, includes the U.S. Army Operational Test Command (OTC). Fort Hood is OTC headquarters, as well as home to half of its eight directorates. In addition to OTC, resources such as the Research Lab-South, the Defense Innovation Unit, and the swiftly burgeoning Army Futures Command provide host opportunities for applied research, innovation, and commercialization.

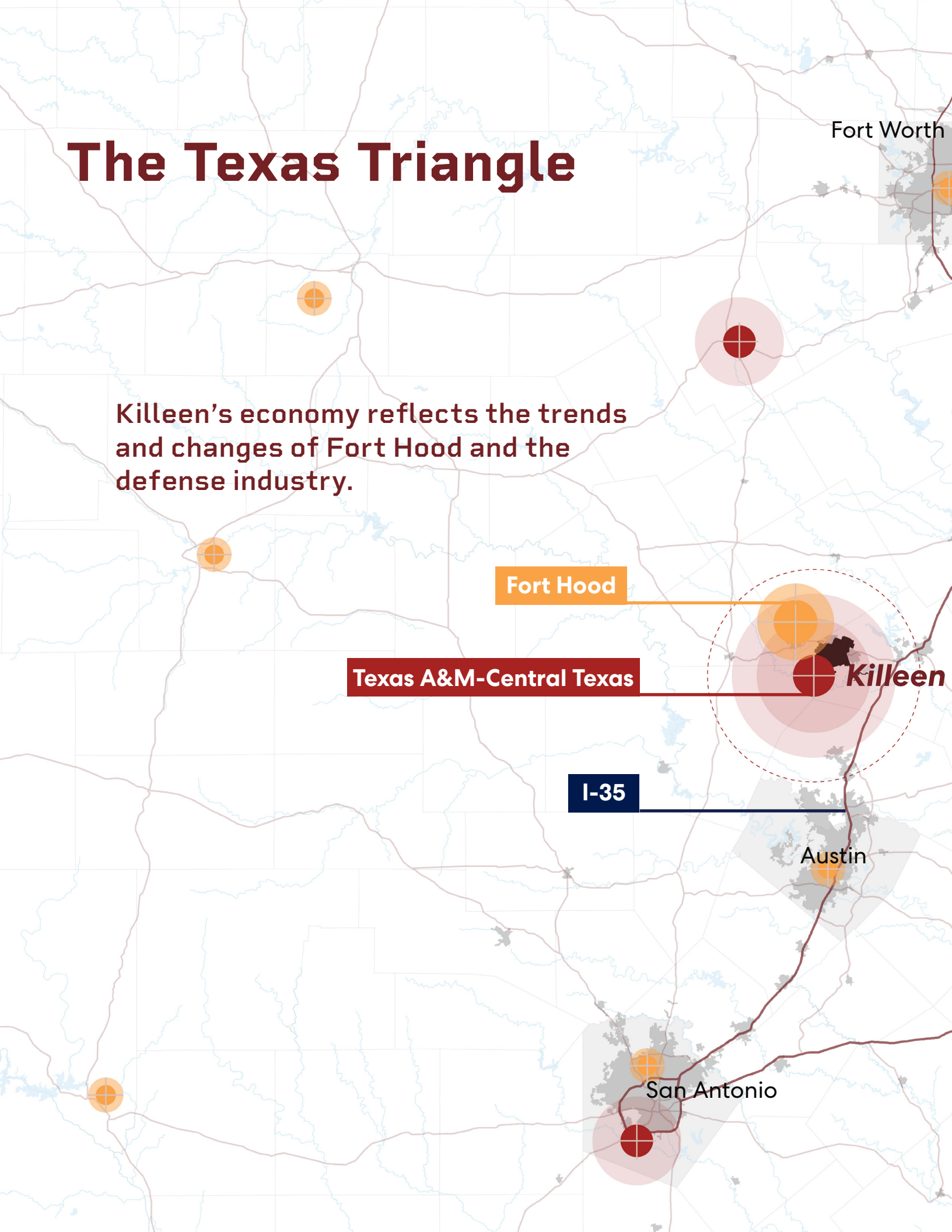
Warrior Hall at A&M-Central Texas

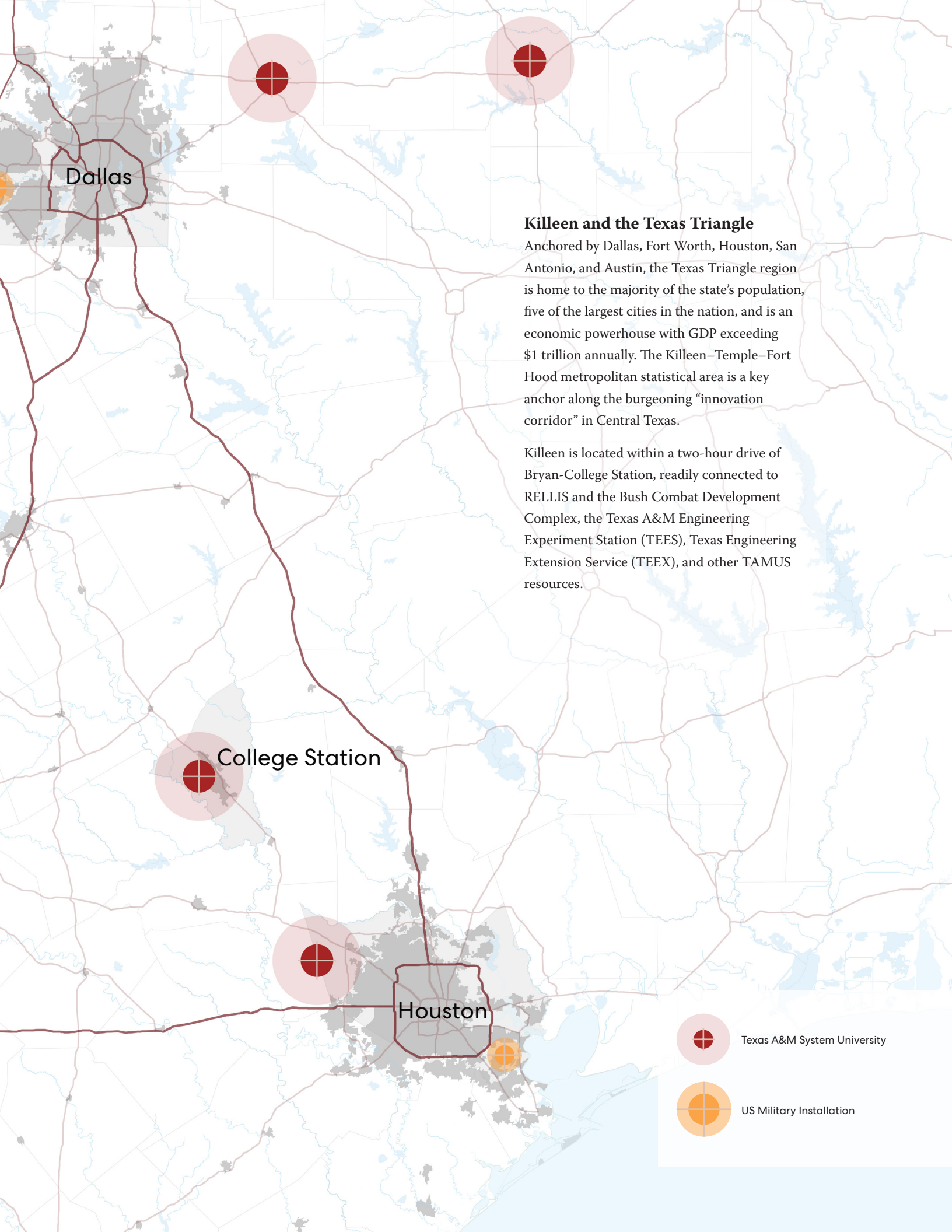
Fort Hood is the largest employer and economic driver in Killeen.

Fort Hood is one of the largest military installations in the nation.

The Texas Triangle

Killeen's economy reflects the trends and changes of Fort Hood and the defense industry.



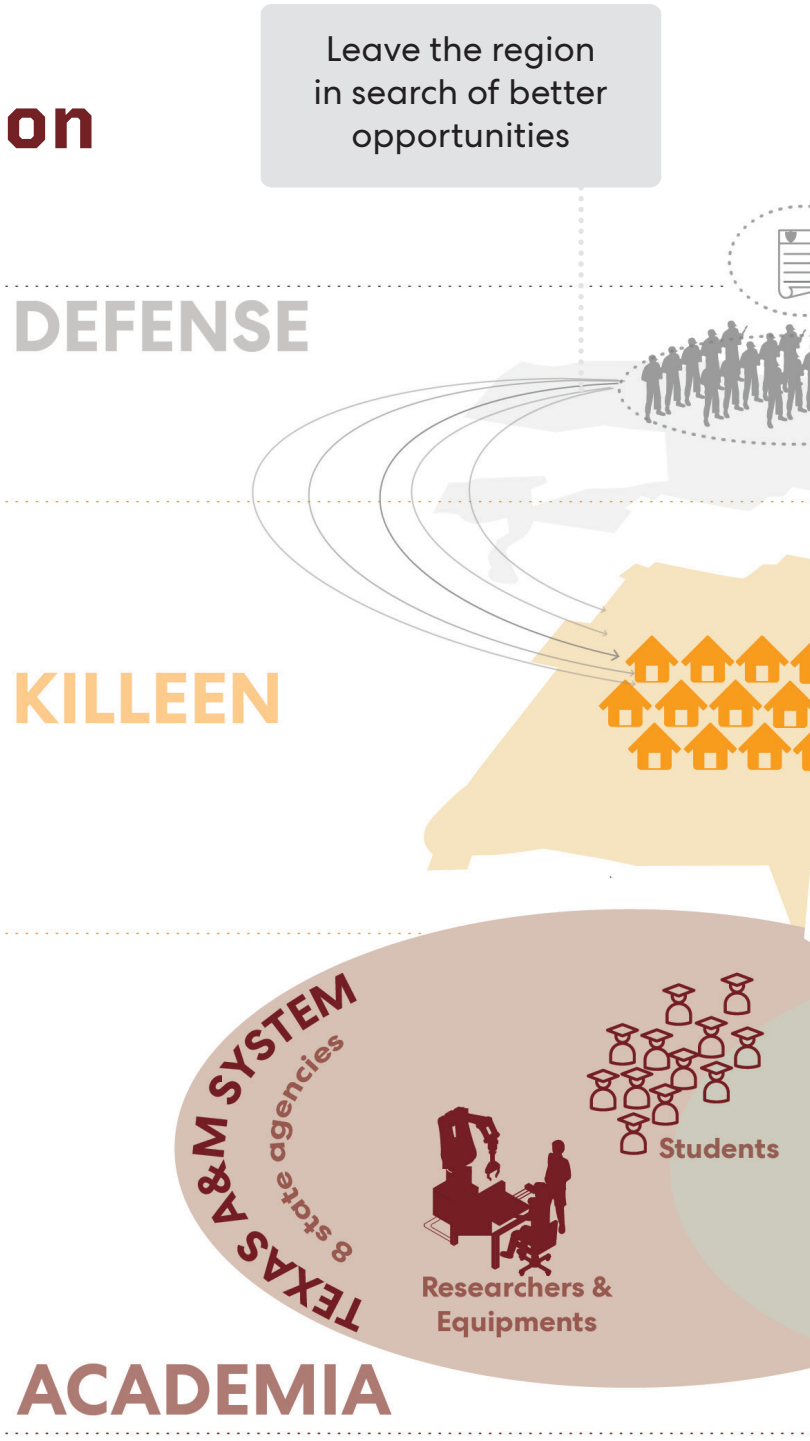


Killeen and the Texas Triangle

Anchored by Dallas, Fort Worth, Houston, San Antonio, and Austin, the Texas Triangle region is home to the majority of the state's population, five of the largest cities in the nation, and is an economic powerhouse with GDP exceeding $1 trillion annually. The Killeen–Temple–Fort Hood metropolitan statistical area is a key anchor along the burgeoning "innovation corridor" in Central Texas.

Killeen is located within a two-hour drive of Bryan-College Station, readily connected to RELLIS and the Bush Combat Development Complex, the Texas A&M Engineering Experiment Station (TEES), Texas Engineering Extension Service (TEEX), and other TAMUS resources.

Systems in Isolation



The Specific Challenge

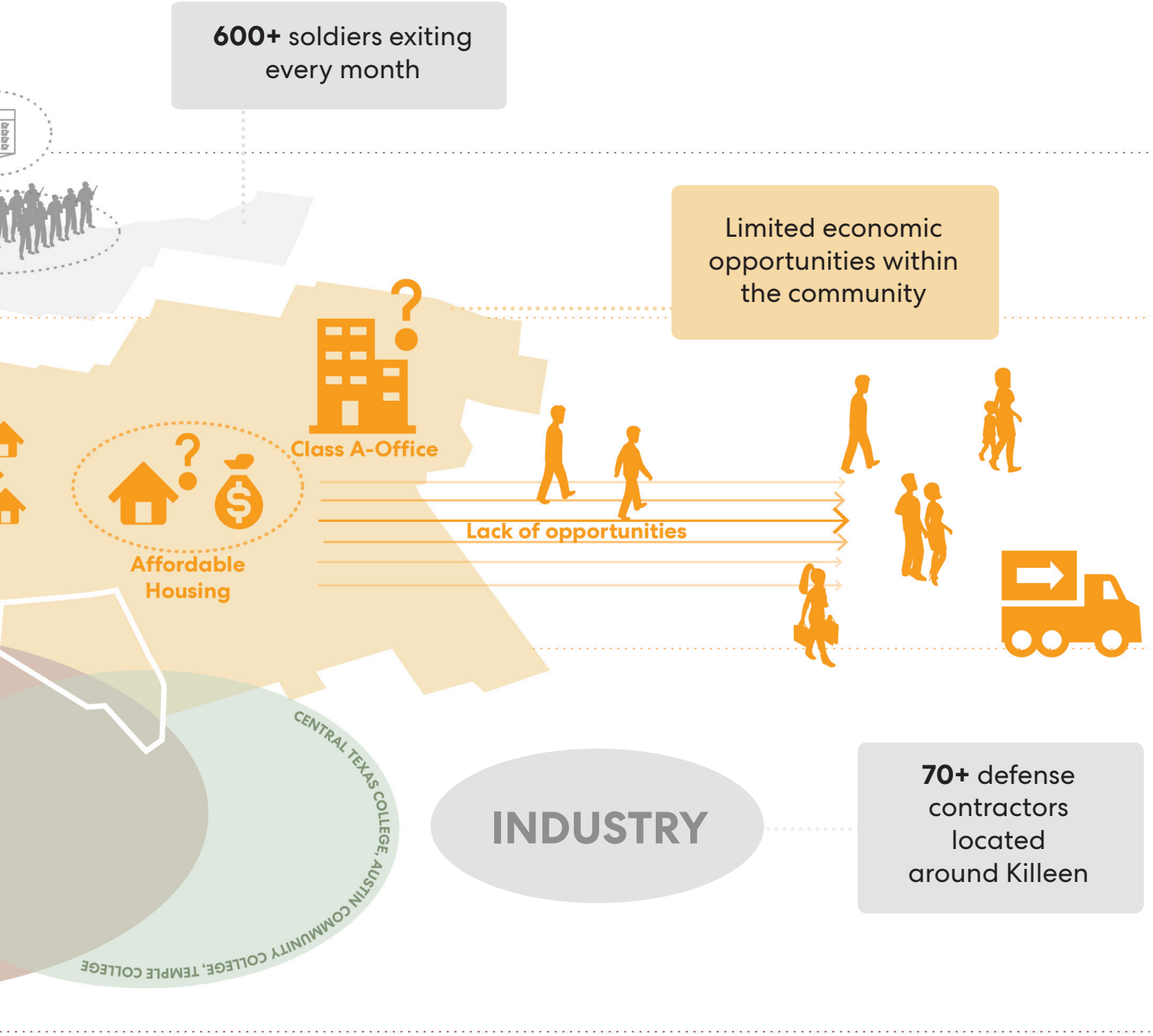
Given the total size and scale of Fort Hood, there are a large number of service members moving through the installation, many of whom exit their service as highly skilled, knowledgeable, disciplined members of the workforce – some with high-level security clearance. Soldiers and their families have often established ties within the community that are difficult to leave upon being discharged from service. And while some are readily employable, others need to further their education or receive additional skills and training.

As this large number – approximately 600 soldiers per month - leave the post, many are unable to find proper employment opportunities within the region and choose to leave the Greater Killeen area. Other soldiers, veterans and their families are seeking career-aligned employment as they aim to continue their post-military education and training.

This highly desirable workforce creates a virtual "brain drain" and presents a missed opportunity for economic development in the Central Texas region.

The Risk

For decades, the main driver of economy in Killeen has been the presence of military service members in the area. This economic dependency on one institution creates an undiversified economy that could leave the region vulnerable if the military population declines.


600+ soldiers exiting every month
Limited economic opportunities within the community
Class A-Office
Affordable Housing
Lack of opportunities
CENTRAL TEXAS COLLEGE, AUSTIN COMMUNITY COLLEGE, TEMPLE COLLEGE
INDUSTRY
70+ defense contractors located around Killeen

Setting Things in Motion

An Opportunity

Among these vulnerabilities arises opportunities to build on existing strengths of the region to expand into new sectors, grow industry, and diversify the economic base of the community.

A&M-Central Texas, along with its partners in the Department of Defense, local government, economic development agencies, affiliated educational institutions, workforce development organizations, and private industry can seek to create a coalition of change, build on the booming knowledge economy in the Central Texas region, and develop a more diversified economy.

Capitalizing on a unique opportunity to create a center of innovation within the A&M-Central Texas campus, a new trajectory can be launched – one which will set in motion a vibrant and ever-expanding innovation ecosystem.

This is an opportunity for regional stakeholders in academia, industry, defense, and government to coalesce around this shared vision to develop a knowledge economy and broaden the economic base of the region.

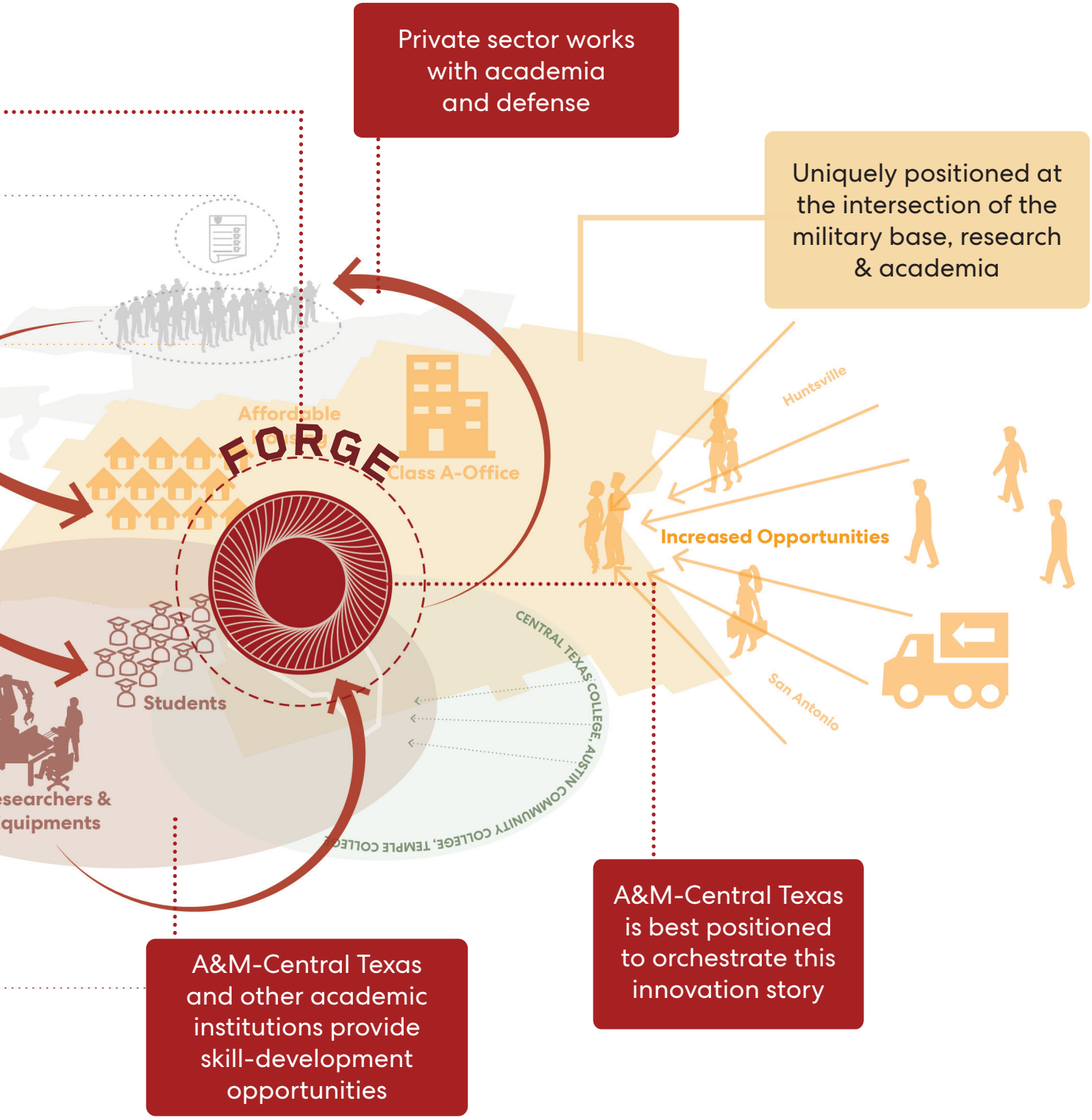
As one of the first keys to building this innovation ecosystem, A&M-Central Texas, along with myriad partners and stakeholders, are collaborating on establishing a blended academic-industry-government knowledge community within the university boundaries. This effort has led to creation of the following plan for the Forge at Texas A&M University-Central Texas.

The Reward

Through this approach, these partners will help advance the role of the Texas A&M University System as a leading defense partner, strengthen national security, and provide opportunities for veterans and their families simply by capitalizing on the existing strengths of the region, thereby transforming a regional economy.

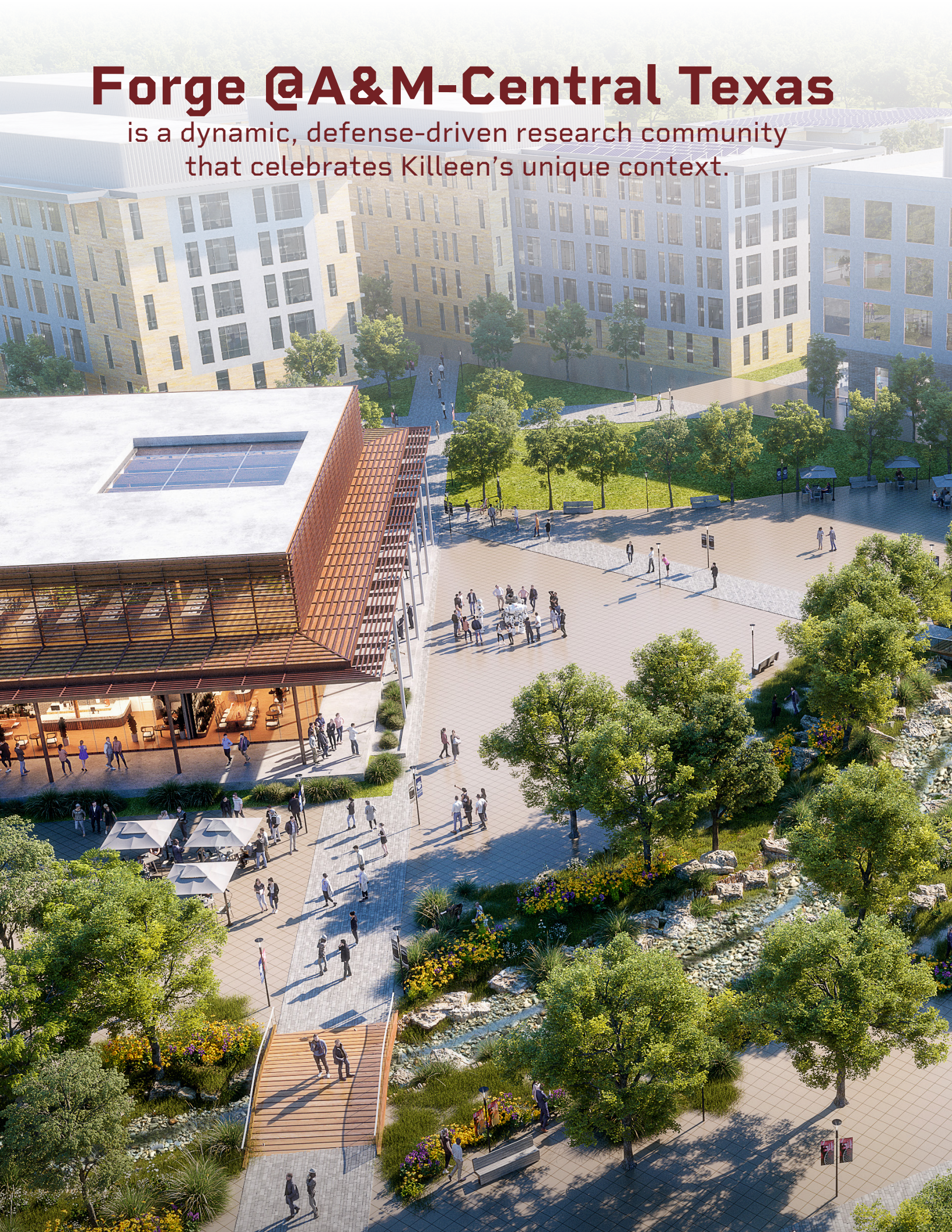
"Why are we in Killeen? Simple: Fort Hood. We're here for the same reason we're based in the Cummings Research Park next to Red Stone Arsenal in Huntsville. We see our collaboration with A&M-Central Texas providing opportunity for meaningful academic, industry, and defense partnership."

- Van Sullivan, Chief Executive Officer, Trideum Corporation



Forge @A&M-Central Texas

is a dynamic, defense-driven research community that celebrates Killeen's unique context.



Forge at A&M-Central Texas is conceived as an idea, driven by program, and grounded in place. By its very definition, Forge innovation is a concept whereby leaders, partners, collaborators, innovators, educators, soldiers, professionals, and more will join together in a great expenditure of effort and talent to create something remarkable. It is driven by programs – cybersecurity, systems simulation, regenerative energy, etc. Forge is a place-based innovation community blending building use both horizontally and vertically to encourage creative collisions between students, faculty, industry professionals, and more.

forge: *(verb)* to form or bring into being especially by an expenditure of effort; to move with a sudden increase of speed and power; *(noun)* a furnace or a shop with its furnace where metal is heated and wrought.

-Merriam-Webster

Forge:
A Blended Knowledge Community

The physical environment of the A&M-Central Texas campus will evolve into a blended knowledge community guided by:

1) **Knowledge & Innovation** – Creative blending of academics and industry applied research.

2) **Community** – Establishing spaces and places to support collaboration.

3) **Economy** – Driving economic prosperity and opportunity.

4) **Ecology** – Celebrating and protecting the unique ecosystems on the property.

The design of the Forge @A&M-Central Texas reflects a strategy of retaining talent, developing talent, and connecting the talent to industry.

The development plan for the Forge envisions more than 1.8 million square feet, concentrated within 184 acres of the 672-acre campus. The design embraces and engages the unique natural character and ecosystems that characterize the Texas Hill Country, while preserving and enhancing critical wildlife habitat. Existing and proposed site infrastructure is leveraged to maximize the site potential.

Placemaking and design strategies are encouraged through intentionally programmed and designed open space that is supported by density of uses. Diversity of spaces is intended to mix throughout the site to enhance opportunity for creative collisions and support collaboration. Building uses blend across the site and within buildings to support interdisciplinary interactions. This flexible approach is conceived to accommodate a range of needs - education and training, basic and applied research, industry advancement and employment, as well as government and partner presence. The site is amenitized with space for food, beverage, and gathering that connects community members to the natural spaces beyond the development footprint.

2. Existing Context

Community and Context
Campus location and community assets lending to the academic institution growth

Market Economics
Economic attributes of the region

Built Fabric
Zoning and existing built conditions

Natural Systems
Habitat, hydrology, and connectivity

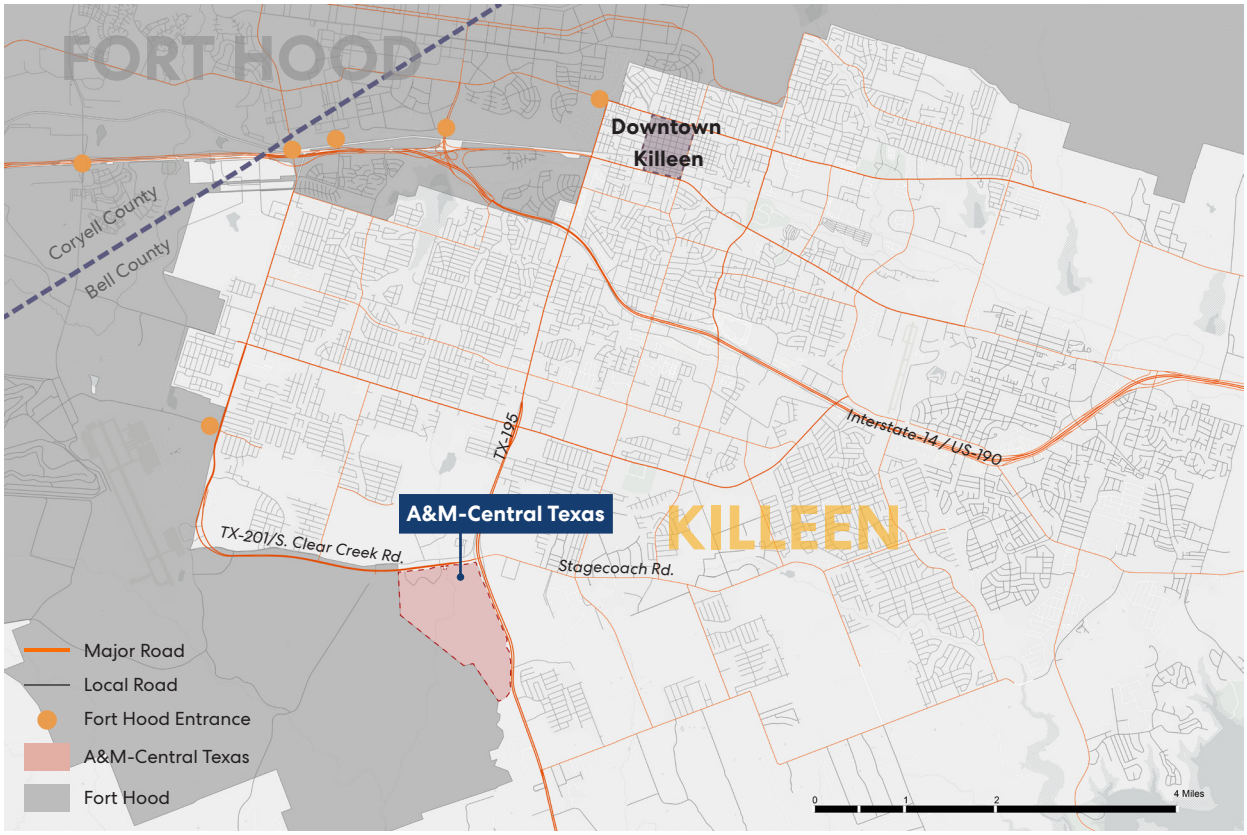
This chapter explores the existing context of the Central Texas region, City of Killeen, Fort Hood, and the A&M-Central Texas property. This context is explored through its physical properties as well through its demographic and economic composition to paint a picture of the area's assets, strengths and challenges in further developing an innovation ecosystem and innovation drivers with the Forge.

Community and Context

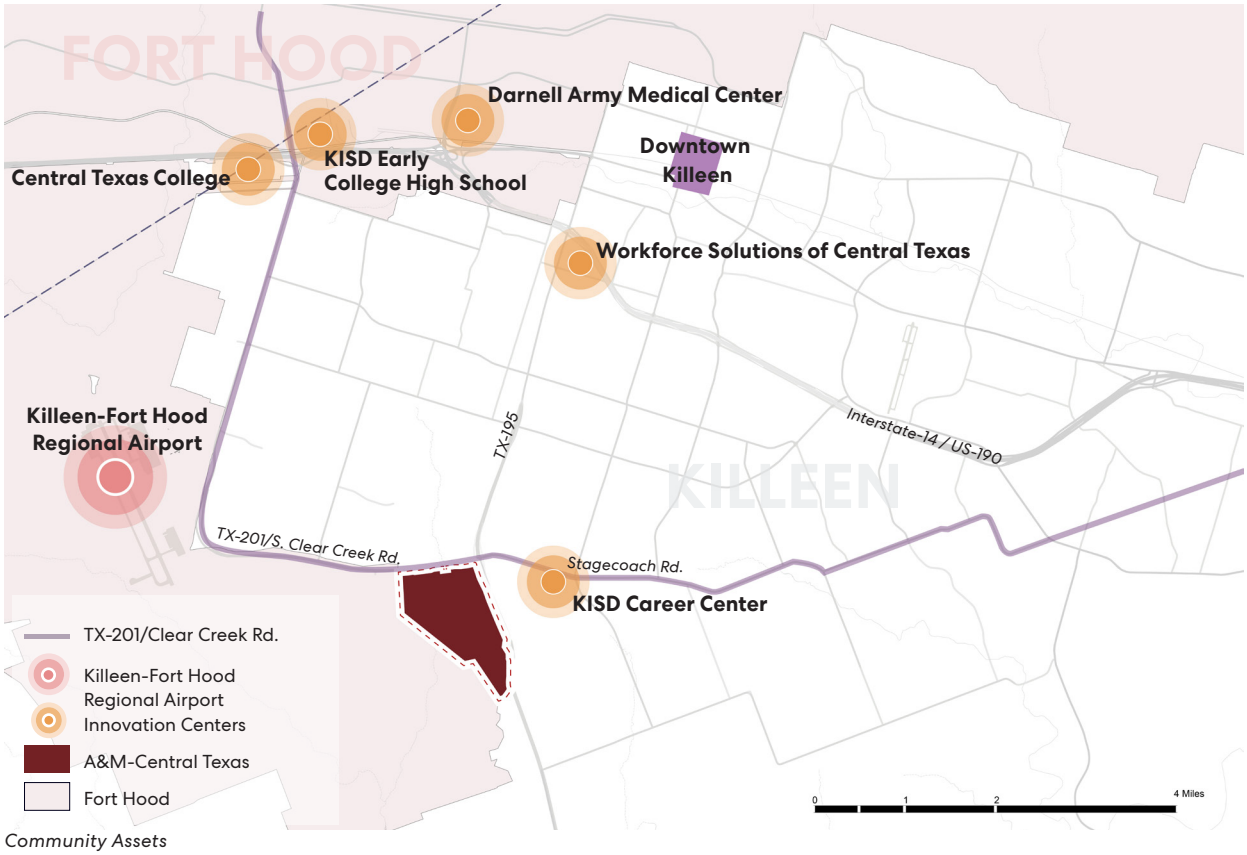
Killeen is located approximately 20-miles west of Interstate 35 at the terminus of Interstate 14. The community is part of the three county Central Texas region, encompassing Bell, Coryell, and Lampasas Counties. The Killeen-Temple-Fort Hood metropolitan statistical area (MSA) boasts a population of almost a half million people, according to 2020 census data, and it includes Fort Hood, the largest U.S. Armed Services active-duty base.

Sharing its western border with Fort Hood, A&M-Central Texas is nestled within a beautiful, hilly 672-acre campus. In addition to Interstate 14, the campus is proximate to significant transportation infrastructure resources. It is located at the intersection of Texas State Highways 195 and 201, an hour's drive to Austin and Waco. The campus is also just over three miles from the Killeen-Fort Hood Regional Airport (GRK), which offers direct and non-stop service with connecting flights to Dallas/Fort Worth International Airport (DFW).

A&M-Central Texas is part of the fabric of the U.S. Army at Fort Hood and its regional community. Soldiers, their family members, and veterans comprise more than 45% of the university's student population. Intentionally created as an upper-level university, A&M-Central Texas is as strong partner with existing educational partners, such as Central Texas College (CTC). The university and CTC have also extended their partnership to local school districts with partners like Killeen Independent School District (KISD), and its nearby Career Center and its Early College High School. The CTC campus and these KISD resources are all within a 10–15-minute drive time from the campus.



Roadway Network



Community Assets

Market Economics

This reliance on Fort Hood creates numerous challenges and opportunities for Killeen that must be considered for the creation of the Forge. Fort Hood is presently stabilized from a Base Realignment and Closure (BRAC) perspective, providing economic stability. In addition, Operational Test Command (OTC) is headquartered at Fort Hood, along with four of its eight directorates, offering numerous opportunities for technology development and advancement. The military presence has afforded Killeen strong infrastructure, including a regional airport.

Some of the challenges Fort Hood has created are regarding the transient nature of the military and the military population skewing toward young males with a lower level of educational attainment. As a result of combat-related experience, Post-traumatic stress disorder (PTSD) impacts on soldiers and their families is a top concern.

Killeen's economy is heavily concentrated in government (which includes the defense sector), accommodations and food services, and the retail trade.

Killeen's economy lacks some of the supportive industries necessary for an innovative, defense-led ecosystem, but nearby Austin has a strong foothold in necessary industries.

Killeen can leverage Austin's industry strengths to grow supportive industries essential to an innovation economy such as Computer Systems Design and Related Services, Scientific Research and Development Services, and Management, Scientific, and Technical Consulting Services.

Location Quotient (2021)	Killeen	Austin
Industry		
Government	3.59	1.02
Supportive Industries		
Federal Government, Military	27.84	0.34
Support Activities for Air Transportation	4.93	0.51
Federal Government, Civilian	4.54	0.65
Facilities Support Services	4.17	0.66
Scientific research & Development Services	0.16	0.82
Management, Scientific, & Technical Consulting Services	0.21	2.08
Computer Systems Design & Related Services	0.29	2.69
Software Publishers	0	2.25
Architectural, Engineering, & Related Services	0.33	1.59

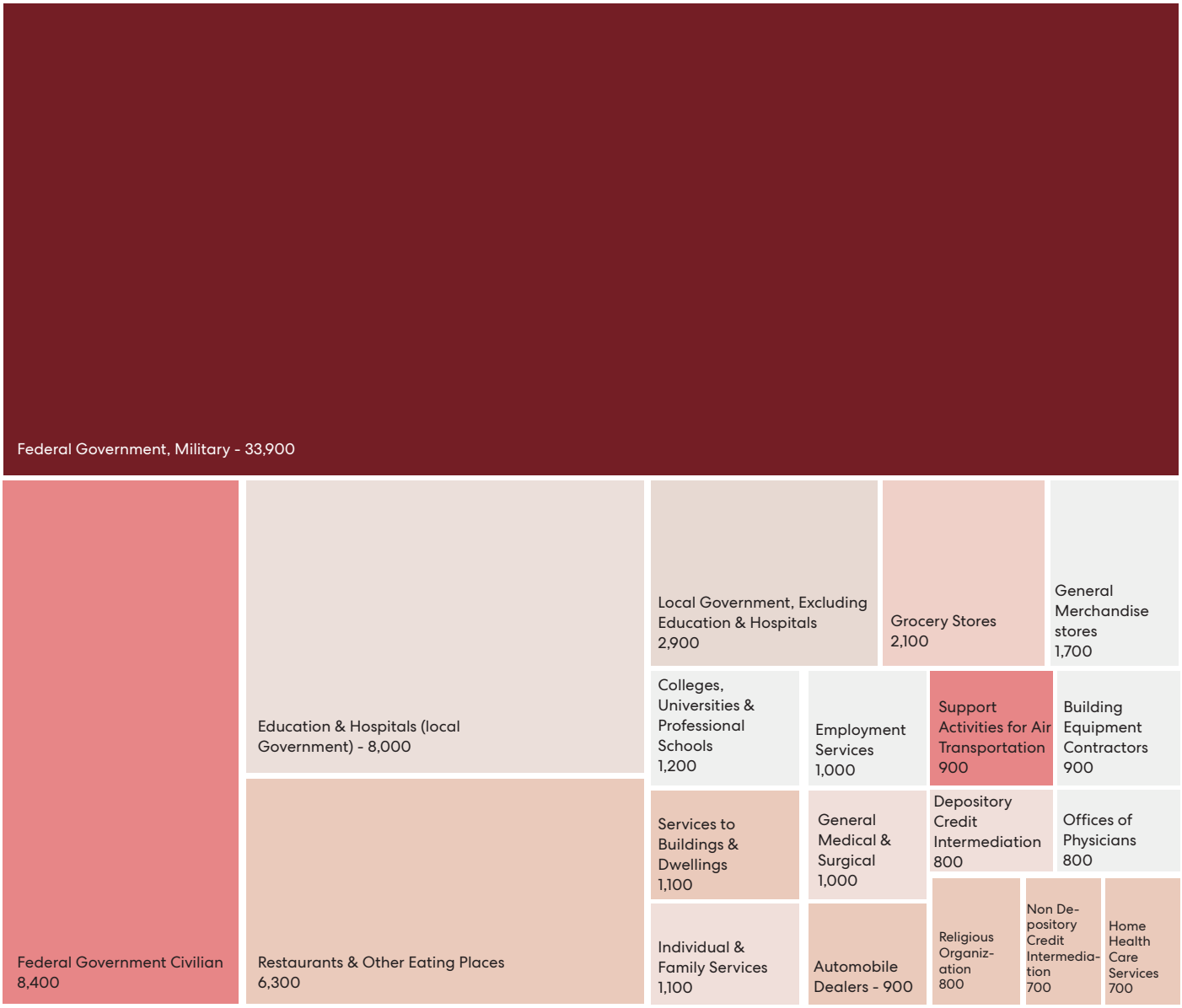
Industry Location Quotient (2021)

*A **location quotient of 1** means an industry is **as prevalent** in a region as in the nation.*

*A **location quotient below 1** means an industry is **less concentrated** in a region compared to the nation.*

*A **location quotient above 1** means an industry is **more concentrated** in a region compared to the nation.*

Fort Hood and the military are the economic anchors of the region and play a critical role in providing regional infrastructure as well as community resources.



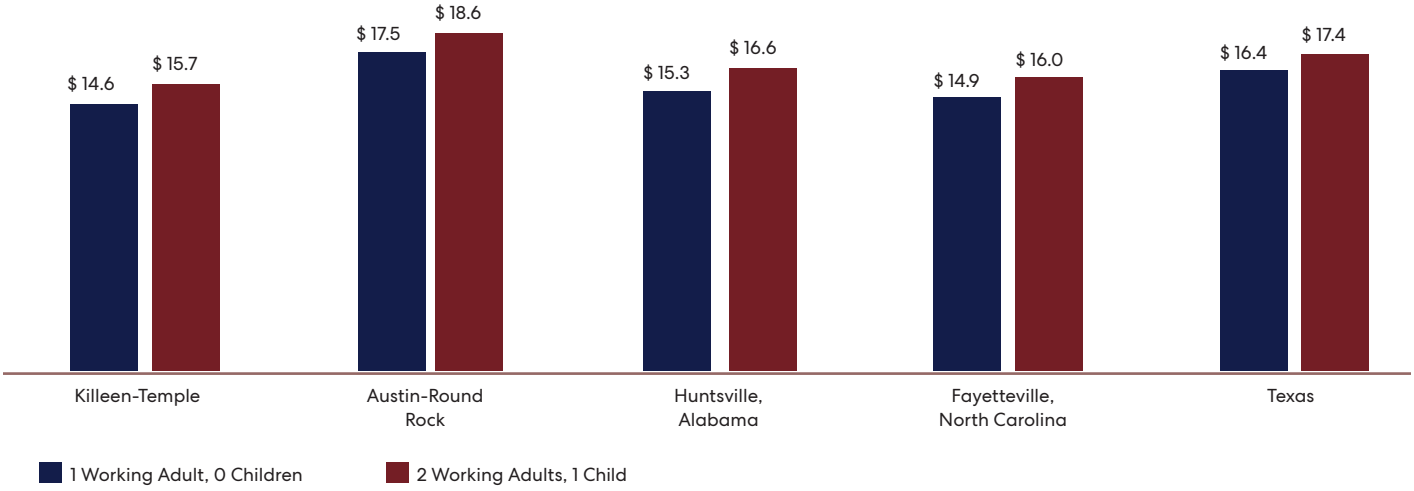
Regional Employers

Fort Hood and the military are the primary employers in Killeen. Healthcare is also a vital component of the region's economy.

Real Estate and Living Conditions

Killeen residents can enjoy a high quality of life for less than Austin and other similar areas such as Huntsville, AL and Fayetteville, NC. Killeen's living wage—the hourly wage needed for a full-time worker to support themselves—is below the Texas state average and $3/hour below Austin. The lower cost of living results in savings that can be passed on to the businesses that choose to locate in Killeen.

Despite Killeen's relative affordability, business attraction has been difficult for Killeen, and the economy remains heavily dependent on the military and service industries. Killeen's economy is heavily concentrated in government (which includes military), accommodations and food services, and the retail trade.



Living Wage Hourly (by County)

The living wage shown is the hourly rate that an individual in a household must earn to support his or herself and their family. The assumption is the sole provider is working full-time (2080 hours per year).

Source: *MIT Living Wage Laboratory, 2022*

MULTIFAMILY

20% Population growth in Killeen in the last 10 years

8% Housing inventory growth in the last 10 years

OFFICE

0 SF Class A office in Killeen

6.6% Vacancy Rate

HOSPITALITY

69% of Hotels in Killeen are Economy or independent

$81 Current ADR in Killeen; $15 below Fort Hood per diem

RETAIL

0% Vacancy in nearby Killeen mall

0 Retail offerings in walking distance of the Forge

Killeen's real estate market offers an opportunity

Existing market conditions alone will likely not drive the economic results that local leadership seeks but show the potential for a vibrant, programmatically driven Forge that can attract private investment.

RESIDENTIAL

The Forge's ecosystem may be **bolstered by multifamily housing;** the supply of multifamily housing has become very tight with few new deliveries in recent years.

OFFICE

The Forge's could deliver the **only class A space in Killeen,** attracting more professional companies and government contractors.

INNOVATION

Killeen has limited existing nnovation space, and almost all existing lab and innovation space is on the university's campus. However, there have been **promising coworking and job training developments recently.**

RETAIL

The Forge's retail offerings should not only serve each user group's immediate needs, but also act as **places for user groups to come together** in a meaningful way that spurs innovation.

Real Estate Opportunities for Forge

Market analysis of Greater Killeen revealed opportunities to make a new market for strategic office and lab but also complementary product types that can drive activation of the research park. Market analysis suggested that a mix of office/lab, multi-family residential, convenience retail, and innovation spaces would be attractive, but would likely need alternative funding and delivery mechanisms to be financially feasible.

Built Fabric

Google Earth Image
Date Captured: 1/2018

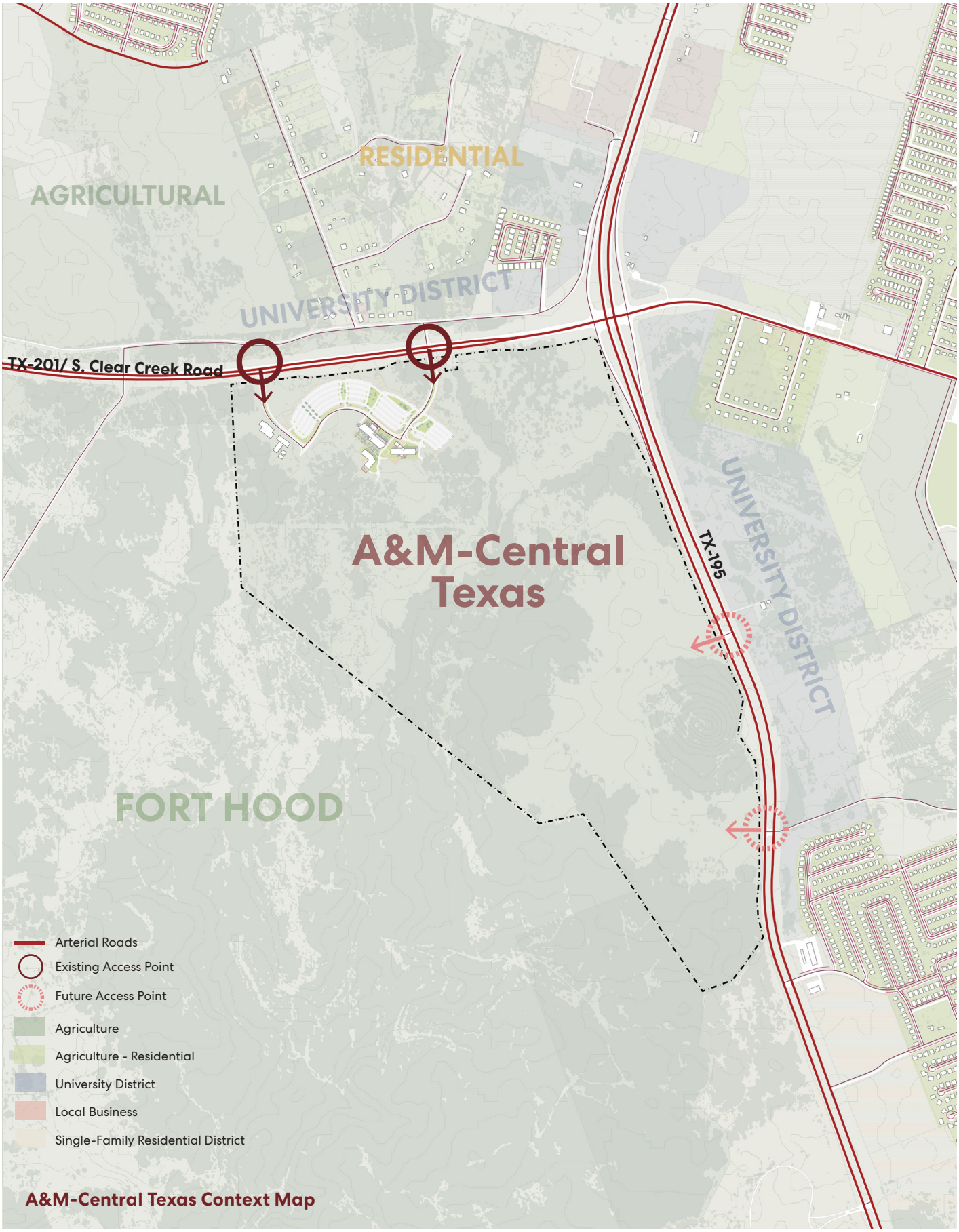
Drone Survey Image
Date Captured: 9/2018

The A&M-Central Texas campus is located in a low-density area at the southwestern edge of Killeen. The surrounding development has a rural character with the prevalent zoning designation being agricultural, agricultural single-family residential, and single-family residential. Across the road at the intersection of the highways neighboring the university campus, there is a "University District" zoning designation which allows for uses supportive of the academic institution with medium-density development (up to four stories).

Most of the neighboring land is composed of large parcels with an average area of 4.2 acres within a half-mile capture area of the campus, while the median area of parcels within the capture area is 0.2 acres. This demonstrates the emergence of subdivided properties within the neighboring land, however further breakdown of land will be required in order to create a well-connected community surrounding the campus.

The existing developed area is located on the northwestern portion of the site, with parking being provided on the northern fringe and development of the campus core south of the campus loop road coming off of TX-201 (Leadership Place). This approach to the site layout allows for a pedestrian-only core and park-once strategy as the campus develops further. Currently there are three buildings on campus, all of which house mix of activities with no single building dedicated to a single function.

The first building of the campus, Founder's Hall, is primarily dedicated to classroom space and academic offices but also has some small areas for student life/services and retail. Founder's Hall also houses the university's first industry partner, Centex Technologies. The second building built on-site, Warrior Hall, houses the library in addition to academic spaces and administrative functions. Trideum, the university's second industry partner, has a space on the third floor. The third building of the campus is Heritage Hall, which is home to the existing recreational spaces. The design of a central plant , police, and service building that will be located near the intersection of entrance two and Leadership Place is currently underway.



A&M-Central Texas Context Map

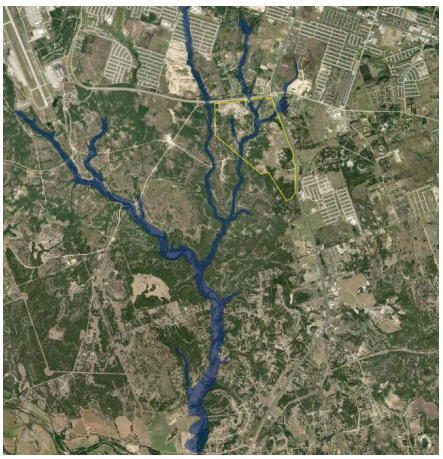
Natural Systems

Bald Knob, a natural landmark on site

Golden cheeked-Warbler, endangered species inhabiting the site

Vegetation on site (shrub, grassland, live oaks, and evergreen forest)

Black-capped vireo



Regional Hydrology

Located on the continental transition from eastern forests to western grasslands, the overlap of habitat types on the A&M-Central Texas property supports exceptional biodiversity and regional connectivity. The campus landscape reflects a classic natural mosaic over limestone geology, with several distinct community types: live oak groves, grassland, evergreen forest, and scrub shrub. The latter offers nesting habitat for the endangered golden-cheeked warbler (GCW) (Dendroica chrysoparia, second photo, left).

The unique rolling topography of the site ranges from a low point of 835 feet, where North Reese Creek drains to the southwest boundary, to 1,075 feet at Bald Knob on the eastern side (top photo, left). Soils on the campus are derived from Lower Cretaceous limestone varying in texture by landform, from higher dry, rocky soils to more alluvial, finer clays in the drainages.

To guide the most thoughtful approach to future campus development, an ecologically based landscape assessment and suitability analysis focused on the most sensitive natural features.

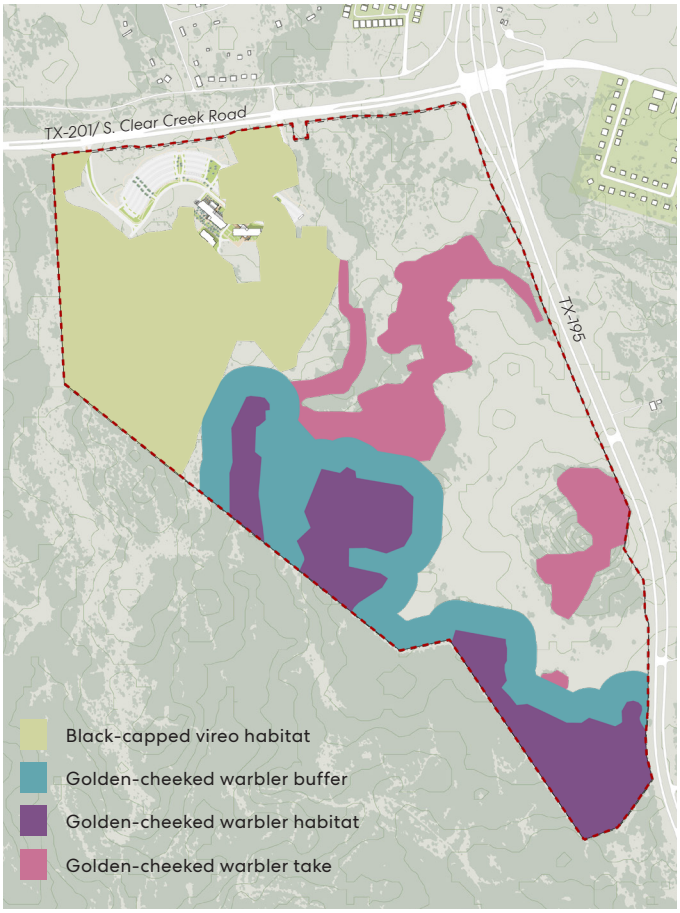
These were identified as:

- Habitat for sensitive, threatened, and endangered species such as the GCW, whose habitat spans the boundary between A&M-Central Texas and adjacent Fort Hood
- Floodplains and riparian buffer, which include their associated creeks and recognizes downstream connections
- Land cover types and connectivity
- Slope
- Soil depth and vulnerability to erosion

Because this landscape retains so much of its native character, this planning effort is a singular opportunity for A&M-Central Texas to reflect best practices for ecological stewardship and to be a living laboratory to study landscape resilience and regeneration.

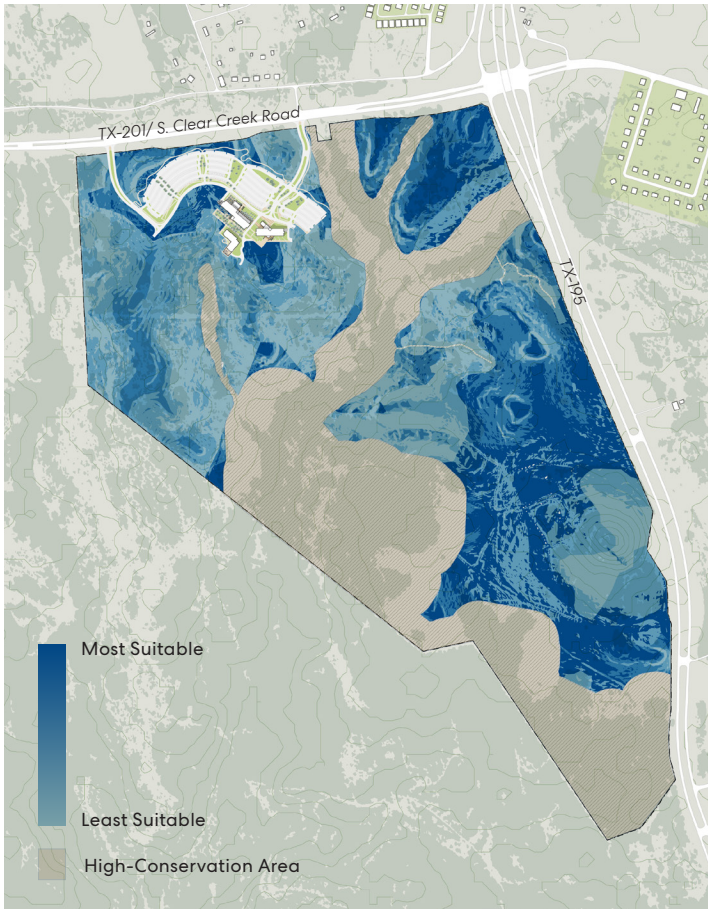
Reese Creek watershed connections

North Reese Creek flows through A&M-Central Texas. Downstream it converges with Reese Creek, which in turn joins the Lampasas River and ultimately the Brazos River. Protection of headwaters such as Reese and North Reese creeks is essential to maintain water basin resilience.



Habitat

Habitat zones for two sensitive bird species known to be present on the site.



Ecological Suitability

Identified high-conservation areas are all GCW habitat, streams, and floodplains (light brown). Other areas were ranked according to likely ecological impacts and need for protection, with the lightest green areas as the most suitable for conservation and protection and the darkest green areas most suitable for future development.

A multiscale ecological planning approach carefully identifies unique features of a site, such as Bald Knob and GCW habitat, which in turn are interpreted in landscape, regional, and continental perspectives. A GIS-based ecological suitability analysis ranked geospatial data of key site features (landcover, soils, sensitive habitat zones, geology, hydrology) to identify high-priority areas for protection (light brown and lighter green, above right) and isolate locations where future development will be the least impactful to the site and regional ecosystems (dark green). GCW habitat and floodplains represent the most sensitive zones, followed by slope due to its relationship to distinct landforms. The final map (right) shows the results of the suitability analysis used in the planning process to site future development and identify ways we can recognize, celebrate, and protect the unique ecological identity of A&M-Central Texas.

3. The Vision

Goals & Objectives
Goals and objectives for the research park

Guiding Principles
The main principles shaping the Forge

Design Framework
Plans and design framework for the vision of the research park

Programmatic Framework
Blended community at the Forge and the building programming framework

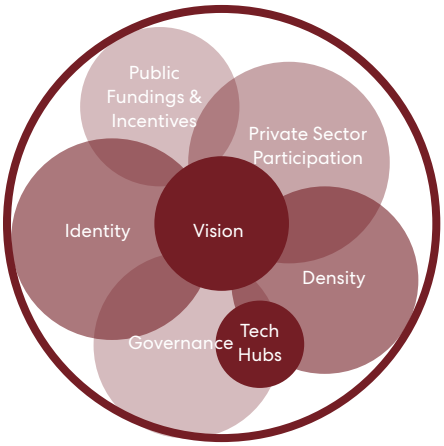
Phasing
Steps throughout the campus development

The Vision for Forge @A&M-Central Texas was a result of an involved stakeholder process, which established goals and objectives for the project, resulting in a set of Guiding Principles that set the direction and intent for future development. This chapter tells that story and paints the vision for the Forge in physical terms, demonstrating the site framework and bringing the vision for its public spaces to life. Finally, it outlines a conceptual phasing plan for future construction and identifies several near-term projects to launch this important initiative.

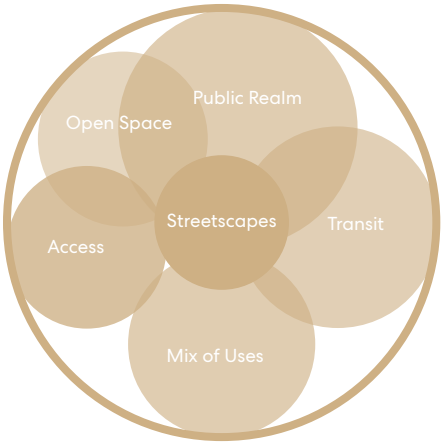
“We believe the concept of having academia live, learn, and work alongside private industry is both desirable and attainable. And our vision for “Forge @ A&M Central Texas” is just that, to have the university engaged with the way our community works, creating a viable environment where one is continuously engaged with the other, and where learning and industrial growth are integrated.”

President Marc A. Nigliazzo

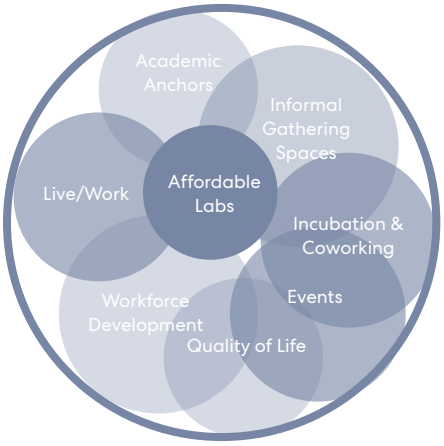
Texas A&M University-Central Texas



Program
Partnerships
Financing & Tools



Place
Infrastructure
Urban Realm



People
Talent & Collaboration
Identity

Goals & Objectives

A group of local leaders were selected as a steering committee during the plan to lead the decision-making process. During a visioning exercise with the consultants, the stakeholders identified that they're looking to create an engine of innovation at A&M-Central Texas that drives economic growth for the local economy. This driver of economy will seek to serve Fort Hood and related defense programs and leverage these assets as a differentiator for research enterprises. Throughout this effort, a synergetic relationship between government, academia, and industry should be developed that benefits the region.

Through interviews with different stakeholders, a set of goals was developed to envision what the future of the Forge looks like.

Forge @ A&M-Central Texas should be:

- An epicenter of innovation that puts Central Texas on the map.
- An engine of economic opportunity and resilience for the region.
- An active hub where students, researchers, industry, and government connect to solve problems.
- A place that is representative of the region, its resources, and community.

Strong innovation economies have an alignment of three key asset types.

Source: *The Rise of Innovation Districts: A New Geography of Innovation in America. Brookings Institute, 2014.*

Engaging with stakeholders

Throughout the design process, the planning team met and collaborated with community stakeholders for envisioning the Forge.

Stakeholders had a range of views on the opportunities and challenges facing the region, but key themes emerged:

Talent	• Academic offerings need to align with industry needs • Military is a driver of talent attraction AND creation; Fort Hood discharges 600+ soldiers per month	• Develop partnerships with industry and the military that can leverage the talent pipeline to fill employment gaps
Space	• The quality of housing built in Killeen has been described as poor • There is limited quality office space in Killeen	• Develop housing and office space for industry at the Forge
Amenities	• People who live in Killeen noted the lack of unique dining options	• Include retail, entertainment, and restaurant amenities to encourage activation
Perception	• Killeen is seen as lacking amenities to attract talent • Some stakeholders expressed concerns with crime and public safety	• Continue to invest in quality-of-life improvements to attract and retain talent
Connection	• Expand existing connections between the university and Fort Hood • There are limited contractors located at Fort Hood	• Build spaces for contractors to conduct research • Include infrastructure conducive to private sector-government collaboration

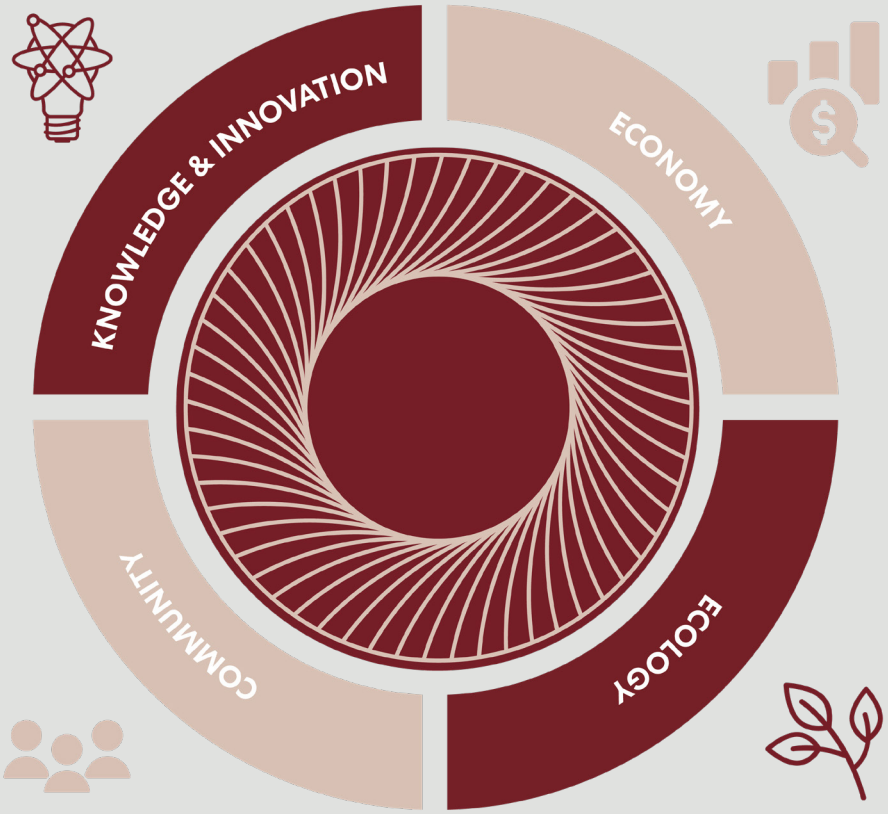
Guiding Principles

Knowledge and Innovation

- Enrich the daily experience by integrating research, academic, and industry uses
- Design distinct characteristic neighborhoods
- Achieve student success in academics and personal development
- Consider the future of education & work

Economy

- Build strategic opportunities and partnerships to further the mission and reach of the institution
- Attract talent and investment to Central Texas
- Develop high-quality facilities that do not currently exist in the Killeen market
- Position the research park as a nexus between government and industry



Community

- Develop a collaborative space and activity that fosters interaction among individuals and organizations
- Foster the diversity among students, faculty, support staff, researchers, industry professionals and families
- Create a cohesive, well-connected place that is accessible and welcoming to all
- Establish a sense of place unique to A&M-Central Texas
- Celebrate & enhance tradition & legacy of the A&M-Central Texas brand

Ecology

- Preserve the unique ecology and natural resources of the site
- Create a robust landscape and network of green spaces
- Implement low-impact development (LID) strategies that go beyond conventional development
- Identify future development opportunity zones and areas where development is not appropriate

Best Practices

At its current phase of planning, the Forge may benefit most from best practices around early-stage research park development. Stakeholder feedback identified three areas of need that best practices research validated as fundamentally important to early-stage research park development: programming, governance, and implementation.

1| Program: The most successful research parks are established around a programmatic strategy to capitalize on existing or planned research funding and growth.

- Prioritize defense-oriented industry with civilian applications to bolster the existing relationship with Fort Hood.
- Build on existing funding opportunities available through federal, state, and local sources.
- Identify programmatic areas that are growing to attract students, partners, and industry.

2| Governance: University-led research parks benefit from governance structures that provide some level of independence and flexibility.

- Establish a governance structure that prioritizes research partnerships and programmatic outcomes rather than institutional process.
- Create governance processes that allow the research park to move at the speed of business.
- Integrate Federal agencies into governance thinking to help drive partnerships and programs forward.

3 | Implementation: Clear and well-developed tactics of implementation, such as real estate development planning and partnerships, often lead to successful outcomes.

- Address deed restrictions and other property constraints that may affect development potential.
- Invest in catalytic infrastructure to encourage and invite private capital.
- Explore State and Federal funding and resources for catalytic investment to support existing and key growth industries.

Program

The most successful research parks are established around a programmatic strategy to capitalize on existing or planned research funding and growth.

Governance

University-led research parks benefit from governance structures that provide some level of independence and flexibility.

Implementation

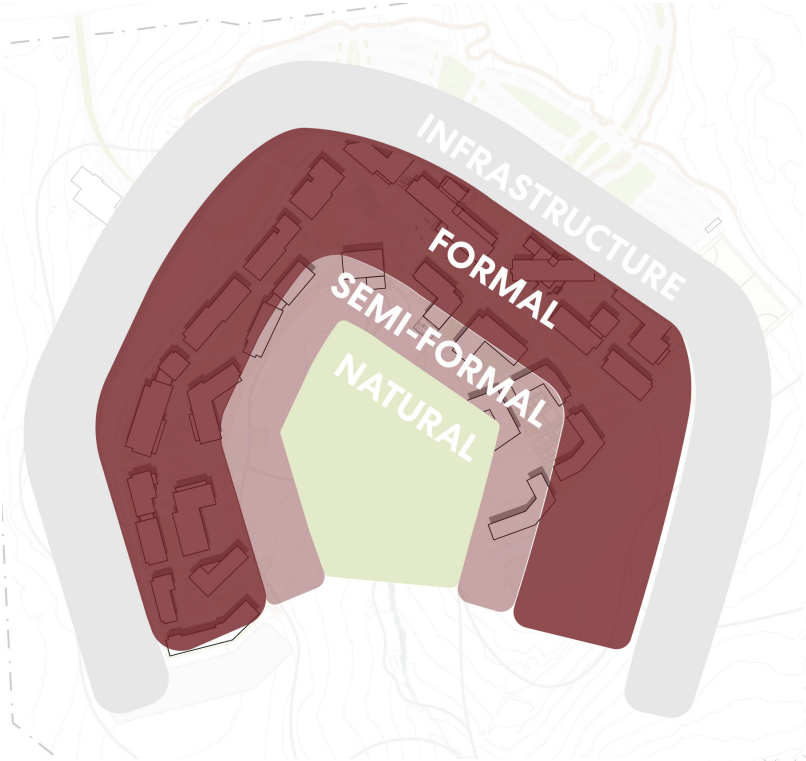
- *Eliminate Deed Restrictions*
- *Catalytic Investment*
- *Explore State and Federal Funding*

Design Framework

The concept plan looks to create a gradient of spaces moving from a natural preserve area at the heart of the full buildout of the campus, to semi-formal spaces, and formal built-environment, all serviced by a ring of infrastructure which will be centered on the continuation of the existing vehicular road at the edge of the existing buildings. This approach will create a walkable campus core that allows for people interacting in a variety of public spaces.

This concept plan supports creating the Forge research park as an embedded part of the Texas A&M University-Central Texas campus with a hybrid approach to housing university and research park functions within the facilities on campus. The epicenter of this convergence will be the main heart of the future campus, the collaboration quad.

The main forming element in this concept plan is the pedestrian mall enveloping the natural preserve area which allows for building sites to be located on both sides of its corridor. Along this pedestrian mall, various forms of open space allow for gathering of academics and industry individuals all together. This creates “bumpability” within the campus - purposeful design of spaces and places to support ‘accidental’ interactions. Mixing uses horizontally across the site and vertically throughout buildings allows for a range of co-location of various users that reinforces the concept of Forge as a blended knowledge community.



Establishing a gradient of space types

←

Creating a connected network of open spaces with the "Collaboration Quad" at the heart of the campus

→

Creating a truly blended knowledge community where programs are nested together

←

Ecological Framework

Herbaceous (foreground), shrub/scrub (background)

A&M-Central Texas Campus is a classic natural landscape mosaic of several community types. The photo at left was taken from the south side of Knob Hill, showing four habitat types. The grove of trees in the middle is shown from the ground above.

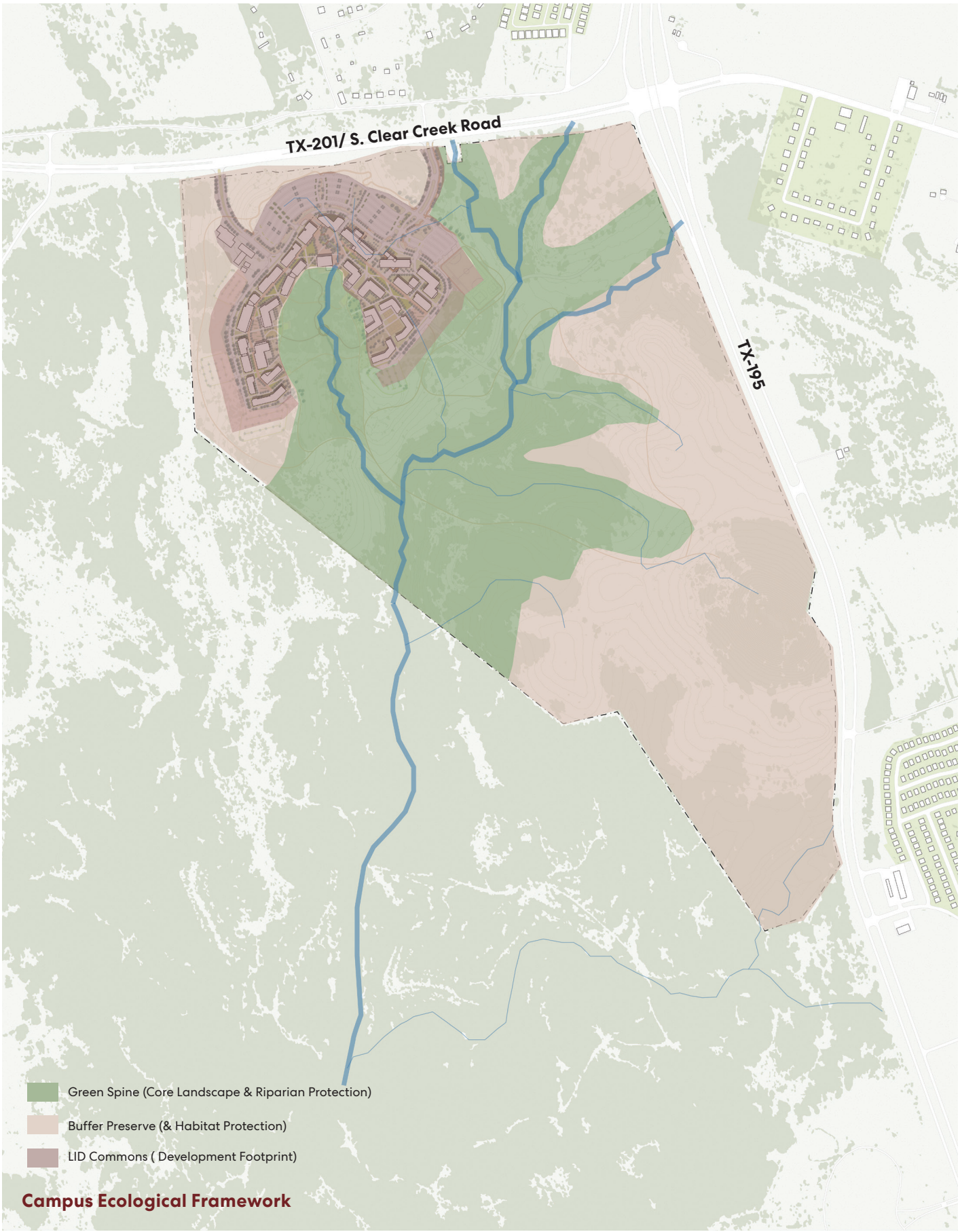
A holistic ecological planning approach for A&M-Central Texas integrates our regional setting, the landscape, the community, and local culture. The ecological network design supports a thriving university, resilient local ecosystems, and a vision for the future that reflects the regenerative ethos of the university. Given its unique ecological value and its significance to the community, it is an opportunity to celebrate and protect our ecosystems and regional connectivity.

The suitability analysis and subsequent design considerations identified three major zones in an overarching ecological framework for the plan. The Buffer Preserve lies along the western borders adjoining Fort Hood and serves as a protective buffer for sensitive habitats on campus. It protects core forested areas including habitat and habitat connections for the golden-cheeked warbler (Dendroica chrysoparia) and black-capped vireo (Vireo atricapilla). Although the vireo is no longer listed as endangered, it remains a species of concern and presents a high-value conservation opportunity (see map, next page).

The Green Spine reaches into the heart of the proposed campus, ensuring protection and enhancement of numerous natural drainages and their riparian zones. With the campus effectively gathering around the northwest sector of the property, this second major planning zone showcases hydrology in an arid landscape, honors the importance of headwaters to downstream function, and connects the campus community to this sensitive resource, both visually and physically.

The third zone, the Low-Impact Development Commons, encompasses the campus development footprint. The LID Commons is the space where sustainable design, construction, and management prioritize regenerative practices and least environmental impact with a focus on plant palette and integrated water strategies.

There are design elements throughout these three major zones to promote recognition of and connection to local habitat. For example, in the LID Commons, a water feature at the heart of the Collaboration Quad protects the existing channel, enhances stormwater management, and provides an opportunity for interaction and learning. Throughout the Buffer Preserve and the Green Spine, a sensitively designed trail network weaves through different habitats and natural features, allowing visitors to experience and learn about these special native ecosystems. Observation points provide spaces for rest and reflection.



Campus Ecological Framework

The Plan

The plan for Forge @A&M-Central Texas is a physical representation of the goals, objectives, guiding principles, and design framework described in this chapter. The plan is organized to build off existing development and infrastructure, while capitalizing on the natural amenities of the unique site location. Development is situated on a local ridge which keeps topographic change within the campus to a minimum, while preserving areas of natural value for habitat and water quality as identified in the site analysis.

A green finger of preserved open space divides the campus into east and west forks, and is punctuated by trails that connect the two sides. Buildings flank either side of a pedestrian spine in the shape of a wishbone, coalescing at a vibrant open plaza or "collaboration quad" at the northernmost apex of the spine. Moving outward in either direction from this main public space, you encounter a series of smaller public spaces, each with its own character and uses.

In keeping with the "blended knowledge community" approach, buildings are not designated as solely academic, research, housing, or student life but may encompass multiple uses or tenants as development progresses and university and industry needs emerge. Flexibility is key to the plan, and the need to adapt to future needs is paramount to the success of the Forge as a place and an economic driver.


TX-2017 Clear Creek Road
E. Campus Dr.
Leadership Pl.
Leadership Pl.
Pedestrian Spine
Pedestrian Spine
Collaboration Quad
Wornor Hall
Heritage Hall
Founders Hall
Preserved Open Space
Recreation Fields

A Connected Environment

The trails and access approach across the campus property preserves and protects natural areas, honoring habitat and sensitive topography while responding to the landscape vernacular. The concept plan is organized around a series of open spaces, interconnected along an interior pedestrian spine that traverses the campus in the form of a wishbone. The two prongs of this wishbone converge at the northern-most vertex of the campus, the first branching directly southeast on the established axis toward Bald Knob, presenting a more formal and traditional campus axis that lends structure to the space and buildings that front it. The second, newly proposed branch, curves its way along the local ridge toward the southwest, following a more sinewy path where the frontages of buildings step in and out from the pedestrian spine, allowing a series of discoveries as the space constricts and opens along its length.

The organization of the plan in this manner allows for a variety of open space types to be strung along this wishbone-shaped pedestrian spine, each space corresponding to and supporting the functions of the buildings that frame it, whether intended for events, informal gathering, collaboration, learning, relaxation, or recreation.

This central pedestrian spine is complemented by a network of trails that first mirror its curve along the interior of the site, skirting the edge of the Green Spine at the rear of the inner ring of buildings, creating a natural connection between the divergent segments of the campus.

This design for a connected campus supports the congregation of academics, researchers, industry professionals, students, locals, and other visitors who gather during different activities within the main quads, pedestrian corridors, courtyards, and indoor gathering spaces. This connective network goes beyond the built environment to respond to the natural hydrology, sensitive habitat areas, and the natural environment unique to this region of Central Texas.

Building Courtyard

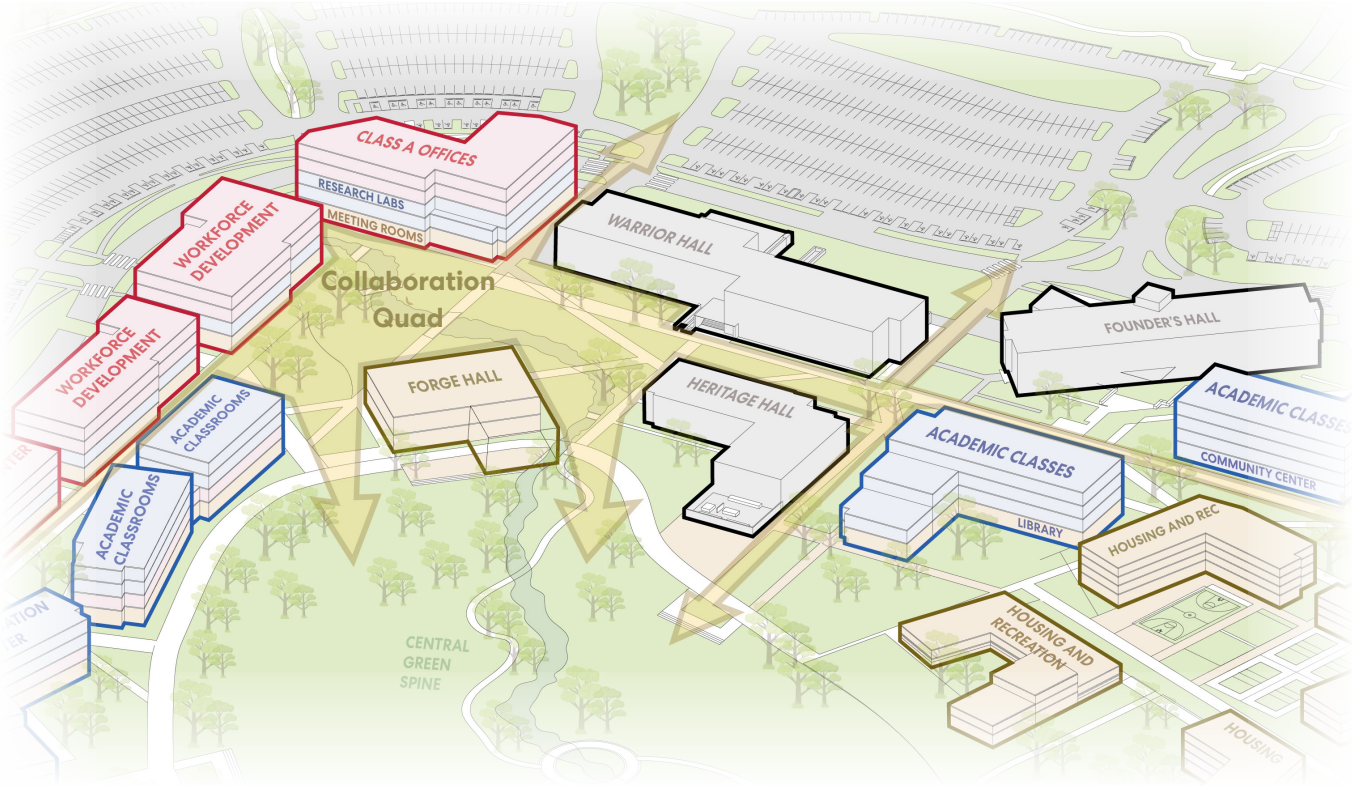
Building courtyards are programed to respond to the surrounding buildings and their uses.

Open Space Hierarchy

A variety of open space typologies are shaped along the central pedestrian mall and trail network.

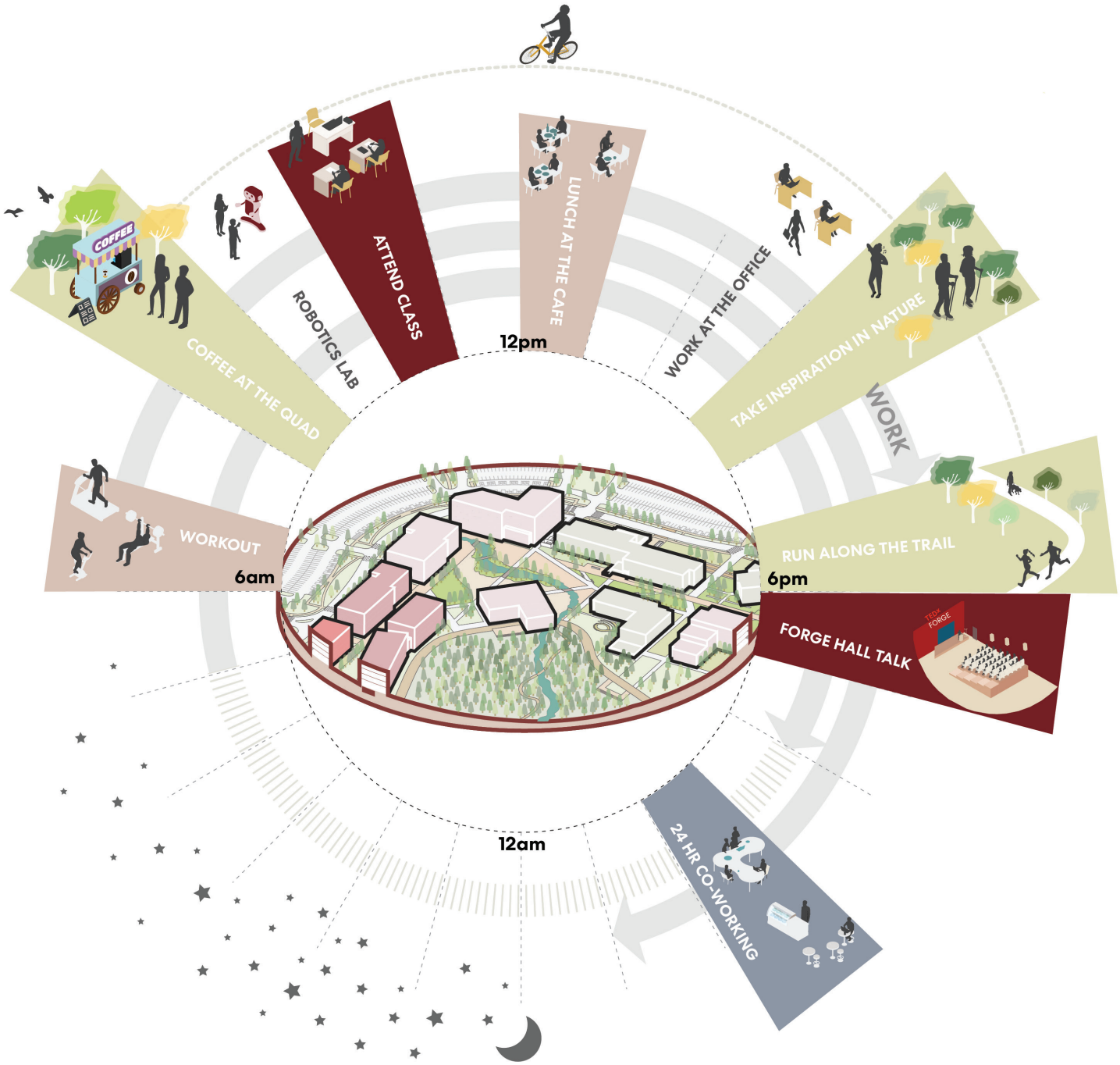
An intersection of preserved open space and the built fabric meet to lend each other the means to support community life in Forge @A&M-Central Texas. The preserved central green area enhances the regional ecology as well as creating a community asset for rest and recreation for people studying, working, or living within the campus area.

A Blended Knowledge Community



The Forge research park as a creative community will be active all throughout the day with different activities taking place at different locations on site. In order to keep the entire campus active and avoid having certain areas becoming dormant during the day, a hybrid space programming approach is proposed to mix academic, industry, and community service uses within all facilities of the campus. In addition to activating all spaces within the campus throughout the day, this approach enhances the opportunities of collaboration between industry and academia, which empowers the knowledge economy within the community.

This programming approach seeks to place elements of a live, work, play community all throughout the campus development. Buildings located geographically together will have a balanced programming that enhances on another's activities while avoiding creating nuisances for their respective functions. This allows for creation of a community that supports most needs of its members and provides opportunities for enhancement of various aspects of their lives.



Day in the Life at the Forge

The Forge is always activated throughout the day and community members participate in various activities within the campus.

Programmatic Drivers

The Forge should be a dynamic, defense-driven research community that celebrates Killeen's unique context. There are three key programmatic mechanisms for making the Forge a reality:

1. Capture and retain the talent pipeline and research opportunities from Fort Hood.

Fort Hood is a natural programmatic driver for the Forge, offering an unrivaled talent pipeline with opportunities for additional workforce development through A&M-Central Texas. There are over 600 soldiers exiting monthly from Fort Hood, many with security clearance and transferable technical skills. Killeen already has 70 defense contractors, but one of the greatest challenges both the contractors and the military face is the lack of a trained workforce in Killeen. The Forge is an opportunity to develop a local talent pool.

2: Train and develop the talent to respond to industry and offer spaces for industry to connect with the talent.

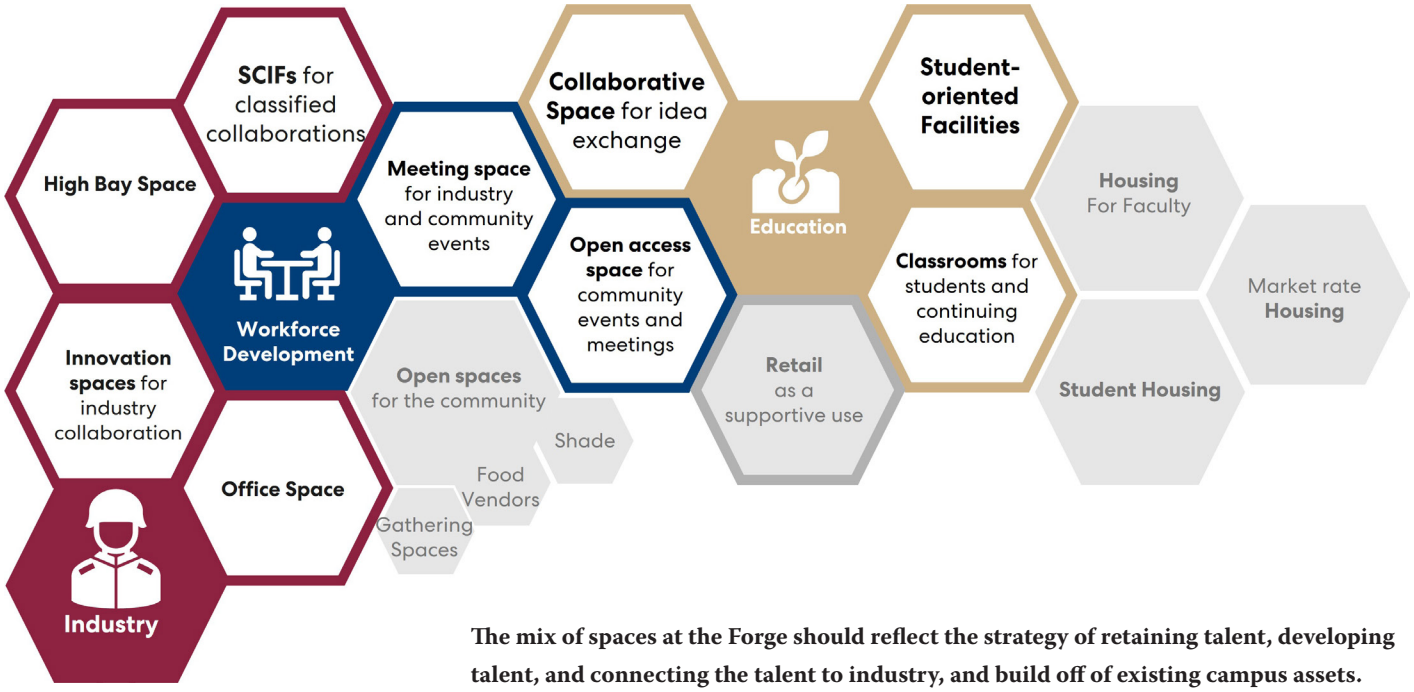
A&M-Central Texas should work with TAMUS to build off existing programs develop new and innovative programs that will support the System's mission. Aside from A&M-Central Texas, Killeen is home or proximate to multiple education institutions that can partner with industry at Forge @A&M-Central Texas.

- Texas A&M Defense Cyber Leader Development Program (DCLDP)
- Cooperative Ed.D in Educational Leadership with Cognate in Research & Testing

Texas A&M-Central Texas should work with TAMUS to develop new programs that will support the local defense industry and create a pool of talent that will draw new defense contractors and research to the region.

3: Leverage the TAMUS's connection to the military to celebrate Texas A&M-Central Texas' unrivaled proximity to Fort Hood.

While the recently established U.S. Army Futures Command (AFC) is not based at Fort Hood, A&M-Central Texas should capitalize on the existing relationship with TAMUS and proximity to AFC in Austin. The Forge can capitalize on this proximity by creating channels for collaborative research and creating facilities that can support AFC's research in a local setting near Fort Hood. While a majority of the AFC relationship may continue to occur in Austin and at the TAMUS RELLIS Campus, the Forge's proximity to Fort Hood and its soldiers cannot be replicated at RELLIS and should be promoted as such. Partner with the military to offer community, exhibition, and conference space that may not be available "inside the fence".



The mix of spaces at the Forge should reflect the strategy of retaining talent, developing talent, and connecting the talent to industry, and build off of existing campus assets.

Collaborative spaces are important to creating an environment at the Forge that will support talent retention and development.

As the defense industry shifts to be more focused on technology, spaces at the Forge should welcome tech-driven defense contractors and entrepreneurs, and should accommodate collaboration and innovation. To support the defense industry and its connection to the talent pipeline, the Forge should offer secure and innovative spaces for collaboration.

The Forge may be able to offer talent – graduating soldiers and students – as well as industry and academic research partnership opportunities that benefit the U.S. Army Operational Test Command (OTC) at Fort Hood and create a vibrant ecosystem of innovation and commercialization.

Industry Assets	Existing A&M-Central Texas assets	To be incorporated into the Forge
Proximity to Fort Hood	●	●
Industry-focused Academics	◕	●
Veteran-heavy student body	●	●
Office space for industry	◔	●
SCIF's	○	●
Collaborative research center	◑	●
Fort Hood student research opportunities	○	●
Housing	○	◑
Supportive Retail	○	◕

First Movers

A&M-Central Texas can catalyze the development of the Forge by focusing on strategic first moves. This should begin by developing a hybrid facility including 40,000 – 60,000 SF mix of creative office and research/lab space that is privately developed and anchored by the university.

A privately developed building anchored by the university is an example of the type of catalytic investment with limited upfront capital requirement that has worked in other innovation districts to attract industry partners and follow-on investment. This approach would be in keeping with other university-driven projects across the United States, such as North Carolina State University, Clemson, Georgia Tech, etc., where the university uses programs to drive a development scenario and stimulate a new market.

New creative office space generated under this recommendation is estimated to generate asking rents in the mid-$20s per square foot, which is likely closer to the market rate needed to drive private development of similar creative office product.

The proposed hybrid facility should include a mix of flex, dry lab, and office spaces intended to capture untapped market opportunities. This hybrid facility absorbs and expands upon the requirements for the previously proposed Research and Testing Annex. For example, the first floor of the hybrid facility may include 20' ceiling heights to accommodate flex space for machinery and equipment related to prototyping, testing, and evaluation.

Flex and dry-lab space could also accommodate select academic programs and/or resources, including, but not limited to, those identified in the prior Research and Testing Annex Program of Requirements POR. Some shared conference/meeting space with the university may be desirable, though the building should function primarily as an office space versus the current arrangements with Trideum and Centex where each firm is creating office space in an otherwise classroom/academic building. Flexible space could include options for small offices, coworking spaces, and shared meeting and conferencing spaces that operate on short-term leases and are subsidized by public funding.

First moves should include uses that will attract people and promote vibrancy.

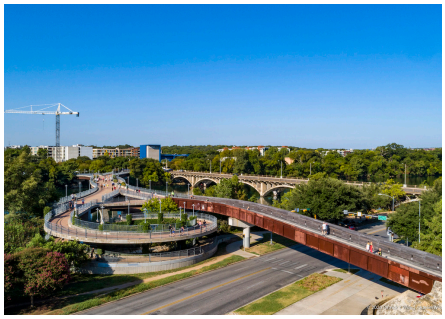
Development of 100-150 units of mixed housing.

A meaningful level of residential development in a first phase will be important for creating a sense of place at the Forge. Residents on campus will create energy beyond the typical "9-to-5" workday. Subsequent development on site should lead with additional residential units to bolster this placemaking goal.

Development should include ground-floor, small-scale, and convenience retail amenities within the office and student housing developments to service office users, residents, visitors, students, and the local community.

As a first move, the research park should focus on small-scale and convenience options located on the ground floor of the office and student housing developments proposed to meet the immediate needs of these users and provide spaces for collaboration. Immediate recommendations include fast-casual restaurants, an independent coffee shop, and small-format convenience store to allow affordable and convenient dining options, informal spaces for collaboration, and access to convenience items.

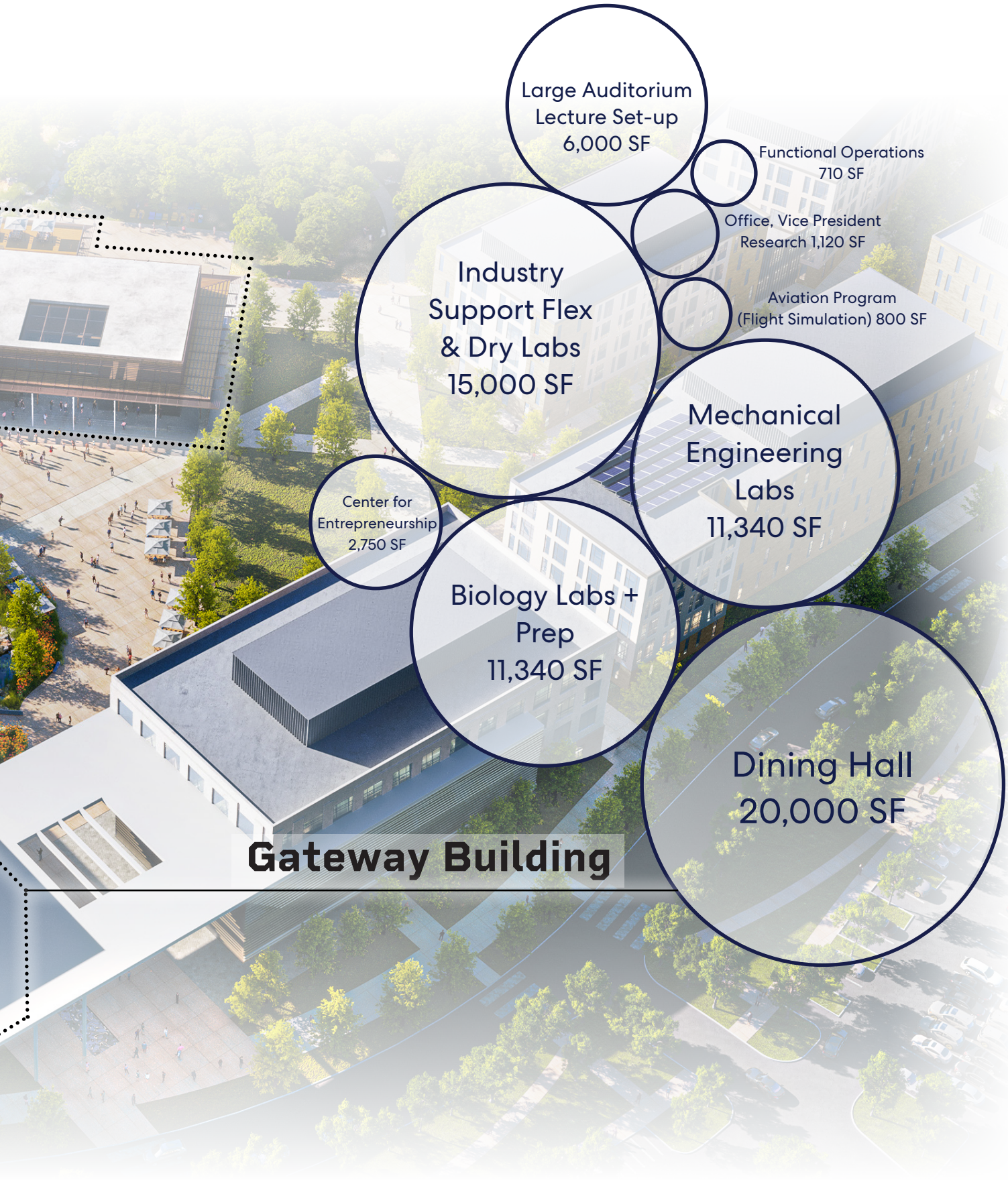
Catalytic infrastructure may include open spaces and amenities that are attractive to talent.



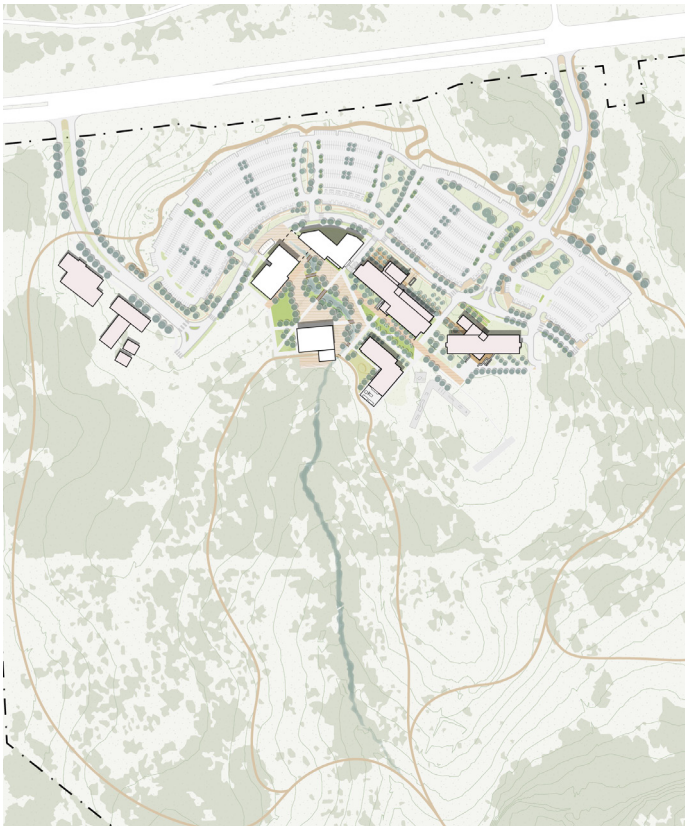
Though not the development of office space, Greenville's redevelopment of Falls Park on the Reedy is an example of how public-led infrastructure investment can ignite private investment. The city invested $13 million in public infrastructure and greenspace to create Falls Park, which then attracted over $100 million in additional private investment within two years. Similarly, A&M-Central Texas has already invested in buildings, infrastructure, and parking to make the Forge a desirable place for growth.

The First Two Buildings:

The first two buildings to be developed on site begin to frame the Collaboration Quad, the heart of Forge @A&M-Central Texas, as well as creating a new gateway to this community space. The Forge Hall is designed to be a community asset, accessible by all that represents the blended community. The first of the Gateway buildings will house a hybrid of academic and industry related uses to support the Forge community.


Large Auditorium
Lecture Set-up
6,000 SF
Functional Operations
710 SF
Office, Vice President
Research 1,120 SF
Aviation Program
(Flight Simulation) 800 SF
Industry
Support Flex
& Dry Labs
15,000 SF
Mechanical
Engineering
Labs
11,340 SF
Center for
Entrepreneurship
2,750 SF
Biology Labs +
Prep
11,340 SF
Dining Hall
20,000 SF
Gateway Building

Phasing Approach



Phase 1a

The initial phase builds out the Collaboration Quad along with the buildings that frame this public space: the Gateway Buildings and Forge Hall.

Phase 1b

The other element of phase one extends the eastern leg of the pedestrian spine and identifies a near term opportunity for housing to the Southeast.

Existing

Academic/Research:	**~300k Sq. Ft.**

Phase 1a

Academic/Research/Industry:	**~210k Sq. Ft.**

Subtotal (Ph-1a)

Academic/Research/Industry:	**~510k Sq. Ft.**

Phase 1b

Academic/Research/Industry:	~100k Sq. Ft.
Residential:	~110k Sq. Ft. (~150 units)

Subtotal (Ph-1b)

Academic/Research/Industry:	~610k Sq. Ft.
Residential:	~110k Sq. Ft. (~150 units)
Subtotal:	~720k Sq. Ft.

Phase 2

The second phase infills the remaining eastern axis and continues growth westward from the Collaboration Quad, beginning the southwestern pedestrian spine.

Phase 3

The third phase extends the remaining portion of the southwest axis, with opportunity for further partnership buildings and housing.

Phase 2

Academic/Research/Industry:	~325k Sq. Ft.
Residential:	~120k Sq. Ft. (~160 units)

Subtotal (Ph-2)

Academic/Research/Industry:	~935k Sq. Ft.
Residential:	~230k Sq. Ft. (~310 units)
Subtotal:	~1.15 M Sq. Ft.

Phase 3

Academic/Research/Industry:	~475k Sq. Ft.
Residential:	~170k Sq. Ft. (~225 units)

Totals (All Phases)

Academic/Research/Industry:	~1,410k Sq. Ft.
Residential:	~400k Sq. Ft. (~535 units)
Total:	~1.8M Sq. Ft.

Site Sustainability & Phasing Strategy

The ultimate goal for the A&M-Central Texas Campus is to be self-sustaining; to maintain capacity over time as social, environmental, and economic dynamics change and evolve. However, it will take time and planning to establish a thriving and regenerative ecosystem as the site continues to develop.

1. First and foremost: protect, enhance, and steward the sensitive existing natural resources on site, including sensitive species habitat, riparian corridors, other unique geological or ecological site features; avoid impacts by keeping the development footprint tight and oriented toward previously developed northern edge of site.

2. Planned future development should adhere to the site-wide ecological framework and green infrastructure network: a green spine is protected and enhanced with native plantings; within the focused development footprint green infrastructure treats water in the development zone before it enters the green spine or the native habitat buffer zones of the campus property. Ensure buildings are sustainable and resilient following the Living Systems Framework. Incorporate sustainable systems that will allow the community to be independent from outside resources (energy, water, materials, etc.).

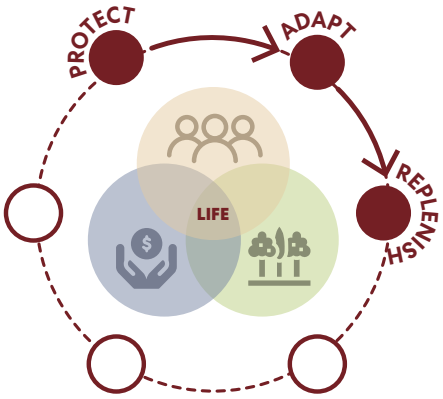
3. Strengthen regional landscape connectivity using sustainable materials.

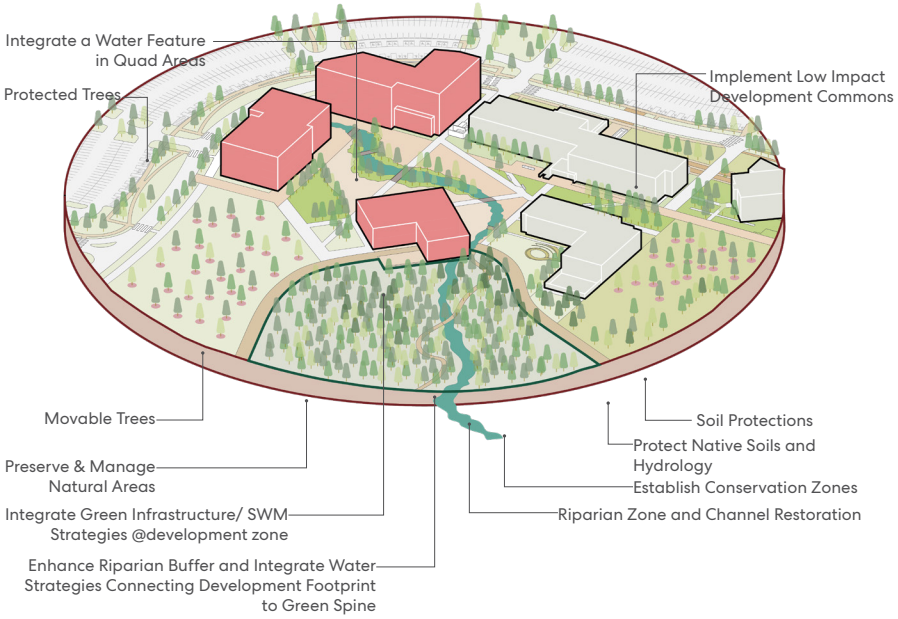
4. For all future new development, integrate native landscape plantings and integrated green infrastructure (bio-retention, rain gardens or wetlands as appropriate) to manage stormwater closest to where it calls (i.e. Low Impact Development strategies).

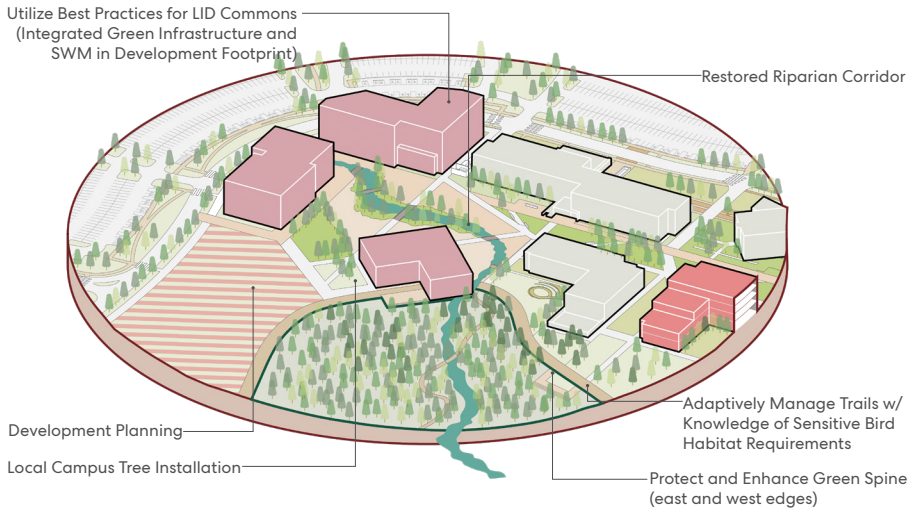
5. Employ sustainable and regenerative management and maintenance practices across the campus landscape to support long-term health and function (avoiding fertilizers and pesticides).

6. Integrate learning and research opportunities connected with curriculum focused on ecosystem services, ecosystem management, sustainable building systems, climate change and resilience in arid landscapes, etc.

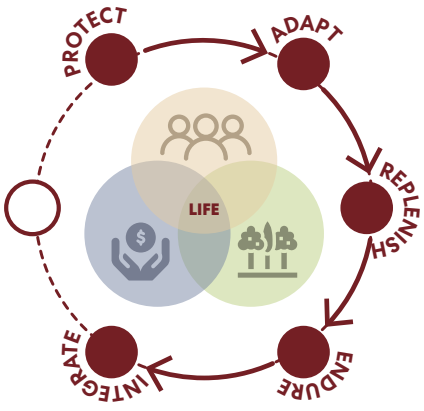
Initial Construction and Site Preservation (0-1 year)



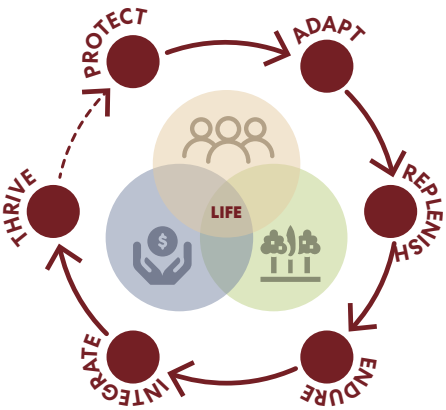


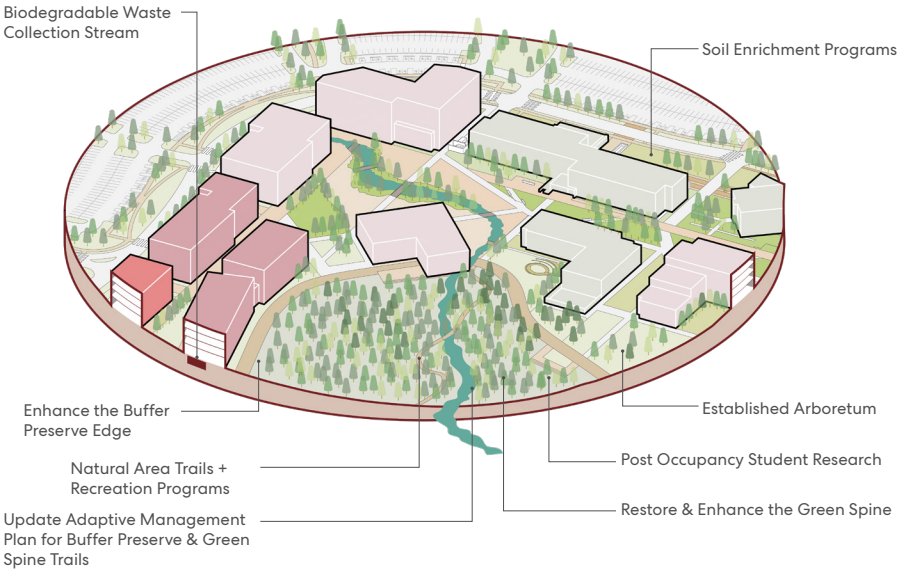


Early Establishment (1-5 years)



Long-Term Objectives (5+ years)





4. Conclusion

Key take-aways
Forging the path forward

Acknowledgement
Community contributors to the plan development process

Conclusion

Together, A&M-Central Texas, TAMUS leadership, the U.S. Army Fort Hood, and key partners of the Greater Killeen community can have a transformational impact on the regional and state economy through focused academic, defense, and industry collaboration.

The idea, the programs, and the place that form Forge @A&M-Central Texas are where emerging and divergent technologies can be incubated, cultivated, and advanced. The creation of this new innovation ecosystem will help in accelerating the Army's modernization efforts and increase talent development and entrepreneurial pathways for soldiers, their families, and veterans, as well as others throughout the community.

This collaboration between university researchers and the private sector will provide direct benefits to both the local community, the Department of Defense, and the State of Texas, and the proof of concept has been delivered on the A&M-Central Texas campus.

The Proof of Concept

Since its founding in 1962, born of an idea by aerospace engineer Dr. Wernher von Braun, Cummings Research Park in Huntsville, Alabama has emerged as the second largest research park in the U.S. Over the last sixty years the site has represented a vibrant mix of a collaboration and economic success as defense, aeronautics, academia, and private industry have come together to solve the most pressing issues of the day.

In 2012, Founders Hall, the first building on the A&M-Central Texas campus was dedicated. In November of 2021, Huntsville-based Trideum opened its Killeen office. Just a year prior, another locally grown national defense contractor, Centex Technologies, partnered with A&M-Central Texas to conduct digital forensics research. Already, two growing private industry defense contractors occupy space in campus buildings, collaborate with faculty and student researchers, recruit and employ graduates and student interns, and are working with the Operational Test Command at Fort Hood to help ensure our soldiers remain at forefront of Army modernization.

Just like Cummings Research Park, successfully implemented, Forge @A&M-Central Texas has the potential of reinventing and diversifying the market and establishing an innovation economy in the Killeen region.

Action without planning is the cause of all failure. Action with planning is the cause of all success."

— Brian Tracy

A Plan Must Be Acted Upon

For further details regarding background, analysis, and recommendation of the plan, supplementing this summary report is a separate detailed appendix, which covers topics in greater detail, such as:

- Detailed existing conditions analysis
- Case studies and best practices
- Real estate market analysis
- Design guidance for sustainable buildings, open space, and infrastructure
- Brand guidance
- Phased implementation and first-movers recommendations
- Key program drivers
- Governance and programming

In conclusion, for A&M-Central Texas and its community to be successful in forging forward on a new innovation trajectory, there are a few key factors that must remain at the forefront:

- U.S. Army Relations – Strong ongoing academic and industry ties with the military (III Corps, Fort Hood, OTC, AFC) must remain in effect and be further cultivated, even as leadership transitions among organizations. This includes addressing existing deed restrictions on the site.
- TAMUS Support – Its vast statewide resources, ranging from TEEX to TEES and from the RELLIS Bush Combat Complex to its partnership with AFC, TAMUS is a crucial resource and potential protagonist that must be enlisted to ensure success.
- State of Texas & Federal Support – Leveraging TAMUS relationships, critical resources may be marshalled from state and federal sources at the Texas State Capitol in Austin and Washington, DC.
- Forge Structure of Implementation – Developing and evolving a strong governance system and operational structure as the blended knowledge community grows at the Forge will be crucial.

"I am excited to see Texas A&M University-Central Texas bring innovation and opportunities to its students and to Central Texas. Trideum's on-campus office will be a great resource for students and staff to expand their education and increase future opportunities. Trideum's goals of enhancing cybersecurity and strengthening our national defense will integrate perfectly with Texas A&M University-Central Texas' cybersecurity program, and I am eager to see the beneficial work this partnership produces."

— U.S. Representative John Carter

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Project Core Leadership Team

Todd Lutz, Vice President for Finance & Administration, A&M-Central Texas

Dr. Russell Porter, Vice President for Research, Economic Development & Innovation, A&M-Central Texas

Dr. Taylor Harvey, Associate Professor, Engineering, A&M-Central Texas & Texas A&M Engineering Experiment Station Regional Division Head

Dr. Walt Murphy, Executive Director for Research, A&M-Central Texas

Scott Connell, President & CEO, Greater Killeen Chamber of Commerce

John Crutchfield, Former President & CEO, Greater Killeen Chamber of Commerce

Lenna Barr, Vice President of Finance & Administration, Greater Killeen Chamber of Commerce

Rebekah Moon, Vice President of Investor Services, Greater Killeen Chamber of Commerce

Texas A&M University-Central Texas Executive Leadership

Dr. Marc A. Nigliazzo, President

Dr. Peg Gray-Vickrey, Provost & Vice President of Academic & Student Affairs

Todd Lutz, Vice President for Finance & Administration

Dr. Russell Porter, Vice President for Research, Economic Development & Innovation

Clifton Jones, Assistant Vice President for Enrollment Management & Acting University Advancement Officer

Dr. Brandon Griggs, Assistant Vice President & Dean of Student Affairs

Other Key Contributors

Bell County

Central Texas College

City of Copperas Cove

City of Gatesville

City of Killeen

Fort Hood Regional Economic Development Corporation

Greater Killeen Chamber of Commerce

Heart of Texas Defense Alliance

Killeen Economic Development Corporation

Killeen Independent School District

Private Industry and Citizen Representatives

U.S. Army Fort Hood

Texas A&M University System

Workforce Solutions of Central Texas

Consultant Team

Perkins&Will | Prime Firm - Planning & Design

HR&A Advisors, Inc. | Real Estate Market Analysis & Advising

Nelson\Nygaard | Parking, Transportation, & Mobility Planning

Pacheco Koch | Engineering & Cost Modeling

Biohabitats | Ecological & Environmental Planning

Perkins&Will

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