Texas State University is in transition from an academic campus to a research campus.

Researchers and other users all highlight power as a problem – need it to be dependable, robust

- **Immediate needs 1 - 2 years**
  - Electric system
    - Two switchgear – need to get interconnected
  - Steam distribution system – need to entire system ASAP
    - Should put in systems with 30 to 50 year life so you don’t have to replace in 10 years
    - Form utility corridors, loops for redundancy
    - Consider pockets of hot water distribution - west campus, east campus
    - Address contamination issues
  - Domestic water system
    - Add treatment for hardness
    - Reclaim water use from city
  - Sanitary Sewer
    - Two of three connections maxed out
    - Define locations and loads ASAP
  - Metering
    - Highly unusual for campus this size of scale to not have individual buildings metered
  - Energy dashboard
    - Real time for occupants, web based, students will work to reduce when they have more information.

- **Three to five year needs**
  - Energy conservation
    - Metering will help identify where we need to focus efforts
  - Delta T
    - Need to use water more effectively
  - Chiller plant efficiency improvements
    - Variable speed
  - Combined heat and power
    - Need to be able to generate own power and not be solely dependent on city power
  - Heat recovery chiller in east plant
    - Good payback, under ten years

- **Other Items**
  - Steam loads
    - Getting close to needing to add another boiler but doing other items would push this out to future
  - Separate cooling loads in buildings
    - Need to develop a standard
- Update design criteria for utility systems
- Reuse and renewable – solar PV pools
- No need now but in future - thermal energy storage tank

- Communication Goals
  - 100% availability/reliability of service (interruptions of electric results in communication interruptions)
  - Integrate strategic plan with utilities plan
  - Migrate to underground fiber – cannot afford loss with overhead fiber
  - Provide data center redundancy

- On Campus Opps
  - Infrastructure in ground won’t support next level beyond one building
  - Multi-mode fiber doesn’t work from building to building.
  - Duct bank at capacity – cannot pull out cable to put in new.
  - Some areas on campus are underserved – e.g. wireless; students do not want dead spots
  - Facilities will need more access to transmit data – wireless is most efficient way
  - Most of communications are set up as single point of failure
  - Facilities support of power and A/C – outages cause failures

- Off Campus
  - Connectivity to data centers on telephone phones susceptible to failure
  - Research easements and ROW’s along pathways for underground fiber

- Have two to three year window to make improvements before it becomes critical.