

University Park Centennial Master Plan

Adopted 2022



Technological Integration

Theme 4



Technological Integration

Cities are already becoming more connected as their residents have more access to physical devices that communicate with the internet. Devices such as smartphones and wearables, smart meters, connected cars, and others are how everyday people are connecting with the world around them. The term used to describe these connected devices is called IoT (Internet of Things), which refers to the 20 billion connected devices in use worldwide at the end of 2020. By the end of 2025, there will be an estimated 75 billion connected devices worldwide, totaling over 1.1 trillion US dollars in value. For cities like University Park, this means in the next few years there will be three times the number of connections in the City, and cities need to get involved in the data game to respond quickly and accurately to Citywide issues.

Cities that use IoT devices and the data they create are called Smart Cities. The purpose of the Technological Integration Theme is to guide University Park into being a Smart City and allow for City officials, staff, and residents to determine how many of the Smart City principles they want to practice. This Theme focuses on action items that will integrate connected devices into City departments, programs, and communication with University Park residents. Integrating devices will help to improve issues like upgrading University Park's traffic system to be responsive to emergency vehicles and changes in traffic flows/activity, and upgrading communication technology between City departments and residents.

Smart Cities use information and communication technologies to create better decisions and improve quality of life in real-time. More robust and real-time data can allow City agencies to adjust to changes in the community with quicker and lower-cost solutions. Cities can improve energy distribution, trash collection, reduce crime, decrease traffic congestion, and more by adapting the City to become smarter. Smart cities want to use data to increase the quality of life in their municipality and to do that cities need to be able to adapt to community issues with speed and precision.

Texas cities have been leaders in the Smart City push, having more Smart Cities than any other state. Texas cities like Austin, Dallas, Waco, and Houston have invested in 5G capabilities. 5G and reliable internet are at the precipice of how to create Smart Cities and Texas already has an advantage in the base building needed to respond to the technological challenges of the future. University Park aims to understand the new technology of today and the near future with the theme of Technological Integration and is looking to take vetted practices from cities on the cutting edge of technology and utilize them throughout public and private space, City departments, and communications.

Technological Integration: Plan Goals and Action Items

1. Improving Traffic Technology

University Park could utilize its traffic signals to better the City's traffic flow and security. Through innovations to the current traffic preemption system, the City can create safer and more efficient travel for emergency vehicles. By creating a network of surveillance cameras the City can be more responsive to traffic accidents and potential safety concerns moving through University Park intersections. Both of the innovations can provide public safety officials increased execution in responding to emergency situations while reducing risk to other drivers and pedestrians.



Action Item 1.1 Fund and implement upgrades to University Park's Traffic Preemption System.

Description: Utilize the most current available traffic signal preemption technology to assist police and fire units safely traveling through intersections when responding to emergency calls for service. New age technology can allow for more seamless traffic signals for emergency vehicles and utilize mobile applications to inform residents of oncoming emergency vehicles, helping to create safer traffic flow when emergencies occur.

Background: In 2022, as this plan neared adoption, University Park upgraded its traffic preemption system. The new system should continue to be expanded/upgraded as new technologies become available.

Examples: Mobile Applications such as "TravelSafely" are using GPS and cell phone data to actively preempt signals, used in Marietta, Georgia, and Harris County; but also serve as a travel app for motorists, cyclists, and pedestrians. The app can notify everyone connected to it of an emergency

vehicle approaching.

Timeframe (short, medium, long): Medium

Action Item 1.2 Use innovative technologies to support public safety in investigating and resolving accidents at signalized intersections.

Description: Surveillance cameras would allow public safety officials to see traffic activity through real-time and access license plate data in high traffic areas within University Park. This would provide a significant return to the community in public safety/awareness. University Park has ended its use of red light cameras to reduce traffic infractions due to state legislation, but continuing to use cameras for monitoring traffic can still serve a benefit to University Park. The use of surveillance technology is adapting and growing daily and policies surrounding its use are bound to adapt along with the technology.

Background: With the increase in population and traffic flow through the City, University Park faces challenges with the possibility of keeping future public events/demonstrations safe and orderly for residents.

Examples: In San Diego, California the municipality uses existing streetlights to aid in safety measures. The streetlights had previously been equipped with sensor-embedded LED lights that would brighten up the community but also convey information on pedestrian and traffic flows. San Diego added a video recording system to the streetlights that have aided in more than 100 criminal and civil cases since 2018.

Timeframe (short, medium, long): Medium

2. Optimizing Utility Use

Using the winter storm and electrical outages of February 2021 as a guide, recommendations for changing ways to protect residents and infrastructure from a similar event created many of the action items listed. One strategy is the use of "internet of things" (IoT), a system of interrelated computing devices (in this case smart

utility meters) that possess the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Utilizing IoT throughout University Park Utilities can help spread information of emergency events quicker and help protect people and property. IoT may be used to meter other flows - sewage or storm sewer to detect potential infiltration or main breaks, etc. Securing backup and additional electricity can help prevent loss of power in extreme weather conditions and reduce reliance on the current electrical grid. Outside of extreme weather conditions, University Park should continue to innovate its lighting of streets around the City. Not only does new technology limit electricity usage but it can help reduce light pollution that is produced by streetlights. Preventing light pollution can benefit residents' enjoyment and preserve the habitat for University Park wildlife.

Action Item 2.1 Implement new technology for water, sewage, and storm sewer systems and use data to improve efficiency and service for customers.

Description: The City should investigate new technology that will aid in identifying sudden and prolonged irregularities in water, sewage, and storm sewer systems and use data to improve efficiency and service for customers.

Background: Use this information to alert residents of potential problems and risks, which can lead to a reduction of property damages, due to leaks, based on smart meter real-time readings and AI recognition of issues.

Examples: During the winter storm in February 2021, Arlington's smart water utility system identified 1,800 private plumbing breaks by showing that residences had higher and continuous water uses, much higher than average. They also were able to pinpoint some 4,800 residences that were without water and utilities in the days after the storm, and able to address utility concerns of the people most in need through data collected through their smart water systems. In Nashville, Tennessee, the Metro Water Service decided to deploy SR II water meters and the FlexNet communication network. With this Sensus technology, the utility now collects meter data remotely. This has reduced the cost per meter read by 95 cents, saving \$181,000 per month.

Timeframe (short, medium, long): Medium

Action Item 2.2 Develop a program to replace streetlights with new technology to reduce light pollution.

Description: To curb the negative effects on University Park residents and wildlife, the City should take steps to reduce light pollution through innovative technology.

Background: The City can reduce light pollution in commercial, residential, and public areas by creating a program that will minimize the amount of illumination, shorten the duration of illumination, use longer wavelengths, and minimize the area of illumination for all streetlights. LED, compact fluorescent, and other dark-sky approved lighting is a best practice to ensure the reduction in light pollution. Technology such as dimmers, timers, and motion sensors are also valuable tools. University Park should utilize all relevant techniques that will best benefit the goal of reducing light pollution.

Examples: Westlake, Texas, has such an ordinance as a local reference. As does Dripping Springs, Texas, named the First International Dark Sky Community in the state.

Timeframe (short, medium, long): Medium

Action Item 2.3 Analyze the best options to upgrade standby power generation at booster station.

Description: University Park should explore ways to increase stand-by generation that will help prevent water shortages to residents.

Background: The Park Cities Municipal Utilities District (PCMUD) supplies water to University Park. The City owns a booster station (operated by PCMUD) that maintains system pressure and supplies water to the City's two water towers. During the February 2021 freeze, ONCOR cut power to the booster station and existing back-up power generation was inadequate to power the booster pumps at a level required resulting in a city-wide boil water notice.

Timeframe (short, medium, long): Medium

Action Item 2.4 Explore battery storage/generation in University Park.

Description: The City should explore the possibility of installing battery storage under parks and in City-owned buildings.

Background: Peak electricity demand is forecasted to increase, and more spaces to store/generate energy

will be important to University Park's long term health. Having stored energy available could also boost city revenues through lending energy to nearby areas.

Timeframe (short, medium, long): Long

3. Increase Communication between City Departments/Services and Residents

Currently University Park uses an alert system to connect residents with the emergency events happening throughout the City. This plan aims to amplify established communication through the use of mobile applications produced by the City to give up-to-date communication with residents. The capabilities of increased connectivity can also provide a centralized online location for all City services/departments, allowing for billing, payments, and information regarding the City.

Action Item 3.1 Make it easier for residents to communicate with the City through phone apps and other innovative measures.

Description: Create a mobile phone application that could be used to report incidents/infrastructure requests and also could be a push app to notify residents of emergency issues such as weather or school issues. Potentially push messages to residents about water usage/irrigation issues.

Background: Increasing communication can allow residents more access to City services and allow for residents to stay informed of emergency/important information. This will also push University Park departments to be integrated with the new age of communication through mobile applications and real-time information.

Timeframe (short, medium, long): Short

Action Item 3.2 Evaluate the Health Data Exchange (HDE) Pilot Program between the University Park Fire Department and Texas Health Presbyterian Hospital Dallas for use with other health care institutions throughout University Park.

Description: Connect EMS and hospitals via a secure, auditable method of data sharing, bringing EMS data to hospitals and hospital outcomes to EMS. Utilize the current UPFD pilot program as research on how University Park can exchange data with multiple healthcare entities.

Background: Hospital clinicians can view critical EMS data in their EHR (Electronic Healthcare Report), virtually in real-time. HDE gives hospital test results and outcomes back to EMS for quality improvement and increases communication with local hospitals to enhance patient care and quality management programs. UPFD started a pilot program with Presbyterian in 2022 which coincides with one of the strategic plans in EMS's five-year strategic plan. Evaluating the pilot program for potential expansion with other entities is a long-term focus of this action item.

Examples: Considering there is already a planned pilot for this program, the major need seems to be the evaluation of the project to justify its use long term. The City has been provided an evaluation from the Agency for Healthcare and Quality that overviews the best ways to evaluate Health Information Exchange Projects.

Timeframe (short, medium, long): Short

Action Item 3.3 Review and implement the latest technology to enhance communications between officers, departments, and the public.

Description: Make communication between City departments and the public more connected.

Background: Increasing the transparency for residents can better help them engage with the City as access to information continues to advance. This action step can be achieved by exploring and implementing E-911 capabilities for text and video communications in emergency situations; remote access to body and dash cams during emergent situations.

Examples: The City of Dallas has created an Emerging Technology program through its Information and Technology Services Department that performs some of the duties described in this action step. The quote below demonstrates how University Park can build out a framework of communication with residents and City departments.

Timeframe (short, medium, long): Short

**All City of Dallas IoT(Internet of Things) initiatives are implemented with a focus on how the specific application being realized is beneficial for Dallas residents and visitors. One vision for the future is the City dynamically adapts to the needs of the residents and communication with the residents is a continuous feedback loop. All IoT initiatives should utilize Security and Privacy Frameworks, and residents should have visibility into how their private information is being treated."- City of Dallas IoT Best Practices, 2020*