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CHAPTER 5

EVALUATION OF FUTURE CONDITIONS

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5.1 Anticipated Growth Patterns

The City of Temple is projected to grow as more residents and businesses move to the area. Areas where the density of population and employment are expected to grow rapidly were thoroughly analyzed for the potential impact on the future transportation system. Mobility needs and service gaps, along with solutions and recommendations, emerge through comparison of future travel demand with the planned transportation system. Having a plan for improvements in place will help the City respond to funding opportunities as they arise. Additional details on each element discussed in this chapter can be found in the Appendix B: Comprehensive System Assessment (CSA) Technical Memorandum.

5.1.1 Population and Employment Growth

Over the past decade, the City of Temple and its ETJ have seen a significant amount of population growth—particularly in the past five years. Forecasted population shows nearly 180,000 residents projected in 2045. Areas where growth has developed more rapidly in recent years are expected to continue this trend well into the future.

Figure 19 shows the growth of the City of Temple and ETJ total population and forecasted population.

Based on an analysis of population and employment projections, the following trends were identified:

- Growth will expand into the ETJ.
- Population and employment will grow in parts of Temple adjacent to communities (e.g., Belton, Troy).
- Population will increase north of downtown.
- Population and employment within Loop 363 will increase.
- Employment will increase to the northwest of downtown, specifically around Loop 363.
- Employment will continue to grow along I-35.
- Population will increase at a high percentage along Loop 363 and south of SH 190.
- Employment will increase in the northwest portion of the study area, surrounding Pendleton.
- Population will increase at a low to moderate growth rate near existing residential development.
- Population and employment will experience a low change around Belton Lake on all sides except to the west near Fort Hood.

Figure 20 shows the percent change of population and employment growth (per square mile) within the Temple MMP study area from 2019 to 2045.

Figure 19: The City of Temple and ETJ Total Population (2005-2019)

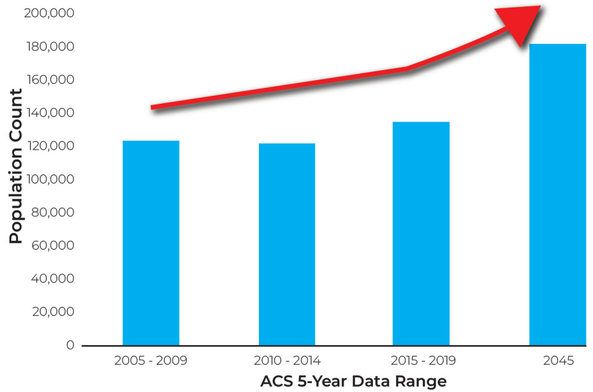
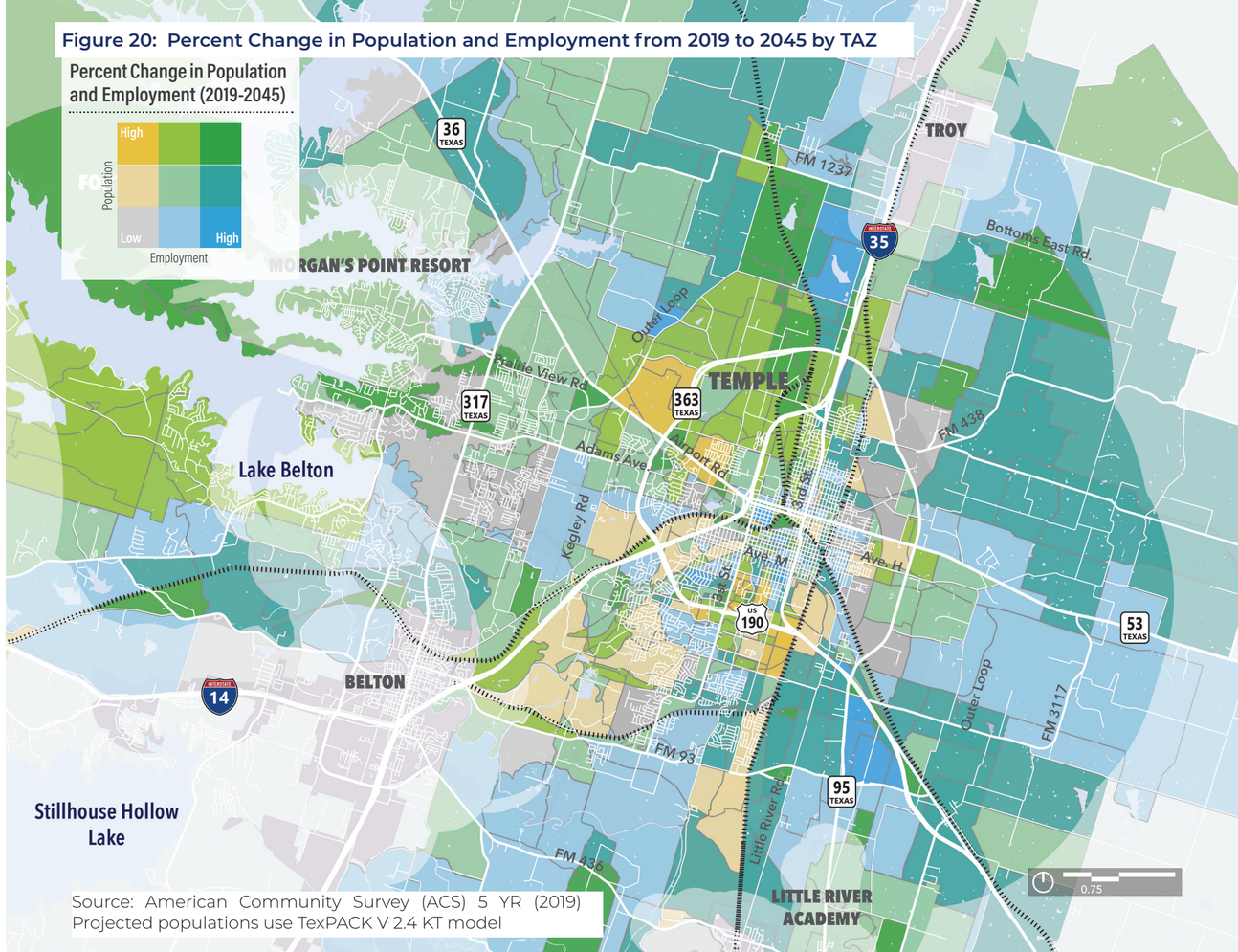


Figure 20: Percent Change in Population and Employment from 2019 to 2045 by TAZ



5.1.2 Household Income and Cost of Living

Based on the development patterns of growth into the ETJ—and even longer commute distances—affordability in Temple may become more challenging. Using the Center for Neighborhood Technology's (CNT) Housing and Transportation's Affordability Index metric on housing and transportation cost to assess the overall affordability of the study area, CNT has determined that places where housing and transportation costs are greater than 45 percent of the area's median income should be considered unaffordable.

Some areas of Temple were already considered unaffordable based on their combined housing and transportation costs, specifically areas south of Temple and near Morgan's Point Resort. Housing costs in Temple are relatively low (ranging from 20 to 35 percent of the area's median income), but transportation costs become gradually higher as people live farther away from downtown. The increases in transportation costs in areas without employment density are expected due to longer commute times and distance. This trend highlights the need to plan for mobility options that provide manageable commute times.

5.1.3 Key Findings

- Study area population is expected to grow by roughly 34% (45,861) and employment is expected to grow by 66% (39,020) over the next 25 years (2019-2045).
- Population and employment are expected to increase throughout the study area, with a higher percentage increase occurring around Loop 363 and to the north of Temple.
- Employment is expected to increase along I-35 and generally throughout the study area.
- Temple has a small but growing population of 55 and older, a declining population between 40 – 54, and a growing population of 25 – 39 years old.
- There is anticipated growth in goods and freight movement in the region.
- Future land use for Temple allocates 42% to industrial and 26% to rural/estate uses. Planning for freight movement and infrastructure that supports truck traffic will be critical to support this growth.

5.2 Transportation Demand Modeling

5.2.1 Roadways

The KTMPO Model 2045 forecast year conditions were used to evaluate emerging and future trend scenarios. The future conditions roadway deficiencies analysis provides policymakers and the public with a better understanding of how the roadway network is currently performing.

Future Capacity Deficiencies

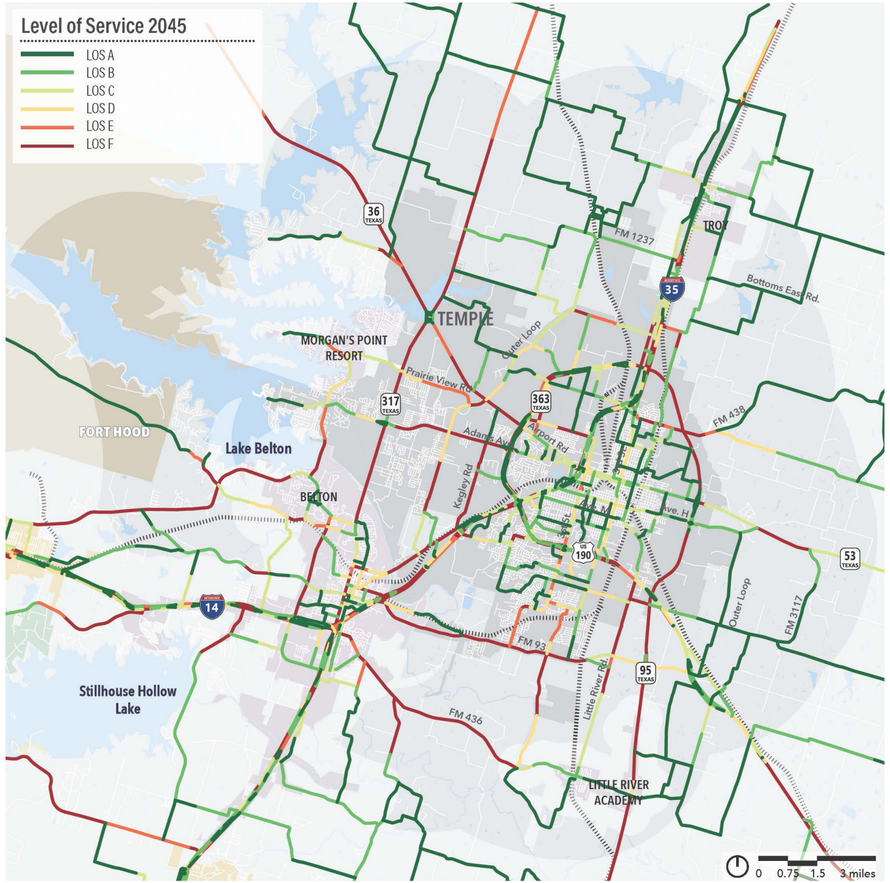
The following list identifies potential future capacity deficiencies expected to occur, despite currently planned improvements, based on the forecast model reported LOS. The streets and intersections below are described by their current design and forecasted impacts.

Roadways and Intersections

- Hartrick Bluff Road from FM 93 to City Limits
- SH 36 from Leon River to Loop 363
- SH 317 from Community Center Road to FM 439
- W. Adams Ave from Loop 363 to SH 317
- Old Waco Rd from S. Pea Ridge Rd to Riverside Trail
- S. Kegley Rd from W. Adams Ave to I-35
- SH 53 from Avenue H to FM 3117
- FM 439 from Sparta Rd to N. 10th Street
- FM 93 from I-35 to Old 95
- SH 95 from Orchard Ln to US 190
- Loop 363 from US 190 to I-35
- E. Young Avenue from N. 1st Street to Loop 363
- FM 436 from I-35 to Hartrick Bluff Rd
- W. Avenue T from W. 37th Street to S. 31st Street
- Scott Blvd from S. 57th Street to S. 51st Street
- Market Loop from Cottonwood Lane to S. 31st Street
- W. Avenue T @ N. 31st Street
- S. 57th Street @ Scott Blvd.

Figure 21 displays the LOS for the roadway network based on 2045 projections.

Figure 21: Temple Subarea Level-of-Service – 2045 Forecast Conditions



It should be noted that commuters from the western areas of Bell County are channelized to the same three routes: SH 36, Adams Avenue, and I-35, based on the existing plus committed network. Additionally, locations where the roadway or intersection is shared with a TxDOT facility, coordination with that agency will need to occur as the City does not own the right-of-way.

5.3 Future Operational Deficiencies Analysis

Using TransModeler software to forecast future conditions, a total of 207 intersections were analyzed for the future year. These projections indicate 24 total failing intersections in the AM with 11 LOS E and 13 LOS F gradings. Projections for the PM show 38 total failing intersections with 12 LOS E and 26 LOS F gradings. The failing areas in the future forecast are based on the assumption that the existing network and currently planned improvements are the only changes to the network. TABLE 8 and TABLE 9 show the top five failing intersections in each peak period.

TABLE 8: FUTURE CONDITIONS – TOP 5 INTERSECTIONS WITH DEFICIENT/FAILING LOS FOR AM PEAK PERIOD

INTERSECTION	LOS	DELAY (SEC/VEH)
Hilliard Rd, FM 2305 & Old Waco Rd	F	363
31st St & I-35 Frontage	F	253
Loop 363, Young Ave & FM 438	F	205
I-35 Frontage & Nugent Ave	F	196
57th St & I-35 Frontage	F	140

TABLE 9: FUTURE CONDITIONS - TOP 5 INTERSECTIONS WITH DEFICIENT/FAILING LOS FOR PM PEAK PERIOD

INTERSECTION	LOS	DELAY (SEC/VEH)
Hilliard Rd, FM 2305 & Old Waco Rd	F	432
Central Ave & I-35 Frontage	F	274
Industrial Blvd & Cearley Rd	F	242
Loop 363, Young Ave & FM 438	F	236
US 190 / Loop 363 & 1st St Connector	F	184

Source: TransModeler V6

5.3.1 Key Findings

- As expected, major roadways such as interstates and state highways are expected to see high levels of congestion and delay in the future.
- Many connections on the west side of town, near Loop 363 are forecasted as failing in 2045.
- Educational facilities within the City of Temple are expected to continue to be one of the largest activity generators in the community. Level of service around these institutions is typically congested, especially during peak hours.
- Industrial land uses will likely continue to expand in Temple, especially to the north. Impacts of the current delay and the freight network on future LOS will inform potential routing recommendations.

5.4 Planned Multimodal Developments

5.4.1 Transit

The need for future transit options will continue to arise as the City looks for more mobility options. Technology innovations continue to change how the public views transit and its role in their personal mobility choices. The future will likely involve higher levels of telecommuting, more ride-hailing services such as Uber and Lyft, and additional bike/scooter share programs that will impact traditional transit ridership. These services currently operate throughout the city and are expected to continue to be a major part of the transportation network.

The HOP is part of the Hill Country Transit District (HCTD). The HCTD Service Provision Options Report completed in May of 2021 evaluated four future transit options for how HCTD could organize itself. Two scenarios were carried forward with implementation plans established by the HCTD Board. These scenarios focus on internal operations and not future routes or service operations that may impact the city of Temple. At the time of this planning process, plans for future improvement to the system were not publicly available.

5.4.2 Active Transportation

Analysis of the active transportation system using a grid of hexagons shows where walking and biking trips might likely happen. Hexagons were used because they provide a shape to which different input factors can be evenly attributed. If walking and biking facilities are comfortable and connected to key destinations in the areas identified in this analysis, it is likely that walking and biking trips may occur in those locations. This is not to say that walking and biking facilities should not be present outside of these higher demand areas, but that these areas may be a good starting place to examine current facilities and potentially make improvements.

Figure 22 shows areas with high concentrations of potential demand for walking and biking trips. The areas of higher demand are clustered near the central Temple area, especially along the gridded street network south of E. Adams Avenue. Areas with moderate demand are also scattered around the study area, especially where they are within proximity to parks or schools. There are pockets of moderate to high demand in areas west of I-35 and south of US-190 near Smith.

Planned and proposed bicycle facilities shown in Figure 23 were sourced from the 2020 Park and Trails Master Plan, Neighborhood Plans and Future Bicycle & Pedestrian Plan for the Region.

Figure 22: Likely Active Transportation Demand

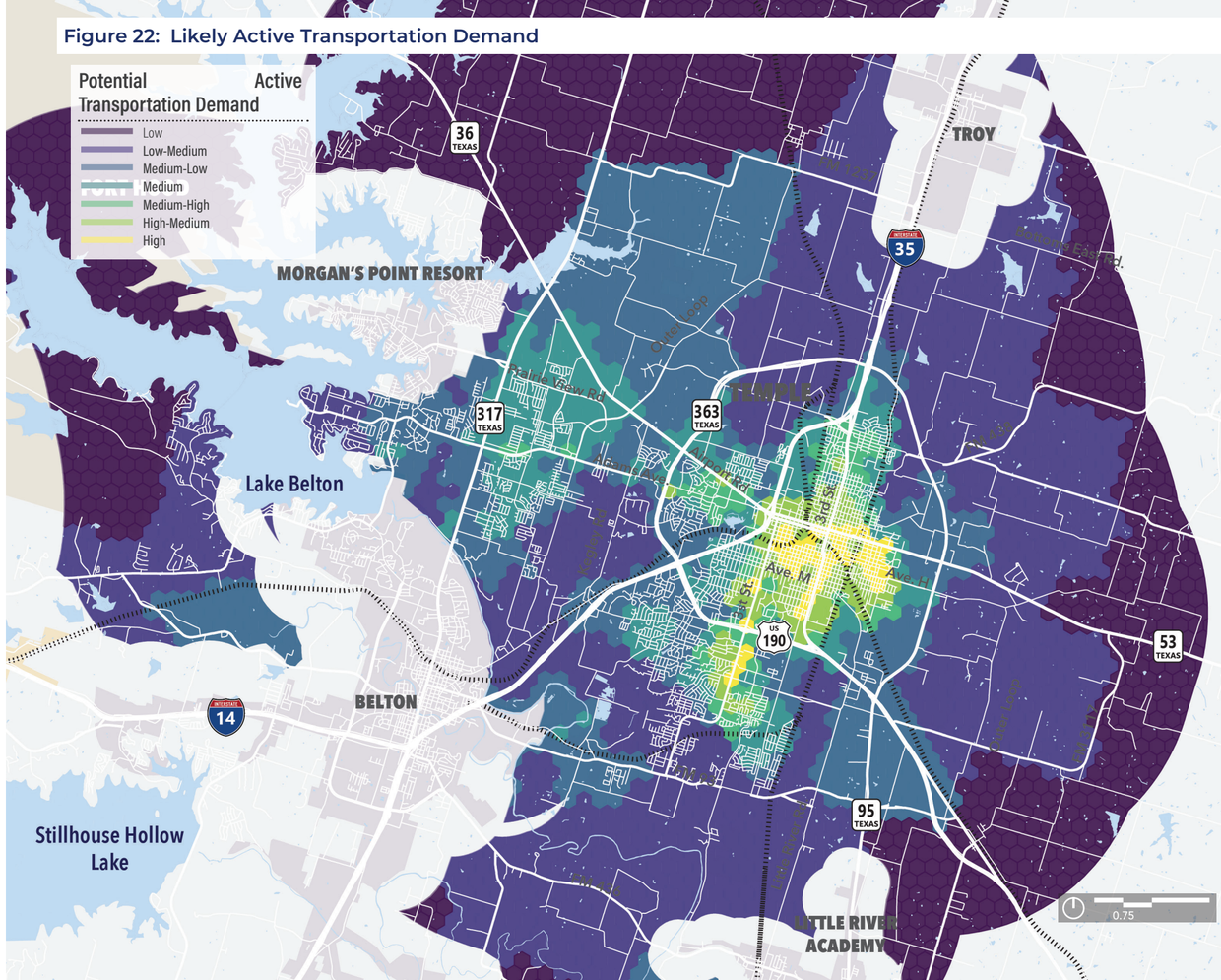
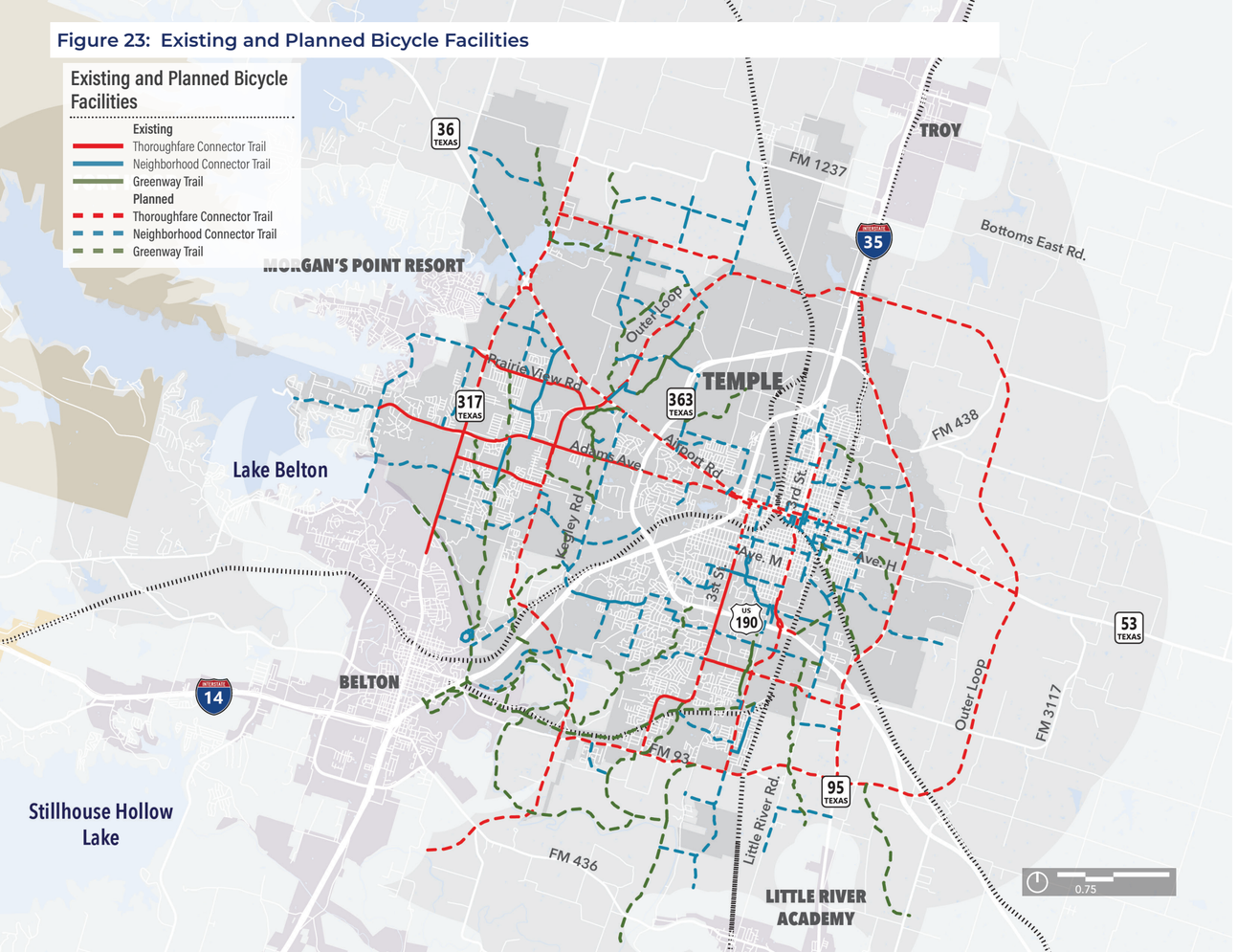
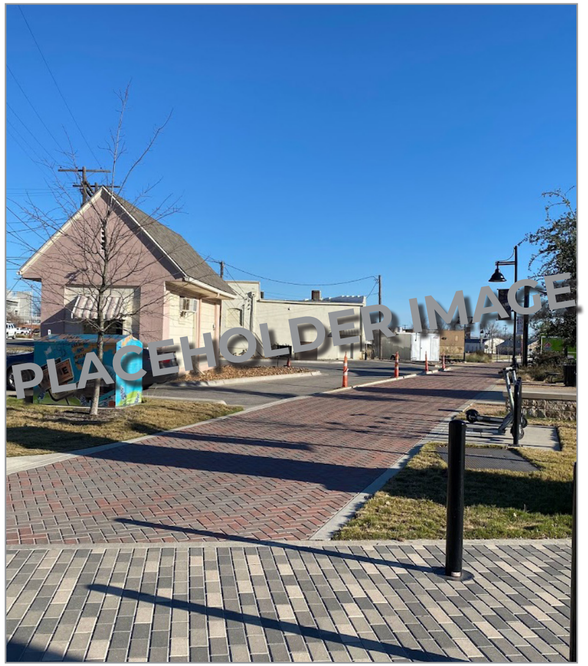


Figure 23: Existing and Planned Bicycle Facilities



Continuity between Park Trails and Planned On-Road Network

The planned connections for trails and on-street bicycle facilities do an excellent job of connecting the network, turning a set of park trails into part of the active transportation network (where it is feasible). Because these are planning level connections, there are yet to be precise plans for their location and design, specifically at intersections/crossings.



Parks and Trails Master Plan Recommendations

The City recently completed their Parks and Trails Master Plan that included a long-term vision for Temple's parks and trails system. The plan focused on a 10-year horizon that prioritized implementation actions that respond incrementally to community needs. The plan is intended to be evaluated, adjusted and changed as needed. The following list highlights a few key park and trail mobility recommendations:

1. Expand Friar's Creek Trail: 3–5-year initiation timeframe
2. Reconfigure 24th Street Bridge: 1–2-year initiation timeframe
3. Develop Georgetown Railroad to a Rails to Trails network: 1-2, 3-5 initiation timeframe
4. Develop a Regional Trail Network: Ongoing
5. Prioritize Trails: Various initiation timeframes
   - Georgetown Railroad Trail #1
   - Georgetown Railroad Trail #2
   - Georgetown Railroad Trail #3
   - Gateway Trail
   - Hog Pen Creek Trail
   - Veteran's Trail
   - Friar's Creek Trail Extension
   - Lake Terrace Trail
   - Ferguson Trail
   - FM 2305 Trail Extension
   - Bird Creek Interceptor Trail
   - Pepper Creek Trail Extension
   - Leon River / Belton Trail

5.4.3 Neighborhood Plans

The City has taken the initiative to complete individual neighborhood plans that identify community concerns, values, visions, and goals. The plans are intended to provide improved quality of life while increasing access to affordable housing. Each neighborhood plan helps inform the MMP by providing local context and identifying opportunities for specific project level recommendations. Additionally, future neighborhood plans should take into account the guidance from the MMP to provide consistency.

5.4.4 Freight and Aviation

Combining the positive economic outlook, potential for growth in freight-dependent industries, and the level of freight activity on the study area transportation system, the City of Temple shows opportunity for freight growth in the future. It is critical that the freight system is designed and maintained to support anticipated development and corresponding increases in freight traffic. Currently, the City does not have any plans in place to manage the freight network. The combination of industrial growth projections and identification of future LOS deficiencies on the freight network provide the City with valuable information resources for identifying and taking positive action steps to support economic sustainability.

The Airport Master Plan was developed in 2015, with short-, intermediate- and long-term planning extending to 2026. The plan focuses on recommended improvement on the actual site of the airport, including the design/construction of a Helicopter approach strip, hangers, and taxiways. Future connections and emerging technologies that would interface with the airport were not discussed in this plan. Connecting this resource with ground transportation through existing modes and emerging technologies can increase the utilization of this resource by residents and stakeholders.

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