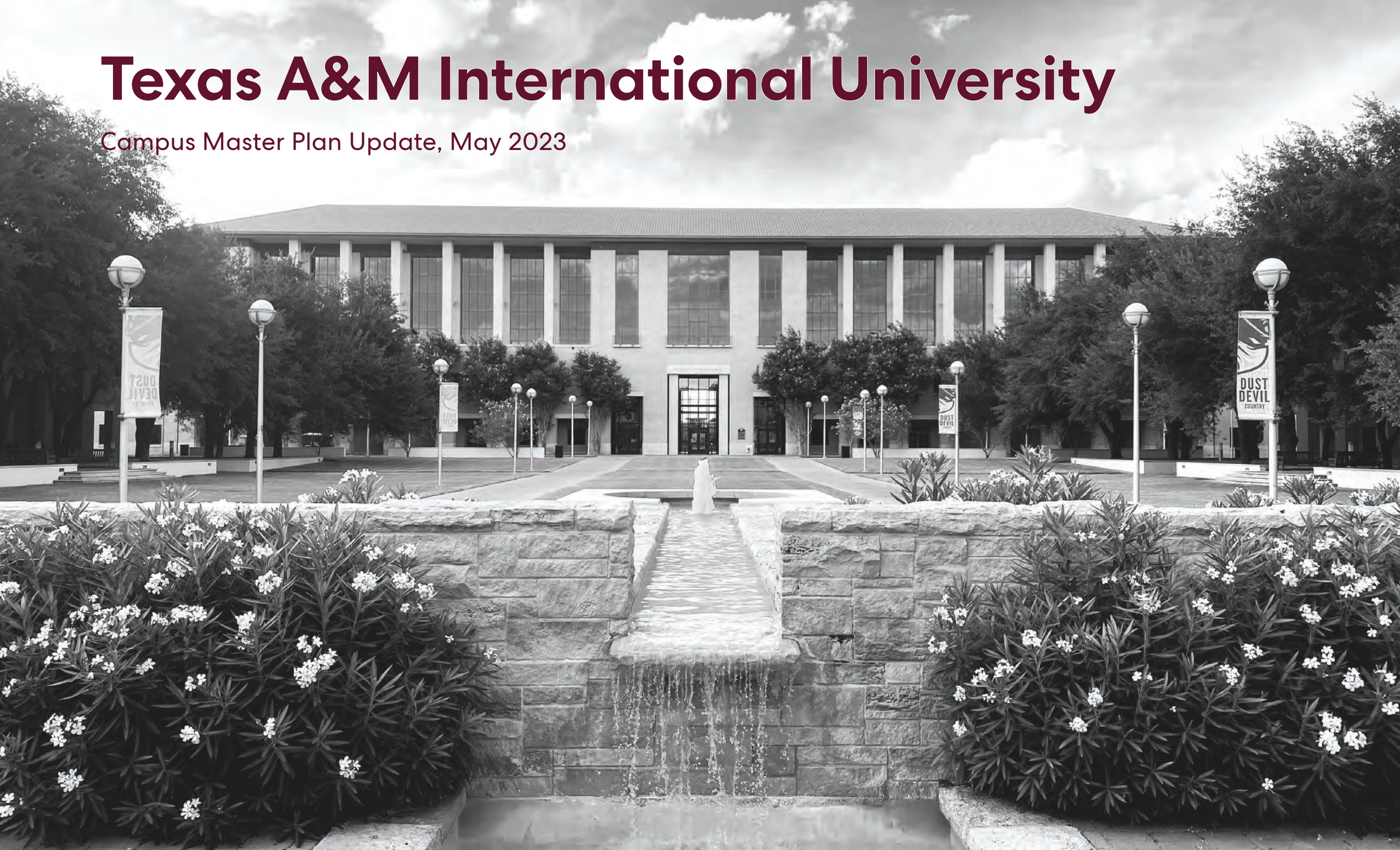


# Texas A&M International University

Campus Master Plan Update, May 2023







**TEXAS A&M INTERNATIONAL UNIVERSITY**  
A Member of The Texas A&M University System

Dear TAMIU Community Member,

I am pleased to present our Master Plan 2023, a vital tool to help guide the growth of Texas A&M International University's (TAMIU) 300-acre campus for years to come.

Great universities are the result of careful, deliberative planning. Dedicating our resources to creating a Master Plan affirms the importance of a unifying vision guiding future buildings, land use, and infrastructure changes needed to reach goals, adapt to change, and align with our overarching Strategic Plan objectives and our cherished Mission.

Simply put, regularly creating or updating a campus Master Plan is a smart thing to do. It helps ensure that the caliber and delivery of our programs and services emanate from a campus optimized for this. Project partner Perkins&Will have provided integrated services including planning, architecture, engineering, landscape design, and cost consulting.

The resulting Master Plan's data-informed inputs include existing conditions analysis, space utilization and benchmarking, enrollment statistics, and facility condition assessment. As such, it offers a holistic set of future improvement recommendations for land use and building renovation/ demolition/ new construction. Landscape design, infrastructure, transportation, and parking solutions have also been considered and created. As this Master Plan will inform our future capital plans, project descriptions, prioritization, phasing, and budgeting are included as essential elements.

With two new campus construction projects ahead, the new Health Sciences Education and Research Center and the Western Hemispheric Trade Center expansion, TAMIU's dynamic growth continues.

We're excited to share this Master Plan for TAMIU with you. My thanks to all involved in the Plan's creation and completion. It provides a powerful opportunity to look into our shared future and see how we can and will continue to "Go Beyond".

To find out more and view the Master Plan online, please visit [go.tamiau.edu/masterplan](https://go.tamiau.edu/masterplan)

Sincerely yours,

Pablo Arenaz, Ph.D.  
President

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# Acknowledgments

## TEXAS A&M INTERNATIONAL UNIVERSITY

### **Vice Presidents Council**

Dr. Pablo Arenaz, President  
Dr. Thomas R. Mitchell, Provost and Vice President for Academic Affairs  
Mr. Juan J. Castillo, Vice President for Finance and Administration  
Ms. Rosanne Palacios, Vice President for Institutional Advancement  
Mr. Juan G. Garcia, Interim Vice President of Student Success  
Mr. Steve K. Harmon, Director, Public Relations, Media, and Information Services  
Mr. Gilbert Zimmerman, Director of Athletics

### **Campus Planning Consultants**

Perkins and Will, Lead Campus Planner  
Nelson/Nygaard, Parking and Mobility  
Shah Smith & Associates, MEP Engineering  
Martinez Moore, Civil Engineering  
Coleman & Associates, Landscape  
Sunland, Cost Estimating

### **University Campus Plan Leads**

Mr. Juan J. Castillo, Vice President for Finance and Administration  
Mr. Trevor Liddle, Senior Director, Campus Safety & Planning



TEXAS A&M  
**INTERNATIONAL**  
UNIVERSITY

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TEXAS A&M INTERNAT



# Overview

1

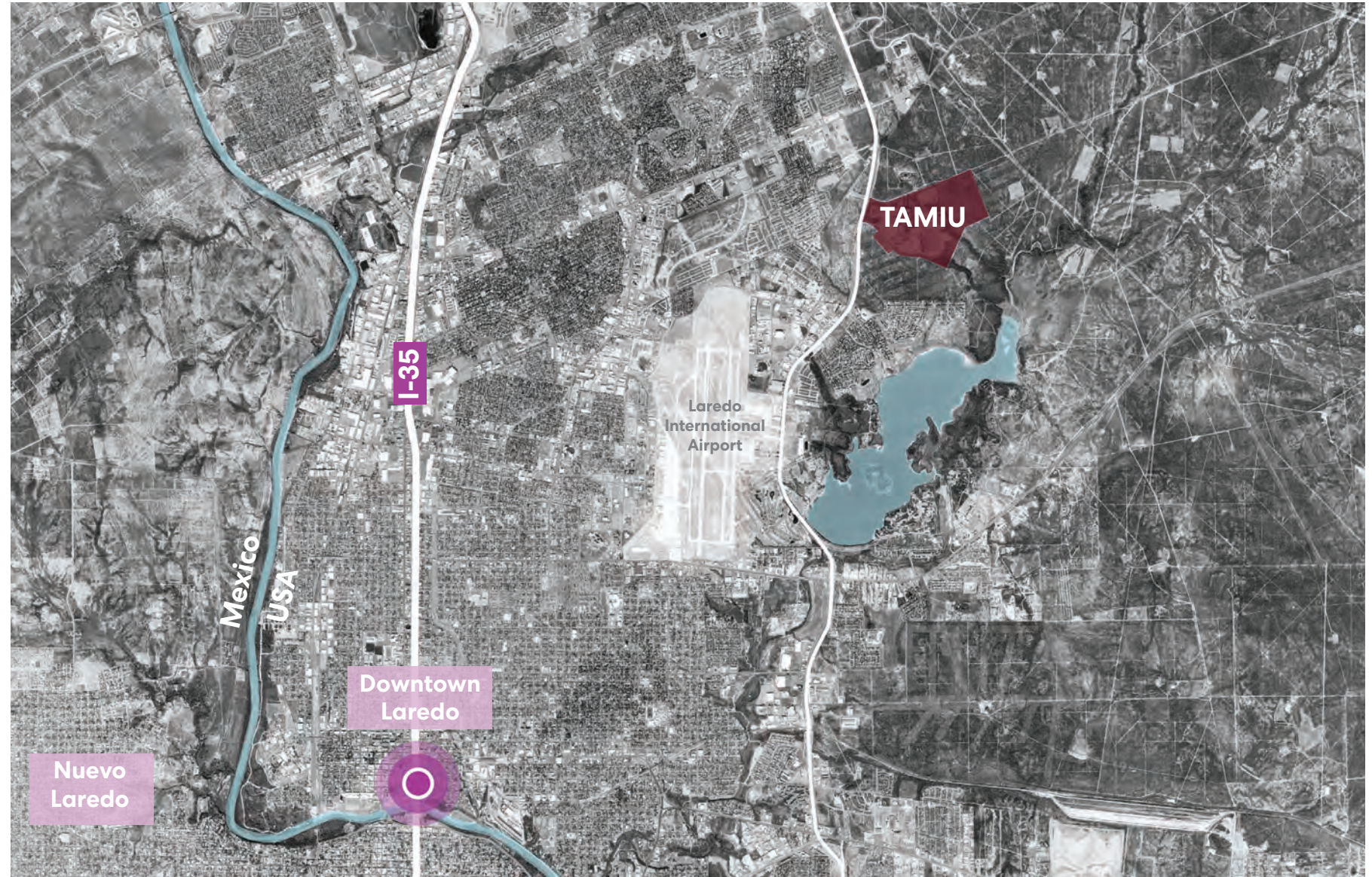
# Introduction

## Introduction

Texas A&M International University is situated in the northeastern portion of Laredo, about 10 miles from Downtown and the busiest overland port of entry into the United States from Mexico. The university's location in the south Texas borderland region is one element that makes TAMIU unique among its peers. The institution has grown rapidly over its relatively short history, having just recently celebrated the 50th Anniversary of its founding. Accordingly, the TAMIU continues to play a critical educational, civic, and economic role within the Laredo community and region.

## The Scope of this Plan

This planning effort was undertaken to look comprehensively at the existing and future needs for Texas A&M International University, set a vision for a long term future of the university from a physical standpoint. The plan considers academic, research, student life, athletics, recreation, housing, and support needs, looking at the facilities, infrastructure, transportation, and landscape systems that facilitate the mission of the university. The plan seeks to create both a “blue sky” vision for the future of campus and implementable near term projects that can have a more immediate impact.



TAMIU Campus Location Diagram





DUST  
DEVIL  
COUNTRY

DUST  
DEVIL  
COUNTRY

# Campus Evolution

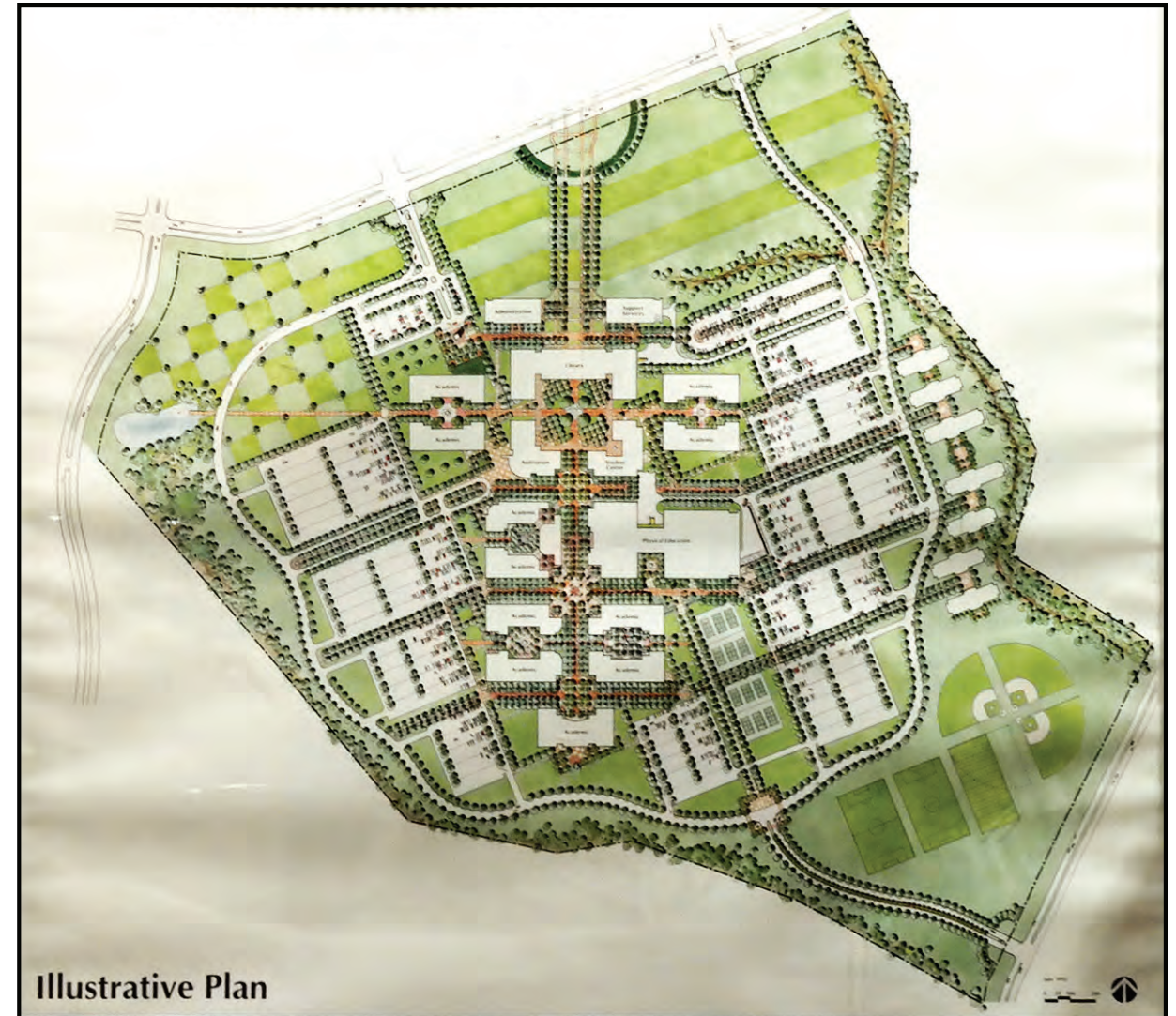
## From Concept to Campus

Texas A&M University was established by the Texas State Legislature in 1969 (originally known as Texas A&I University at Laredo and later Laredo State University), and shared space with Laredo Junior College for its first two plus decades. Beginning in with the completion of the original campus master plan in 1992 and the donation of 300 acres of land by the Killam family shortly thereafter, Texas A&M International University took its first steps to establish a new and permanent campus on the northeast edge of Laredo. The original plan for the campus was laid out along a north-south pedestrian axis with buildings closely framing building plazas, courtyards, and one larger quad, surrounded by a ring road and parking.

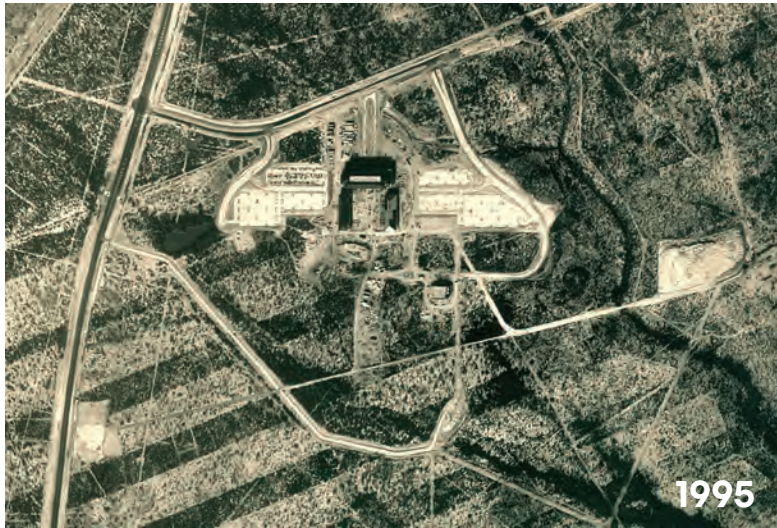
Beginning with Killam Library, the campus plan has hewed to this original concept with a high degree of fidelity, earliest and northernmost buildings which frame the

main and most formal quad in particular. Moving further south and later in the development of campus, the original form of the campus plan becomes somewhat looser, but continues the north-south axis which forms the backbone of the campus. The newest buildings, the Academic Innovation Center (AIC) and University Police Department expand on the east west spine that further draws out the cruciform shape shown in the original plan.

Over the first 30 years of the TAMIU campus, an extraordinary amount of development has taken place, growing to its current size of 24 buildings and approximately 1.2 million square feet of total space. The original campus plan vision has largely been realized and built out as it was first intended. This plan, therefore, seeks to establish a new vision for the next thirty years and perhaps beyond, to imagine what the TAMIU campus may be a full generation or more into the future.



Original Campus Plan, early 1990s



Twenty-five Years of Campus Development (1995-2020), Images Google Earth

# 1 - OVERVIEW

## Campus Plan Process

Beginning in the fall of 2021 and coming to a conclusion in March of 2023, the campus plan process spanned 18 months and involved a large number of faculty, staff, and students from the university as well as outside alumni, partners, and community members.

The process was structured into five phases: Initiate, Discover, Ideate, Develop, and Formulate. This process is structured to gather information about the campus and where it is heading, develop a series of big ideas to test with the campus stakeholders, and ultimately arrive at a preferred development concept for the near, mid, and long term future of the campus.

Each phase of the process involved an on-campus workshop, which included meetings with Executive and Vice Presidents Councils, focus group / user meetings (i.e. athletics, student life, facilities), and engagement opportunities for students, faculty and staff.

Several open houses were held at different phases of the process for these members of the TAMU community to gather input on what was important to the campus plan, share progress on the plan itself, and get feedback on the plan's development. Highlights of this process included a student engagement session with pizza in the STC courtyard with visual preference boards, a special alumni dinner hosted on campus, and spending a Saturday morning and afternoon at "Discover TAMU," a community open house showcasing many offerings of the university, of which the plan itself was only a small part.



# Guiding Principles

## 1 Create spaces and places that reinforce campus community and culture:

- Indoor/Outdoor Spaces
- Collaboration & Gathering
- Celebrating & Enhancing Identity
- Build Campus Life



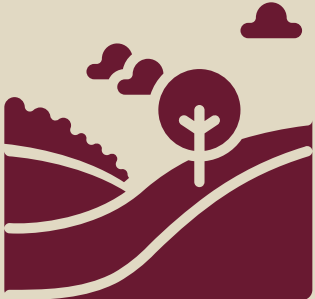
## 2 Enhance learning & discovery:

- Recruitment and Retention
- New Paradigms for Teaching & Research
- Support Economic Mobility
- S.T.E.A.M.



## 3 Celebrate the natural environment:

- Celebrate Natural Beauty
- Habitat & Ecosystem Stewardship
- Reduce Environmental Impacts







# Analysis & Observations

2

# TAMIU at a Glance

## Academics

TAMIU offers over 95 bachelor's, master's, and doctoral degree programs across its five colleges - the A. R. Sanchez Jr. School of Business, the College of Arts and Sciences, the College of Education, and the College of Nursing and Health Sciences, and University College - as well as the Graduate School.

The A.R. Sanchez, Jr. School of Business offerings are highly regarded, with the school offering undergraduate and graduate programs in fields such as accounting, economics, finance, management, and marketing.

The College of Education offers undergraduate and graduate programs in areas such as bilingual education, curriculum and instruction, educational administration, and counseling psychology. The college also offers certification programs for teachers and other education professionals.

The College of Nursing and Health Sciences offers undergraduate and graduate programs in nursing, as well as a Bachelor of Science in Public Health. The college also offers certificate programs in areas such as forensic nursing and school nursing.

The College of Arts and Sciences offers a wide range of undergraduate and graduate

programs in fields such as biology, chemistry, criminal justice, psychology, sociology, and communication.

The University College is designed for students who are undecided about their major or who are exploring different academic disciplines. The college offers a range of courses and resources to help students discover their academic interests and develop the skills they need to succeed in college.

## Athletics

TAMIU competes in the Lone Star Conference at the NCAA Division II Athletics level. Sports include Men's and Womens Basketball, Cross Country, Golf and Soccer; Men's Baseball; Women's Softball and Volleyball; as well as Cheerleading and Dance Teams. Indoor teams are housed in the KCB, while outdoor sports utilize the complex at the southeastern portion of campus, trails on the eastern portion of campus, and local golf courses for cross country and golf events.

## Residential & Student Life

There are currently two residential communities on campus: University Village Apartments and the Residential Learning Community. Both facilities offer a mix of housing unit types, as well as a clubhouse and pool. Student activities and organizations are housed in the Student Center, with along with

Dusty's Diner cafeteria and several local and franchise restaurants within the building as well.

The university takes pride in its culture and hosts numerous events to celebrate its diverse student population including cultural fairs, festivals, and performances, providing students with an opportunity to learn about and celebrate different cultures.



## Building Legend —→

- AIC - Academic Innovation Center
- KLM - Sue & Radcliffe Killam Library
- CWT - Dr. Billy F. Cowart Hall
- BLK - Bob Bullock Hall
- WHT - Western Hemispheric Trade Center
- PLG - Anthony J. & Georgia A. Pellegrino Hall
- CNS - Dr. F.M. Canseco Hall
- LBV - Lamar Bruni Vergara Science Center
- PLA - Lamar Bruni Vergarag
- STC - Student Center
- KCB - Kinesiology Convocation Building
- H - Physical Plant
- FPA - Center for the Fine & Performing Arts
- ECHS - Early College High School
- ZSC - Zaffrini Success Center
- REC - Kinesiology, Wellness & Recreation Center
- RLC - Residential Learning Community
- UPD - University Police Department
- UVIL - University Village
- JHBF - Jorge Haynes Baseball Field





UVIL

KLM

CWT

BLK

LBV

AIC

RLC

UPD

WHT

PLG

CNS

H

STC

KCB

H

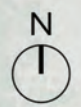
REC

FPA

ECHS

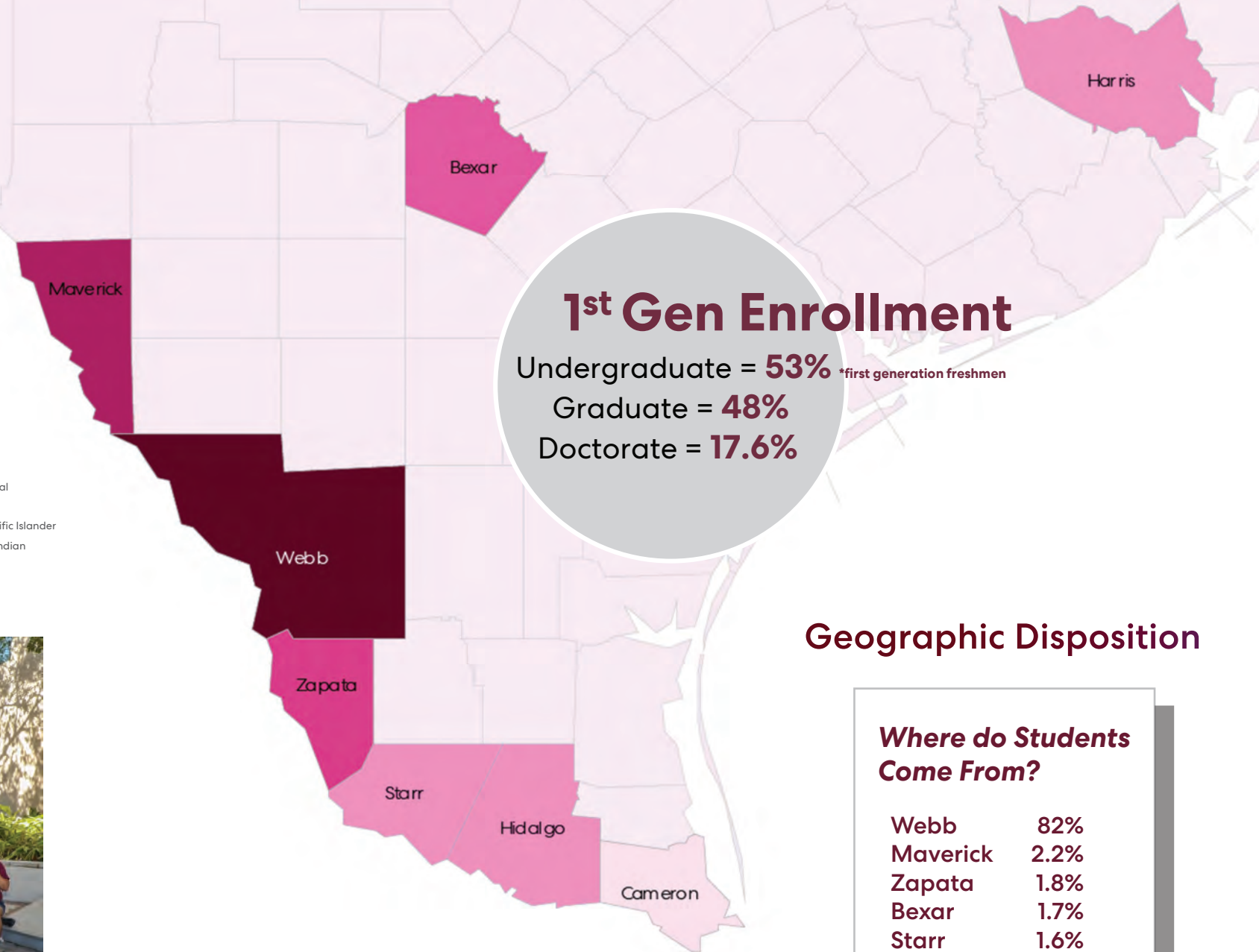
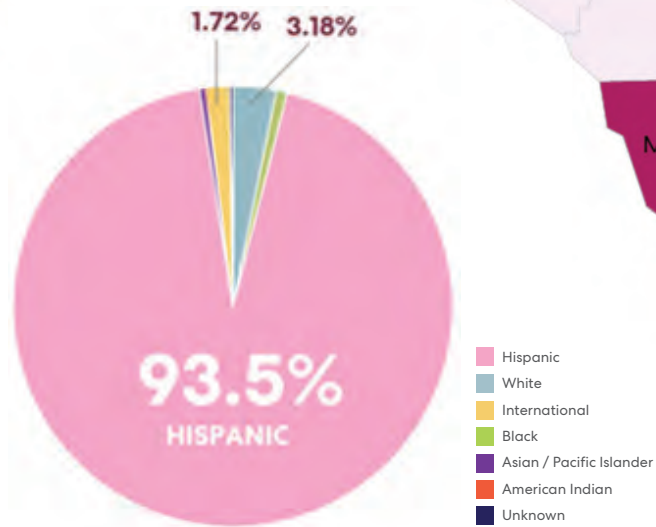
ZSC

JBHF



0 100 200 500 1,000 Feet

## Demographic Composition



**1<sup>st</sup> Gen Enrollment**  
 Undergraduate = **53%** \*first generation freshmen  
 Graduate = **48%**  
 Doctorate = **17.6%**

## Geographic Disposition

**Where do Students Come From?**

|          |      |
|----------|------|
| Webb     | 82%  |
| Maverick | 2.2% |
| Zapata   | 1.8% |
| Bexar    | 1.7% |
| Starr    | 1.6% |
| Hidalgo  | 1.5% |
| Harris   | 1.4% |

### Enrollment

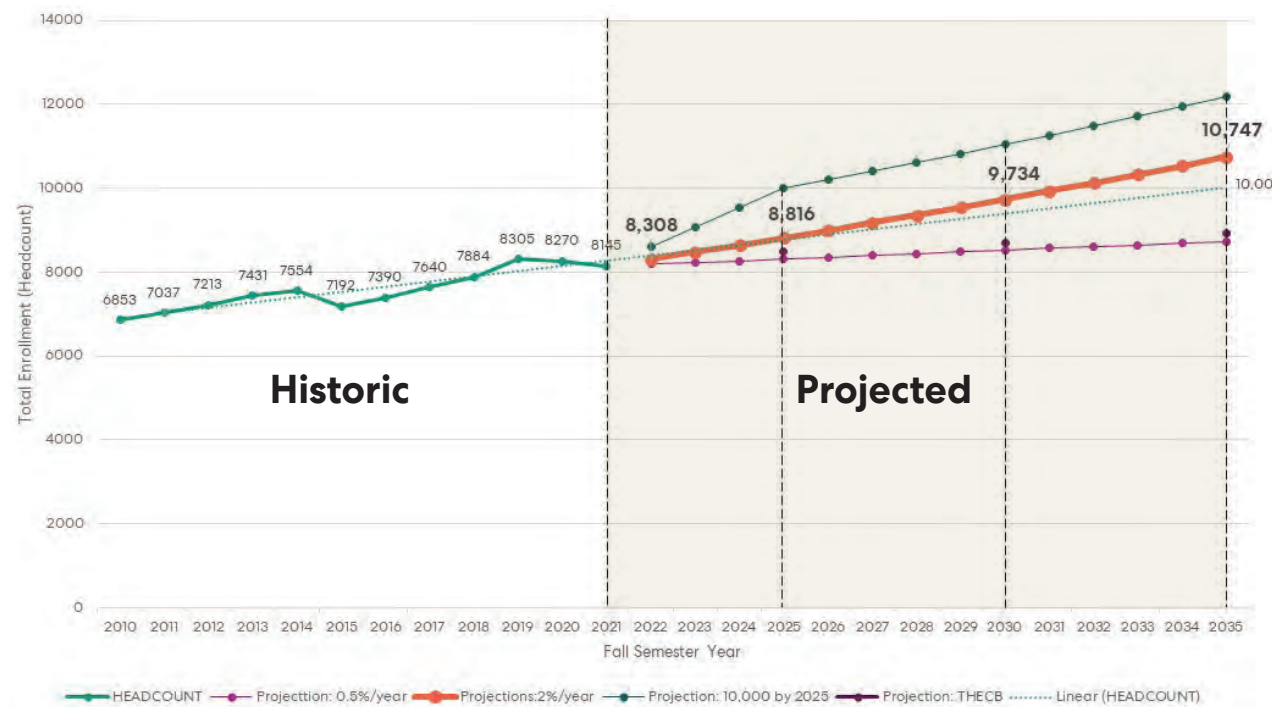
For most of the past decade, TAMIU has seen steady growth, growing from a student body of around 7,000 fall semester headcount enrollment in 2011 to a local high point of approximately 8,300 in 2019. This population has leveled off and slightly declined in the past few years, hovering just above 8,000. The COVID-19 pandemic may have had impacts on this leveling off, along with other factors.

TAMIU has a unique student body in several respects. First, the student body is made up overwhelmingly of hispanic students, with 93% coming from this demographic. Over 60% of the student body is also first-generation college students. Additionally, TAMIU is comprised of students geographically concentrated around Laredo, with roughly 82% of students coming from within Webb County, and smaller shares to neighboring counties in south Texas.

This last point creates a unique challenge for the institution. As future forecasts from the Texas State Demographer show leveling or declining trajectory for the college-aged cohort in the coming decades. As the state overall continues to grow, the university may need to expand its recruitment strategy to reach further into other population centers such as San Antonio to meet future enrollment targets.

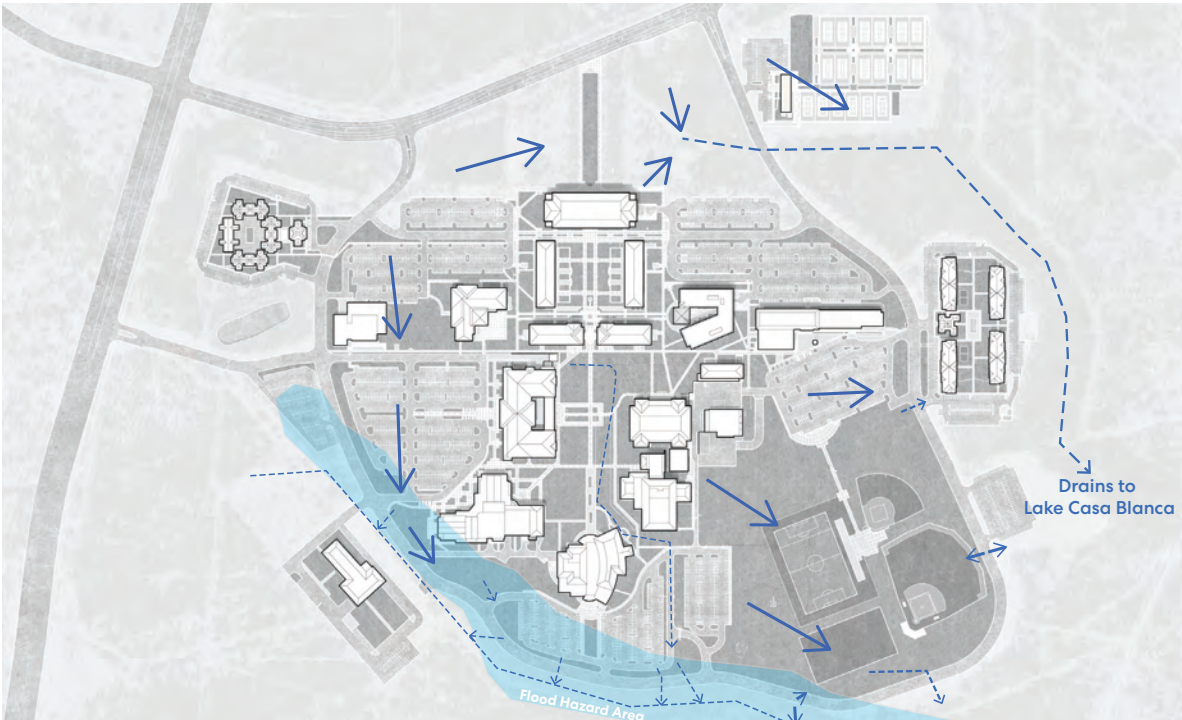
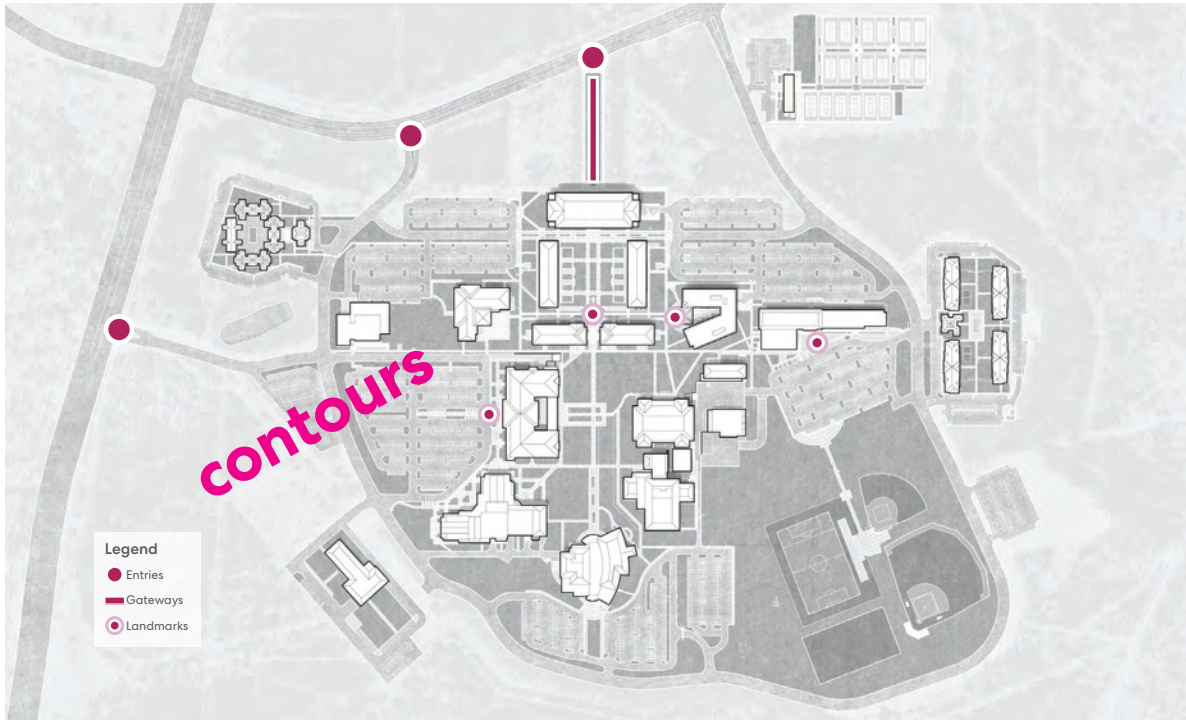
### TAMIU Enrollment Projections

The Campus Plan assumes a 2% annual growth trajectory. Looking out to 2035, this translates to nearly 11,000 students (headcount enrollment).



|                  | Fall Year | Headcount |
|------------------|-----------|-----------|
| <b>Historic</b>  | 2010      | 6,853     |
|                  | 2011      | 7,037     |
|                  | 2012      | 7,213     |
|                  | 2013      | 7,431     |
|                  | 2014      | 7,554     |
|                  | 2015      | 7,192     |
|                  | 2016      | 7,390     |
|                  | 2017      | 7,640     |
|                  | 2018      | 7,884     |
|                  | 2019      | 8,305     |
|                  | 2020      | 8,270     |
| <b>Projected</b> | 2021      | 8,145     |
|                  | 2022      | 8,308     |
|                  | 2023      | -         |
|                  | 2024      | -         |
|                  | 2025      | 8,816     |
|                  | 2026      | -         |
|                  | 2027      | -         |
|                  | 2028      | -         |
|                  | 2029      | -         |
|                  | 2030      | 9,734     |
|                  | 2031      | -         |
|                  | 2032      | -         |
|                  | 2033      | -         |
|                  | 2034      | -         |
|                  | 2035      | 10,747    |

2 - ANALYSIS & OBSERVATIONS



**Topography**

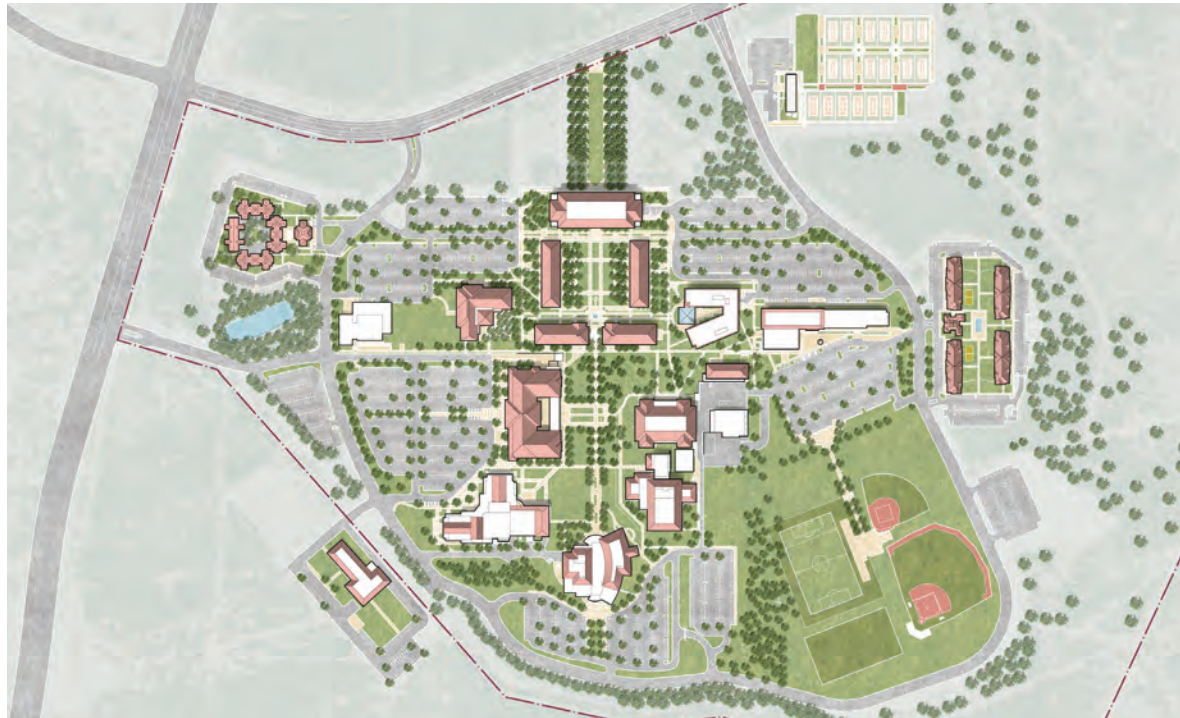
The TAMIU campus enjoys a relatively level site, with a number of smaller runnels or draws that create the more dramatic topographic changes on the campus. Notably, the dropoff to the east of the RLC and Tennis Complex that forms the eastern edge of development currently, and separates the campus from the eastern portion of undeveloped property presents the primary natural physical site challenge.



**Flooding/ Drainage**

The campus is framed by two main drainage challenge that flow southeast and into to Lake Casa Blanca. The southern channel also contains designated FEMA 100-year floodplain which overlaps the south loop road and several parking facilities.





### Environmental Factors

The semi-arid and warm south Texas climate has a major impact on the existing and proposed design of the TAMU campus and its facilities. Mild temperatures in the winter make for very pleasant outdoor spaces, while heat and sun in the other months can severely limit the usability of these very same spaces. and climate change only promises to make these challenges more dramatic in the future. Shade, plant selection, building articulation and facade design and other strategies can all have substantial impacts on human comfort, usability of outdoor spaces, energy and water use and more.

### Landscape Types

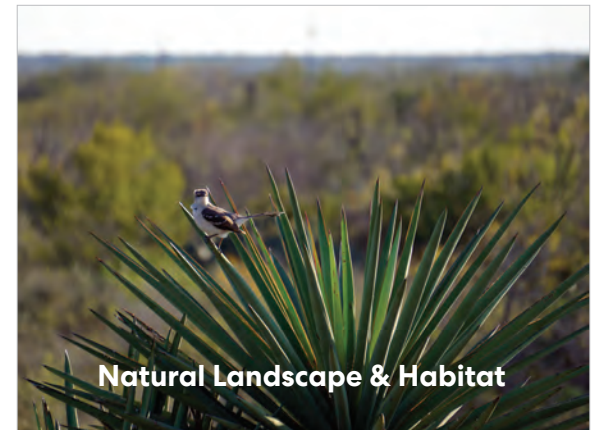
The TAMU campus has several main types of landscape present. Within the main developed portions of campus the landscape could be described as “formal” with highly structured spaces defined by buildings, hardscape, turfgrass, and rows of tree plantings. As you move away from the core there are other areas that could be described as “informal” which may be mowed or otherwise maintained but are not as heavily designed or defined. Finally, other areas beyond the developed portion of campus might be described as “natural,” with only dirt roads or trails within the eastern portion of the TAMU property.



Formal Landscape



Informal Landscape



Natural Landscape & Habitat

# Campus Organization

## Entries, Gateways, and Landmarks

The TAMU campus has a number of entries, gateways, and landmarks that help to define the campus experience and help with orientation and navigation of the campus. Arriving by vehicle, there is an entrance directly into campus off Bob Bullock Loop, and two more off of University Boulevard at the north. Each entrance signals arrival with monument signage and landscape treatment. Within the campus there are a number of

additional gateways or thresholds that continue this arrival sequence, sometimes at the transition from one space to another. Within the campus itself, there are a number of landmark pieces of architecture (such as the planetarium pyramid, Trailblazer Tower, and the hemisphere in the front of KLM) and views that are established to give a clear orientation to campus users.



## Campus Use Zones

The TAMU campus is characterized by several main zones of activity. The heart of the academic core is situated in the northern half of campus, surrounding the original quad. As you move to the southern half of the campus, the uses transition to more student life functions, though FPA and KCB house academic uses as well. Student housing is situated at the east and west poles of the campus, while athletics and recreation flanks the southeastern northeastern corners.

Support buildings, including UPD and the physical and central plant facilities are situated toward the edges of the main core of the campus.

# Existing Building Character and Typologies

Academic



Residential



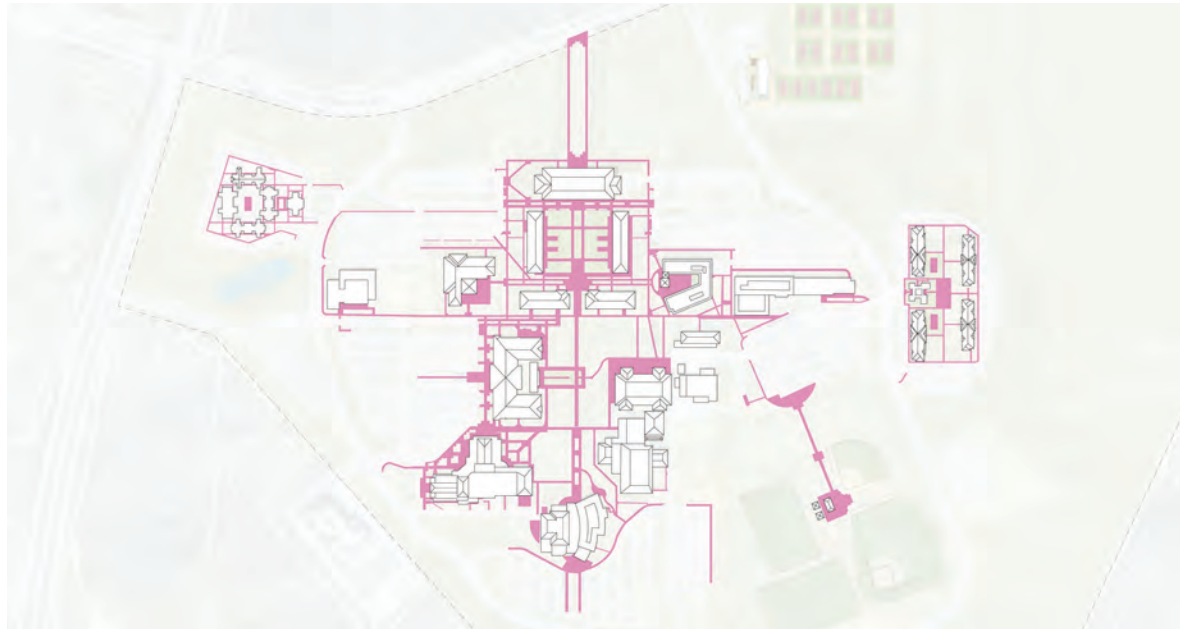
Student Life



Support



## 2 - ANALYSIS & OBSERVATIONS



### Pedestrian Network

The TAMU campus has a strong pedestrian core comprised a network of primary, secondary and tertiary pedestrian pathways. These range from the central spine north-south spine, to a network of connecting pedestrian malls and finally more functional sidewalks as one moves outward from the campus core.

The great strength of this element of the design is that it fully excludes vehicles from the campus core, creating a pleasant and safe experience for of the campus. While the majority of people arrive by car to campus, once they have parked and left their vehicle behind, the entire campus is very accessible by a short and enjoyable walk or roll.

While the campus core is highly pedestrianized, as one moves outward the pedestrian network is less connected and lacks basic amenities such as sidewalks along University Boulevard. Large surface parking lots and more limited amenities, such as lighting and trees, reduce the walkability of the campus. As a result, parking lots at the edge, although within a short walk, are underutilized and affiliates complain about the lack of front-door parking access.

The surrounding roadway infrastructure (Bob Bullock Loop) creates a high-stress and uncomfortable environment for walking. The 2020 Active Transportation Plan identified



Pedestrian Conditions - Campus Interior

“feeling unsafe” as the primary reason Laredo residents do not travel by active transportation. At TAMU, this sentiment is compounded by the extremely limited street connectivity in the residential neighborhoods of nearby North Laredo, where much of the affiliate population lives.

Wide roads with limited built frontage tend to make walking distances feel much bigger than they are. Especially in an area with wide roads and high-speed traffic between the Bob Bullock Loop and University Boulevard, TAMU's pedestrian network exhibits strong internal connections but very poor external connectivity.



Pedestrian Conditions - Campus Perimeter



## Cycling

The closest bicycle facility to TAMIU is located along Loop 20, which is a 3.73-mile shared use, off-street bikeway. As part of the Bob Bullock Loop upgrade, a separated bikeway will be built parallel to the highway and be extended farther south to close a key bicycle network gap (Figure 10). However, the highway expansion project may create more challenging crossing conditions and increase the number of conflict points between pedestrians, cyclists, and motor vehicles. An on-street bicycle lane on University Boulevard has been identified in the Laredo and Webb County MPO 2020 Active Transportation Plan as a future project, slated for design and implementation in the next 20 years.

TAMIU allows bicycling on its campus grounds but has no on-street bicycle lanes or dedicated facilities. The compact size and flat topography of the campus provide strong conditions for biking on campus. The lack of high visibility crossings and expansive parking lots, however, can create stressful conditions. TAMIU has numerous bicycle racks located outside its buildings, and in 2021 unveiled a new bicycle repair and air station by the Kinesiology, Wellness, and Recreation Center. TAMIU Recreational Sports hosts multiple bike rides each month to trails across the county. Ridership analysis conducted by the Laredo

and Webb County MPO revealed 830 bicycle boardings on El Metro Route 16 in 2019, averaging 17 boardings on a weekly basis. This suggests that some transit commuters carry their bicycles with them from home to campus.



Bicycle Facility along Bob Bullock Loop



A New Bicycle Maintenance Station on Campus



## Transit

El Metro is the primary public transit provider in the region. Route 16 provides direct connectivity between downtown Laredo and the TAMIU campus via Del Mar Boulevard (Figure 9). Route 16 operates at 90-minute headways on weekdays from 7 a.m. to 9:10 p.m., 75 minutes on Saturdays between 7 a.m. to 6:55 p.m., and every 60 minutes on Sundays from 12 a.m. – 5:30 p.m. Based on 2019 ridership data, Route 16 had the 5th highest ridership in El Metro’s system with 159,590 boardings across the route.

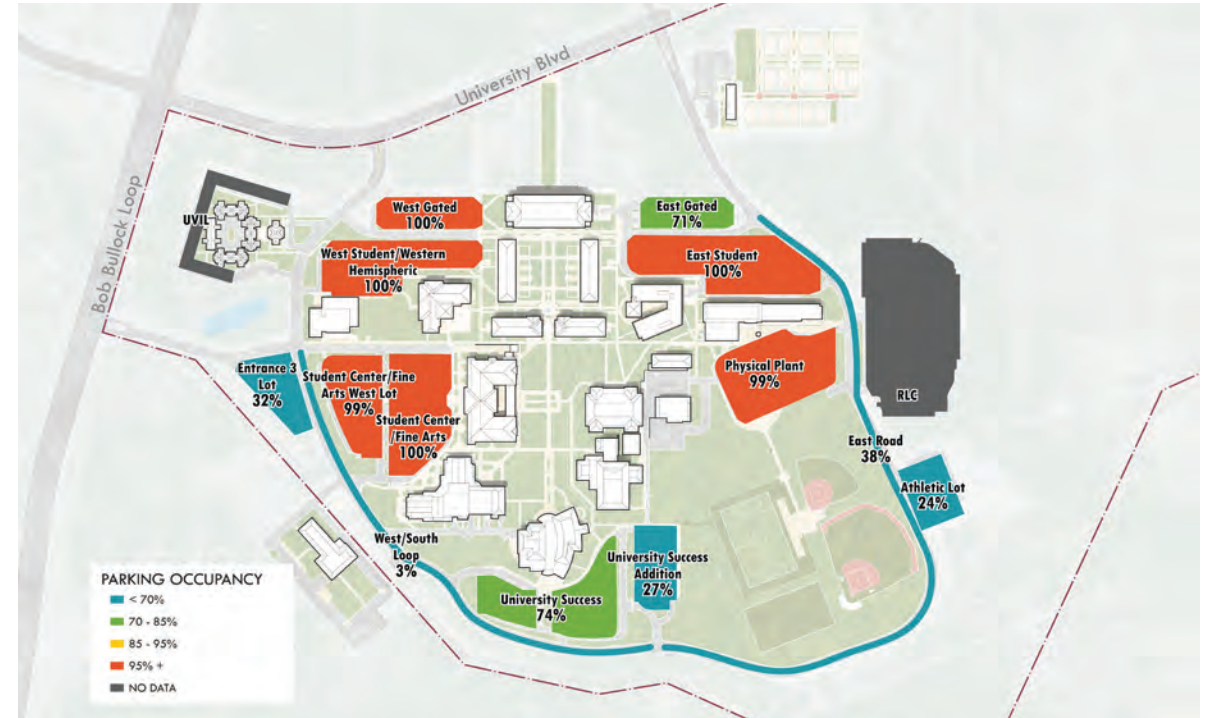
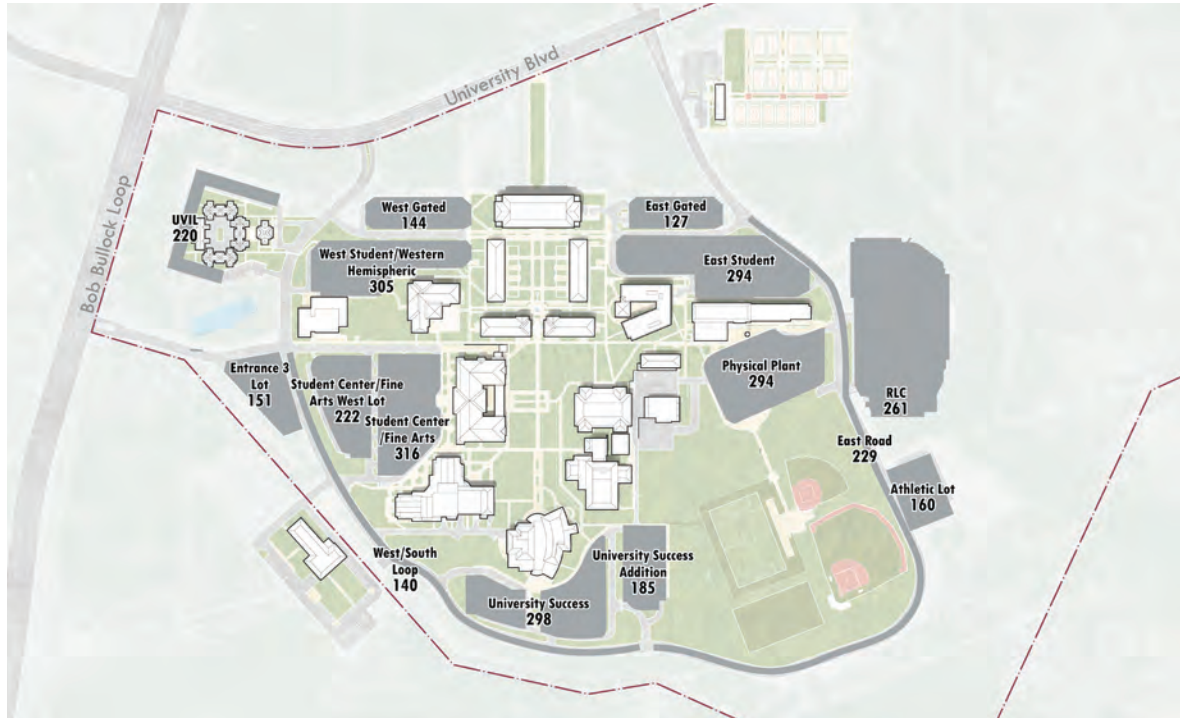


El Metro stopping on Campus in front of STC

A standard adult fare is \$2.00, while student fares are \$1.50. A monthly pass is \$120, while student semester passes range from \$250-\$280. Schedules, route maps, and real-time information is available via the El Metro smartphone app.

Route 16 stops at three locations on campus: the Student Center, the eastern Residential Learning Community housing complex, and University Village housing complex to the west. Stops lack adequate passenger amenities such as shelters or schedule information. A single bench under a small canopy is available off to one side of the Student Center stop.

## 2 - ANALYSIS & OBSERVATIONS



### Parking Provision

TAMU has 13 parking lots arranged peripherally around the exterior of the campus core, with an additional on-street parking along the University Boulevard loop road. Two of the parking lots are designated for university housing residents, while the others support student, faculty and staff, and visitor daily parking. As of Fall 2022,

TAMU had a total of 3,346 parking spaces on campus. Aside from a limited number of “reserved” spaces, parking on campus is free, and operates on a “first-come, first-serve” policy.

### Parking Utilization

Overall, the existing parking on campus is well-used but there is additional availability within the system. Close-in parking lots may achieve near full capacity at peak times, but more remote lots often have plenty of space available. In Fall 2022, the West Gated, East Student, Student Center/Fine Arts, West Student, and Physical Plant lots experience the highest peak hour occupancies at 99-100%.

This high level of demand corresponds to their proximity to main campus buildings and the campus core. By contrast, the lots farther from the core were only 3-38% full. On-street parking along University Boulevard loop road was about 25% occupied at peak. Appendix C contains a more detailed look at parking data and future need.







# Campus Plan

3

A GLIMPSE OF THE FUTURE



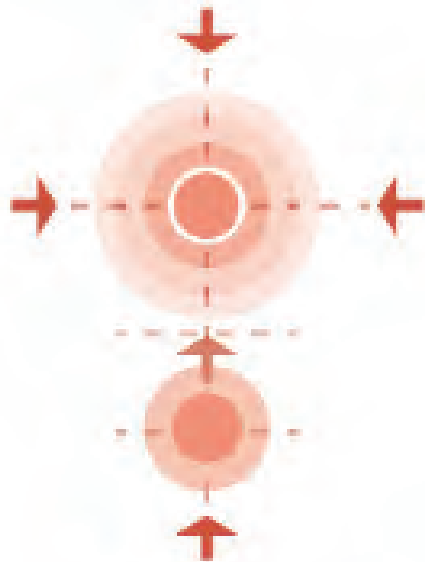


# Design Strategies

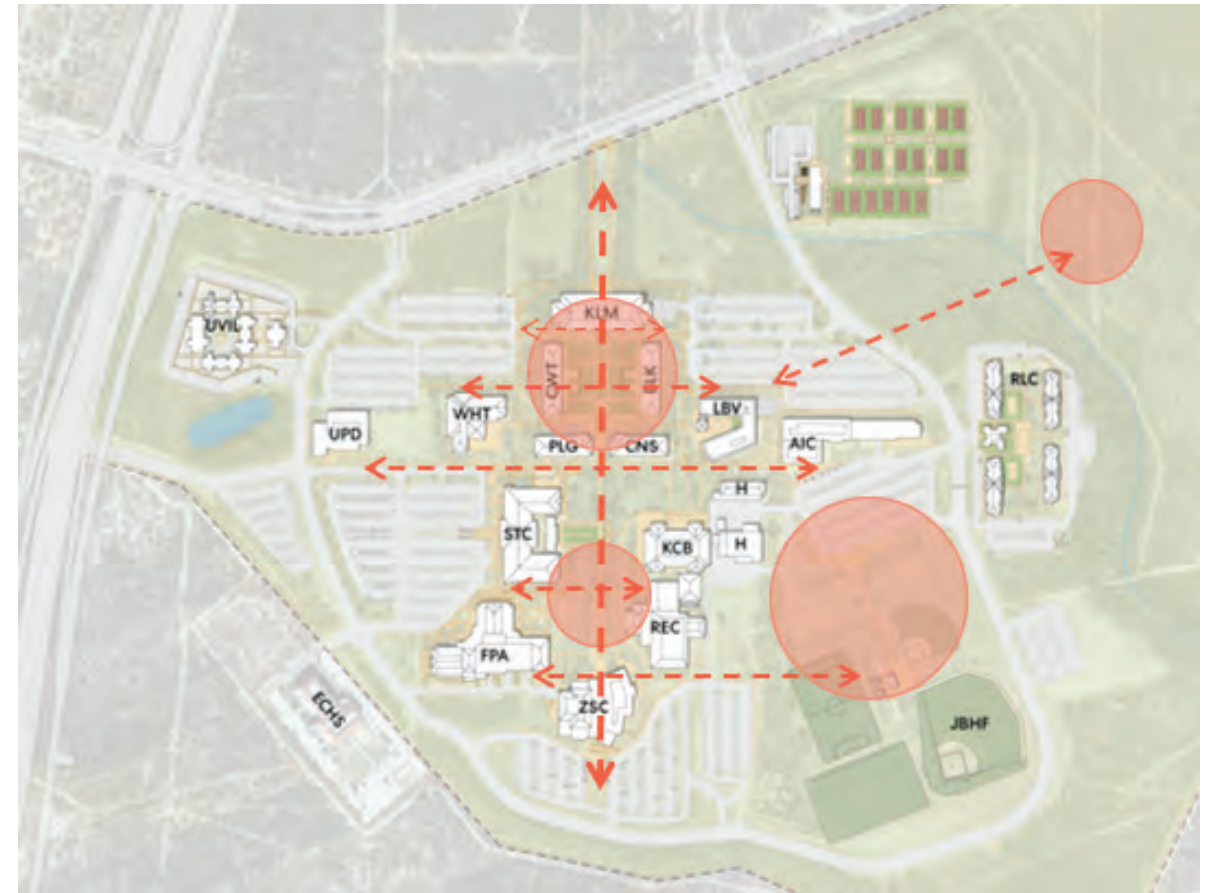
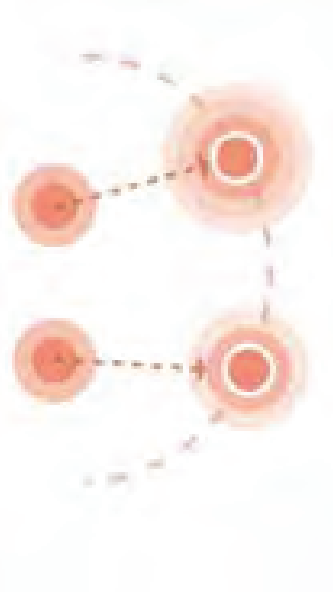
As noted previously, the original vision of the original campus plan has largely been realized with development to date already beginning to push beyond that original framework. During the “Ideate” phase of the planning process, the design team explored a number of different infill and expansion strategies, ultimately landing on a hybrid of two overall concepts: “Reinforce” which targets projects to build on and strengthen the existing campus framework, and “Re-Orient” which envisions

expansion of a new east quad, residential village, and athletics and recreation complex beyond. This vision moves beyond the campus core, filling a gap to connect the RLC, bridging the loop road, and extending into fully undeveloped portions of the property east of the arroyo that bounds the Tennis Center and RLC today. The combination of these two strategies defines the approach to campus development over the next twenty-five year horizon for TAMIU.

**Reinforce**



**Re-Orient**

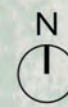






**Building Legend**

- A - Health Sciences Building
- B - Nursing Building
- C - Business Addition
- D - Alumni Center
- F - Student Housing
- G,H - Academic Building
- I - FPA Expansion
- J - Student Housing
- K,L,M,N - Academic Building
- O - Student Life
- P,Q - Administration
- R - Arena
- S - Ball Fields



0 100 200 500 1,000 Feet

# Near-Term Plan

## NEW CONSTRUCTION

### Health Sciences Building (A)

This new facility will house existing and expanded programs in the Health Sciences including Kinesiology, Communication disorders, and Public Health, with new classrooms, labs, and demonstration rooms. The building is planned, funded, and underway with architectural design at the time of writing, with an estimated gross square footage of roughly 57,000. The building is intended to be sited on the east side of campus at the southwestern corner of the diagonally oriented Physical Plant Parking Lot.

### Western Hemisphere Trade (WHT) Expansion (C)

The A.R. Sanchez School of Business will expand its space to accommodate business outreach programs, including the Center for the Study of Western Hemispheric Trade, the Texas Center for Economic Development, and the Small Business Development Center, and will include classroom, student support, and faculty office spaces. It is intended to be sited on the open parcel west of and connecting to the existing WHT building.

### Nursing Building (B)

The next new building need identified by the university is for a Nursing Building, which will complement the HSC and create a strong relationship for the health professions in their new location at the East Quad.

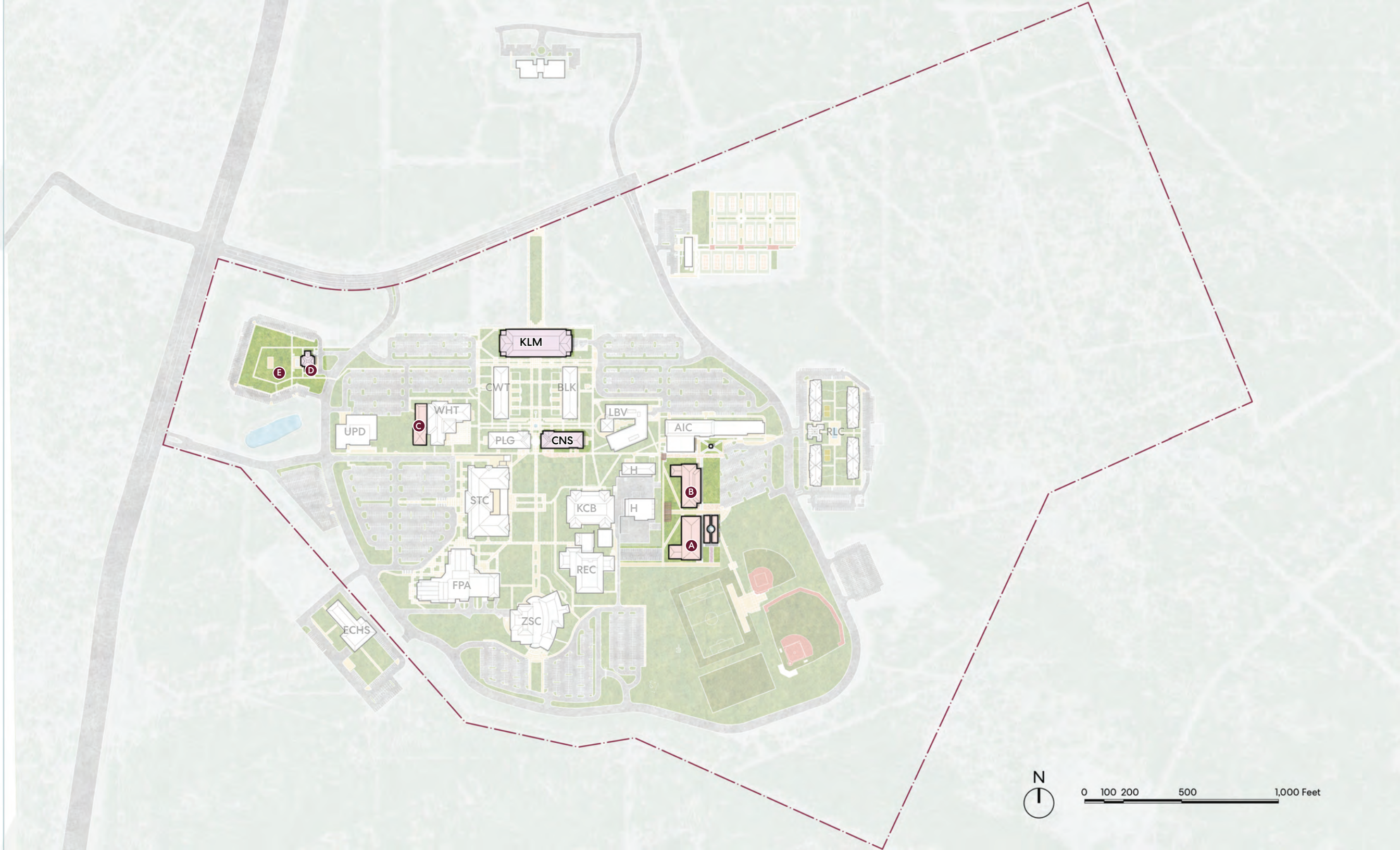
## Near-Term Projects

| KEY             | TYPE* | NEW CONSTRUCTION       | FOOTPRINT | FLOORS | GSF (EST.)     | NOTES                     |
|-----------------|-------|------------------------|-----------|--------|----------------|---------------------------|
| A               | AC    | Health Sciences Center | 24,000    | 3      | 57,000         | Partial third floor shown |
| B               | AC    | Nursing                | 22,400    | 3      | 67,200         |                           |
| C               | AC    | Business Addition      | 12,250    | 2      | 22,500         | Two-story addition to WHT |
| <b>Subtotal</b> |       |                        |           |        | <b>146,700</b> |                           |

| KEY             | TYPE* | RENOVATION                       | FOOTPRINT | FLOORS | GSF (EST.)   | NOTES                |
|-----------------|-------|----------------------------------|-----------|--------|--------------|----------------------|
| D               | SL    | UVIL Clubhouse for Alumni Center | 4,446     | 1      | 4,446        | Future Alumni Center |
| <b>Subtotal</b> |       |                                  |           |        | <b>4,446</b> |                      |

| KEY             | TYPE* | DEMOLITION                       | FOOTPRINT | FLOORS | GSF (EST.)    | NOTES |
|-----------------|-------|----------------------------------|-----------|--------|---------------|-------|
| E               | RE    | University Village (4 buildings) | 26,220    | 3      | 78,660        |       |
| <b>Subtotal</b> |       |                                  |           |        | <b>78,660</b> |       |

\*In terms of "TYPE", AC - Academic, AR - Athletics / Recreation, RE - Residential, SL - Student Life, SP - Support



UPD

CWT

KLM

BLK

LBV

AIC

RLC

PLG

CNS

WHT

STC

KCB

H

REC

FPA

ZSC

ECHS

E

D

C

B

A



0 100 200 500 1,000 Feet

# Near-Term Plan

## DEMOLITION

### University Village Student Housing (UVIL)

The UVIL student housing complex is nearing the end of its useful life and will be phased offline and then demolished in the near-term. The right-of-way for the conversion of Bob Bullock to an interstate highway will also intrude significantly on this site, limiting its desirability for residential use.

## RENOVATION

### University Village Clubhouse Renovation for Alumni Center (E)

Once the UVIL housing buildings have been demolished, the existing clubhouse is anticipated to be retained and renovated for use as alumni center. The surrounding parking can be retained, while the remainder of the site can be repurposed as open space to complement the Alumni Center in the near term, or future uses yet to be determined.

### Killam Library (KLM)

The Killam Library is a high priority for a significant renovation. The University has been working to “unpack” certain uses from the building in order to expand and enhance library and learning support programs, as well as other uses. A Program of Requirements was completed in 2016 which includes the intended renovation program as an appendix.

### Canseco Hall (CNS)

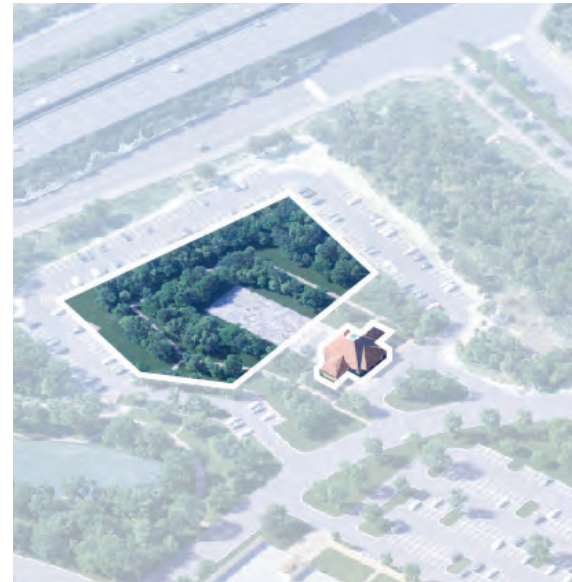
With new facilities planned for Health Sciences and Nursing, many of the existing space uses in Canseco Hall may be decanted in the near term and renovation & repurposing of existing facilities can occur. During the functional condition assessment carried out by the planning team, Canseco Hall emerged as an academic building with significant need. While the uses were generally appropriate to the space and reasonably adequate for their purpose, the interior quality is lacking and in need of refurbishment.



Health Science Center & Nursing Building



WHT Addition



Alumni Center Renovation



Existing UVIL Clubhouse to be Renovated

**The greenspace between KCB and STC is transformed into “Student Commons” and “Arroyo Park” on either side of the north-south pedestrian spine.**





# Mid-Term Plan

## NEW CONSTRUCTION

### Student Housing Buildings

Several new student housing buildings are intended at the north end of the existing RLC. These buildings will replace the UVIL demolished in the previous phase, creating a center of energy for residential life on the east side of the campus, as opposed to two separate housing villages that have existed on campus to this point. There is also intended to be space for dining facilities reserved in the ground floor of the southernmost building of the three shown.

### Academic Buildings

Two additional academic buildings are shown flanking the east side of the new East Quad, framing in this important open space. These buildings do not yet have specific academic uses targeted, but the programmatic needs will be identified by the campus in future years as it sees fit to serve its academic mission.

## Mid-Term Projects

| KEY | TYPE* | NEW CONSTRUCTION  | FOOTPRINT | FLOORS | GSF (EST.)      | NOTES  |
|-----|-------|-------------------|-----------|--------|-----------------|--|
|     | RE/SL | Student Housing   | 11,200    | 4      | 44,800          | w/ dining hall and commons on the ground floor |
| F   | RE    | Student Housing   | 15,500    | 4      | 62,000          |  |
|     | RE    | Student Housing   | 15,600    | 4      | 62,400          |  |
| G   | AC    | Academic Building | 30,500    | 3      | 91,500          |  |
| H   | AC    | Academic Building | 21,800    | 3      | 65,400          |  |
|     |       |                   |           |        | <b>Subtotal</b> | <b>326,100</b>                                 |

\*Facility "TYPE": AC - Academic, AR - Athletics / Recreation, RE - Residential, SL - Student Life, SP - Support



UPD

WHT

KLM

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0 100 200 500 1,000 Feet

# Mid-Term Plan

## RENOVATION

### **Student Center (STC)**

Needs for this facility include additional student organization space

### **Western Hemispheres Trade (WHT)**

Having been expanded in the near-term plan, WHT will have some light to moderate renovation needs in existing spaces. Particularly on the western wing of the second floor.

### **Lamar Bruni Vergara Hall (LBV)**

LBV is a workhorse academic building with science labs



New Student Housing north of and connecting to RLC



Two new Academic Buildings frame the East Quad

**The new East Quad facing northwest, with Health Sciences Building and pavilion in the foreground and AIC and Trailblazer Tower in the distance.**







# Long-Term Plan

## NEW CONSTRUCTION

### Fine & Performing Arts Expansion

As a part of the programming for the Health Sciences Building and WHT expansion, the university also developed a program for the FPA expansion. Ultimately, there was not budget available for undertaking all three buildings and the FPA expansion was not carried forward, and was shelved for the future, and is now represented in the long term vision for the campus.

### Convocation Center / Arena

The university has long been exploring the potential for a Convocation Center and Arena on campus that would provide space for events and athletics programs. Several locations were explored during the planning process, and ultimately the preference was to locate it on the undeveloped portion of the campus to the east to anchor a future Athletics and Recreation Complex.

### Athletics and Recreation Complex

As the campus expands to the east, it will displace the existing athletics and recreation fields. These facilities are intended to be relocated, expanded, and improved in a large complex on the far east side of the property. The plan indicates competition and practice facilities for Baseball, Softball,

## Long-Term Projects

| KEY             | TYPE* | NEW CONSTRUCTION                 | FOOTPRINT    | FLOORS | GSF (EST.)     | NOTES                           |
|-----------------|-------|----------------------------------|--------------|--------|----------------|---------------------------------|
| I               | AC    | FPA Expansion                    | 7,932/25,472 | 2/3    | 92,280         | Draft Program completed in 2022 |
| J               | RE    | Student Housing                  | 12,768       | 4      | 51,072         |                                 |
|                 | RE    | Student Housing                  | 10,447       | 4      | 41,788         |                                 |
| K               | AC    | Academic Building                | 34,975       | 3      | 104,925        |                                 |
| L               | AC    | Academic Building                | 28,900       | 4      | 115,600        |                                 |
| M               | AC    | Academic Building                | 20,185       | 3      | 60,555         |                                 |
| N               | AC    | Academic Building                | 32,889       | 3      | 98,667         |                                 |
| O               | SL    | Student Life                     | 20,500       | 2      | 41,000         |                                 |
| P               | AC    | Administration                   | 25,300       | 2      | 50,600         |                                 |
| Q               | AC    | Administration                   | 25,300       | 2      | 50,600         |                                 |
| R               | AR    | Convocation and Event Center     | 57,100       | 1.25   | 71,375         |                                 |
| S               | AR    | Athletics and Recreation Complex | n/a          | n/a    | -              | Approximately 48 acres as drawn |
| <b>Subtotal</b> |       |                                  |              |        | <b>777,462</b> |                                 |

\*In terms of "TYPE", AC - Academic, AR - Athletics / Recreation, RE - Residential, SL - Student Life, SP - Support



UPD

WHT

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0 100 200 500 1,000 Feet

# Long-Term Plan

Soccer, as well as a number of multipurpose fields for recreation purposes. Space for the cross country team who currently uses this undeveloped land should also be included in the ultimate design of this area.

## Academic Buildings

Several additional academic buildings are indicated to finish out the East Quad in the long term. These buildings do not yet have specific uses intended for them, but will be determined at a later date.



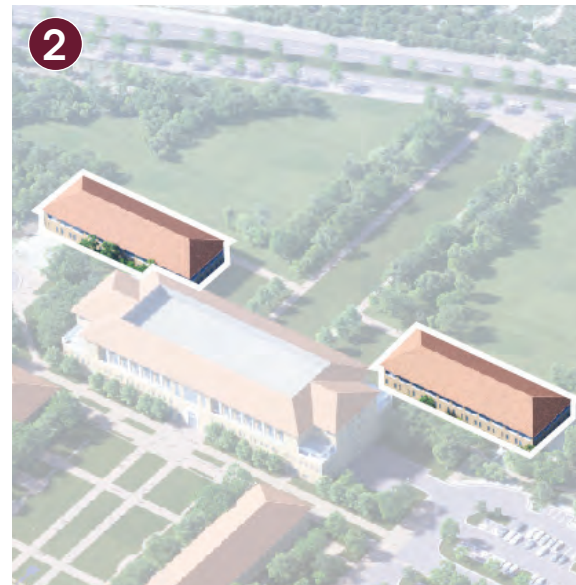
Academic Buildings

## Student Housing

Two additional student housing buildings are situated to the south of the existing RLC. These two buildings would nicely complement the existing housing and fill out the student housing village and create a center of gravity for student living as the campus grows.

## Administration Buildings

In keeping with the original 1992 campus plan, a matching pair of administrative buildings has been situated flanking the the Killam Library.



Administration Buildings

## RENOVATION

### Kinesiology & Convocation Building

Once the new Convocation & Event Center has been built, the existing KCB, which has been identified as a facility with a high need for renovation, can be renovated and repurposed as existing programs are decanted into the new facility.



Student Life

### Other Renovations

Several other facilities, including FPA, RLC, and perhaps others will be candidates for renovation in the long-term.



Athletics and Recreation Complex

**The full vision for the long-term expansion of the TAMIU Campus.**





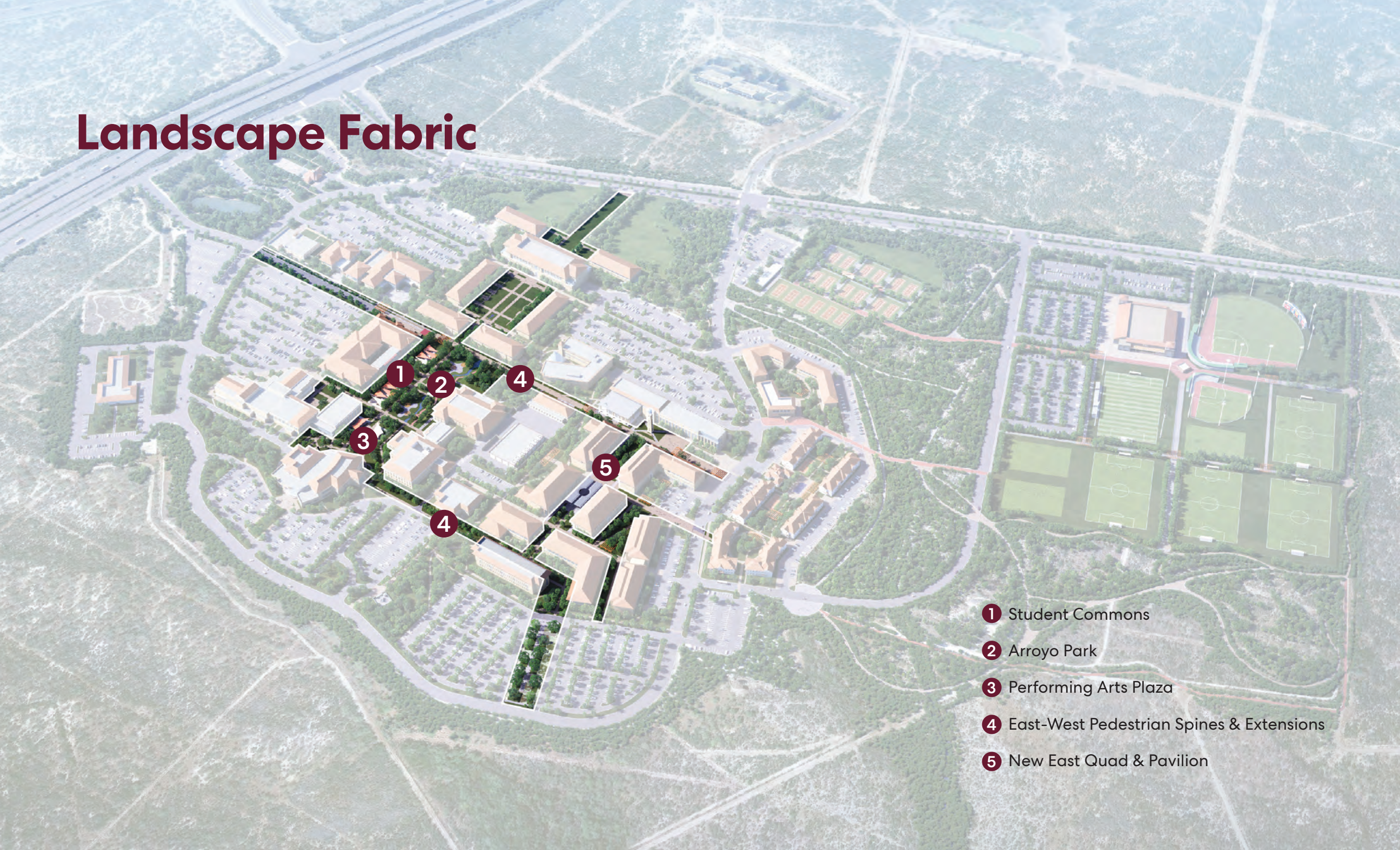
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4

# Landscape Fabric



- 1 Student Commons
- 2 Arroyo Park
- 3 Performing Arts Plaza
- 4 East-West Pedestrian Spines & Extensions
- 5 New East Quad & Pavilion

## Landscape Fabric

The campus landscape fabric weaves together a number of different space types, ranging from open, formal lawns and public plazas, to vegetated landscape areas and multi-use trails. The variety and scale of spaces is important to

complement different building uses and create a range of experiences across the campus and support a greater diversity of activities. The TAMU campus currently has a number of spaces that express the traditional qualities of a campus

visually, but has room to expand the types of spaces that are sticky to students, can be transformed to different purposes, and suit different needs on a day-to-day basis, from individual study and outdoor class meetings to festivals and events.

### Formal Quad



### Informal Landscape



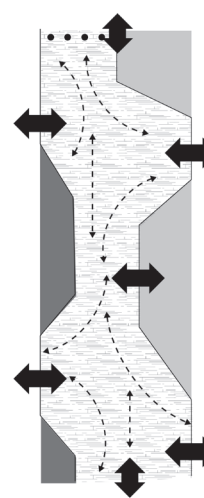
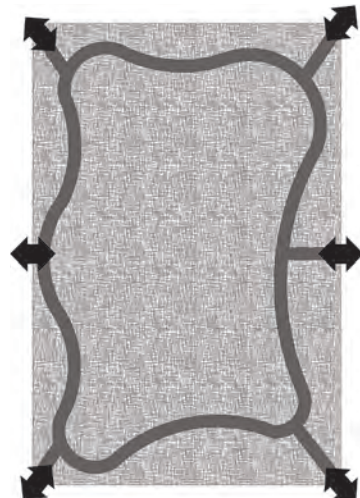
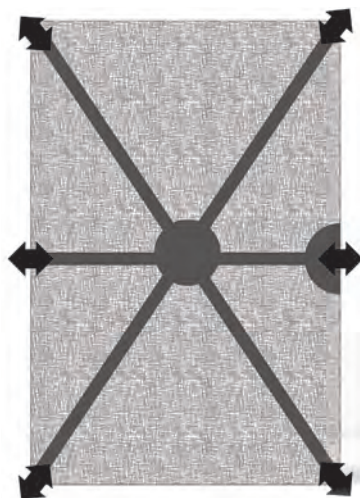
### Public Plaza



### Pedestrian Mall



### Trail

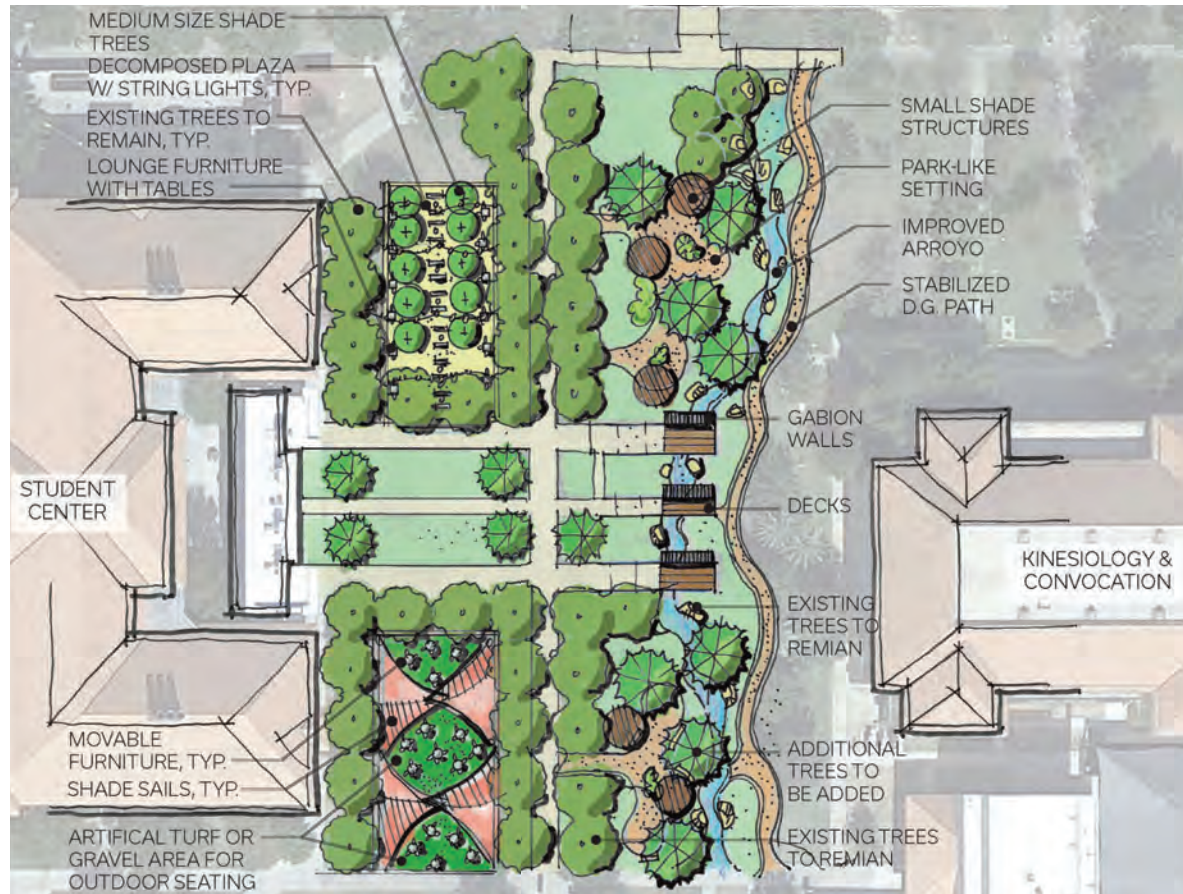


# Student Commons

There is presently a large open space on the east side of the Student Center, containing an formal garden and a large swath of lawn planted with live oaks as the predominant species. The plan seeks to reimagine and rejuvenate this space as a vibrant student commons space. Landscape improvements, both plantings and hardscape, will increase access to outdoor gathering spaces and create an activated and welcoming Student Center front door. This area is imagined as an outdoor space that students “own,” and the looser nature of the design intent for this area should lend itself to a less formal space where as a place to study, relax, and gather.





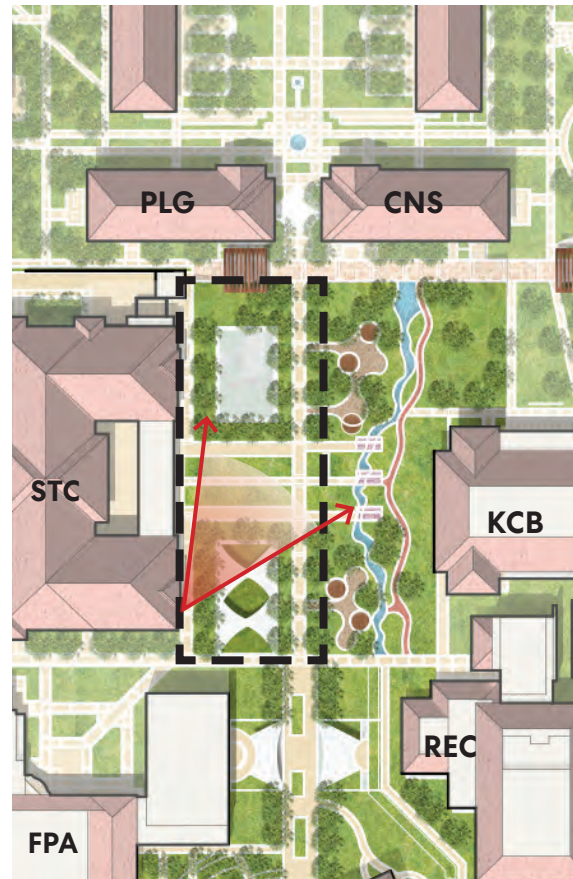


# Student Commons (continued)

The renovated commons area will create two different spaces: the north commons, and the south commons, divided by a pedestrian walk into two spaces with different characteristics—each rectangular features running north/south.

The first new space, the north commons, will be a flexible, informal plaza to create a place for informal gatherings or studying. Comfort and scale will be created with plentiful shade created by a new grove of shade trees and accented by blooming ornamental trees and shrub plantings.

The second space, the south commons, has a rectangular area of gravel with café/moveable seating and protected from the elements by generous shade sails. A unified planting scheme will reinforce the relationship between the north and south commons spaces. All of these landscape improvements will preserve the existing visual access between the Student Center and adjacent Kinesiology & Convocation buildings.



EXISTING



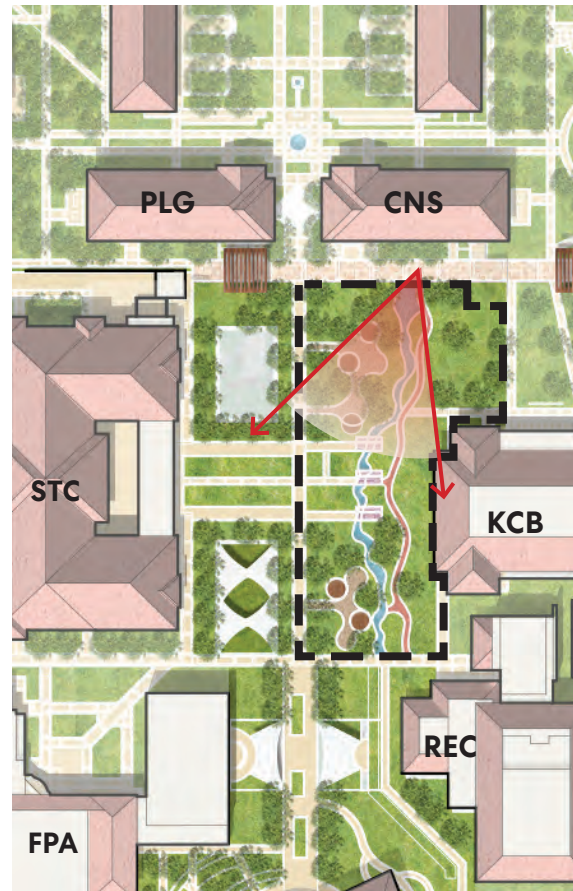
**FUTURE STUDENT COMMONS**

# Arroyo Park

## Arroyo Park

The landscape space on the west side of the Kinesiology & Convocation building will provide much-needed drainage improvements creatively solved with a proposed Arroyo Park. This park will be a landscape solution to an engineering challenge—graded to improve existing drainage from surrounding areas and conveyed into a native plant bioswale running north to south.

Plant selection for the swale should include native plants that provide biofiltration and naturally exist in riparian areas without supplemental irrigation. A decomposed granite pedestrian trail will run parallel and across this arroyo, as an alternate park-like route for pedestrians. Additional landscape enhancements in this park include seating nodes, comfortable furnishings, and a biophilic nature experience—water, plants, stones, and paths.



EXISTING

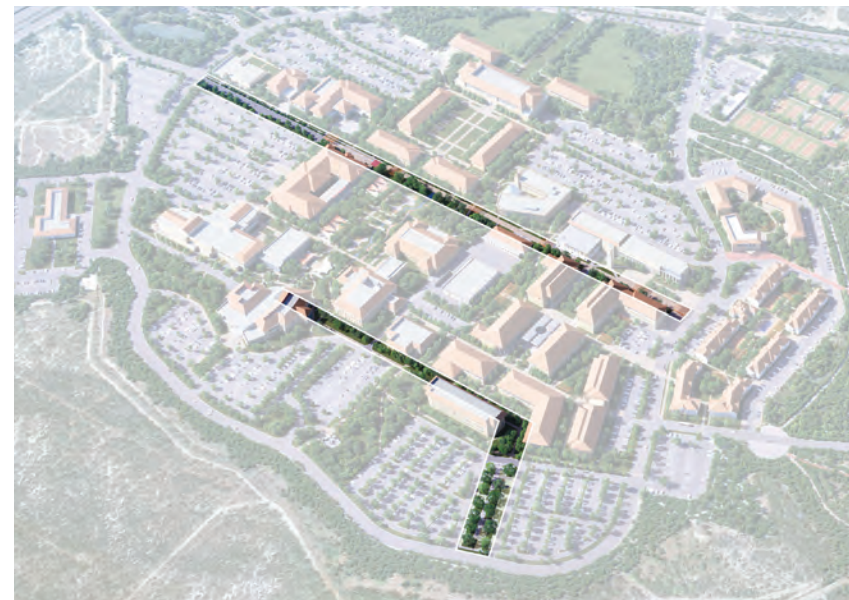
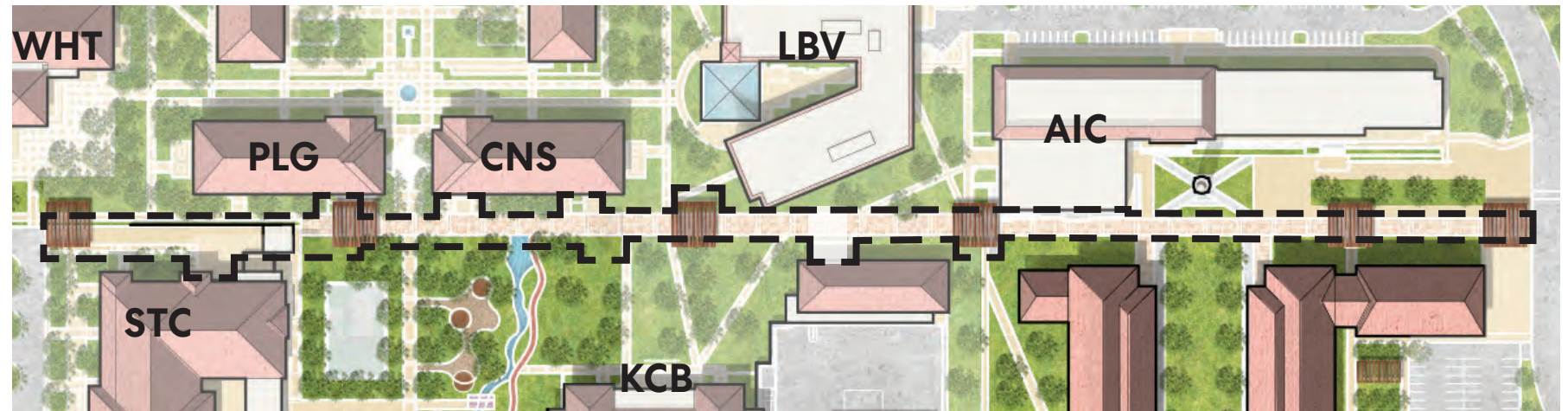


**FUTURE ARROYO PARK**

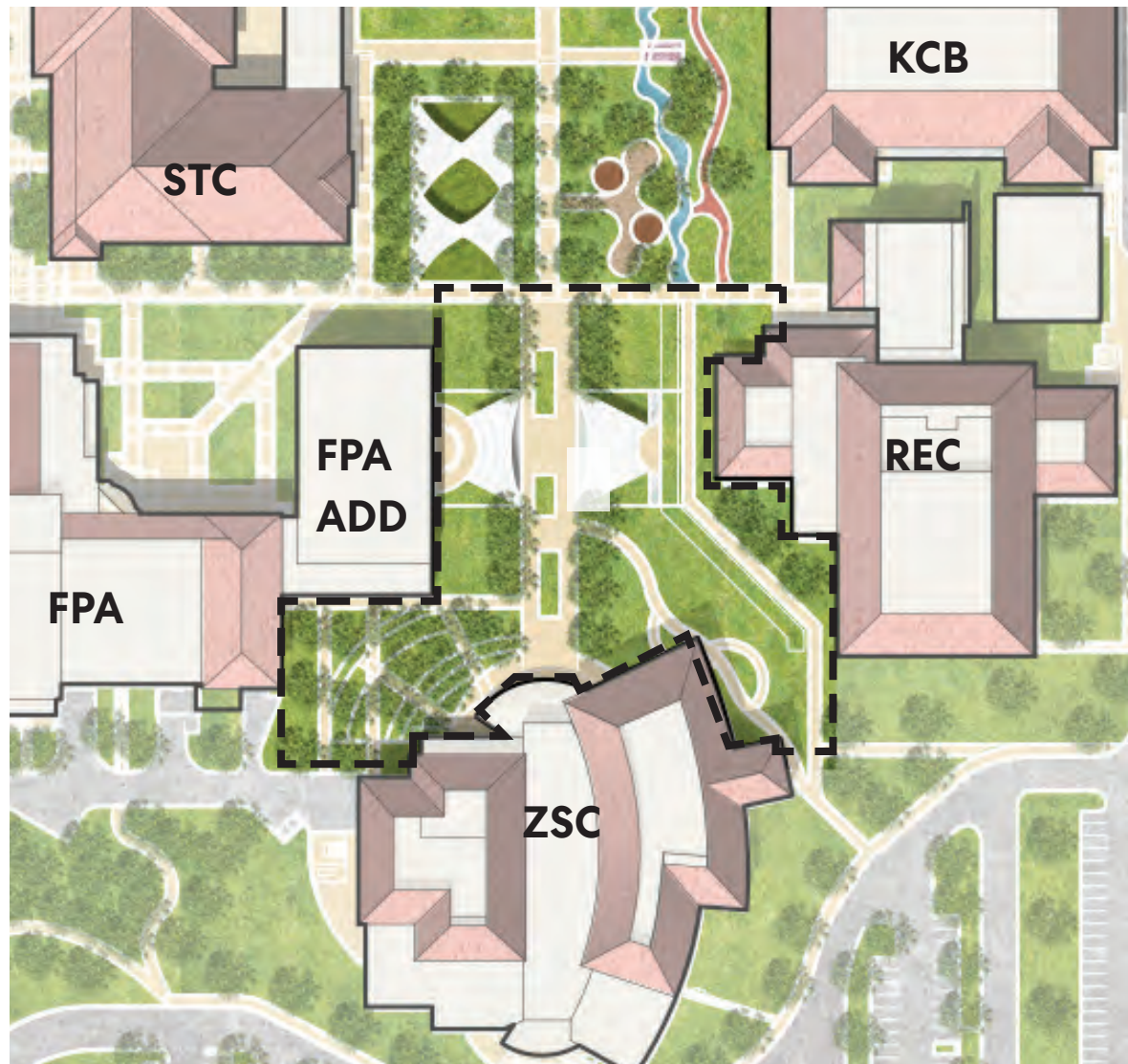
# Pedestrian Spines & Extensions

The improved east/west promenade traversing the campus from West Loop to East Loop south from UPD to RLC, will stitch together many existing and new campus facilities. This promenade will provide a much-needed east/west artery on campus. The new promenade should be wide enough to provide generous circulation for multiple pedestrians moving in both directions. Additionally, this promenade can be utilized for life/safety purposes by incorporating bollards, campus emergency phones, shaded nooks, and charging stations.

In addition to pedestrian traffic, this new promenade should accommodate bikes, golf carts, and utility vehicles utilized for commuting to class, campus tours, or for maintaining and accessing multiple points on campus. This significant path should be articulated with pavers, lighting, and site furnishings to complement the significance of this major campus mover. This spine will incorporate activity and seating nodes at intentionally-located intervals along the path or and complement gathering areas or plazas adjacent to buildings.



# FINE & PERFORMING ARTS PLAZA



## Fine & Performing Arts Plaza

The new campus master plan landscape improvements also features a new cultural node for the areas adjacent to the new Fine Arts Addition. Existing underground utilities will need to be relocated as part of the new construction. Programming and planning for this building will include plans for an outdoor space to support the creative programs and education of the Fine Arts curriculum. This unique campus asset will feature an outdoor plaza to support performances in a comfortable space between two structures; thus, providing shade and great acoustic opportunities. Lighting, supplemental shade with shade sails, or a substantial trellis element will enhance the experience for both performers and visitors.

This Performing Arts plaza can also be designed to function as an amphitheater for graduation, student meetings, and other department, program, or university gatherings. New lawn spaces located between the radial pathways on the south end of the Fine Arts Addition provide both flexible outdoor spaces for everyday use and an opportunity for art installations. Vibrant plantings and ornamental trees will enhance these park-like reflective and quiet spaces. Pedestrian circulation will be constructed from special paving and/or decomposed granite to reinforce the pastoral feel of this pedestrian node.

# New East Quad

The “East Quad” will reimagine and dramatically transform the southeastern portion of campus within the loop road. This significant new phase of future buildings for academics and student life on the east side of campus represents a clean slate opportunity for a new signature open space for the campus, and to create a network of unified network of complementary landscape and circulation elements to unify this area with the existing campus core.



Circulation and connectivity to the existing campus and within these new phases should be thoroughly considered to ensure appropriate sidewalk locations, widths, materials, and overall safety. Special attention to street crossings (often invisible to distracted students and drivers) should be considered with either traffic sign controls, raised crossings, blinking light indicators, bollards, or a combination of all.



The implementation of the East Quad should consider green infrastructure solutions like rain gardens, bioswales, and biofiltration strips to complement the nature and character of the surrounding native landscape (i.e., Arroyo Park).



## EXISTING

The Physical Plant Parking Lot to the south of AIC will be transformed into an open space flanked by new academic buildings in the near term, with much future development to follow moving beyond into the current sites of athletics and recreation fields





**FUTURE EAST QUAD**

# New East Quad (continued)

The signature open space is oriented north-south on axis with the existing Tralblazer Tower on the south facade of the AIC. This landmark frames a view through a new signature pavilion in the center of the open space, creating a flexible shaded space for seating, gathering, and events.

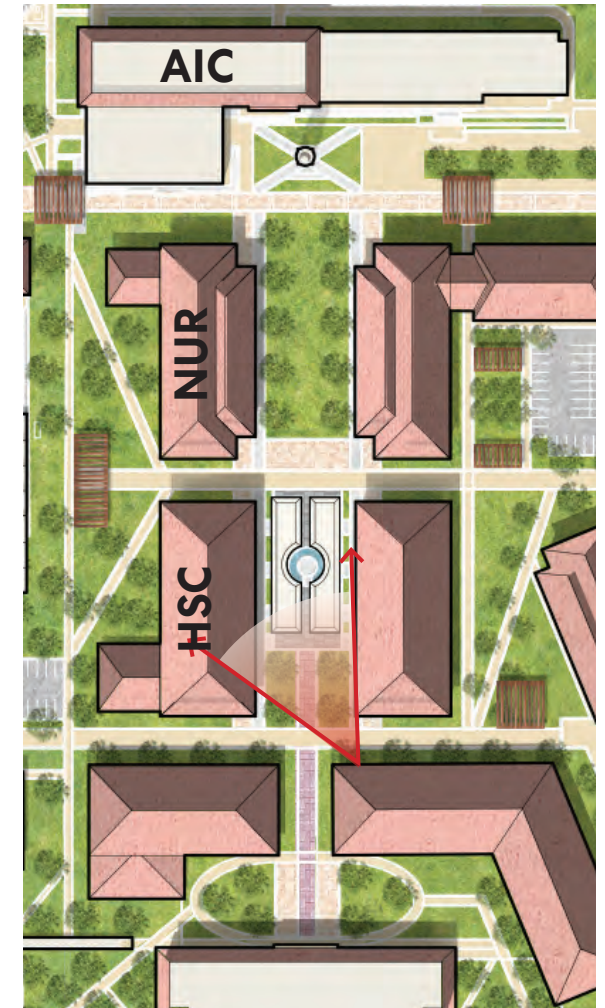
In addition to this major feature, outdoor shade structures such as pavilions, trellises, and shade sails, should be implemented as part of the development process rather than simply as independent projects. This strategy ensures that every new construction project for a new building includes an investment in outdoor amenity infrastructure.

With the adjacent construction of a residence halls and a new athletic complex to the west, connectivity from the existing campus and the new East Quad should be thoughtfully planned. These new connections can promote the use of bicycles and walk/jog trails; all contributing to a sense of community and commune with nature. Lighting, shade, access to water, and emergency phones should all be considered along these new connectors.

Plentiful and aesthetically pleasing signage and way-finding will be helpful to new students and visitors; especially in this

new campus area. There may even be an opportunity to feature signage that celebrates and educates everyone on the natural environment and beauty of the landscape encompassing this campus.

New tree plantings in this quad should be 4" caliper trees (minimum). When possible, a few trees in open spaces should have a bigger caliper size, to give this new campus area a running start to creating a dense tree canopy as quickly as possible.





**FUTURE EAST QUAD AND PAVILION**

# A Glimpse of the Future of TAMIU:

## Existing

Taken from the northwest, the image on this page captures the TAMIU campus not long before the master planning process commenced. Bob Bullock Loop is in the foreground, while the tennis complex (under construction) and RLC housing form the westernmost edge of development.

## Long-Term Vision

From the same vantage point on the opposite page we see a vision for the TAMIU campus several decades into the future. Bob Bullock Loop has become Interstate-69, and the campus has grown with a combination of infill and eastward expansion. The new boundary of development formed by the athletics and recreation complex has pushed all the way to the western property line.



EXISTING

FUTURE 





# Appendices

## CONTENTS

### APPENDICES

A: Parking & Mobility

B: Landscape Guidelines

C: Utility Infrastructure Plan

*Mechanical*

*Electrical*

*Civil*

D: Cost Estimates



TEXAS A&M  
INTERNATIONAL  
UNIVERSITY





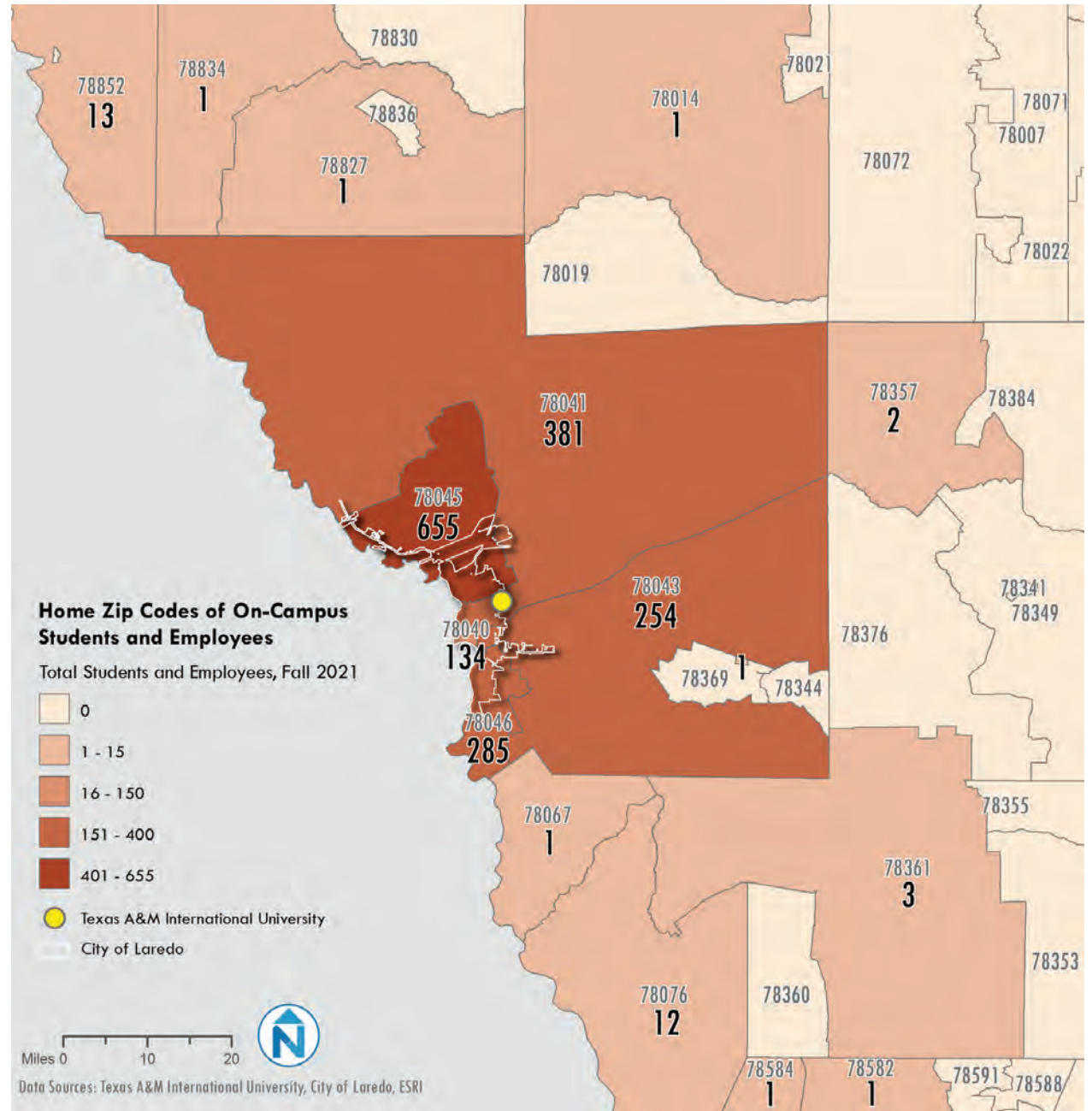
**PARKING &  
MOBILITY A**

# PARKING & MOBILITY

## EXISTING CONDITIONS

### Travel Patterns

Most Texas A&M International University (TAMIU) affiliates live close to campus. Data provided by TAMIU on affiliate home ZIP codes in Fall 2021 indicates that 93% of students and 95% of faculty and staff live within the five closest ZIP codes to campus (Figure 1). The greatest share of affiliates live in the 78045 ZIP code, which has a travel shed of about 1-30 miles.



**Parking**

**Inventory**

TAMIU has 13 parking lots and additional on-street parking along University Boulevard loop road (Figure 2). Two of the parking lots are designated for university housing residents, while the others support student, faculty and staff, and visitor daily parking. As of Fall 2022, TAMIU has a total of 3,346 parking spaces on campus. Aside from a limited number of “reserved” spaces, parking on campus is free, and operates on a “first-come, first-serve” policy.



Certain spaces are designated as “reserved” in the East Gated and half of the West Gated parking lots. Reserved permits cost \$100 for the full year (\$45 for one term) or \$40 for motorcycle spaces (\$17 for one term).

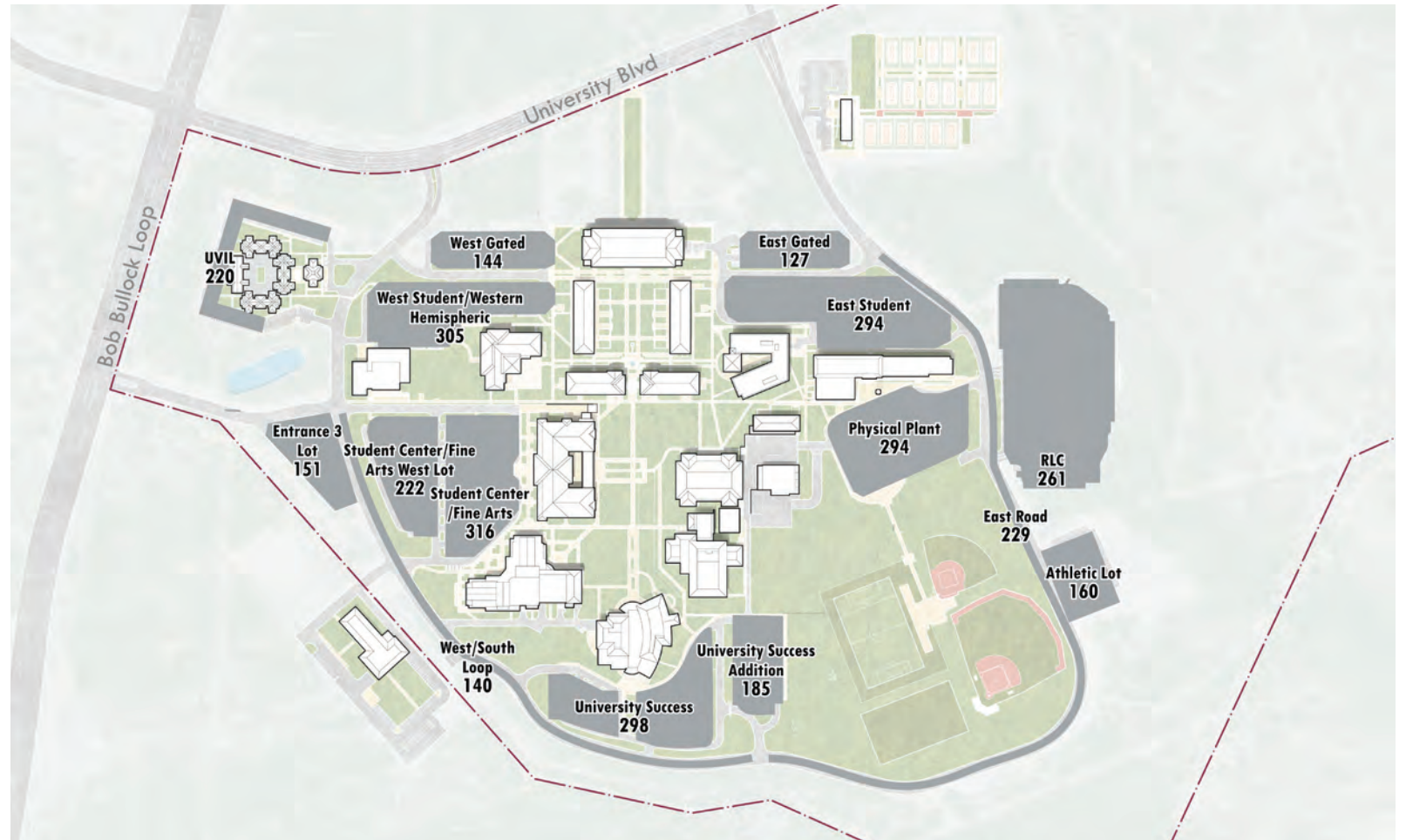


Figure 2 Parking Inventory, Fall 2022

A/ APPENDIX

Occupancy

TAMU conducts parking occupancy counts each semester. In Fall 2022, parking occupancy peaked at 12 p.m. at 74% across the whole campus. Even at its busiest, and accounting for a 5% buffer, the campus has an average of 300-350 available spaces (Figure 3). Fall 2022 findings are consistent with data collected since 2017, which reveals that TAMU supply has exceeded demand since 2018. Parking occupancy dropped substantially during the Covid-19 pandemic, has since rebounded, but still is lower than in 2017.

In Fall 2022, the West Gated, East Student, Student Center/ Fine Arts, West Student, and Physical Plant lots experience the highest peak hour occupancies at 99-100% (Figure 4). This high level of demand corresponds to their proximity to main campus buildings and the campus core. By contrast, the lots farther from the core were only 3-38% full. On-street parking along University Boulevard loop road was about 25% occupied at peak.

Figure 3 Average Peak Parking Occupancy, by Year



\* Excludes Fall 2020 data

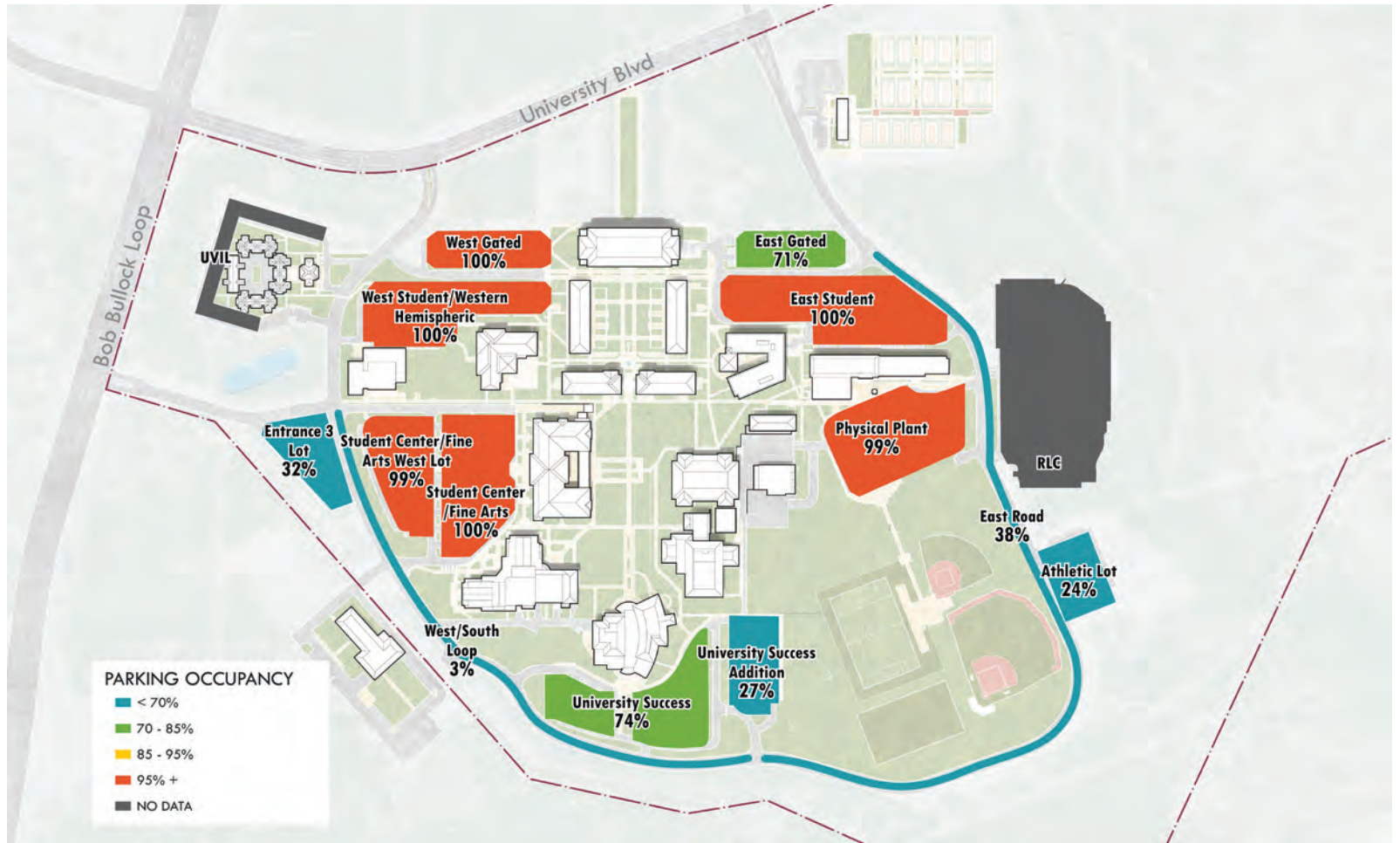


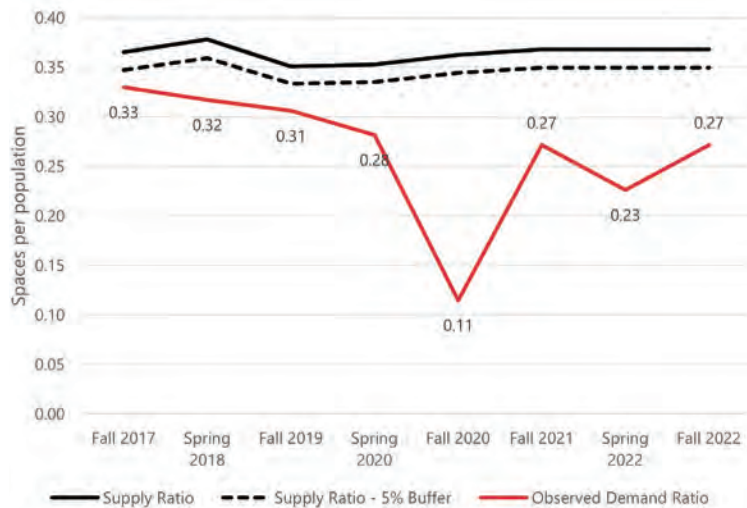
Figure 4 Peak Parking Occupancy, Fall 2022

**Future Parking**

A parking demand model was utilized to estimate the need for new parking spaces in the next ten years based on the Master Plan. The basic methods for estimating parking demand and right-sizing future parking build include:

1. Project campus population growth by year based on the existing population and a 2% annual growth rate. The assumptions include a constant factor of 2% of affiliates being “online” and not coming to campus on the average day.
2. Calculate the TAMIU parking demand ratio (spaces per on-campus user) based on observed parking data. As shown in Figure 5, the parking demand ratio has declined since Fall 2017. For future demand analysis, a ratio of .29 was assumed, which is comparable to national guidelines for similar suburban/rural universities.
3. Estimate parking demand by year based on population growth and demand ratio. A 3% reduction in parking demand was assumed (beginning in 2028) to account for improved

Figure 5 TAMIU Parking Supply and Demand Ratios, by Year



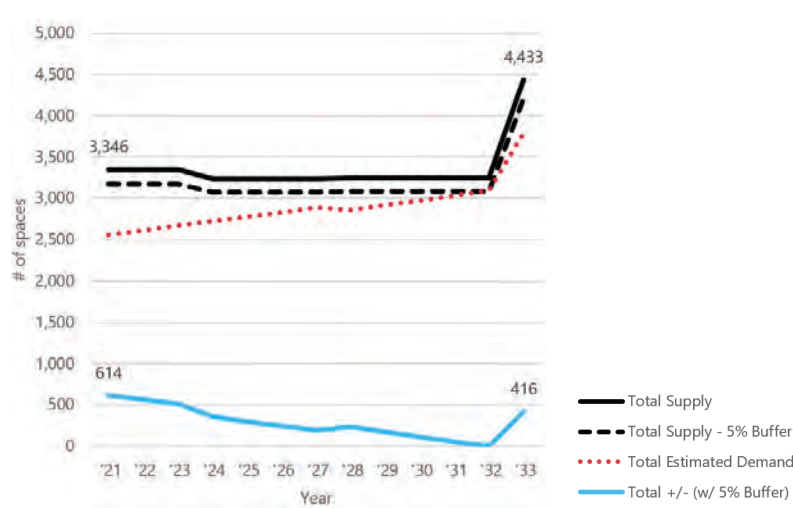
mobility services and parking management. The analysis also accounts for new parking demand from the proposed Athletics Complex and events center.

4. Estimate net losses of parking supply by phase of the master plan (Figure 7).
5. Calculate surplus or deficit of parking by year, accounting for a 5% buffer.
6. Right-size number of spaces for each proposed facility (Lots 1-7 in the Master Plan).

Key findings of the parking analysis include:

- Even with loss of the Physical Plant lot in the near-term, it is estimated that TAMIU will have adequate supply to accommodate near-term campus growth without adding more parking.
- Doing nothing, however, is not an option. Without new supply in the next 10 years, the assumed campus growth and loss of existing parking due to planned development would result in a

Figure 6 Parking Supply versus Demand, by Year



parking deficit by 2028.

- The preferred master plan concept assumes the construction of new parking supply. It is estimated that TAMIU will need approximately 1,400 gross new parking spaces, or net new 800 spaces, by full build out. Figure 6 shows the estimated demand relative to supply. Figure 7 shows the assumed loss and addition of parking by facility.
- Enhanced parking management and improved walkability is crucial to making TAMIU a park-once campus and maximizing the utility of all its parking facilities.

Figure 7 Parking Supply, by Phase

| Facility                          | Current (2022) | Near Term (2024-2027) | Mid Term (2028-2032) | Long Term (2033+) |
|-----------------------------------|----------------|-----------------------|----------------------|-------------------|
| Physical Plant                    | 294            | 128                   | -                    | -                 |
| West/South Loop                   | 140            | 140                   | 70**                 | 70**              |
| East Road                         | 229            | 229                   | 115**                | 115**             |
| RLC                               | 261            | 261                   | 124                  | 124               |
| All other Lots                    | 2,422          | 2,422                 | 2,422                | 2,422             |
| <b>EXISTING SUB-TOTAL*</b>        | <b>3,346</b>   | <b>3,180</b>          | <b>2,731</b>         | <b>2,731</b>      |
| <b>FUTURE PARKING FACILITIES*</b> |                |                       |                      |                   |
| Lot 3                             | -              | -                     | 250                  | 250               |
| Lot 1                             | -              | -                     | -                    | 529               |
| Lots 4-7                          | -              | -                     | -                    | 653               |
| Lot 2                             | -              | 60                    | 60                   | 60                |
| Lot 8                             | -              | -                     | 120                  | 120               |
| Lot 9                             | -              | -                     | 90                   | 90                |
| <b>TOTAL PARKING SPACES*</b>      | <b>3,346</b>   | <b>3,240</b>          | <b>3,251</b>         | <b>4,433</b>      |
| <b>DEMAND</b>                     | <b>2,620</b>   | <b>2,900</b>          | <b>3,200</b>         | <b>3,800</b>      |

\* Does not include spaces at joint development parking lot.

\*\* Assumes 50% of on-street spaces along the University Boulevard loop are removed to facilitate safety and multimodal streetscape improvements.

^ Spaces by lot are estimated based on physical size of facility. Exact number of spaces may vary based on implementation needs.

Data does not include Athletic Mud Lot and lots at UVIL and RLC

## A/ APPENDIX

### Roadways

University Boulevard is TAMIU's main roadway, circling around the campus grounds in a loop and connecting to US-59 and Casa Verde Road. Most of University Boulevard has two general purpose travel lanes per direction. The main arterial portion of University Boulevard at the north of campus is divided by a median and has a posted speed limit of 35 miles per hour (mph). The accessway on the campus' western edge has a posted speed limit of 30 mph. The rest of University Boulevard loop has a posted speed limit of 20 mph. As an area that sees higher traffic volumes, the western sections of University Boulevard prohibit street parking with extensive red curbs, while the southern and eastern sections of the "campus loop" have on-street parking with marked spaces.

Neighborhoods surrounding the TAMIU campus include many cul-de-sacs, gateways, and street segments that funnel vehicles onto the same few arterials. As a result, the street network around TAMIU has very poor connectivity and poses a significant barrier to anyone hoping to access



Entrance 1 (left) is the primary entrance to the University Boulevard loop (right), which provides on-street parking but does not include sidewalks.

the campus by active transportation or non-driving means. Congestions at the bottleneck gateways and arterials are also an obstacle to expanding mobility options.

The Bob Bullock Loop, also known as US-59 or Loop 20, is the major arterial/highway that connects downtown Laredo to University Boulevard and the TAMIU campus. Texas Department of Transportation (TxDOT) data reports 44,654 daily vehicles travelling along the Loop north of University Boulevard, and an estimated 2,000 vehicles turn in or out of campus on the average day. The higher traffic volumes and speeds correlate with the limited alternative options to travel to campus.

Bob Bullock Loop will be expanded and upgraded to Interstate standards with additional general-purpose lanes, grade-separated interchanges, and a separate shared-use sidewalk and bikeway. The completion of the shared-use path connecting the TAMIU campus to Laredo will be a benefit, but the new interchange presents potential issues



to mitigate, including higher speed turning movements at on- and off-ramps, additional conflicts points and longer connection to Casa Verde Road for pedestrians and bicyclists, and noise and air quality impacts to existing student housing.



Figure 8 Average Daily Traffic (2021)

**Transit**

El Metro is the primary public transit provider in the region. Route 16 provides direct connectivity between downtown Laredo and the TAMU campus via Del Mar Boulevard (Figure 9). Route 16 operates at 90-minute headways on weekdays from 7 a.m. to 9:10 p.m., 75 minutes on Saturdays between 7 a.m. to 6:55 p.m., and every 60 minutes on Sundays from 12 a.m. – 5:30 p.m. Based on 2019 ridership data, Route 16 had the 5th highest ridership in El Metro’s system with 159,590 boardings across the route.

A standard adult fare is \$2.00, while student fares are \$1.50. A monthly pass is \$120, while student semester passes range from \$250-\$280. Schedules, route maps, and real-time information is available via the El Metro smartphone app.

Route 16 stops at three locations on campus: the Student Center, the eastern Residential Learning Community housing complex, and University Village housing complex to the west. Stops lack adequate passenger amenities such as shelters or schedule information. A single bench under a small canopy is available off to one side of the Student Center stop.



Source: Google Street View of TAMU University Village Bus Stop



Source: The Bridge Student Newspaper

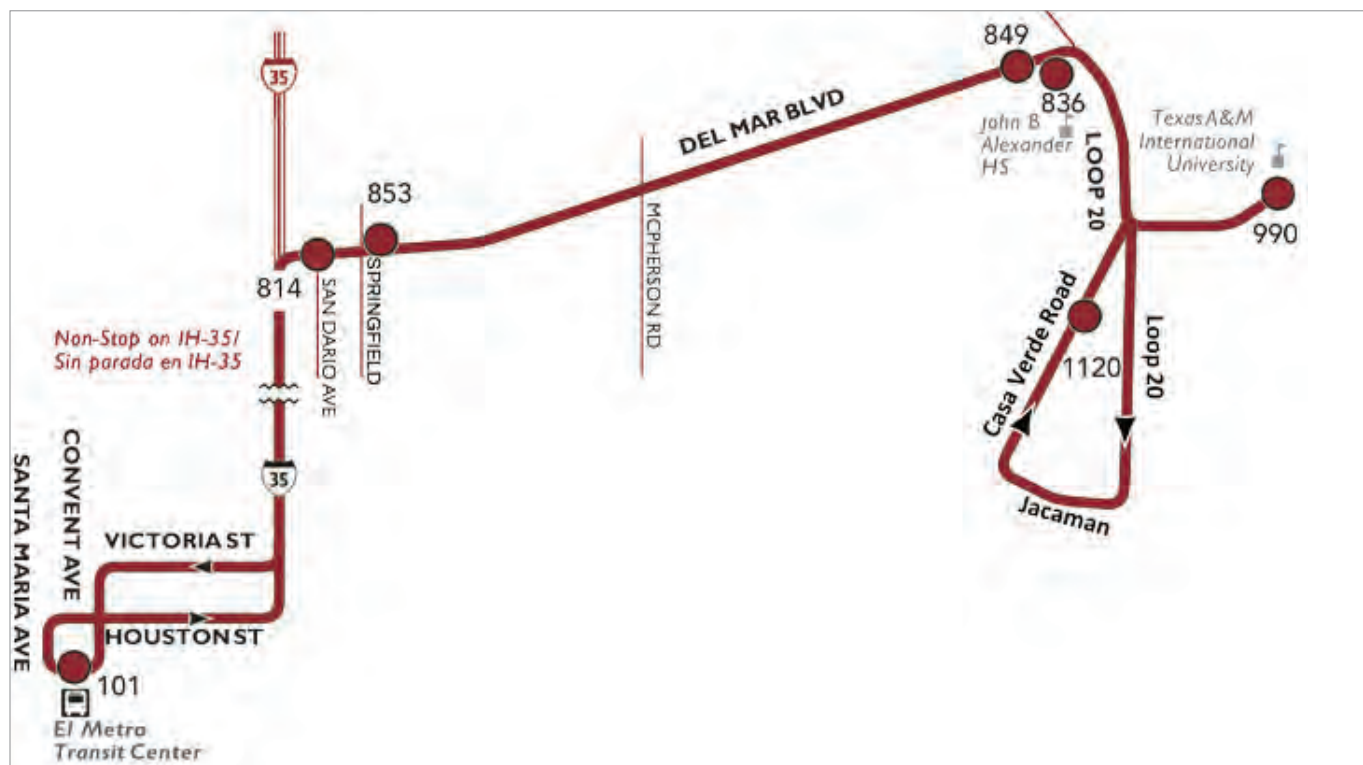


Figure 9 El Metro Transit – Route 16

Source: El Metro Transit

**Biking**

The closest bicycle facility to TAMIU is located along Loop 20, which is a 3.73-mile shared use, off-street bikeway. As part of the Bob Bullock Loop upgrade, a separated bikeway will be built parallel to the highway and be extended farther south to close a key bicycle network gap (Figure 10). However, the highway expansion project may create more challenging crossing conditions and increase the number of conflict points between pedestrians, cyclists, and motor vehicles.

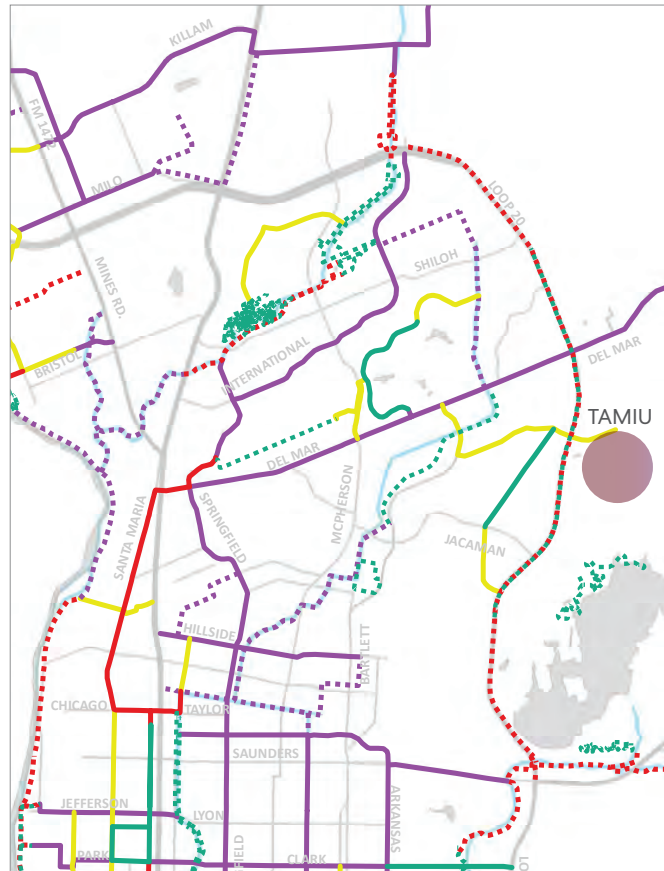


Figure 10 Existing and Future Bicycle Network

An on-street bicycle lane on University Boulevard has been identified in the [Laredo and Webb County MPO 2020 Active Transportation Plan](#) as a future project, slated for design and implementation in the next 20 years.

TAMIU allows bicycling on its campus grounds but has no on-street bicycle lanes or dedicated facilities. The compact size and flat topography of the campus provide strong conditions for biking on campus. The lack of high visibility crossings and expansive parking lots, however, can create stressful conditions. TAMIU has numerous bicycle racks located outside its buildings, and in 2021 TAMIU unveiled a new bicycle repair and air station by the Kinesiology, Wellness, and Recreation Center. TAMIU Recreational Sports hosts multiple bike rides each month to trails across the county.

Ridership analysis conducted by the Laredo and Webb County MPO revealed 830 bicycle boardings on El Metro Route 16 in 2019, averaging 17 boardings on a weekly basis. This data suggests that some TAMIU transit commuters carry their bicycles with them from home to campus.

**Walking**

The TAMIU campus core is a well-connected and compact pedestrian environment, with most of campus within a quarter-mile walk shed. As one moves out from the core, the pedestrian network is less connected and lacks basic amenities, such as sidewalks along University Boulevard loop. Large surface parking lots and more limited amenities, such as lighting and trees, reduce the walkability of the campus. As a result, parking lots at the edge, although within a short walk, are underutilized and affiliates complain about the lack of front-door parking access.

The surrounding roadway infrastructure creates a high-stress and uncomfortable environment for walking. The 2020 Active Transportation Plan identified “feeling unsafe” as the primary reason Laredo residents do not travel by active transportation. At TAMIU, this sentiment is compounded by the “low” and “extremely low” street connectivity in the residential neighborhoods of nearby North Laredo, where much of the affiliate population lives. Wide roads with limited built frontage tend to make walking distances feel much bigger than they are. Especially in an area with wide roads and high-speed traffic between the Bob Bullock Loop and University Boulevard, TAMIU’s pedestrian network exhibits strong internal connections but very poor external connectivity.



The TAMIU campus core is a well-connected and comfortable pedestrian environment.



**Summary of Challenges and Opportunities**

- The vast majority of TAMIU’s affiliates commute from the closest few ZIP codes. With additional resources, **active mobility and transit could be more attractive travel options to campus.**
- TAMIU has a **strong campus core for walking, bicycling, and rolling.** Strengthening the campus loop and periphery connections is crucial to a safe and vibrant campus.
- **Parking supply at TAMIU has consistently exceeded parking demand.** Improving walkability will reduce perceptions of “no available parking” and ensure all parking facilities are efficiently utilized.
- There is a well-established transit ridership despite the limited infrastructure and service availability. TAMIU can **consider partnerships with El Metro Transit** to improve the rider experience and local transit connectivity.
- Transportation Demand Management (TDM) programs such as subsidized transit passes and carpool matching can **reduce cost burdens and help manage parking demand at TAMIU.**
- The upgrade to Bob Bullock Loop may alleviate congestion at campus gateways, however it may also exacerbate access challenges for bicyclists and pedestrians. **Coordination with TxDOT will be crucial** if TAMIU seeks to improve its “front door” and external connectivity for active mobility users.

**RECOMMENDATIONS**

The Master Plan recognizes that driving and parking will remain central to how people access the TAMIU campus. Building too little parking will limit growth and user-friendly access to campus. Building too much parking, however, will maximize vehicle trips and traffic congestion, take up more campus land with hardscape, and cost a substantial amount of money.

A right-sized and cost-efficient parking system, combined with safe and convenient walking, biking, carpooling, and transit investments over the coming decade, will support TAMIU’s place as an institution of higher learning and source of community pride.

The transportation and parking recommendations are guided by the Master Plan principles.

| MASTER PLAN GUIDING PRINCIPLE   | WHAT DOES THIS MEAN FOR PARKING & MOBILITY?  |
|---|--|
| Create spaces and places that reinforce campus community and culture. | <ul style="list-style-type: none"> <li>• Preserve the pedestrian-oriented core.</li> <li>• Enhance walkable connections as campus grows.</li> <li>• Better connect TAMIU to Laredo.</li> <li>• Use mobility to create a sense of place.</li> </ul>   |
| Enhance learning and discovery  | <ul style="list-style-type: none"> <li>• Reduce transportation as a barrier to education and employment.</li> <li>• Make transportation an asset to getting the best and brightest.</li> <li>• Facilitate more transportation options for lower-income affiliates.</li> </ul>  |
| Celebrate the natural environment                                     | <ul style="list-style-type: none"> <li>• Encourage sustainable transportation options.</li> <li>• Encourage safe and active travel to, from, and within campus.</li> <li>• Reduce transportation impacts to TAMIU and Laredo.</li> <li>• Prioritize land for nature and core uses, not roads or parking lots.</li> <li>• Emphasize cost-efficient travel modes.</li> </ul> |

Future Mobility Network



## Parking

### 1. Improve access and connectivity to underutilized facilities.

Parking in the core is in high demand, but several peripheral lots are underutilized - the Entrance 3 lot had a Fall 2022 average peak of 45% - in part because TAMIU affiliates do not feel comfortable walking to or from them. Connecting these facilities with safe and comfortable infrastructure, such as sidewalks, bike lanes, high-visibility crossings, pedestrian-scale lighting, or additional greenscape, is crucial to an efficient parking system and is far cheaper than building more parking in the campus core.

### 2. Reallocate underutilized on-street loop parking to sidewalks and pedestrian amenities.

As described below, improvements to the University Boulevard loop can enhance connections between peripheral parking facilities and the core, as well as increase the parking walkshed as campus expands to the east. Such enhancements can also create a more pleasant and welcoming campus environment and landscape. The parking analysis assumes 50% of parking spaces would be removed to facilitate streetscape improvements. Since 2017, average peak parking occupancy on the University Boulevard loop has been about 33%.

### 3. Incentivize carpooling with allocation of proximate carpool/vanpool in designated lots/spaces.

TAMIU should designate one to two lots, and a portion of spaces within each, as carpool/vanpool spaces. Spaces should be in proximate lots and locations to incentivize and reward shared rides that reduce parking demand on campus. TAMIU should start with about 30 spaces, or about 1% of total supply, and adjust as needed. This program should be paired with a carpool/vanpool matching program (discussed below) and well-marketed to all affiliates. The program should also be managed through a permit system and include spot enforcement to ensure compliance.

### 4. Explore use of additional permits and/or pricing to better distribute demand.

In the long-term as the campus grows, TAMIU should explore expansion of its existing permit program to additional lots to manage overall demand and distribute demand to more peripheral lots. Permits can also be utilized to prioritize access for key affiliates users and create a park-once environment. For example, parking at student residences could be managed through a permit system to ensure that only residents park at those facilities, but also that resident students do not drive their vehicle the short distance to one of the campus core lots to get to class.

### 5. Invest in state-of-practice technology, wayfinding, and enforcement systems.

To facilitate efficient use and management of its parking system, TAMIU should invest in upgrades to its parking systems. Priority improvements may include:

- a. Pair online permitting with deployment of License Plate Recognition (LPR) enforcement, establishing a truly “virtual” permit system. This improvement likely requires new/upgraded permitting software and purchase of an LPR vehicle. While upfront costs are high, LPR would significantly reduce labor costs, improve compliance with regulations, and allow for automated occupancy data collection.
- b. Expand virtual permit and/or access control systems at certain lots to improve compliance with regulations.

c. Update parking wayfinding across campus to provide user-friendly information and dispel perceived shortages of parking by directing motorists to available parking. TAMIU should adopt a formal parking brand and style guide for signage, wayfinding, and parking collateral. A wayfinding program should include a suite of static, directional, informational per lot, arrival/entry, and digital message signs. Digital signage would allow for continually updated real-time information, be integrated across facilities, and facilitate distribution to websites and mobile apps.

### 6. Prioritize right-sized parking build with planned growth.

Based on the future parking analysis, TAMIU should construct additional parking to mitigate loss of spaces due to development on existing parking lots and accommodate additional growth. The parking analysis estimates that TAMIU needs to add approximately 1,400 gross spaces, or 800 net new spaces, over the next 10 years. The campus master plan proposes new or expanded facilities in Lots 1-9. Figure 11 summarizes the estimated number of parking spaces by new parking facility and by master plan phase.



Figure 11 Proposed Parking, by Phase

| Facility                          | Current (2022) | Near Term (2024-2027) | Mid Term (2028-2032) | Long Term (2033+) |
|-----------------------------------|----------------|-----------------------|----------------------|-------------------|
| <i>EXISTING PARKING</i>           | 2,422          |                       |                      |                   |
| <i>EXISTING PARKING (NET)</i>     | 3,346          | 3,180                 | 2,546                | 2,546             |
| <i>FUTURE PARKING FACILITIES*</i> |                |                       |                      |                   |
| Lot 3                             | -              | -                     | 250                  | 250               |
| Lot 1                             | -              | -                     | -                    | 529               |
| Lots 4-7                          | -              | -                     | -                    | 653               |
| Lot 2                             | -              | 60                    | 60                   | 60                |
| Lot 8                             | -              | -                     | 120                  | 120               |
| Lot 9                             | -              | -                     | 90                   | 90                |
| <b>TOTAL PARKING SPACES*</b>      | <b>3,346</b>   | <b>3,240</b>          | <b>3,251</b>         | <b>4,433</b>      |

\* Spaces by lot are estimated based on physical size of facility. Exact number of spaces may vary based on implementation needs.

Tarleton State University transitioned to a virtual permit system in Fall 2022, allowing affiliates to manage their accounts online. Parking staff no longer administer or enforce physical parking decals. The parking website also includes an interactive map with detailed information on parking regulations by facility.

**Roadways**

**1. Create a safe and distinctive gateway and entrance corridor to campus.** TAMIU can work with the City of Laredo and future development to shape the experience people have accessing campus via University Boulevard and Loop Road. While the land surrounding campus is currently undeveloped and roads lack biking and walking facilities, parcels north of University Boulevard are zoned commercial and the reconstruction of Bob Bullock Loop will include a multi-use path.

In the future, University Boulevard may serve as a destination with businesses that affiliates access from campus, in addition to its role as the entrance to campus for people driving, taking transit, walking, and bicycling. Distinctive signs, architecture, and multimodal street design could better connect the heart of campus to the surrounding area.

Figure 12 Examples of Campus Gateways



Texas A&M University



Texas A&M University



Entrance to UNC Charlotte



Bike path entering UC Davis

**Roadways**

**2. Redesign University Boulevard for multimodal access.** When the Bob Bullock Loop reconstruction is completed, University Boulevard will be the last missing link for people who wish to walk and bicycle to campus from other parts of Laredo. The Laredo and Webb County MPO 2020 Active Transportation Plan proposes an on-street bicycle lane on University Boulevard in the 20-year timeframe. TAMIU should work with the City and MPO to determine the best design for this facility. The existing cross-section is shown in Figure 13 and two future options are illustrated in Figure 14.

**3. Redesign Loop Road to support a “park once” campus.** The existing design and use of Loop Road provides an opportunity to better support walking and bicycling through campus. Currently there are sidewalks on portions of the road, but substantial gaps exist. On-street parking sees low utilization (average of 33% peak occupancy over the past five years), and some segments have multiple travel lanes in one or both directions, which may not be needed to support the volume of traffic. Buildings and parking lots are generally set back from the road, which provides the potential for sidewalks or a multi-use path along the road. Existing cross-sections on are shown in Figure 15 and Figure 16 illustrates three potential design options.

**University Boulevard**

Figure 13 Existing Cross-Section on University Boulevard

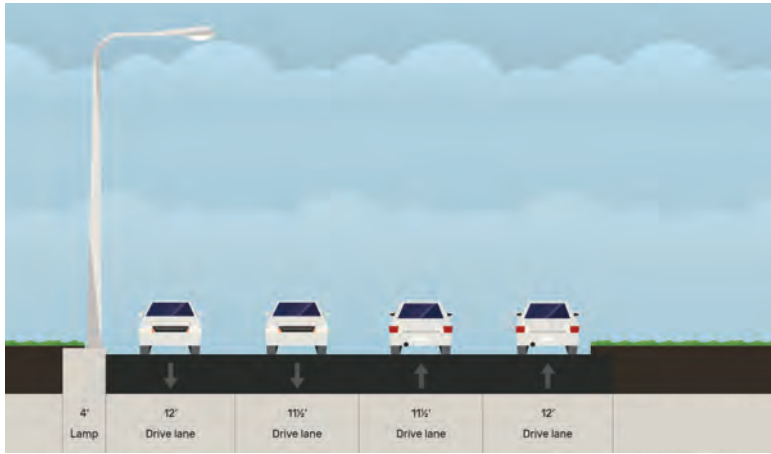


Figure 14 Potential Cross-Sections for University Boulevard

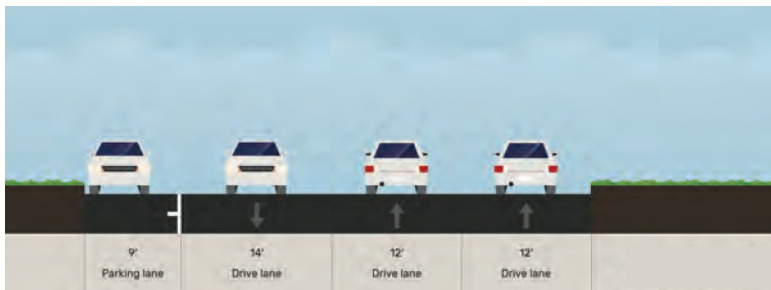
| OPTION  | CROSS-SECTION | PROS   | CONS  |
|---|---------------|--|---|
| <p>Option 1:<br/>Shared biking and walking path on south side</p> |               | <ul style="list-style-type: none"> <li>• Flexible space for walking and/or biking</li> <li>• No impacts to travel lanes</li> <li>• Vertical separation between people biking and motor vehicles</li> </ul> | <ul style="list-style-type: none"> <li>• Impacts to trees and other vegetation</li> <li>• Higher construction cost</li> <li>• Possible topography challenges</li> </ul>   |
| <p>Option 2: On-street buffered bike lanes and sidewalk</p>       |               | <ul style="list-style-type: none"> <li>• On-street bike facility, consistent with Laredo and Webb County Active Transportation Plan</li> <li>• Easier to minimize impacts to trees</li> </ul>              | <ul style="list-style-type: none"> <li>• Removes motor vehicle travel lane in each direction</li> <li>• Providing vertical separation (such as bollards) between people biking and motor vehicles is recommended but may be unacceptable for fire access</li> </ul> |

University Boulevard Loop Road

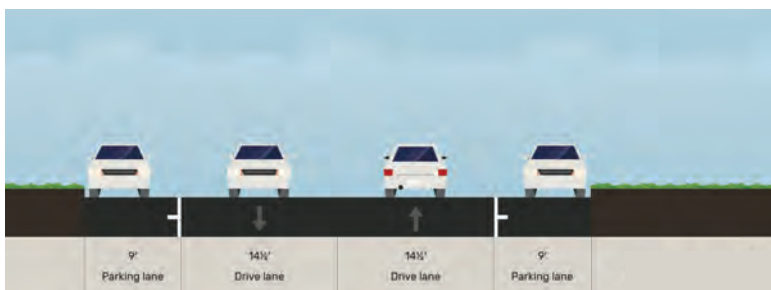
Figure 15 Existing Cross-Section on University Boulevard Loop Road



Northeastern and northwestern portions from University Blvd to campus housing



In front of student center



Southern portion

Figure 16 Potential Cross-Sections for University Boulevard Loop Road

| OPTION  | CROSS-SECTION | PROS   | CONS  |
|---|---------------|--|---|
| <p>Option 1: Add sidewalks where they do not exist, keep roadway as-is (~60' total)</p>                                       |               | <ul style="list-style-type: none"> <li>• Continues existing sidewalks</li> <li>• Does not require moving curb</li> <li>• No impacts to on-street parking or travel lanes</li> </ul>  | <ul style="list-style-type: none"> <li>• Potential impacts to trees and utilities</li> <li>• Topographical constraints</li> <li>• No bike facility</li> </ul>   |
| <p>Option 2: Add shared-use path on one side, keep roadway as-is (~60'-64' total)</p>   |               | <ul style="list-style-type: none"> <li>• Flexible space for walking and/or biking</li> <li>• Does not require moving curb</li> <li>• No impacts to on-street parking or travel lanes</li> </ul>  | <ul style="list-style-type: none"> <li>• Potential impacts to trees and utilities, but less than in Option 1</li> </ul>   |
| <p>Option 3: Move curb to add shared-use path on one side, roadway with two travel lanes and one parking lane (47' total)</p> |               | <ul style="list-style-type: none"> <li>• Flexible space for walking and/or biking</li> <li>• No impacts to trees or utilities</li> <li>• Adds on-street parking to northern portions of loop road</li> <li>• Narrower road = shorter crossing distance for pedestrians</li> <li>• Consistent number of travel lanes on entire Loop Road</li> </ul> | <ul style="list-style-type: none"> <li>• Require moving curbs and re-striping roadway</li> <li>• Removes one lane (travel lane on northern portions, parking lane on southern portion)</li> <li>• Net parking loss of about 125 spaces if applied to entire Loop Rd (over 200 spaces available on Loop Rd during avg peak hr.)</li> </ul> |

## A/ APPENDIX

### Biking and Walking

**1. Ensure there are direct, comfortable walkways to the heart of campus from the peripheral and expanding parts of campus.** With the construction of student housing and relocation of the athletic center to the east of the campus core, it will be important for TAMIU to create connections for walking and biking, including direct paths through undeveloped areas and through parking lots. Additional paths should include pedestrian lighting similar to the lighting in the campus core.

**2. Consider a shared bike and scooter program.** As the campus grows and more residential uses are added, shared bikes and electric scooters may have strong appeal to affiliates to circulate on campus. Given the compact scale and flat topography of TAMIU, shared bike and scooter programs can also support the park-once approach and facilitate easy access to parking facilities. Multiple service models are available, including smart lock and free-floating or smart kiosk systems. Numerous vendors, such as [BLOOM](#) and [BCycle](#), work with universities and employers to operate campus bike share programs.

**3. Add bike parking and other active trip amenities.** TAMIU can support new bicycle connections to campus and a campus bike or scooter share parking program by installing bike parking near all campus buildings. Bike parking should include a mix of bicycle racks and secure lockers or indoor bike parking. Ensure that bike parking is located at building entrances and key nodes of activity. Explore provision of lockers and showers for affiliates with new campus development.



Pedestrian connections through parking lots



Covered bike parking



Pedestrian lighting in campus core



SunCycle - UTEP Bike Share Program



**Transit and Shared Rides**

**1. Continue to support El Metro’s Student Bus Pass Program.**

Improving outreach and marketing to TAMIU affiliates will help grow transit ridership, reduce parking demand, and reduce individual transportation cost burdens. TAMIU should evaluate additional transit pass subsidies. A subsidy of 50-80% of the cost of transit passes for TAMIU affiliates would incentivize transit use and further improve transportation equity for those who do not have access to car.

**2. Improve campus transit facilities.**

Stops, wayfinding, and passenger amenities can be added to enhance the rider experience and make transit a welcoming and attractive option. All transit stops should include basic amenities such as shelter, benches, lighting, maps and passenger information, and clear wayfinding. As the campus grows, create additional stops prioritizing key nodes of campus activity such as new student housing and the proposed athletics complex and events center.

**3. Partner with El Metro to provide additional transit service as the campus grows.**

a. Partner with El Metro Transit to conduct a rider benchmark survey and identify any service gaps. The survey can also be used to gauge if a student/employee transit pass would be well received.

b. Adding a direct transit connection to North Laredo, where many affiliates live, would provide a valuable alternative and alleviate the burden of car-based commutes.

**4. Explore a TAMIU rideshare matching program.**

Developing a carpool matching or vanpool platform to facilitate shared rides among affiliates can help reduce traffic volumes, make commutes more accessible, and reduce travel costs. Shared rides can be especially valuable for those travelling to and from lower density neighborhoods, where public transit is not a convenient option. Numerous platforms exist, such as RideAmigos, Liftango, or Zimride, that allow for carpool matching in a closed system so that TAMIU affiliates

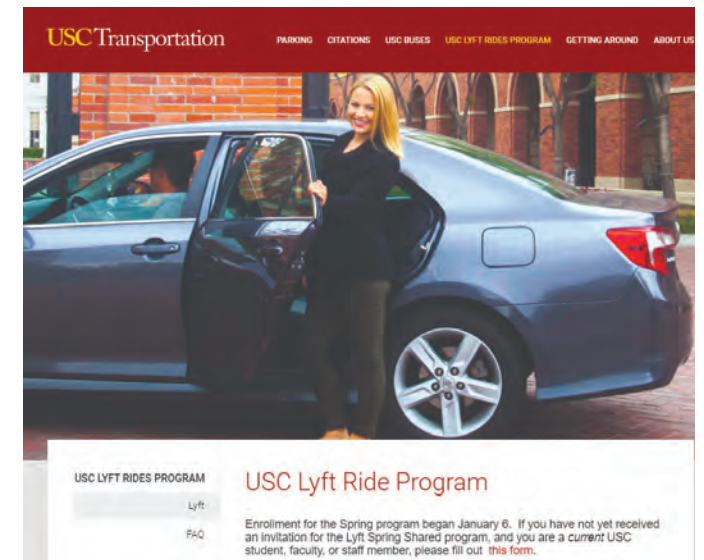
can identify a ride and/or passengers specific to campus and their travel schedule. Ridehail companies, such as Lyft or Uber, also allow universities to provide subsidies through voucher codes for shared affiliate rides.

**5. Establish an Emergency Ride Home (ERH) program.**

A subsidized emergency ride home can help affiliates pay for a taxi/ridehail service if they do not drive alone to campus and need to leave suddenly or leave campus during late hours. Ridehail companies, such as Lyft or Uber, allow universities to provide subsidies through voucher codes or dedicated programs for affiliate ERH rides.



Left: Example transit wayfinding signage. Right: Bus siding and shelters at the University of Wisconsin-Madison.



The University of Southern California partners with Lyft to provide free evening and late-night rides for students, faculty, and staff within a designated radius of the campus. Lyft operates these using pass programs that can be modified to fit different parameters, limitations, and capacities.





# Landscape Guidelines

B

# Landscape Guidelines

## Introduction

The following landscape guidelines are a set of objectives for both hardscape (sidewalks, plazas, furnishings, trellises, etc.) and softscape (trees, shrubs, groundcovers, grasses) improvements that work in synchronicity to stitch a campus together to create vibrant, safe, and sustainable outdoor places. These landscape guidelines establish and outline the materials, amenities, programs, and details that will support the daily activities and future growth of TAMIU. The intent of these landscape guidelines is to set up a reference vocabulary that builds a stronger campus identity and is consistent across the broader campus and future development.



The Sue and Radcliffe Killam Library, existing  
Photo credit: TAMIU Gallery (online)

## 1. Existing Tree Preservation and Planting Assessment

The TAMIU campus has a healthy framework of existing trees, native plantings, and open grassy areas. This framework will be built upon when new infrastructure is created. Whenever new projects are considered, existing trees should be preserved when feasible. Additionally, native and low-water use plantings should be installed with the goal of creating a diverse planting palette that works with the micro-climates created when new structures are erected. These landscape plantings should include plants that support pollinators, are adaptive, and also provide seasonal interest with a strong backbone of evergreen species. The installation of new turf should be limited and only used as a ground cover or for open lawn areas within quads and plazas.



Existing tree preservation at outdoor plaza, Texas Tech University. Photo credit: Coleman & Associates

## 2. Softscape for an Arid Environment

The TAMIU campus is fortunate to have an existing landscape with mature trees and plantings, many along a strong network of sidewalks and central promenades with a prominent central spine featuring an acequia water feature that provides a cooling element in an arid landscape.

The updated Master Plan will further enhance this existing landscape by continuing the planting of native trees, focusing on planting low water-use, native shrubs, and groundcovers, and preserving undisturbed land in its natural state to the benefit of indigenous flora and fauna of this region.



Planting for an arid environment, UT El Paso  
Photo credit: Ten Eyck Landscape Architects

Strengthening the softscape spaces across campus, particularly in the beforementioned landscape focus areas, improves the campus's "first impression" of both enrolled and potential students and visitors.

Therefore, the Updated Recommended Plant List in Appendix A builds upon the previous TAMIU's Master Plan 2004-2014 Recommended Plant Material List with a new set of specified plantings that are well suited for these campus ecoregions.



Planting at rain garden at E-Quad, Texas A&M University  
Photo credit: Coleman & Associates

**3. Hardscape - Promenade / Connectors**

Promenades and connectors are the pedestrian linkages between buildings, quads, courtyards, plazas, and roadways. These “pedestrian movers” are meant to be of a width that accommodates the anticipated volume of pedestrians or multi-model uses (typically 4’-8’ wide for small connectors and 8’-12’ wide for medium sized connectors and up to approx. 25’ for life/safety access or primary mall spaces).

The articulation of the paving for each of these connectors can be a crucial aesthetic statement on a college campus. The width and type of detailing of these pedestrian movers signal their significance among the network of campus circulation.

The widest promenade/connectors should feature paver banding and/or paver fields that can be combined with a percentage of concrete to reduce costs if necessary. If the connector is being utilized for fire truck access or utility vehicle and/or golf carts, the concrete and pavers should be vehicular rated. Narrow paths do not need paver articulation and can be simple broom finished concrete.

It is important to curve or angle path intersections to reduce the “cut through” pedestrian damage to turf or plantings; simply because pedestrians do not naturally make

90-degree turns in their movement. Diagonal paths can also be helpful in accommodating “point A to point B” patterns of movement.

Pedestrian path lighting and lighting of gathering spaces shall meet the required foot candle requirements for TAMIU. Additionally, emergency phone access should be installed at key outdoor locations and be readily accessible and visible. Light fixtures and canopy trees should not be in conflict. Special consideration should be taken to predict accurately the mature canopy of adjacent trees when determining the light fixture and/or tree spaces and location.

Places to sit or gather with others should be located along pedestrian movers to maximize their use. Careful consideration should be made to ensure that these places and “nooks” along these paths do not hinder pedestrian flow.

In fact; being off to the side of this movement is ideal to ensure these spaces function as intended; as a place to rest, converse or linger. This is an important component of campus life. Hanging out, seeing and being-seen are the hallmark of campus connections amongst students, visitors and faculty.



Austin Community College, Round Rock’s promenade with paver bands, removable bollards, light poles, seating nook with a shade structure, and landscape beds. Photo credit: Coleman & Associates



Grass Pave fire lane at University of Texas’ Engineering Education Research Center. Photo: Coleman & Associates

**3A. Existing/Future Utility Corridors**

Emphasis should be placed on the location of utility corridors to avoid conflicts between existing/future utility lines, overhead structures, trees, plantings, lighting, etc. All utilities, such as manholes, underground and overhead utility lines, etc., must be accurately and precisely located, identified, and marked on the field before construction. This avoids impromptu field decisions that could potentially compromise the intent of the landscape design, the health of planting materials, or the structural integrity of hardscape materials.

**3B. Fire Lanes**

Ease of emergency vehicle access throughout campus is essential. Emergency lanes require heavy-duty concrete and vehicular-rated pavers. To lessen their visual impact, these lanes may consider the use of gravel pave, grass pave, or pavers. Emergency lanes at TAMIU should comply with the applicable codes and standards listed in TAMIU’s Safety Manual under VIII. Fire & Life Safety. All fire lanes must be appropriately marked on the curbs and curb ends. If a fire lane is required, but no continuous curb exists, then mounted signage, alternate painting, or collapsible bollards are required to prevent access to unauthorized vehicles. The local fire department should review all building projects. Fire lane markings/signage must be approved by the Fire Marshall.

# Landscape Guidelines (cont.)

## 4. Site Furniture / Exterior Lighting

Site furnishings, which include benches, tables, shade structures, bicycle racks, trash receptacles, lighting, etc. (reference Appendix B), are an integral part of the development of campus quads, plazas, outdoor gathering spaces, promenades/connectors, etc., to create a consistent campus character. These furnishings should be consistently applied throughout the campus with the exception of areas of historical significance, or a unique program that may have unique site furnishings specific to the character of those spaces.

All outdoor furniture should have periodic assessments to ensure they are sturdy, safe, and not vandalized. Some existing furnishings in good shape can be relocated to new places as new furnishings are installed.

The Site Furnishings List (Appendix B) introduces new outdoor resilient furnishings that were unavailable 5 to 10 years ago. Appendix B's furnishing options reflect how today's user (students, staff, visitors, etc.) utilizes outdoor spaces. Moveable furniture and outdoor "living room" furniture that imitate comfortable lounging options are more prevalent on campuses than ever before. Additionally, charging stations, outdoor WiFi, and lighting for both study and safety are becoming the norm and could be embraced by TAMU.

Exterior lighting is critical for maintaining a high level of safety across campus during the evening hours and ensuring programmed outdoor spaces, such as athletic fields, are usable after dark. New exterior lighting should respect any existing aesthetics on campus and fit within the campus' maintenance program. All fixtures must be a "white light" (no High-Pressure Sodium) and be "dark-sky" compliant as required by state law. It is important to ensure that lights and trees are properly placed and not in such proximity that the tree canopy interferes with lighting. To minimize light obstruction, planting trees no closer than 12' to light poles is recommended.

Emergency Telephones, or "blue light," phones, are an important element in the overall campus safety strategy. Blue light phones can be used to contact campus security for any reason, such as to call for an escort, to report a suspicious person, or report an emergency so that security, police, fire, or medical personnel can be contacted and directed to a specific location.



Movable furniture on artificial turf, Texas A&M University, Rudder Plaza & Student Services. Photo credit: Lake Falto



Light fixtures at connector, Tarleton State University, Applied Sciences. Photo credit: Coleman & Associates

## 5. Architectural Shade Elements

Shade is a "must have" in this region of hot, sunny days. Trees are an obvious way to combat the heat and direct sunlight but the time for a shade tree to grow to a size that creates beneficial shade can take several years. Therefore, in newly create campus improvements, the use of structural shade combined with the planting of shade trees can help immensely by delivering both immediate shade and future shade simultaneously. These structural shade elements can also effectively create outdoor rooms, completed with lighting, charging stations, ceiling fans, WiFi, and comfortable furnishings.

Another added benefit of structural shade is that these elements can become architectural aesthetics in the landscape. These structures can be repeated throughout the campus as a unifying fabric that works in concert with trees, plantings, wayfinding, and architectural expressions of the buildings themselves.

These high-value/low costs improvements that are repeatable and architecturally scalable can be readily and easily integrated into outdoor gathering spaces and amenities adjacent to primary existing and proposed promenades.

All proposed shade elements should keep sun patterns in mind to determine size and location.

These structural shade elements can be constructed of metal/aluminum, or as shade sails (in less formal settings). They should be designed and located to compliment the surrounding architectural expressions and uses.



Utility vehicle at major connector, Tarleton State University  
Photo credit: Coleman & Associates

**6. Golf Cart / Utility Vehicle and Bike Parking**

Golf Carts for faculty, staff, or VIP visitors, as well as Utility Vehicle routes and parking, should be coordinated with campus leadership members and planned for in every new project. The parking should be integrated into every new site plan to minimize pedestrian/vehicular conflicts and to create readily identifiable parking spots for the drivers.

Bike parking should be encouraged, adequate, and easily accessible (LEED requires proximity to building entries). Bicycle parking should be screened; either with a masonry wall (approximately 42” in height) or in combination with metal screens and evergreen hedge plantings.

**7. Artificial Turf**

Artificial turf should be limited and utilized only in site-specific situations where natural Turfgrass will not thrive or when artificial turf is used as an outdoor amenity, such as for outdoor student gatherings, horseshoes/washers, or other specialized applications, such as the Student Center Commons. Artificial turf should only be installed where shade exists during the hours of 10 a.m. to 6 p.m. Wherever artificial turf is installed, a hose bib (water source) for cooling and cleaning should be located within 100 feet of the artificial turf. Drainage and the proper stabilizing subsurface shall be installed as per the manufacturer’s specifications.



Metal shade structure, Texas A&M University Rudder Plaza  
Photo credit: Coleman & Associates



Shade sails, Purple Rock courtyard, Concordia University  
Photo credit: Coleman & Associates



Bicycle parking enclosure (masonry wall & metal panels), E-Quad, Texas A&M University. Photo: Coleman & Assoc



Hammock stand on artificial turf, Rudder Plaza, Texas A&M University. Photo credit: Coleman & Associates

# Landscape Guidelines (cont.)

## 8. Gravel

Gravel is a popular and sustainable alternative for Turfgrass, paved areas, and plant-based mulch. It can also be used as a strip band (maintenance band) around structures to access building walls for maintenance or in areas where plant materials will not thrive. Due to its permeable nature, gravel can be a good material choice in areas where increased storm-water management methods are incorporated. While gravel does have low-maintenance properties, it is not completely maintenance-free and must be secured in place by containing it with a border or edge. Because gravel can migrate, it must also be replenished periodically as necessary.



Gravel as groundcover, University of Texas at Austin  
Photo credit: Coleman & Associates

## 9. Opportunities for Art Installations

Outdoor art installations on college campuses can evoke thought, reflect purpose, honor individuals, and a myriad of other purposes. Often outdoor art is sponsored by a donor who might have requests of their own. It is important in a landscape that an art installation has the proper visibility, placement, scale consideration, and requirements for clearance, safety, and even ADA compliance. The placement of trees and other landscape features should also be considered when art is placed. Most collegiate campuses require a maintenance endowment in addition to funding for an outdoor piece because the outdoor elements can often require maintenance that is not always a consideration for indoor installations.



Gravel as groundcover, University of Texas at Austin  
Photo credit: Coleman & Associates



Olafur Eliasson's sculpture at E-Quad, Texas A&M University. Photo credit: Coleman & Associates



Special place and node at Texas State Campus, San Marcos. Photo credit: Coleman & Associates

## 10. Service and Mechanical Screening

Wherever possible, all service, mechanical, and back-of-house elements (utilities, dumpsters, loading docks etc.) shall be buffered or screened with brick enclosures, softscape, or metal fencing/screening (louvered metal fence system). Brick enclosures should match existing or proposed building structures. Softscape buffers should include robust (heavily foliated) shrubs, small trees, planted berms, or a combination of all to mitigate views of back-of-house elements and screen them from pedestrians and vehicular views. Screening should keep service areas out of sight, while providing proper ventilation for the equipment and positive drainage.



Metal fence/panel screening a loading dock  
Photo credit: Coleman & Associates



# UPDATED RECOMMENDED PLANT MATERIAL LIST

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

## Trees

<https://arizona-trees.com/quercus-virginiana.html>



<https://www.tree-land.com/tree-finder/tree/live-oak/>



Southern Live Oak  
*Quercus virginiana*

<https://www.tree-land.com/tree-finder/tree/monterey-oak/>



<https://www.tree-land.com/tree-finder/tree/monterey-oak/>



Monterey Oak  
*Quercus polymorpha*

<https://www.austintexas.gov/department/grow-green/plant-guide/elm-cedar>



<https://www.plantanddallas.com/cedarelm>



Cedar Elm  
*Ulmus crassifolia*

## Small Trees

[https://www.depts.ttu.edu/plantresources/Pages/directories/landscape-info-sheets/woody-info/Vitex\\_agnus-castus.php](https://www.depts.ttu.edu/plantresources/Pages/directories/landscape-info-sheets/woody-info/Vitex_agnus-castus.php)



<https://plantara.com.au/trees/lagerstroemia-indica-x-fauriei-natchez-ii/>



Vitex spp.\*  
*Vitex agnus-castus*

<https://www.greenthumbsgarden.com/products/white-natchez-rape-myrtle-free>



<https://www.speciallytrees.com.au/trees/lagerstroemia-indica-x-fauriei-natchez-ii/>



Crape Myrtle\*  
*Lagerstroemia indica*

<https://discountriestreesofbrenham.com/nursery/ornamental-trees/deciduous/desert-willow/>



<https://hucson.com/lifestyle/home-and-garden/plant-of-the-month-desert-willow/>



Desert Willow\*  
*Chilopsis linearis*

<https://arizona-trees.com/prosopis-seedless-hybrid.html>



<https://hocroneinfo.com/bsk/mesquite-tree-leaves.htm>



Thornless Mesquite  
*Prosopis chilensis*

B/ APPENDIX

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

Small Trees (continued)

<https://us.oncleaneandbeautiful.org/product/blue-palo-verde/>



<https://www.succidentandmore.com/2015/05/palo-verde-palo-verde-update.html>



Palo Verde  
*Parkinsonia aculeata*

<https://www.amwua.org/plant/txas-mountain-laurel>



<https://waterwisevisely.com/blog/plant-month-teas-mountain-laurel-sophora-secundiflora/>



Texas Mountain Laurel  
*Sophora secundiflora*

[https://www.austintexas.gov/department/grow-green-plant-guide/kichewoodhttps://www.wildflower.org/gallery/result.php?id\\_image=19733](https://www.austintexas.gov/department/grow-green-plant-guide/kichewoodhttps://www.wildflower.org/gallery/result.php?id_image=19733)



[https://www.wildflower.org/gallery/result.php?id\\_image=19733](https://www.wildflower.org/gallery/result.php?id_image=19733)



Texas Kidneywood  
*Eysenhardtia texana*

<https://www.austintexas.gov/department/grow-green-plant-guide/sumac-evergreen>



<https://www.austintexas.gov/department/grow-green-plant-guide/sumac-evergreen>



Evergreen Sumac  
*Rhus virens*

Shrubs

<https://www.fragingteas.com/2006/05/oganta.html>



Agarita  
*Mahonia trifoliolata*

<https://www.sitgardenwise.com/eplant.php?plantnum=24933&etum=12&E>



Boxleaf Euonymus  
*Euonymus japonicus 'Microphyllus'*

<https://waterwisegardening.com/plants/teucrium-fruticans/>



Bush Germander  
*Teucrium fruticans*

<https://www.horticulturist.com/plant-search/plant-details.php?id=466>



Texas Sage\*  
*Leucophyllum spp.*

<https://www.succidentandmore.com/2015/05/palo-verde-update.html> [https://www.topogarden.com/fay-plants/shrubs/elaegnus-silverberry-for-sale/elaegnus-silverberry-for-sale.html](https://www.topogarden.com/fay-plants/shrubs/elaegnus-silverberry-for-sale/elaegnus-silverberry-for-sale/elaegnus-silverberry-for-sale.html)



Elaeagnus or Silverberry  
*Elaeagnus pungens*

<https://www.robspants.com/plants/tecstans>



Yellow Bells\* (photo: Sparklette)  
*Tecoma stans*

[https://www.chroniconline.com/lifestyle/home/native-firebush/article\\_ab9a0a9c-ba8f-11e5-80a7-471b10c46711.html](https://www.chroniconline.com/lifestyle/home/native-firebush/article_ab9a0a9c-ba8f-11e5-80a7-471b10c46711.html)



Firebush  
*Hamelia patens*

<https://mtcubcenter.org/plants/fuslyst-johns-vort/>



Goldcup\*  
*Hypericum spp.*

**Shrubs (continued)**

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying



Gray cotoneaster\*  
*Cotoneaster glaucophyllus*



Japanese Boxwood\*  
*Buxus microphylla japonica*



Japanese Yew\*  
*Podocarpus macrophyllus*



Nandina\* (photo: Lemon Lime)  
*Nandina spp.*



Oleander\* (photo: dwarf oleander)  
*Nerium oleander*



Pineapple Guava  
*Acca sellowiana*



Pomegranate  
*Punica granatum*



Primrose Jasmine  
*Jasminum mesnyi*



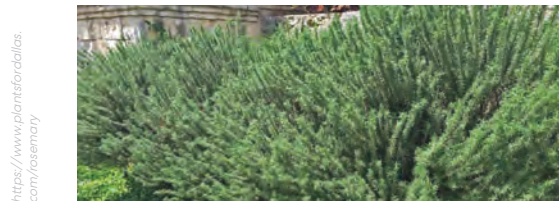
Reeve's Spirea  
*Spirea reevesiana*



Soft Leaf Yucca  
*Yucca recurvifolia*



Sotol\*  
*Dasyllirion spp.*



Upright Rosemary  
*Rosmarinus officinalis*



Dwarf Yaupon\* (photo: Nana)  
*Ilex vomitoria*



Yucca\* (photo: Red Yucca)  
*Hesperaloe spp.*



Drift® Rose\* (photo: Pink Drift® Rose)  
*Rosa 'Meijocos'*



Bicolor Iris  
*Dietes bicolor*

B/ APPENDIX

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

Ground Covers

<https://plantmaster.com/plants/ep/ant.php?plantnum=1477>



Prostrate Rosemary  
*Rosmarinus officinalis Prostratus*

<https://www.rareroots.com/products/teucrium-chamaedrys>



Germander  
*Teucrium chamaedrys*

<https://championlandscapesupply.com/products/wedelia>



Wedelia  
*Wedelia trilobata*

<https://www.ballandscapes.com/products/plantinfo.aspx?phid=093100000005071>



Silver ponyfoot  
*Dichondra argentea*

[https://www.wildflower.org/gallery/result.php?id\\_image=10966](https://www.wildflower.org/gallery/result.php?id_image=10966)



Woolly Stemodia  
*Stemodia lanata*

Perennials

[https://www.wildflower.org/gallery/result.php?id\\_image=1704](https://www.wildflower.org/gallery/result.php?id_image=1704)



Blue Mistflower / Wild Ageratum  
*Conoclinium coelestinum*

<https://www.nativeseed.com/product/salvia-mystic-spires-blue>



Indigo Spires\*  
*Salvia 'Indigo Spires'*

[https://plants.oaklandnursery.com/12100001/Plant/2126/Silver\\_King\\_Artemisia/](https://plants.oaklandnursery.com/12100001/Plant/2126/Silver_King_Artemisia/)



Silver King Artemisia  
*Artemisia ludoviciana*

<https://www.smekscampcrafts.com/herbloom-seeds/wormwood-seeds>



Wormwood  
*Artemisia absinthum*

<https://mwn.com/plants/salvia-greggii-autumn-sage/>



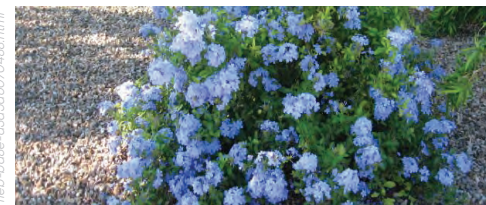
Autumn Sage\*  
*Salvia greggii*

<https://www.gardeningmagazine.com/articles/flowers-plants/plant-guide/bearded-iris-growing-guide/>



Bearded Iris\*  
*Iris spp.*

<https://www.gymnews.com/lifestyle/gv-gardener-plumbago-for-the-desert-garden/article.8416632-b405-11e3-b08e-a0566d070488.html>



Blue Plumbago  
*Plumbago auriculata*

<https://seedcorner.com/candytuft-perennial-evergreen-white-iberis-sempervirens/>



Candytuft  
*Iberis sempervirens*

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

Perennials (continued)



Copper Canyon Daisy  
*Tagetes lemmonii*



Green Lavender Cotton Santolina  
*Santolina virens*



Dusty Miller  
*Jacobaea maritima*



Flame Acanthus  
*Anisacanthus quadrifidus var. wrightii*



Sedum\*  
*Sedum spp.*



Jerusalem Sage  
*Phlomis fruticosa*



Gray Santolina  
*Santolina chamaecyparissus*



Mallow Hibiscus  
*Hibiscus moscheutos*



Marguerite  
*Argyranthemum frutescens*



Mealy Cup Sage  
*Salvia farinacea*



Mexican Bush Sage  
*Salvia leucantha*



Mexican Hat  
*Ratibida columnaris*



Mexican Honeysuckle  
*Justicia spicigera*



Mexican Mint Marigold  
*Tagetes lucida*



Mexican Oregano  
*Poliomintha longiflora*

B/ APPENDIX

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

Perennials (continued)



*Leucanthemum vulgare*



*Pavonia lasiopetala*



*Stachys coccinea*



*Achillea millefolium*



*Caesalpinia pulcherrima*



*Opuntia ellisiana*



*Cestrum parqui 'Orange Peel'*



*Philodendron selloum*



*Thryallis spp.*

<https://www.thespruce.com/oxeye-daisy-growing-guide-5100951>

<https://waterwisegardenplanner.org/plants/cistus-x-purpureus/>

<https://plants.shadesofgreeninc.com/Plant-Name/Opuntia-cacanapa-Ellisiana-Thornless-Prickly-Pear>

<https://www.almostedemplants.com/shop/Products/2750-split-leaf-Philodendron-erectum-monstera-cutleaf-Philodendron-nivis-cheese-plant-arrangement-mexican-plant/>

<https://www.austintexas.gov/department/grow-green-plant-guide/lewis-betony>

<https://planturagarden.uk/herbs/yarrow/common-yarrow>

<https://www.gardeningexpress.co.uk/cestrum-parqui-orange-peel-tree-shrubby-willow-leaved-jessamine>

<https://natureswayflorida.com/thryallis/>

\* Multiple varieties are available; check availability and confirm performance of selected variety in this region prior to specifying

**Ornamental Grasses**

<http://www.perennialsource.com/variety.php?ID=CHALA>



**Inland Sea Oats**  
*Chasmanthium latifolium*

<https://www.gardeningmagazine.com/articles/flowers-plants/plant-guide/the-best-maiden-grasses-for-your-garden/>



**Maiden Grass**  
*Miscanthus sinensis*

<https://australianhscaping.com/plant/muhlenbergia-capillaris-gulf-muhly-tesa-muhly-grass-floral-muhly-grass-gulf-muhly-pink-hair-grass/>



**Gulf Muhly**  
*Muhlenbergia capillaris*

<https://agrillseedart.com.edu/2018/09/18/lindheimer-muhly-grass-named-latest-tesa-superstar/>



**Lindheimer's Muhly**  
*Muhlenbergia lindheimeri*

<https://parrieblossomnursery.com/products/cortaderiaselloanpumila>



**Dwarf Pampas Grass**  
*Cortaderia pumila*

<https://www.thespruce.com/purple-fountain-grass-2132874>



**Purple Fountain Grass**  
*Pennisetum setaceum rubrum*

**Annual Color**

<https://www.thespruce.com/popular-larkspur-types-5090142>



**Larkspur**  
*Delphinium consolida*

<https://www.thespruce.com/growing-mexican-marigolds-tagetes-erecta-510113>



**Marigold\***  
*Tagetes spp.*

<https://letipia.com/personal-essays/Periwinkle-Another-Name-for-Daddy>



**Periwinkle**  
*Catharanthus roseus*

[https://www.chillenseeds.co.uk/item/1309/zinnia-elegans-dahliaflowered\\_mixed\\_colors](https://www.chillenseeds.co.uk/item/1309/zinnia-elegans-dahliaflowered_mixed_colors)



**Zinnia\***  
*Zinnia spp.*

# RECOMMENDED SITE FURNITURE LIST

## 1. Landscape Forms <https://www.landscapeforms.com/en-US/Pages/default.aspx>



Trash and Recycling Receptacle, Scarborough- 30 gal., side opening, surface mount

## Landscape Forms Benches



Scarborough bench (Formal Spaces)- metal, with/ without arms and dividing arms, color: Silver

## Landscape Forms Tables with Fixed Chairs



Carousel Tables- (multiple options and quantity of seats) casual height (loung height) with hooped seats, color: Silver

## Charging Station with Area light- 1-GFCI Outlet, 1-4 Port USB



## Bike Rack Bola by Landscape Forms- stainless steel, embedded



## Austin Bench (Informal Spaces)- IPE or Jarrah wood, with arms and 4 legs, color of metal: Silver



## Carousel Tables- (multiple options and quantity of seats) dining height (study and eating height) with backed seats, color: S





**Landscape Forms Community Tables**



Harvest Tables- fixed benches, color: Silver or pop of color

**Landscape Forms Movable Tables & Chairs**



Parc Centre- metal, with/without arms, color: Silver

**Landscape Forms Loose (informal) Furniture**



Loll chairs- (multiple styles and options) for use where theft is not a concern, i.e., courtyards, color: pop of color

**Catena Table-** steel head/perforated, color of metal: Silver



**Loll chairs-** (multiple styles and options) for use where theft is not a concern, i.e., courtyards, color: pop of color



**2. Gardco** (<https://www.signify.com/en-us/brands/gardco>)

**Campus Standard**



Light Fixture, Gardco- round form 10' pole

**3. Maglin** (<https://www.maglin.com/>)

**Maglin Very Informal Furniture**



720 Chairs (Informal Spaces)- metal, color: Silver or pop of color, MCH-0720-0001

720 Chairs (Informal Spaces)- IPE wood, color of metal: Silver or pop of color, MCH-0720-0004



**Maglin Informal Study or Dining Tables**



FAVA Cluster Seating 2800 Series- (multiple options) with/without umbrella, single/double/combined seat, color: silver or pop of color





**ENGINEERING  
NARRATIVE**





# MECHANICAL UTILITIES

## A. EXECUTIVE SUMMARY

The Texas A&M International University master plan projects the campus to grow by approximately 1,200,000 square feet by the year 2040. Most of this growth will be outside of the existing campus thermal infrastructure with some growth internal to existing site infrastructure. The growth is projected to require an additional 3,370 tons of campus cooling demand. Heating demand will increase by 19,160 MBH.

The current campus cooling demand is approximately 2,300 tons. The central plant is located adjacent to the Kinesiology and Physical Plant buildings and consists of four 1,000 ton chillers. The current total cooling capacity is 4,000 tons with a firm capacity of 3,000 tons (firm capacity is equal to the total capacity with the largest piece of equipment not in service). The current campus cooling firm capacity exceeds the cooling demand by approximately 700 tons.

11,900 MBH. The campus growth will increase heating demand by approximately 19,160 MBH for a total heating demand of 29,160 MBH. The current campus heating firm capacity exceeds the heating demand by approximately 1,900 MBH. An additional 17,850 MBH of heating capacity will be needed to meet the future demands and provide firm capacity. To meet the future demand, the central plant shall be expanded to the South in order to house the additional cooling and heating equipment necessary.

Prepared by



**SHAH SMITH  
& ASSOCIATES, INC.**

Texas Registered Engineering Firm F-2113  
March 2023

Based on the planned campus growth, the campus cooling demand will increase to about 5,850 tons. An additional 3,000 tons of cooling capacity will be needed to meet the future demands and provide firm capacity.

The campus is projected to mostly grow in a South East direction from the location of the central plant. This area of the campus is currently without thermal infrastructure, which will be needed to facilitate campus growth. For a summary of the additional site thermal infrastructure necessary, refer to Appendix II for a breakdown of additional piping required per developmental phase.

The campus distributes heating hot water from the central plant to buildings for comfort heating. The current campus heating demand is estimated to be 10,000 MBH. The current campus heating capacity is 17,300 MBH with a firm capacity of

**B. CHILLED WATER ANALYSIS**

Texas A&M International University uses chilled water as its primary means of campus cooling. The campus has one central plant distributing chilled water through a common piping system. Refer to Appendix II for a site plan showing the existing conditions of the campus thermal piping routing and sizes. The current central plant cooling capacity is 4,000 total tons with 3,000 tons of firm capacity. The current campus peak cooling demand is 2,300 tons. The current cooling equipment is listed in Table 1 below:

| Equipment      | Location      | Age      | Capacity     |
|----------------|---------------|----------|--------------|
| Chiller 1      | Central Plant | 1 Year   | 1,000        |
| Chiller 2      | Central Plant | 25 Years | 1,000        |
| Chiller 3      | Central Plant | 1 Year   | 1,000        |
| Chiller 4      | Central Plant | 17 Years | 1,000        |
| Total Capacity |               |          | 4,000        |
| Firm Capacity  |               |          | <b>3,000</b> |

The university is planning to add about 1,200,000 square feet by 2040. This growth will increase the cooling demand of the campus. Table 2 below shows the load factors associated with each type of building planned. The load factors are based on historical data for similar buildings.

| Building Type | BGSF/TON |
|---------------|----------|
| Support       | 325      |
| Housing       | 300      |
| Academic      | 250      |
| Research      | 125      |

Tables 3, 4, and 5 break down the growth in cooling demand between phases 1, 2, and 3 of the campus expansion, respectively. A campus wide diversity factor of 70% was used. This diversity factor takes into account that all buildings will not have their peak demands at the same time. The “Key” assigned to each building represents the name of the building on the master plan site plan. The increase in cooling demand for the expected campus growth is about 3,370 tons total.

| Key*                   | Building Name     | GSF    | Tonnage    |
|------------------------|-------------------|--------|------------|
| A                      | Health Sciences   | 57,000 | 253        |
| B                      | Nursing           | 67,200 | 299        |
| C                      | Business Addition | 22,500 | 100        |
| Total at 70% diversity |                   |        | <b>460</b> |

| Key*                   | Building Name     | GSF     | Tonnage    |
|------------------------|-------------------|---------|------------|
| F                      | Student Housing   | 169,200 | 564        |
| G                      | Academic Building | 91,500  | 407        |
| H                      | Academic Building | 65,400  | 291        |
| Total at 70% diversity |                   |         | <b>890</b> |

| Key*                   | Building Name       | GSF     | Tonnage      |
|------------------------|---------------------|---------|--------------|
| I                      | FPA Expansion       | 55,782  | 248          |
| J                      | Student Housing     | 92,860  | 310          |
| K                      | Academic Building   | 104,925 | 466          |
| L                      | Academic Building   | 115,600 | 514          |
| M                      | Academic Building   | 60,555  | 269          |
| N                      | Academic Building   | 98,667  | 439          |
| O                      | Student Life        | 41,000  | 126          |
| P                      | Administration      | 50,600  | 156          |
| Q                      | Administration      | 50,600  | 156          |
| T                      | New Business School | 46,341  | 206          |
| Total at 70% diversity |                     |         | <b>2,020</b> |

The current campus cooling demand is estimated to be 2,300 tons based on the analysis of the metered data available. Refer to Appendix I for reported daily campus max/min system demand and flowrates. Based on the growth described above and the collected campus data, the new campus cooling demand will be 5,850 tons. This requires 3,000 tons of cooling capacity to be added to the current firm capacity of 3,000 tons. Additional cooling capacity will be provided by expanding the existing central plant in campus expansion phases 2 and 3.

The existing chilled water plant is designed to be expanded to the south. When this expansion is complete, an additional 3,000 tons of firm capacity will be available to the campus. Additionally, new chilled water piping infrastructure will be necessary to serve the campus growth in the SouthEast direction towards University Blvd. Refer to Appendix II for site plans of the additional chilled water piping necessary for campus expansion at each phase of development.



**C. HEATING ANALYSIS**

Texas A&M International University uses heating hot water as its primary means of campus heating. The campus has one central plant distributing heating hot water through a common piping system. Refer to Appendix II for a site plan showing the existing conditions of the campus thermal piping routing and sizes. The current campus heating capacity is 17,300 MBH (output) with 11,900 MBH (output) of firm capacity. The current campus peak cooling demand is 10,000 MBH. Boiler efficiencies are assumed to be 90% for the purpose of this analysis. The current heating equipment is listed in Table 6 below:

| Boiler                    | Location      | Age     | Capacity (MBH)             |
|---------------------------|---------------|---------|----------------------------|
| Boiler 1 (Cleaver Brooks) | Central Plant | 7 Years | 3,300 MBH (Input)          |
| Boiler 2 (Cleaver Brooks) | Central Plant | 7 Years | 3,300 MBH (Input)          |
| Boiler 3 (Cleaver Brooks) | Central Plant | 7 Years | 3,300 MBH (Input)          |
| Boiler 4 (Cleaver Brooks) | Central Plant | 7 Years | 3,300 MBH (Input)          |
| Heat Pump                 | Central Plant | 3 Years | 5,400 MBH (Output)         |
| Total Capacity            |               |         | 17,300 MBH (Output)        |
| Firm Capacity             |               |         | <b>11,900 MBH (Output)</b> |

As the campus continues to grow more buildings will be constructed and demand on the heating infrastructure will increase. To estimate the new heating loads, load factors for each building were utilized. These load factors as shown on Table 7 and are based on historical data for similar buildings.

| Building Type | BTU/SF |
|---------------|--------|
| Support       | 15     |
| Housing       | 20     |
| Academic      | 15     |
| Research      | 30     |

Tables 8, 9, and 10 below breakdown the growth in heating demand between phases 1, 2, and 3 of the campus expansion, respectively. The “Key” assigned to each building represents the name of the building on the master plan site plan. The increase in cooling demand for the expected campus growth is about 19,160 MBH total.

| Key*                 | Building Name     | GSF    | MBH          |
|----------------------|-------------------|--------|--------------|
| A                    | Health Sciences   | 57,000 | 855          |
| B                    | Nursing           | 67,200 | 1,008        |
| C                    | Business Addition | 22,500 | 338          |
| Total Heating Demand |                   |        | <b>2,201</b> |

| Key*                 | Building Name     | GSF     | MBH          |
|----------------------|-------------------|---------|--------------|
| F                    | Student Housing   | 169,200 | 3,348        |
| G                    | Academic Building | 91,500  | 1,373        |
| H                    | Academic Building | 65,400  | 981          |
| Total Heating Demand |                   |         | <b>5,738</b> |

| Key*                 | Building Name       | GSF     | Tonnage       |
|----------------------|---------------------|---------|---------------|
| I                    | FPA Expansion       | 55,782  | 837           |
| J                    | Student Housing     | 92,860  | 1,857         |
| K                    | Academic Building   | 104,925 | 1,574         |
| L                    | Academic Building   | 115,600 | 1,734         |
| M                    | Academic Building   | 60,555  | 908           |
| N                    | Academic Building   | 98,667  | 1,480         |
| O                    | Student Life        | 41,000  | 615           |
| P                    | Administration      | 50,600  | 759           |
| Q                    | Administration      | 50,600  | 759           |
| T                    | New Business School | 46,341  | 659           |
| Total Heating Demand |                     |         | <b>11,218</b> |

The current campus heating demand is estimated to be 10,000 MBH based on the analysis of the metered data available. Refer to Appendix I for reported daily campus max/min system demand and flowrates. Based on the growth described above and the collected campus data, the new campus heating demand will be 29,220 MBH. This requires 17,820 MBH of heating capacity (output) to be added to the current firm capacity (output) of 11,900 MBH. Additional heating capacity will be provided by expanding the existing central plant in campus expansion phases 2 and 3.

The existing central plant is designed to be expanded to the south. When this expansion is complete, an additional 17,820 MBH of firm capacity will be available to the campus. Additionally, new heating hot water piping infrastructure will be necessary to serve the campus growth in the SouthEast direction towards University Blvd. Refer to Appendix II for site plans of the additional heating hot water piping necessary for campus expansion at each phase of development.









## ELECTRICAL NARRATIVE

Prepared by



**SHAH SMITH  
& ASSOCIATES, INC.**

Texas Registered Engineering Firm F-2113  
March 2023

### EXECUTIVE SUMMARY

Texas A&M International University (TAMIU) in Laredo, Texas consists of a total of approximately 1.3 million square feet of campus facility that includes laboratories, offices, classrooms, student housing, and playing fields. Electric power for the facility is provided by one overhead utility line originating from the east side of campus. The overhead lines run along the east and south sides of campus before transitioning to underground duct bank and running to the central plant to serve a medium voltage switchgear that serves the plant and campus feeder loops. These feeder loops serve dedicated transformers in each building via underground duct banks.

Shah Smith & Associates, Inc. was commissioned to perform a facility review and master plan for the expansion of TAMIU from near term (3-5 year) to long term (20+ years) and provide recommendations for electrical distribution system improvements to support these goals.

### A. TAMIU FACILITY REVIEW

The existing buildings on the campus are fed from the loop A and loop B feeders originating in the central plant medium voltage switchgear. The overhead line that serves the campus can serve approximately 10MVA of electrical demand. The feeder loops A and B are sized at 3#4/0 15kV MV90 with #2 600V ground. The ampacity of the feeder loops at this voltage in accordance with Table 311.60(C)(77) of NEC 2020 is 295A. Therefore, the maximum loading capacity of each of these feeder loop conductors is 6,370kVA. As the feeder loops are arranged to be redundant to the campus, the total campus distribution from these two feeder loops is 6,370kVA of campus building load.

The maximum metered load data from AEP Texas, as of August 2021, is 4,337kVA on the overhead line serving campus, which includes both building load and the central plant electrical load.

As part of the Master Plan development, some of these existing buildings are being renovated and new loads will be added. With the estimated current renovation and future loads, the existing overhead utility line serving campus will not be capable of serving the total new and existing loads of the campus. A second overhead distribution line from AEP Texas will be required to serve the long-term needs of the campus.

### B. RECOMMENDATIONS

Attachment A02 shows the list of all the buildings that are slated to be added to the campus as well as their square footages, their estimated electrical demand, their proposed transformer sizes, and the mechanical infrastructure per phase required to support the new building square footages of that phase. This table is split into three parts, the phase 1 or near-term loads anticipated in the next 3-5 years, the phase 2 or mid-term loads anticipated in the next 10-15 years, and the phase 3 or long-term loads anticipated in the next 20+ years.

The new building loads are estimated based on the gross square footage of the proposed new buildings and the proposed use of the building. The proposed use is compared with historical data for similar buildings use in a similar climate. This is especially helpful in determining the transformer sizes for the new buildings. Most electrical transformers are loaded to about 50% of the transformer size. A conservative estimation of not more than 70% loading was used for the new building transformers to account for future load additions.

**Phase 1 - Near Term**

New buildings in this phase include approximately 150,000 square feet of health professional education and an addition to the business building. This represents approximately 1,150kVA of additional load to the campus. During this phase additional loads can be served from the existing campus switchgear; however, as new loads are being added to the east side of campus a new east feeder loop should be added to power these buildings. This east feeder loop will be connected to new switchgear in the future phase.

**Phase 2 - Mid Term**

New buildings in this phase include approximately 330,000 square feet of student housing and academic buildings plus a 1000ton chiller addition in the plant. This represents approximately 1,800kVA of additional load to the campus. During this phase new building loads continue to be added to the east feeder loop.

**Phase 3 - Long Term**

New buildings in this phase include approximately 750,000 square feet of academic buildings, student housing, administration, and an addition to the fine arts building, as well as an arena and ball fields. 2,000tons of cooling will be added to the plant in this phase. These loads represent approximately 5,000kVA of additional load to the campus. During this phase a new service to the campus will be required in the plant expansion. A new medium voltage switchgear

will be added to serve additional plant loads as well as refeeding the east feeder loop added in phase 2 from this new switchgear to balance load on the campus switchgear.

The new buildings and building expansions result in a new campus load of approximately 10,940kVA of new load. The existing peak building load from the AEP Texas meter is 4,337kVA placing the total new and existing loads of the campus at 15,277kVA. The total electrical capacity of the existing overhead utility line is approximately 10,000kVA, which means that the total load cannot be served by the single overhead line presently serving campus. A new overhead line,

preferably served by a new electrical substation or substation transformer, is recommended to serve the campus central plant at some point during the long-term expansion of the campus. Site plans showing the existing overhead utility lines along with all the building loads can be found in attachments MEP-6 (Phase 1), MEP-7 (Phase 2), and MEP-7 (Phase 3).

This distribution recommendation assumes that the present, non-redundant incoming service is acceptable to the campus. If a redundant service to the campus is desired, then further analysis and distribution equipment is required.

| PHASE | BUILDING CODE | PROGRAM                     | GROSS SQFT       | STORIES   | FOOTPRINT (sf) | W/SF  | kVA    | Transformer Size       |
|-------|---------------|-----------------------------|------------------|-----------|----------------|-------|--------|------------------------|
|       | A             | Health Sciences             | 57,000           | 3         | 24,000         | 4.5   | 256.5  | 500                    |
|       | B             | Nursing                     | 67,200           | 3         | 22,400         | 4.5   | 302.4  | 500                    |
|       | C             | Business Addition           | 22,500           | 2         | 12,250         | 3.5   | 78.8   | Existing WHT expansion |
|       | CUP           | New tonnage in plant        | 400              |           |                | 1.2   | 480.0  |                        |
|       |               | <b>Phase 1 Subtotal</b>     | <b>146,700</b>   |           |                |       | 1150.0 |                        |
| 2     | F             | Student Housing             | 44,800           | 4         | 11,200         | 3.5   | 156.8  | 300                    |
|       |               | Student Housing             | 62,000           | 4         | 15,500         | 3.5   | 217.0  | 500                    |
|       |               | Student Housing             | 62,400           | 4         | 15,600         | 3.5   | 218.4  | 500                    |
|       | G             | Academic Building           | 91,500           | 3         | 30,500         | 3     | 274.5  | 500                    |
|       | H             | Academic Building           | 65,400           | 3         | 21,800         | 3     | 196.2  | 300                    |
|       | CUP           |                             | 600              |           |                | 1.2   | 720.0  |                        |
|       |               | <b>Phase 2 Subtotal</b>     | <b>326,100</b>   |           |                |       | 1800.0 |                        |
| 3     | I             | FPA Expansion               | 55,781           | 2~3       | 25,472         | 3.5   | 195.2  | 2 @ 2500               |
|       | J             | Student Housing             | 92,860           | 4         | 12,768         | 3.5   | 325.0  | 500                    |
|       |               | Student Housing             |                  | 4         | 10,447         | 3.5   | 0.0    |                        |
|       | K             | Academic Building           | 104,925          | 3         | 34,975         | 3     | 314.8  | 500                    |
|       | L             | Academic Building           | 115,600          | 4         | 28,900         | 3     | 346.8  | 500                    |
|       | M             | Academic Building           | 60,555           | 3         | 20,185         | 3     | 181.7  | 300                    |
|       | N             | Academic Building           | 98,667           | 3         | 32,889         | 3     | 296.0  | 500                    |
|       | O             | Student Life                | 41,000           | 2         | 20,500         | 3.5   | 143.5  | 225                    |
|       | P             | Administration              | 50,600           | 2         | 25,300         | 3     | 151.8  | 225                    |
|       | Q             | Administration              | 50,600           | 2         | 25,300         | 3     | 151.8  | 225                    |
| R     | Arena         | 71,375                      | 1.25             | 57,100    | 4              | 285.5 | 500    |                        |
| S     | Ball Fields   | n/a                         | n/a              | 2,107,200 | 0.1            | 210.7 | 300    |                        |
|       | CUP           |                             | 2000             |           |                | 1.2   | 2400.0 |                        |
|       |               | <b>Phase 3 Subtotal</b>     | <b>741,963</b>   |           |                |       | 5000.0 |                        |
|       |               | <b>Total GSF all Phases</b> | <b>1,214,763</b> |           |                |       |        |                        |

Attachment A02,  
New Building Load







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**Keyplan**

TX Registration # F-2113

REGISTERED ELECTRICAL ENGINEER  
 JOSEPH L. ROSENBERG  
 LICENSE NO. 10512  
 EXPIRES 04/12/2023

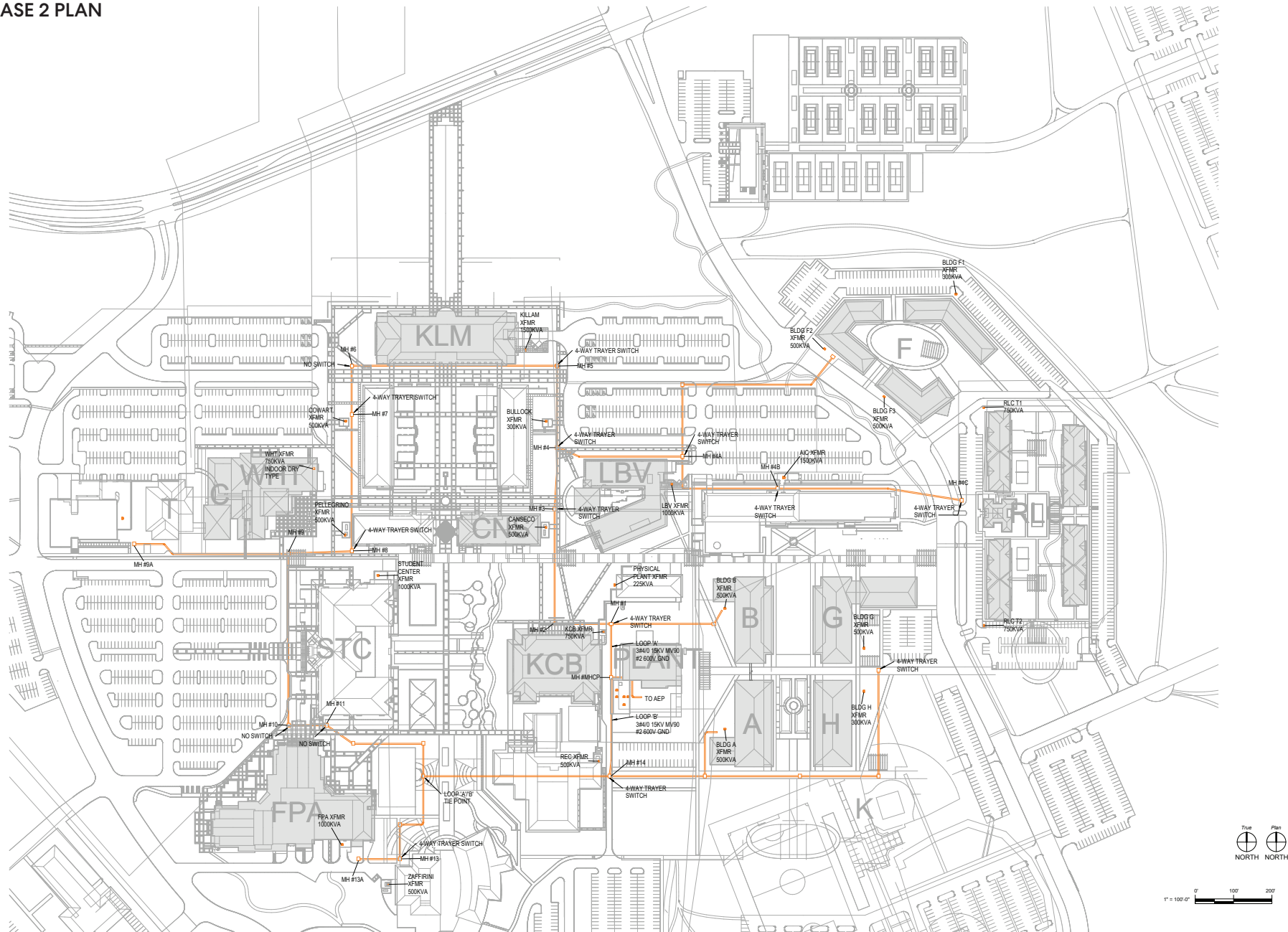
PERKINS & WILL

**TAMU MASTER PLAN**

Client Project Number  
**ELECTRICAL PHASE 2 PLAN**

SSA Project Number: 1111-098-01  
 Date: 03/03/2023  
 Designed By: Designer  
 Checked By: Checker  
 Drawing No. **MEP-7**  
 Scale: 1" = 100'-0"

**MEP-7: ELECTRICAL PHASE 2 PLAN**





**APPENDIX I (CURRENT ANNUAL  
CAMPUS DEMANDS)**

**APPENDIX II (CURRENT THERMAL  
UTILITY PLANS)**

## PLUMBING UTILITIES

Prepared by



**SHAH SMITH  
& ASSOCIATES, INC.**

Texas Registered Engineering Firm F-2113  
March 2023

### A. TAMIU EXISTING UTILITIES REVIEW

#### Natural Gas

The campus is currently served from the Central Plant via a line from Centerpoint Energy. The line goes through a meter and pressure reducing station and then splits into two lines, a 6" 10psi line and a 3" 5psi line. The 6" line serves the mechanical equipment in the Central Plant and the 3" line serves the Phase 1 buildings on campus and several others. The 3" line is at capacity and there is not room for additional building to be added to this line. The 6" line can provide a maximum of 123,000 CFH at a 10% pressure drop. The current load on the line is 15,700 CFH, which is 2,500 CFH for domestic water boilers and 13,200 for heating hot water boilers. Based on Mechanical recommendations for the expansions and increased domestic hot water load, an additional 25,000 CFH of natural gas will be required. The total demand on the 6" natural gas line will be 40,700 CFH. There is adequate capacity for the additional mechanical and domestic water equipment to serve the campus expansion.

#### Domestic Hot Water

Domestic hot water is provided via a campus loop to all of the existing buildings on campus except for RLC, UPD, and UVIL. At these 3 locations domestic hot water is generated locally. The DHW for the campus loop is generated at the Central Plant by two boilers that can provide 1,241 gph recovery each. During the site visit only one boiler was running, and it was running at 50%, so it is believed that there is capacity in the existing equipment to serve the Near-Term and Mid-Term expansions. However, the existing distribution loop throughout the campus appears to be at capacity.

### B. RECOMMENDATIONS

#### Near-Term

The Near-Term expansion is comprised of a Health Science Center building (A), a Nursing Education building (B), a Business Addition to the existing Western Hemisphere Trade Center building (C), and an Alumni Center at the current location of University Village (D). The DHW for buildings A and B will be provided by routing piping from an existing tap to the domestic hot water system loop that was installed but not connected to any buildings. The 3" supply and 2" return lines will be extended to the area between buildings A and B to serve them. The lines will also be valved and capped in a way to allow for connection of two buildings in the Mid-Term phase. A third boiler of the same capacity as the two existing boilers will be installed in order to provide redundancy for the DHW supply. The DHW for building C will be provided via connection to the Western Hemisphere Trade Center building. DHW will be generated locally at building D.

#### Mid-Term

The Mid-Term expansion is comprised of a 3-building Student Housing Complex (F) and two Academic Buildings (G and H). Buildings G and H are located adjacent to buildings A and B. DHW will be provided to G and H by extending the loop serving A and B as described in the Near-Term plan. DHW will be generated locally for building F by natural gas water heaters. The Centerpoint natural gas line runs adjacent to the project site for F, making it a practical solution for hot water production.

#### Long-Term




The Long-Term expansion is comprised of an addition to the Fine Performing Arts building (I), a two building Student Housing Complex (J), 6 new Academic Buildings (K, L, M, N, P, and Q), a Student Life building (O), and a new Arena and Ball Fields (R and S). There will also be a Central Plant expansion (U) and an expansion to C for a Business School Academic Building (T). A new domestic hot water loop will need to be installed to serve projects K through O. The estimated size of the loop is 3" supply and 2" return. This will also require an estimated 2 new boilers of the same capacity as the existing boilers be installed in the Central Plant expansion, and as stated above there appears to be adequate natural gas capacity for the new equipment. DHW for project I will be provided by the existing connection to the system serving the FPA building. DHW for project J will be served from new natural gas water heaters added to the RLC DHW plant. There is roughly 2,800 CFH capacity in the 2" line that serves the RLC site, which is estimated to be adequate for serving project J. The new Administration Buildings P and Q will have local

DHW generation either by electric water heaters or natural gas water heaters. The natural gas option will require a new tap off of the Centerpoint line that serves the campus. DHW for projects R and S will be generated locally either by electric water heaters or natural gas, with the natural gas option requiring a new tap from the Centerpoint service line.

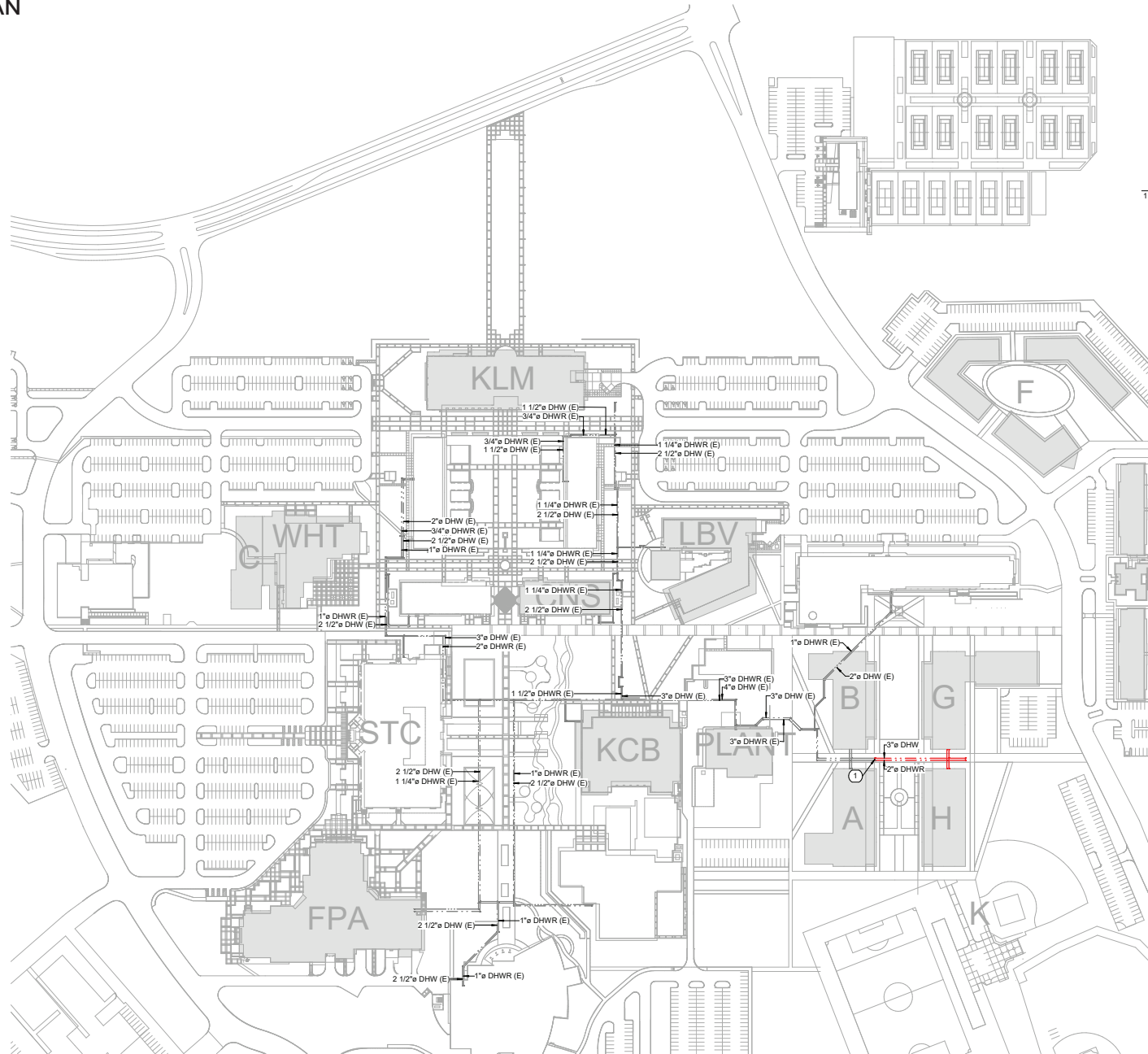




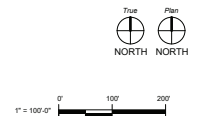


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|  <b>SHAH SMITH &amp; ASSOCIATES, INC.</b><br>8445 Freepoint Pkwy, Suite 500 Irving, Texas 75083<br>Phone: 214.358.2204<br><small>Texas Registered Engineering Firm F-2113</small> |               |      |
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| <small>Tx. Registration # F20213</small><br>  |               |      |
| PERKINS & WILL<br><b>TAMU MASTER PLAN</b><br>Client Project Number<br><b>PLUMBING PHASE 2 PLAN</b>   |               |      |
| SSA Project Number   | 1111-098-01   |      |
| Date   | 03/03/2023    |      |
| Designed By  | Designer      |      |
| Checked By   | Checker       |      |
| Drawing No.  | <b>MEP-11</b> |      |
| Scale  | 1" = 100'-0"  |      |

**MEP-11: PLUMBING PHASE 2 PLAN**



**KEYED NOTES - MEP11 - PLUMBING**  
 1 CONNECT NEW DHW AND DHWR PIPING TO PHASE 1 PIPING.

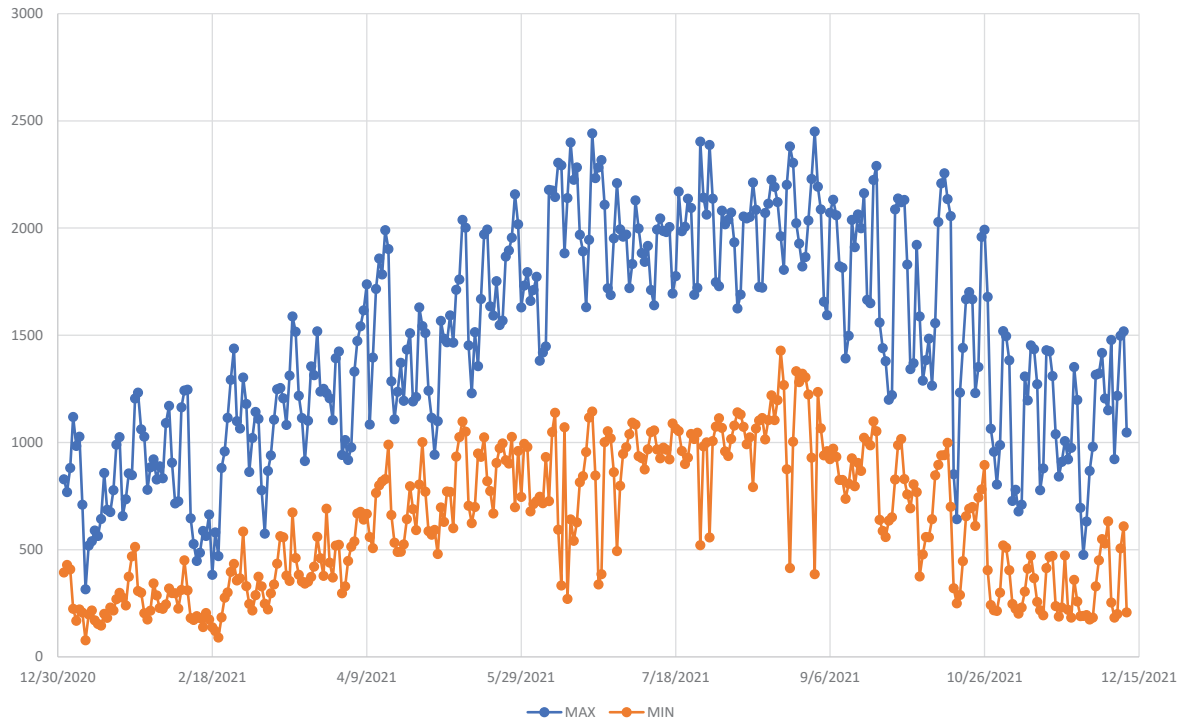


**PLUMBING PHASE 2 PLAN**  
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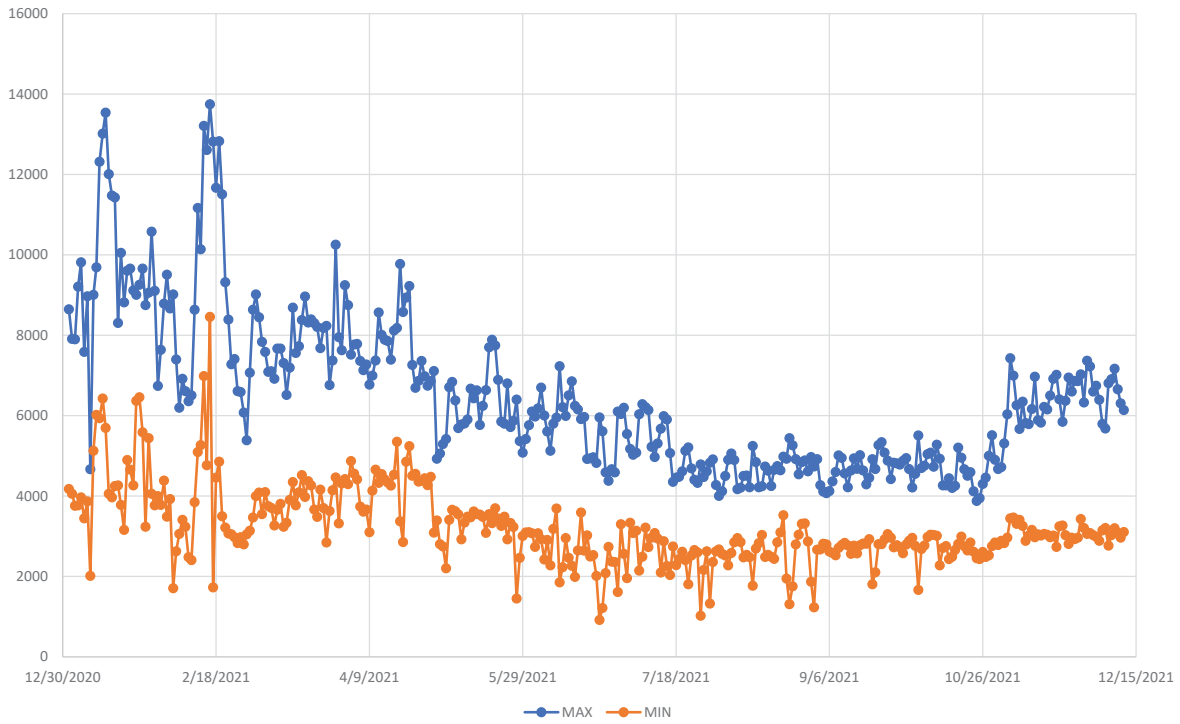


Mechanical Appendix I:  
TAMIU Master Plan - Utility Usage Data

Campus Daily Maximum and Minimum Chilled Water Demand (tons)

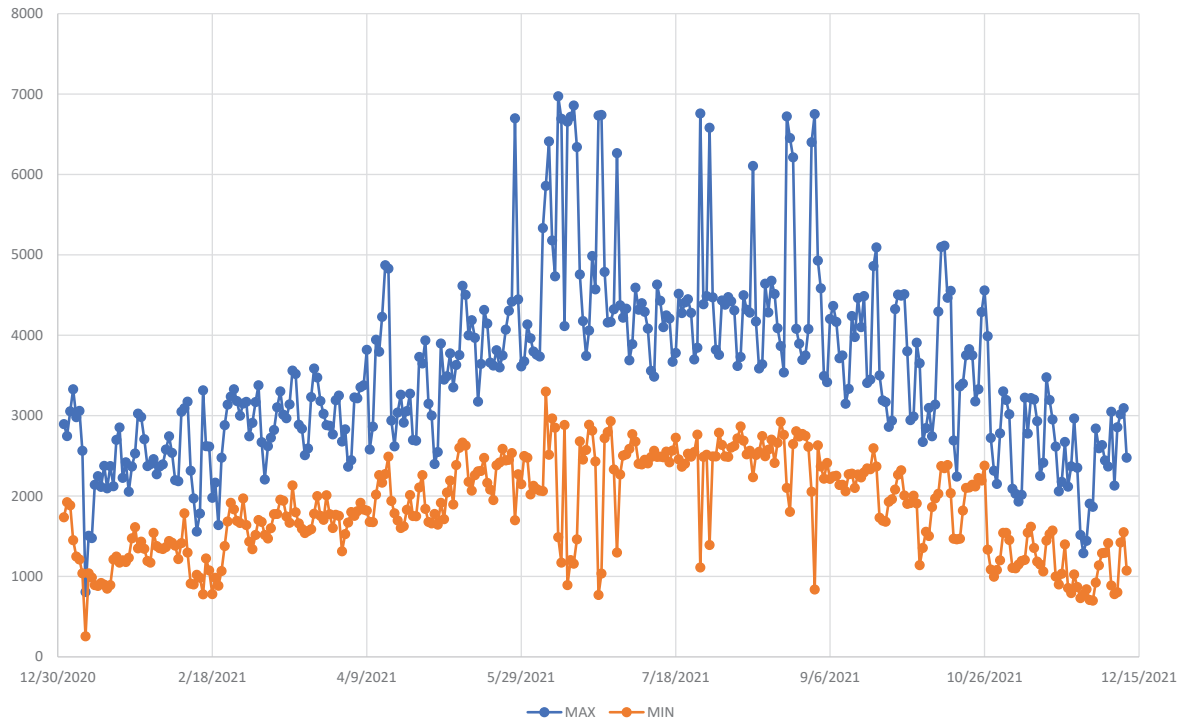


Campus Daily Heating Hot Water Maximum and Minimum Demand (mbh)

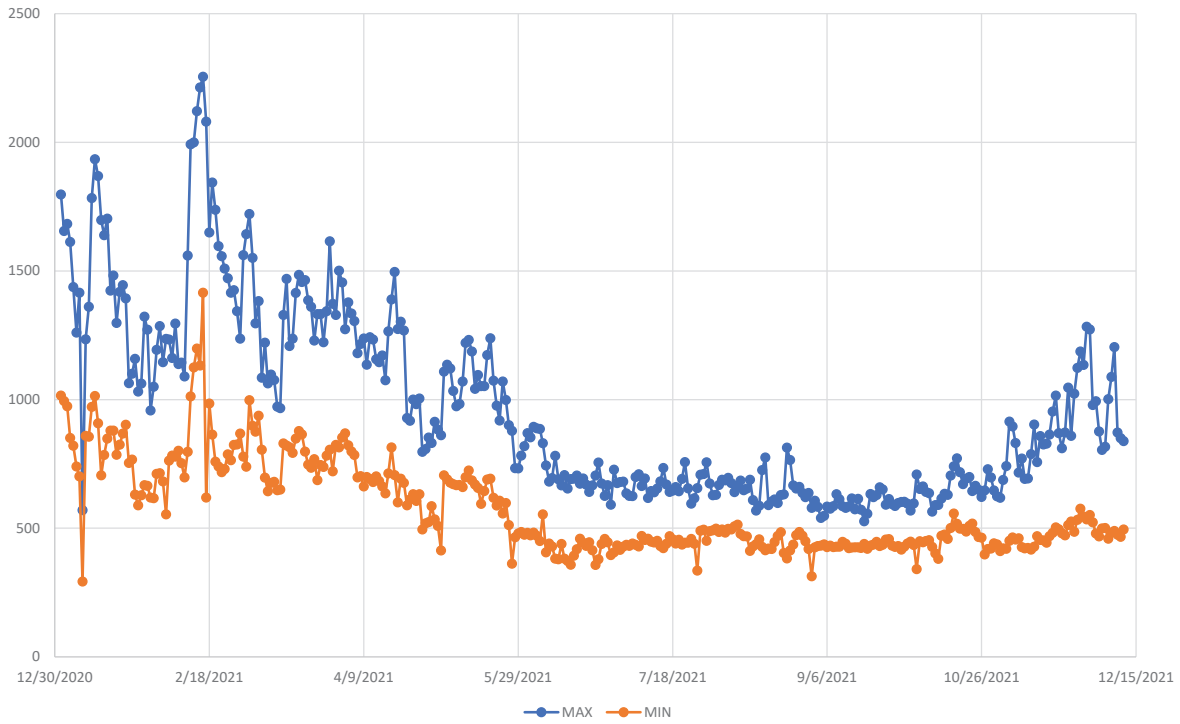


Mechanical Appendix I:  
TAMIU Master Plan - Utility Usage Data

Campus Daily Chilled Water Maximum and Minimum Flow Rates (gpm)



Campus Daily Maximum and Minimum Heating Hot Water Flow Rates (gpm)



## CIVIL NARRATIVE

### WATER

The TAMUI water distribution system is fed from the City of Laredo water distribution system. To serve the campus the City of Laredo has a 16-inch Water line in Bob Bullock Loop and a 16-inch line in University Boulevard. These lines loop into the City of Laredo distribution system on south-west side and couple of points on the northside of the campus with 12-inch lines.

The campus is served with 16 connections to the City of Laredo distribution system. Eight connections are north of Office of International Engagement, three connections to the east and five connections to the south. Four of the 16 connections are to the individual buildings and rest of the 12 connections are to the TAMUI on campus distribution system.

The TAMUI distribution system includes both domestic and fire service throughout the campus. The attached City of Laredo GIS exhibits and PDF exhibit shows the location of the lines and fire hydrants on the campus.

#### Near-Term Plan:

The proposed renovation of the Lobby at the Student Village (Key D) is adjacent to one of TAMUI water service connections and there is an existing 6-inch Water line north of the building. The renovation of the facility can be provided water service without any major line extensions. The proposed Business addition building (Key C) has 8-inch water line on the south side and 8-inch water line on the North-West side. The proposed building can be provided water service without any major line extensions. The proposed Health Science Center (Key A) has 8-inch water line on the West side. The proposed Health Science Center can be provided water service without any major line extensions. The proposed Nursing building (Key B) sits on 8-inch water line and has a 12-inch water line on the west side of the proposed addition. The proposed Nursing building can be provided water service without any major line extensions. Although the 8-inch existing water line which is approximately 640ft that is currently under the new proposed building will need to be relocated and

rerouted, see the exhibit attached for the new routing. There are fire hydrants connected to this existing 8-inch water line, when the water line is re-routed the fire hydrants need to be connected back to the new water line. Coordination in phasing the hydrant shutdowns will be critical to ensure fire protection is maintained. The existing 8-inch water line needs to be abandoned in place or removed. The student Housing Building at the Student Village (Key E) is proposed to be demolished. These existing buildings have 4inch, 6-inch and 8-inch connections, these water lines need to be demolished or abandoned in place. There are fire hydrants in this area and these need to be removed if they are not necessary.

#### Mid-Term Plan:

The proposed Academic building (Key H) has TAMUI water service connections on the west side of the proposed Health Science Center building and also a 12-inch water line on the east side in the University Blvd. The proposed building can be provided water service with the major (about 610ft) extension from the West side (proposed line is shown in the exhibit attached) as extending the line from the University boulevard includes additional cost of tearing some part of the road. The proposed Academic building (Key G) sits on an 8-inch water line which will need to be relocated (see the reference about the same in Near-Term Plan for the Nursing Building). As part of the near-term plan, an 8-inch water line is proposed to be on the north side of the academic building (Key G) and can get the connection from that line and would require major extension of approximately 410ft. The proposed student Housing (Key F) has a 12-inch water service along the University Blvd. on the West side of the proposed buildings. A portion of this water line conflicts with the proposed building footprint so a new 12-inch water line of approximately 310ft) is required (new 12-inch line is shown in the exhibit attached) in the student housing site and shall tie back into the existing on the North and South side of the new student housing site.

#### Long-Term Plan:

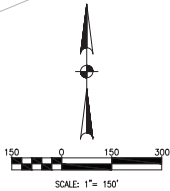
The proposed administrative building (Key P) sits above the 8-inch

water line on the south-side and adjacent to 12-inch main water line loop on the west side. The 8-inch water line will need to be removed. Since the 12-inch water main loop is adjacent to the building, the water service to the new building can be provided without any major line extensions. The proposed administrative building (Key Q) is adjacent to 12-inch main water line loop on the south side. The proposed facility can be provided water service without any major line extensions. The proposed FPA expansion (Key I) sits on the 12-inch water line. The 12-inch water line will need to be relocated as shown in the attached exhibit. The expansion of FPA building requires major line extensions. The proposed student life building (Key O) and academic buildings (Key K, L & M) has a new 8-inch water line on the north-east side (see the reference about the proposed 8-inch line in near term plan for the Nursing building and mid-term plan for academic building H). The new buildings can be provided water service without any major line extensions. The proposed academic building (Key N) can also be provided water service from the new 8-inch water line mentioned above with extension.

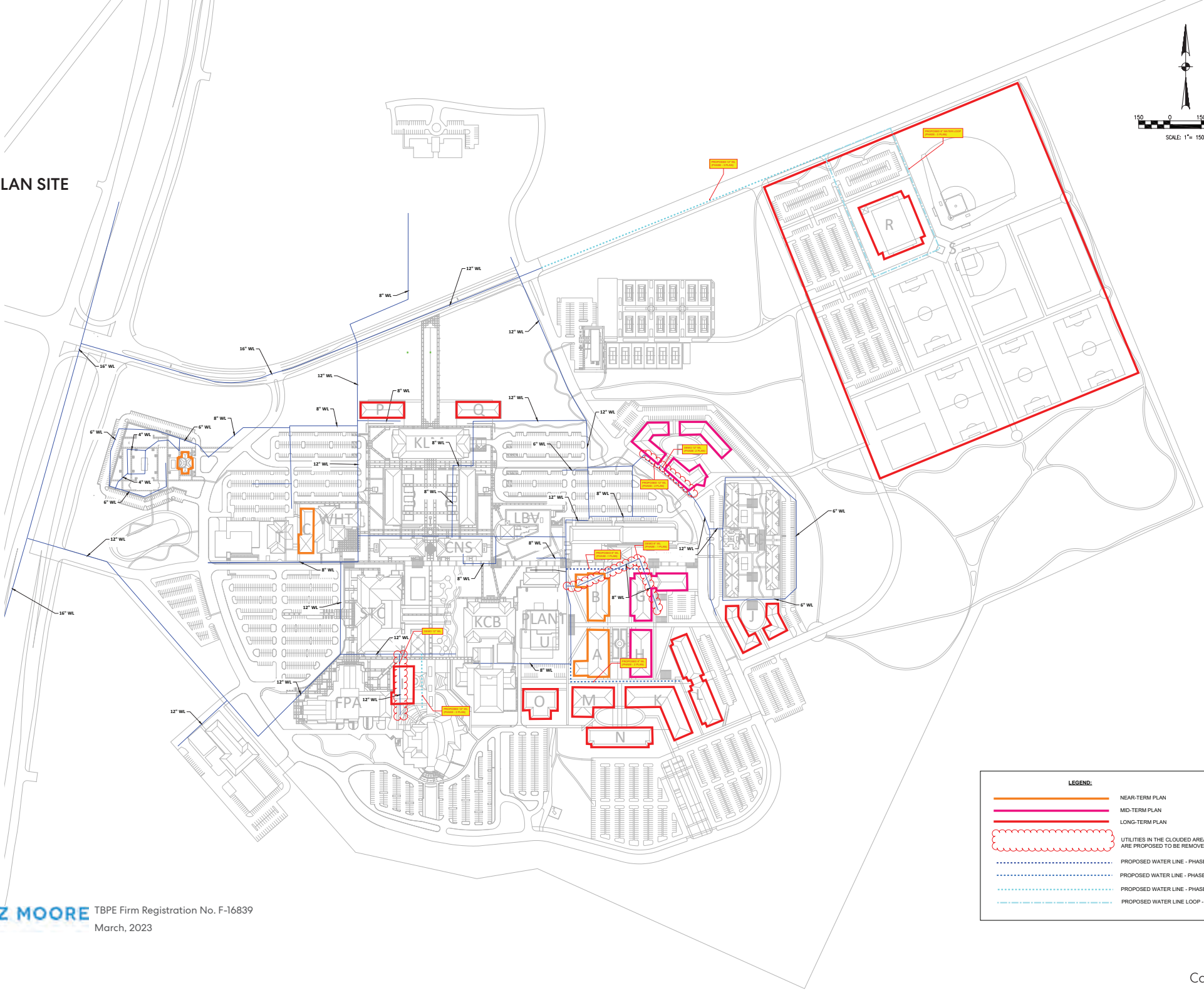
The proposed student housing (Key J) has 12-inch water main on the West side along University Blvd and a 6-inch water line on the North. The new student housing can be provided water service from either of the existing lines without major extension or re-routing.

The proposed Arena (Key R) and Ball Fields (Key S) does not have any water service nearby and would require proposing a new 8-inch water line connected to the existing 12-inch water line loop or propose a new 12-inch loop around this area (see the attached Exhibit). The Arena and Ball Fields can be provided water service with a major line extension.

The long-term plan may require upsizing the main Water lines as per the demand.



TAMIU MASTER PLAN SITE WATER EXHIBIT



**LEGEND:**

|  |  |
|--|--|
|  | NEAR-TERM PLAN   |
|  | MID-TERM PLAN  |
|  | LONG-TERM PLAN   |
|  | UTILITIES IN THE CLOUDED AREA ARE PROPOSED TO BE REMOVED |
|  | PROPOSED WATER LINE - PHASE 1                            |
|  | PROPOSED WATER LINE - PHASE 2                            |
|  | PROPOSED WATER LINE - PHASE 3                            |
|  | PROPOSED WATER LINE LOOP - PHASE 3                       |

## SANITARY

The TAMUI wastewater collection system discharges into the City of Laredo wastewater collection system via force main (6" force main on the East side and 8" Force main on the South side, refer City of Laredo GIS exhibits). The wastewater is treated at the City of Laredo's any of the six Wastewater Treatment Plants.

There is one 8-inch connection in the Bob Bullock Loop running along the south of the University Blvd. There are two Sewer Lift stations on the site, one on the east side of the Residential Learning Community and another one on the west side of the Jorge Haynes Baseball field.

The existing gravity sanitary system is in good operating condition. The existing lift stations on campus run approximately 3.5 hours. Six hours of run time is the maximum capacity of the lift station force main system. The existing lift stations need to be examined carefully and future development may require an upgrade to the existing lift stations and force mains. Future expansion of sanitary will require an upgrade to the existing lift stations and force mains. Currently the existing lift station is at approximately 60% capacity.

The attached City of Laredo GIS exhibits and PDF exhibit shows the location of the Sewer Force main, Sewer main, Sewer Manholes and Lift Stations.

### Near-Term Plan:

The proposed renovation of the Lobby at the Student Village (Key D) has a 12-inch Sanitary line east to the University Blvd. The renovation of the facility can be provided Sanitary service with a major extension from the 12-inch line on the east. If an existing sanitary connection point exists, the pipe size and the new flow rates need to be verified to make sure the existing Sanitary sewer can be utilized. The proposed Business addition building (Key C) sits on top of 12-inch Sanitary sewer line and right next to the Western Hemispheric Trade Center.

This existing facility already sits on top of the 12-inch Sanitary line which needs to be re-routed and existing Sanitary line underneath the building needs to be abandoned in place (see the attached exhibit). The proposed business addition building can be provided Sanitary service with some major extension. The proposed Health Science Center (Key A) sits on an existing 12-inch Sanitary line that connects to the Sewer Lift Station on the South and is adjacent to the 12-inch Sanitary line. The existing 12-inch Sanitary will require rerouting (see the attached exhibit). The proposed Health Science Center can be provided Sanitary service without any major extensions. The proposed Nursing building (Key B) has 12-inch Sanitary line on the West side of the building. The proposed Nursing building can be provided Sanitary Service without any major extensions. The student Housing Building at the Student Village (Key E) is proposed to be demolished. These existing buildings might have Sanitary lateral tie-ins, these Sanitary lines need to be demolished or abandoned in place.

### Mid-Term Plan:

The proposed Academic buildings (Key H and G) has 12-inch on the East side. These buildings can be provided Sanitary connection with major extension. The proposed student Housing (Key F) has a 6-inch Sewer Force Main on the South side of the proposed buildings. The proposed Student Housing can be provided Sanitary connection without major extension. Flow rates for the proposed student housing may require upsizing the Sewer Force main. Replacing the Sewer Lift Station should be part of this renovation with connection to the existing lift station.

### Long-Term Plan:

The proposed administrative building (Key P) sits on the existing 12-inch Sanitary line and this line needs to be re-routed (see the attached exhibit). The Sanitary service to the new building can be provided from the re-routed 12-inch Sanitary on the West side. The proposed administrative building (Key Q) has 8-inch Sanitary line on the South side and a portion

of the proposed building sits on the existing 8-inch line which will require removal from under the building footprint. The proposed facility can be provided Sanitary service without any major line extensions. The proposed FPA expansion (Key I) doesn't have Sanitary lines adjacent to it, there's one 8-inch Sanitary sewer main and 8-inch Sewer Force Main to the south of the University Blvd. The expansion of FPA building can be provided Sanitary service and requires major line extensions.

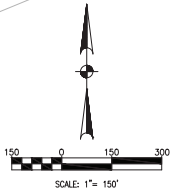
The proposed student life building (Key O) and academic buildings (Key K, L, M&N) have a 12-inch Sanitary line and 8-inch re-routed Sanitary line (see the reference in the near-term plan) in between Key O and Key M. These buildings can be provided Sanitary services with some major and minor extensions to the buildings from the main 12-inch or 8-inch lines.

The proposed student housing (Key J) has 8-inch Sanitary main on the North side. The new student housing can be provided Sanitary service from existing lines without major extension. If the flow rates are more then the Sanitary main needs to be upgraded to accommodate the flow rate.

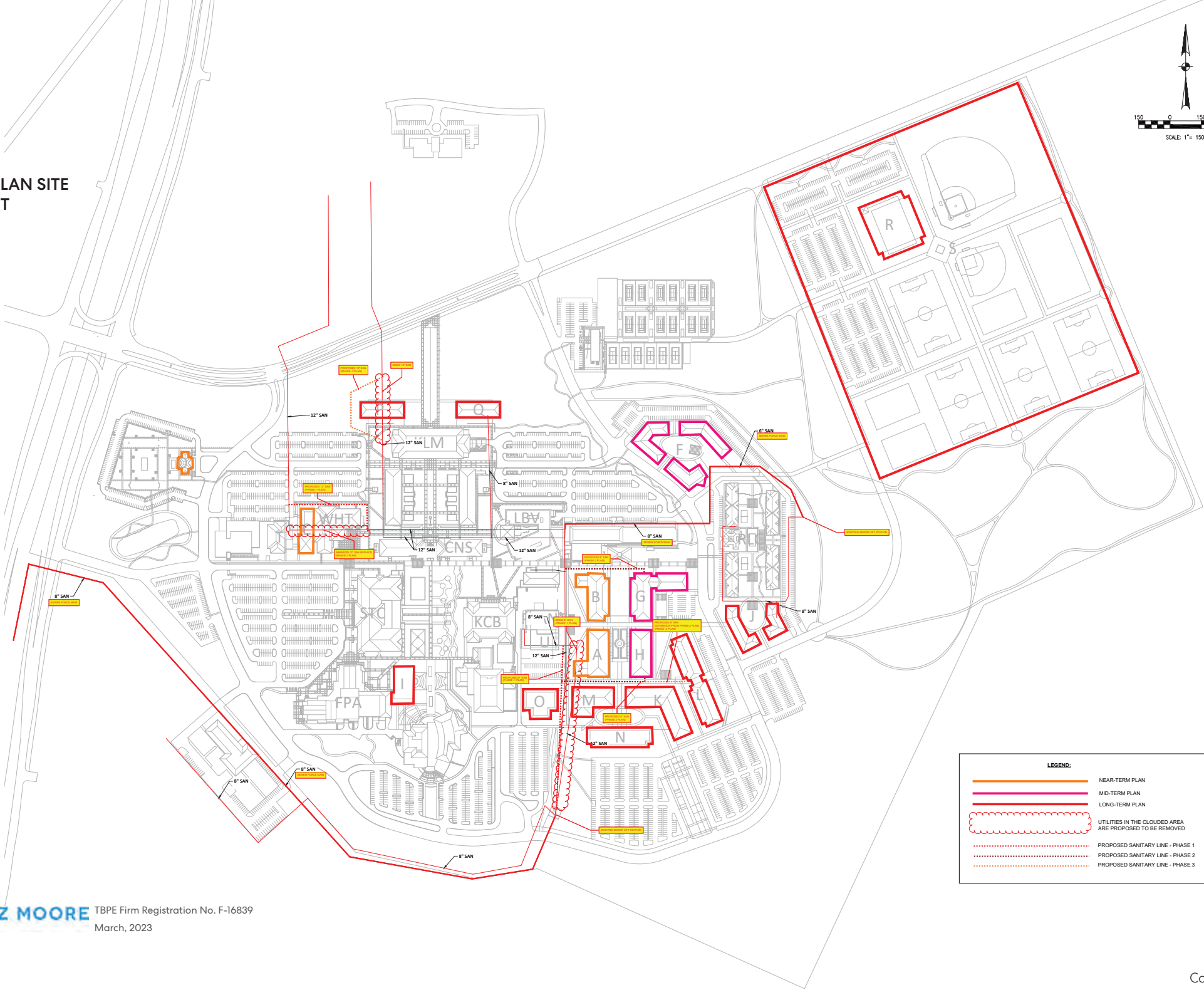
The proposed Arena (Key R) and Ball Fields (Key S) do not have any Sanitary service nearby and would require proposing a new 8-inch or 12-inch Sanitary mains depending upon the flow rate. These lines will need to be connected to the city with new tie-in point or connect to the existing Sanitary system on the TAMUI site which will require upgrading the existing Sanitary system on the site to meet the future demands. The Arena and Ball Fields can be provided Sanitary service with major line extension.

The long-term plan may require upsizing the Sanitary mains as per the demand.





TAMU MASTER PLAN SITE  
SANITARY EXHIBIT



**LEGEND:**

|  |  |
|--|--|
|  | NEAR-TERM PLAN   |
|  | MID-TERM PLAN  |
|  | LONG-TERM PLAN   |
|  | UTILITIES IN THE CLOUDED AREA ARE PROPOSED TO BE REMOVED |
|  | PROPOSED SANITARY LINE - PHASE 1                         |
|  | PROPOSED SANITARY LINE - PHASE 2                         |
|  | PROPOSED SANITARY LINE - PHASE 3                         |

## STORMWATER

All Campus Site Drainage drains to the Southeast into existing drainage swales to Lake Casa Blanca. All Storm water appurtenances are maintained by the University. Curb inlets are located around the perimeter road and parking areas and convey stormwater to the south and southeast.

The roadway also has open back inlets that allow stormwater to be directed to various existing swales. Mid campus storm water is conveyed via a grass lined swale and various grate inlets and located in the area and storm pipe to the south.

Current campus has a small portion that sits within the 100- year floodplain. Campus is not within the 500- year floodplain. Future development should be planned outside of the 100-year floodplain or finished floor elevations raised to be above the floodplain elevations. See the attached flood plain map.

Potential areas for drainage improvements at the Athletic Fields. Future expansion within the existing campus may require some reconfiguration of the drainage pattern and storm lines. Future Development should consider incorporating storm water quality ponds, bioswales and retention ponds.

### Near-Term Plan:

The existing conditions in the area near proposed renovation of the Lobby at the Student Village (Key D) and the student Housing Building at the Student Village (Key E) demolishing is sheet flowing toward the south side into the detention area (see the snip below). This existing drainage pattern needs to be maintained even after the proposed renovation.



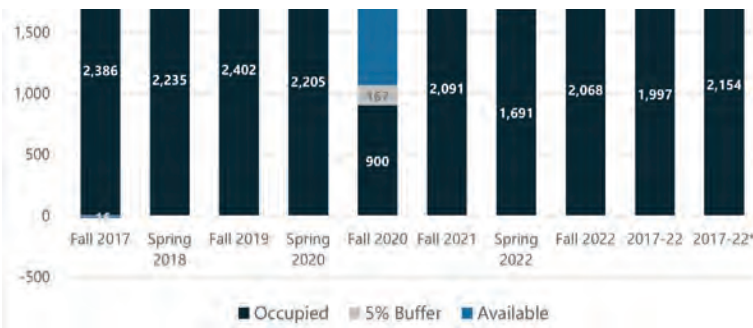
The proposed Business addition building (Key C) sits on top of existing inlets and those inlets will need to be relocated (see the snip below). The existing area near this proposed building has storm infrastructure which is collected and released near a swale next to the parking lot south of the Senator Judith Zaffirini Student Success Center which eventually flows into an existing storm pipe underneath the University Blvd. and sheet flows to the South of University Blvd. This existing drainage pattern can also be maintained with the proposed Business addition building.



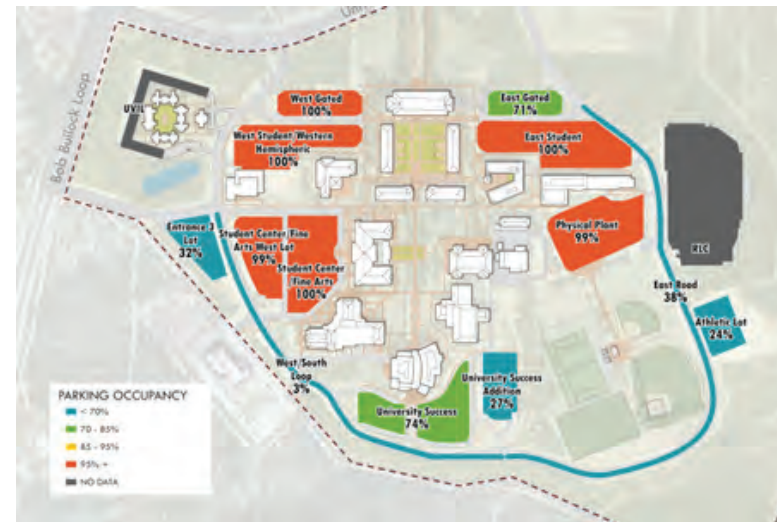
The proposed Health science Center (Key A) and proposed Nursing building (Key B) sits on existing parking lot and baseball fields which are sheet flowing to the South, crossing University Blvd and flowing towards the green belt on the South (see the snip below). The proposed Health Science Center sits on an 18" RCP storm pipe which flows towards East passes underneath the university Blvd and eventually flows into the green belt south of the Residential Learning Community buildings. This pipe will need to be re-routed. With the new improvements, we can incorporate some storm water quality ponds, bioswales and retention ponds in the Landscape areas (see the attached exhibit) and connect them to the existing storm infrastructure (or re-routed) on the University Blvd.

### Mid-Term Plan:

The proposed Academic buildings (Key H and G) sits on existing parking lot and baseball fields which are sheet flowing to the South, crossing University Blvd and flowing towards the green belt on the South (see the snip above) (see the reference in the near-term plan). The proposed buildings sit on 18"/24" RCP storm pipes and there are couple of existing inlets next to building G which connects to the 18"/24" pipes



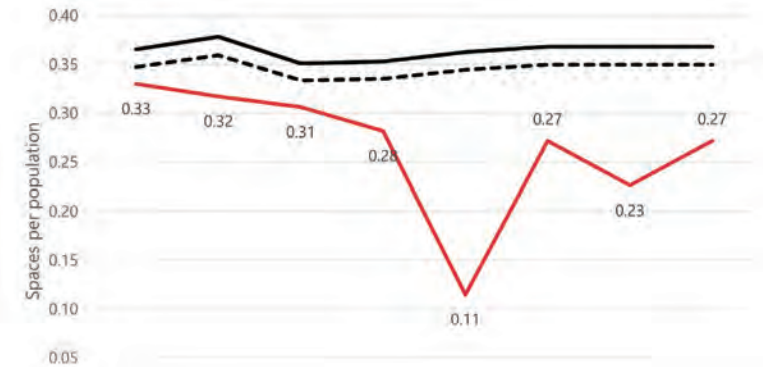
infrastructure needs to be relocated and re-routed. The proposed student housing can be drained using sheet flow towards East side to the green belt (see the snip below). Attached the exhibit showing the proposed drainage pattern. There's Landscape planned between the proposed buildings, and this can be a good place to incorporate some storm water quality ponds, bioswales and retention ponds in the Landscape area and connect them to the re-routed storm infrastructure.



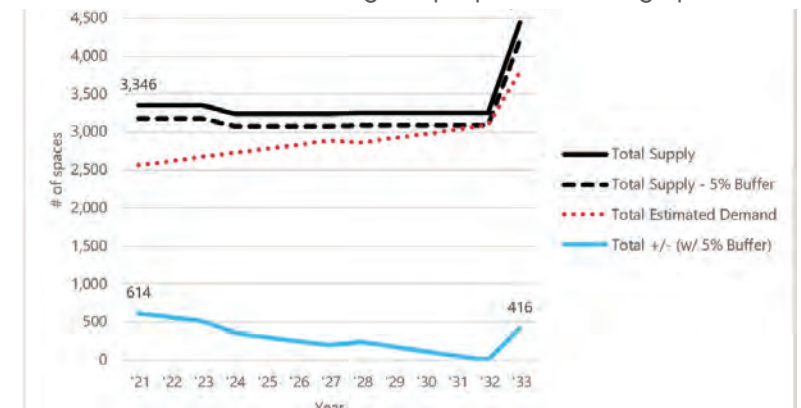
that flows towards the East and passes underneath the University Blvd via existing storm culverts and this eventually flows into the green belt south of the Residential Learning Community buildings. These pipes and inlets require rerouting . With the new improvements, we can incorporate some storm water quality ponds, bioswales and retention ponds in the Landscape areas (see the attached exhibit) and connect them to the existing storm infrastructure on the University Blvd.

The proposed student Housing (Key F) is north to the existing Residential Community which is at higher elevation than the University Blvd. The existing drainage pattern follows sheet flowing the storm water on to the University Blvd and to green belt on the South and East side. There are existing inlets, 36" RCP (which carry flow from part the Campus on the West side) and 4" HDPE pipes (which loops around Residential Learning Community building). All the existing storm infrastructure flows towards East into the green belt. The existing storm

Long-Term Plan:  
The proposed administrative building (Key P) drainage can be sheet flown to the East to the green belt and eventually connect to the existing storm infrastructure or we can propose storm infrastructure and connect it to the curb inlets on the University Blvd and there is existing Storm infrastructure on the West side as well to tie-in to (See the snip below). Attached the exhibit showing the proposed drainage pattern.



The proposed administrative building (Key Q) drainage can use sheet flow to the West towards the green belt and eventually connect to the existing storm infrastructure or new proposed storm infrastructure could be established and connected to the curb inlets on the University Blvd (which flow towards the East into the green belt). There is also existing Storm infrastructure on the East side as well to tie-in to (See the snip below). Attached the exhibit showing the proposed drainage pattern.



The proposed FPA expansion (Key I) have existing inlets and 15" RCP pipes in the area which needs to be relocated and tied back into the existing storm infrastructure. Depending upon the addition of more impervious cover, existing inlet sizes and pipes might need to be upsized.

C/ APPENDIX

The proposed student life building (Key O) and academic buildings (Key K, L, M&N) sits on an existing parking lot and the baseball fields which are sheet flowing to the South, crossing University Blvd, and flowing towards the green belt on the South (see the snip below) (See the reference in near-term and mi-term plans). There are existing inlets, 24" RCP, 30" RCP and 42" RCP pipes in the area South, East, and West to the Building N and none of these conflict with the proposed buildings. All these pipes are connected to the storm infrastructure along University Blvd which eventually flows into the creek on the South side. Existing storm infrastructure may need to be re-routed and relocated depending on the new building locations and grading around them. With the new improvements, we can incorporate some storm water quality ponds, bioswales and retention ponds in the Landscape areas (see the attached exhibit) and connect them to the existing storm infrastructure on the University Blvd.

|                              |              |              |              |              |
|------------------------------|--------------|--------------|--------------|--------------|
| EXISTING SUB-TOTAL*          | 3,346        | 3,052        | 2,731        | 2,731        |
| FUTURE PARKING FACILITIES^   |              |              |              |              |
| Lot 3                        | 0            | 0            | 250          | 250          |
| Lot 1                        | 0            | 0            | 425          | 575          |
| Lot 4-7                      | 0            | 0            | 0            | 435          |
| Lot 2                        | 0            | 0            | 0            | 60           |
| <b>TOTAL PARKING SPACES*</b> | <b>3,346</b> | <b>3,052</b> | <b>3,406</b> | <b>4,050</b> |

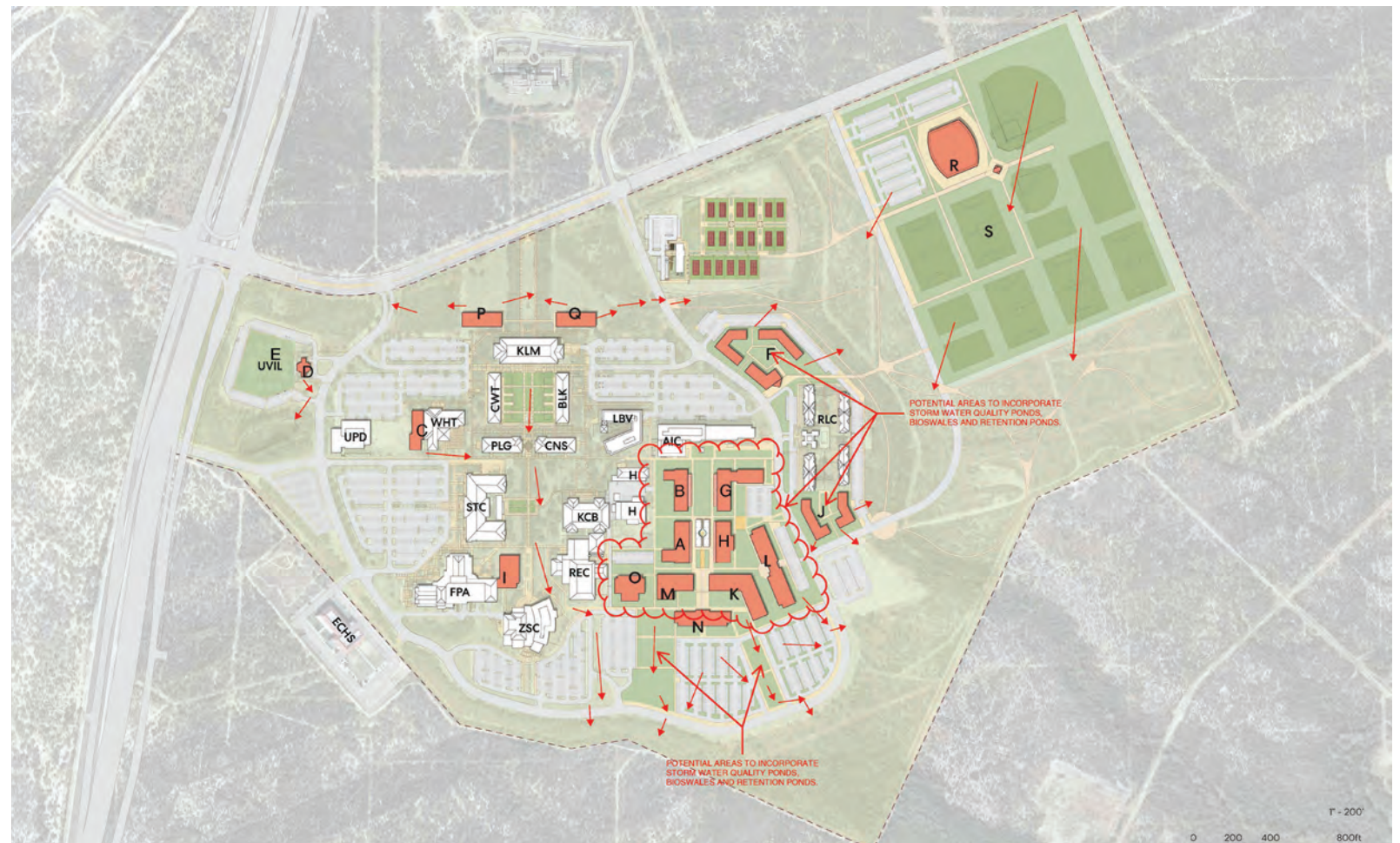
The proposed student housing (Key J) is South of the existing Residential Community which is at a higher elevation than University Blvd. The existing drainage pattern sheet flows to the storm culverts along University Blvd. and to green belt on the South and East side. There is existing storm infrastructure (4" HDPE and 24" RCP pipes) in this area which will require rerouting and relocation. The proposed student housing can be drained via sheet flow towards the South and towards the green belt. Refer to the attached exhibit showing the proposed

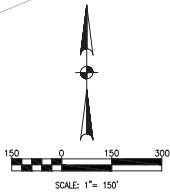
drainage pattern. There is new proposed Landscape planned between the proposed buildings, and this could create an opportunity to incorporate some storm water quality ponds, bioswales and retention ponds and connect them to the existing re-routed storm infrastructure.

The proposed Arena (Key R) and Ball Fields (Key S) doesn't have

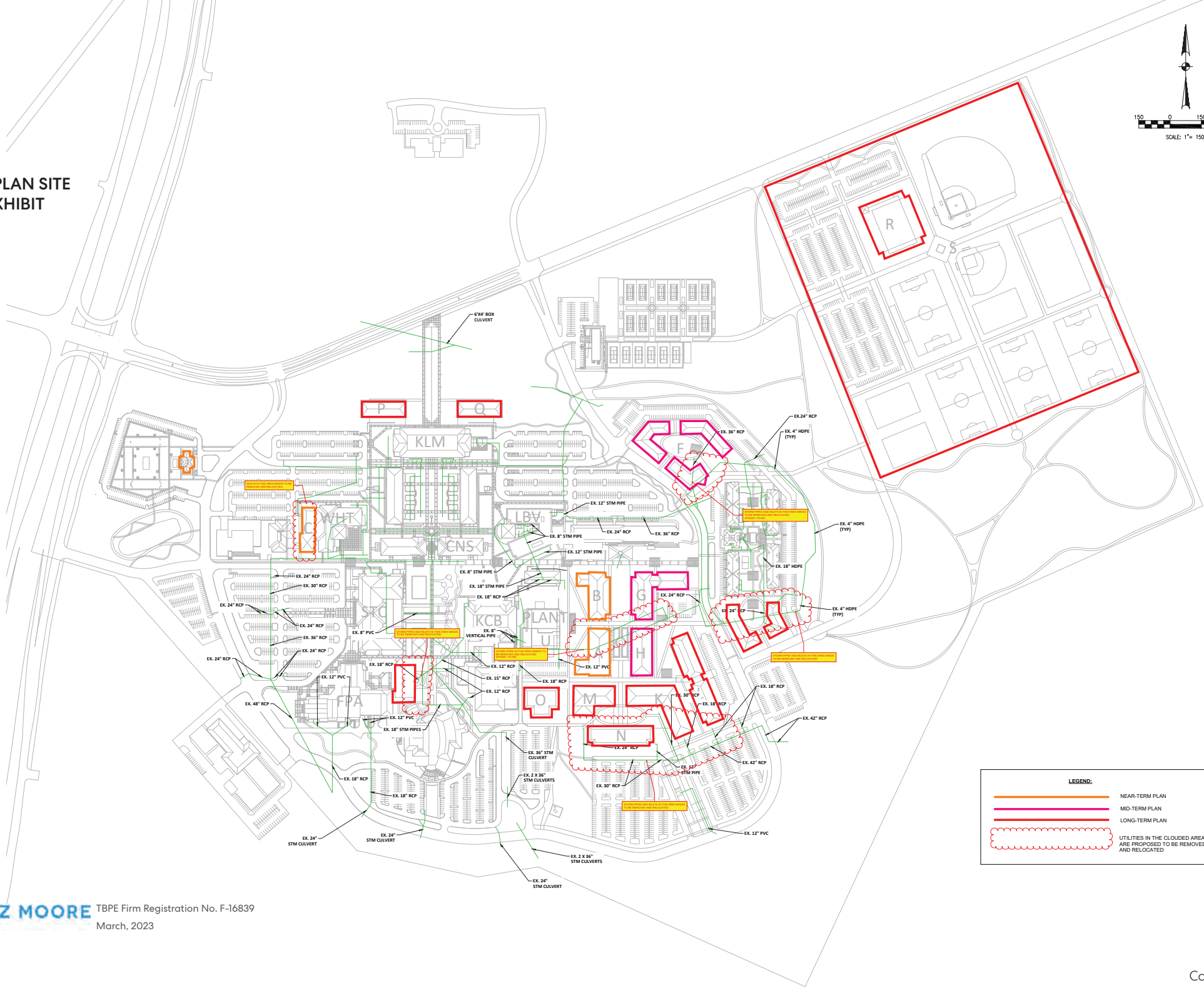
any existing storm infrastructure. As these are fields, the storm water can sheet flow into the green belt towards South-West (See the attached Exhibit).

The long-term plan may require upsizing the existing Storm mains as per the demand and proposed new storm infrastructure.





TAMU MASTER PLAN SITE  
STORMWATER EXHIBIT



**LEGEND:**

- NEAR-TERM PLAN
- MID-TERM PLAN
- LONG-TERM PLAN
- UTILITIES IN THE CLOUDED AREA ARE PROPOSED TO BE REMOVED AND RELOCATED

## CIVIL-COST REDUCTION NARRATIVE

### Near-Term Plan:

- For the building Key D, water and sanitary connections will be individual building costs as it will be lateral connection to the building only. There is no storm infrastructure needed as the water is and will be sheet flowing towards south.

- For the building Key C, water connection will be individual cost as it will be lateral connection to the building only. As far as the Sanitary goes, existing Sanitary is underneath the Western Hemispheric Trade Center but as best method practices the utilities shouldn't be under the building, so we proposed to abandon that line and add a new line around the building. This cost can't be reduced as we must connect back the Sanitary lines as it is part of the main 12" Sanitary line. Storm infrastructure removal and adding new storm infrastructure comes under individual building cost as it captures only the water around the proposed building and connects back to existing storm infrastructure only.

- For the buildings Key B, removal of existing water lines need to be done as it sits under the proposed building footprint. Water and Sanitary connections to this building will be individual building costs as it will be lateral connection to the building only.

- For the building Key A, removal of existing sanitary lines and relocating needs to be done as it sits under the proposed building footprint and this sanitary is connected to the lift station. Sanitary connection to the building will be connected to the re-routed sanitary line, this will be individual building cost as well. Water connections to this building will be individual building costs as it will be lateral connection to the building only. The proposed building sits on top of the existing storm infrastructure which needs to be re-routed and this will be under individual building cost as well.

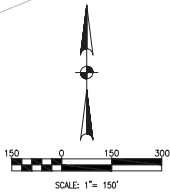
### Mid-Term Plan:

- The proposed Academic building (Key G) sits on an 8-inch water line which will need to be relocated. This water line will be removed as part of the near-term plan for proposed building key B. Major water line extension towards the north is required to provide water connection to this building and will be individual cost to the building. The proposed building sit on 18"/24" RCP storm pipes and there are couple of existing inlets next to building G. These pipes and inlets require rerouting and will be an individual cost to the building. Sanitary line is on the west side and requires major extension to provide sanitary connection to this building and will be individual cost to the building.

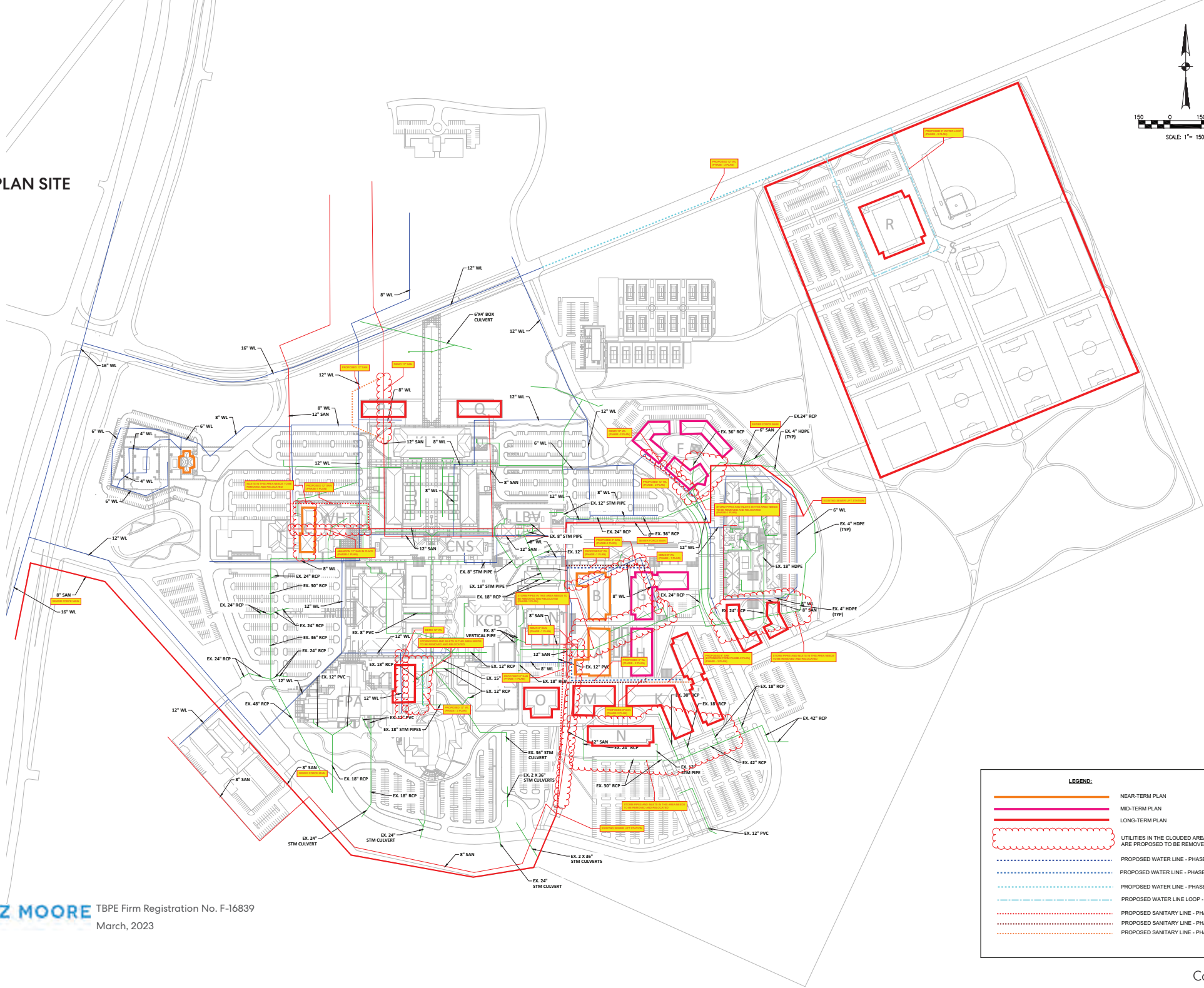
- The proposed Academic building (Key H) has TAMUI water service connections on the west side of the proposed Health Science Center building and also a 12-inch water line on the east side in the University Blvd. The proposed building can be provided water service with the major (about 610ft) extension from the West side (proposed line is shown in the exhibit attached) as extending the line from the University boulevard includes additional cost of tearing some part of the road. Major water line extension towards the south is required to provide water connection to this building and will be individual cost to the building but will be used in future-term buildings Key K, M, N, O lateral connections. Sanitary line is on the west side and requires major extension to provide sanitary connection to this building and will be individual cost to the building but will be used in future-term buildings Key K, M, N, O lateral connections. The proposed building sits on 18"/24" RCP storm pipes. These pipes require rerouting and will be an individual cost to the building.

- The proposed student Housing (Key F) has a 12-inch water service along the University Blvd. on the West side of the proposed buildings. A portion of this water line conflicts with the proposed building footprint so a new 12-inch water line of approximately 310ft) is required in the student housing site and shall tie back into the existing on the North and South side of the new student housing site. The proposed student Housing (Key F) has a 6-inch Sewer Force Main on the South side of the proposed buildings. The proposed Student Housing can be provided Sanitary connection without major extension. Water and Sanitary connections to this building will be individual building costs as it will be lateral connection to the building only. The existing storm infrastructure needs to be relocated and re-routed and will be an individual building.

Flow rates for the proposed buildings may require upsizing the Sewer Force main. Replacing the Sewer Lift Station should be part of this renovation with connection to the existing lift station. With the new improvements, we can incorporate some storm water quality ponds, bioswales and retention ponds in the Landscape areas (see the attached exhibit) and connect them to the existing storm infrastructure (or re-routed). These costs will be part of over all development and can't be defined to individual building.



TAMIU MASTER PLAN SITE  
OVERALL SITE



**LEGEND:**

- NEAR-TERM PLAN
- MID-TERM PLAN
- LONG-TERM PLAN
- UTILITIES IN THE CLOUDED AREA ARE PROPOSED TO BE REMOVED
- - - - PROPOSED WATER LINE - PHASE 1
- - - - PROPOSED WATER LINE - PHASE 2
- - - - PROPOSED WATER LINE - PHASE 3
- - - - PROPOSED WATER LINE LOOP - PHASE 3
- - - - PROPOSED SANITARY LINE - PHASE 1
- - - - PROPOSED SANITARY LINE - PHASE 2
- - - - PROPOSED SANITARY LINE - PHASE 3





**COST  
ESTIMATES D**





