

Fort Bend County Transit – New Park and Ride at the University of Houston – Sugar Land

The attached documents include the following:

1. TTI report evaluating Downtown Transit Demand: *Seamless Regional Transit from Fort Bend County to Downtown Houston*
2. Fort Bend County Transit Long Range Plan

Ridership on FBCT's commuter services has grown at approximately 15 percent per year during the last 10 years (see the Fort Bend County Long Range Transportation Plan, attached here). Projected ridership on the downtown service at maturity is over 434,000 riders annually. Fort Bend provided 239,204 commuter trips in 2017.

The Park & Ride at UH Sugar Land will allow FBCT to accommodate its growing rider base, as well as develop new routes (to Downtown Houston, for example) that will considerably expand FBCT's ridership base in the years ahead. The 2014 study, *Seamless Regional Transit: Fort Bend County to Downtown Houston*, found significant demand for commuter service from Fort Bend County to Downtown Houston. The study recommended the development of a new commuter service operated by FBCT from the Sugar Land area to capture the highest ridership potential. The 2017 Fort Bend County Transit Long Range Plan, states in 2015, Fort Bend County residents made over 32,000 trips per day to Downtown Houston. That number is projected to increase by 43 percent to over 46,000 trips per day in 2040.

2014



SEAMLESS REGIONAL TRANSIT FORT BEND COUNTY TO DOWNTOWN HOUSTON



Seamless Regional Transit from Fort Bend County to Downtown Houston FINAL REPORT

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Available Online
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USE OF TERMS

Bus Rapid Transit (BRT)—Express bus service aimed at mirroring light rail service by offering high frequency trips often with dedicated lanes and branding. Boarding and alighting take place at a street-side bus stop or transit depot. Fares are typically collected at the front interior of the bus in a farebox or at an off-vehicle ticket vending machine.

Capital Cost of Contracting (CCC)—Federal assistance with costs attributable to privately owned capital consumed during the course of contracting public services.

Common fare—Single payment method utilized and accepted by all participating regional agencies as fare media, often in the form of a smart card.

Commuter rail—Passenger train service that operates on existing freight rail right of ways. Fares are typically collected onboard the train during service or at an off-vehicle ticket vending machine and boarding occurs from low platforms.

Commuter bus service—Fixed route service with limited stops traveling longer distances; typically provided by over-the-road (motor) coaches with standardized commuter amenities (high back seats, overhead luggage racks).

Good neighbor policy—Agreement among two or more transit providers to use each other's stops or stations. The transit provider that owns the bus stop/station is responsible for posting the route numbers of the other provider using the stop/station and vice versa.

Light rail—Passenger train service that operates on urban streets or on dedicated right of ways powered by overhead electric lines. Fares are typically collected in advance of the passenger boarding process and boarding occurs on dedicated platforms.

Local bus service—Bus service with several passenger stops per mile on local streets.

Peak hours—Time of day when most transit vehicles is in operation to provide the highest level of service to the largest number of riders (as compared to other times of the day).

Seamless transit service—Any type of service (bus, rail, paratransit) coordinated and integrated across jurisdictional boundaries and agencies resulting in transit services that are coordinated, efficient, and convenient to the rider.

Smart cards—Stored-value card with built-in semiconductor chip. The chip is loaded with monetary value and used by customers in place of using cash or paper passes.

FINAL REPORT PURPOSE

The purpose of the final report is to document research for the Central Houston- Fort Bend County (FBC) Working Group to develop and evaluate seamless transit service from FBC to downtown Houston. Seamless transit service is coordinated across jurisdictional boundaries, typically features a single fare medium, and emphasizes customer convenience. Researchers present the final report in two sections, Phase 1 Research and Phase 2 Research. The first section describes the need for research, identifies the study partners, documents options for seamless transit service from FBC to downtown Houston, and provides a preliminary financial risk analysis. The second section of the report documents the capital plans required to implement any of the options for seamless transit service from FBC to downtown Houston, and provides an updated financial plan. An important consideration for the updated financial plan is the impact of the 2012 federal authorization bill, Moving Ahead for Progress in the 21st Century (MAP-21), on transit funding for the Houston Urbanized Area (UZA).

PHASE 1 RESEARCH

PROBLEM STATEMENT

Transportation systems throughout the United States (U.S.) must increase coordination to meet the changing needs of riders due to long-range commuting, activity centers spread across multiple transit districts, and funding sources limited in availability and application. Through improved coordination and integration, agencies can provide seamless transit service in both urban and rural areas that is cost-effective, efficient, and beneficial for all stakeholders.

In 2010, approximately 13,700 people lived in Fort Bend County and commuted to their primary job in downtown Houston (U.S. Census, Longitudinal Employer-Household Dynamics Statistics). Currently, seamless transit service is not available for FBC residents to commute to downtown Houston.

PARTNERS

Major partners in the study included:

- Central Houston, Inc. and the Central Houston Transportation Committee
- Chevron
- City of Sugar Land
- Fort Bend County Public Transportation Department (FBC Transit)
- Metropolitan Transportation Authority of Harris County (METRO)
- Federal Transit Administration



WORKING GROUP

The above listed partners formed an advisory Working Group to develop and evaluate seamless transit service from FBC to downtown Houston. FBC Transit engaged Texas A&M Transportation Institute (TTI) to provide background research, facilitation services, and technical support to the working group. As the project progressed, TTI posted work products to a central website for the convenience of all partners. Click here to find documents on the website:

<http://tti.tamu.edu/group/transit-mobility/commuteworkgrp/>

PHASE 1 OBJECTIVES

During Phase 1, researchers conducted a literature review to document industry best practices for transit provider collaboration to provide seamless transit service across jurisdictional boundaries that involve large urban, small urban, and rural providers. Researchers then estimated latent demand for commuter transit service connecting Fort Bend County residents to downtown Houston. Finally, TTI developed and independently evaluated five options associated with the most financially prudent and mutually advantageous means to develop commuter transit service from Fort Bend County to downtown Houston. The options included both one-seat rides (no transfer) and two-seat rides (one transfer) for services provided either by FBC Transit using smaller, medium-duty buses or by METRO using larger, heavy-duty commuter buses.

SUMMARY OF LITERATURE

There are many barriers to creating and maintaining seamless transportation systems, including funding conflicts, infrastructure discrepancies, and financial risk. However, “chances of success are greatly enhanced with the presence and strong action of a regional champion(s)” (Miller & Lam, 2003, p. ii) and with the presence of a common vision among all stakeholders, including non-transit agencies (Lewis C. A., Higgins, Perkins, Zhan, & Chen, 2009, p. 22).

Ease of system use by riders can help facilitate successful regional transit coordination. One way to coordinate services and diminish the complexity of transfers between transit providers is to create a common fare, which riders can use interchangeably between services. Smart cards, loaded with monetary value and used by customers in place of using cash or paper passes, can digitally store information about fares for different transit services. Smart cards facilitate seamless transit service because passenger trips and applicable fares can be tracked, making it possible to allocate revenues among multiple transit providers. (Miller & Lam, 2003, p. ii).

Transit agencies can also coordinate schedules to minimize passenger wait times at transfer points and effectively synchronize service. In addition, agencies can provide pertinent information to riders about other agencies; examples include signage, route information, and trip-planning applications that can schedule trips between multiple agencies.

Regional coordination between agencies can take various forms including consolidation to create a new regional transportation entity, creation of an umbrella agency to coordinate services between various agencies, or creation of joint agreements where autonomy is maintained (Lewis, Higgins, Perkins, Zhan, & Chen, Public Transportation Solutions for Regional Travel: Technical Report, 2008, p. 6).

Strategically coordinated regional transit service can reduce duplicative service and save financial resources (Lewis, Higgins, Perkins, Zhan, & Chen, Public Transportation Solutions for Regional Travel: Technical Report, 2008, p. 7). Agencies can save money by pooling assets such as vehicles, workers, and facilities with other regional operators, and still maintain the same level of service. Long-range and capital planning for regional transportation can also help increase connectivity and eliminate gaps in service.

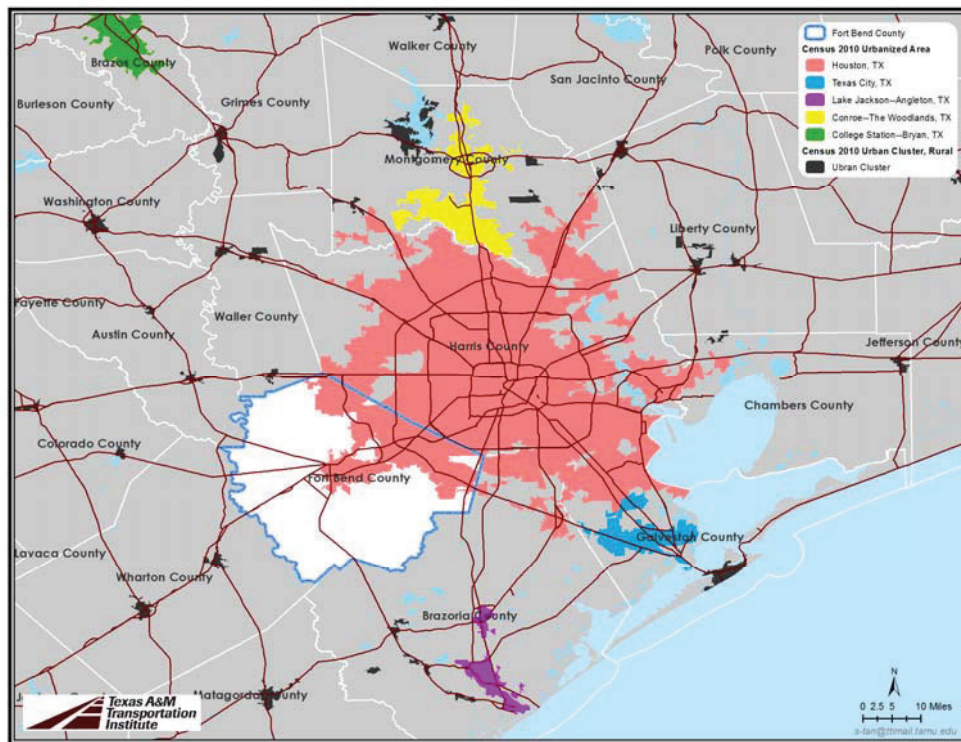
BACKGROUND: HOUSTON REGIONAL TRANSIT SERVICES

The Houston-Galveston metropolitan planning area includes eight counties and four urbanized areas. The Houston UZA and Conroe–The Woodlands UZA each have a population over 200,000 and so the Federal Transit Administration (FTA) classifies each as a “large” UZA. Table 1 provides the population and area of each county and UZA in the metropolitan planning area. Figure 1 provides a map of the counties and UZAs in the region.

Table 1. Area Population and Size

County	2000 Population	2010 Population	2010 Area (Sq Mi)
Brazoria County	241,767	313,166	1,386
Chambers County	26,031	35,096	599
Fort Bend County	354,452	585,375	875
Galveston County	250,158	291,309	398
Harris County	3,400,578	4,092,459	1,729
Liberty County	70,154	75,643	1,160
Waller County	32,663	43,205	514
Montgomery County	293,768	455,746	1,044
Total	4,566,754	5,891,999	7,705
Houston UZA	3,822,509	4,944,332	1,295
Conroe–The Woodlands UZA	89,445	239,938	42
Texas City UZA	96,417	106,383	59
Lake Jackson-Angleton UZA	73,416	74,830	34

Source: U.S. Census Decennial Census, 2000 and 2010



Source: 2010 U.S. Census Bureau. TTI Analysis

Figure 1. UZAs in the Houston-Galveston Region

Fixed route bus and paratransit operators in urbanized and rural areas coordinate regional transit services including co-sponsored park and rides, shared service area, and Interlocal agreements. There are several examples of regional transit service coordination in the Houston area.

- **Co-Sponsored Park and Rides**
 - Harris County sponsors and METRO operates commuter bus service from the Baytown Park & Ride to downtown Houston.
 - Gulf Coast Center Connect Transit (the transit provider in Brazoria County), the City of Pearland, and METRO are jointly exploring the possibility of building a new park & ride and operating commuter bus service from Brazoria County to the Texas Medical Center (TMC).
- **Shared Service Area**
 - FBC operates Fort Bend Express commuter bus service to destinations in METRO's service area including Uptown/Galleria, Greenway Plaza, and the TMC.
 - Brazos Transit District manages The Woodland Express commuter bus service from Montgomery County to downtown Houston, Greenway Plaza, and the TMC.
- **Interlocal Agreements**
 - Gulf Coast Center Connect Transit contracts with Galveston Island Transit to provide commuter service in Galveston from League City to Galveston Island.

CASE STUDIES OF REGIONAL TRANSIT SERVICES

TTI conducted case study research to document the most important elements of complex regional transit coordination. Table 2 highlights key elements from each case study. The project website contains more details under *Case Studies of Regional Transit Services in Other Areas*.

Table 2. Regional Coordination Case Studies

Metropolitan Region Served	Collaboration Examples	Regional Partners	Agreement Types	Services Provided under Agreement
Atlanta, GA	<ul style="list-style-type: none"> Coordinated regional service Shared infrastructure Park and rides 	<ul style="list-style-type: none"> Cobb Community Transit Metro Atlanta Rapid Transit Authority Georgia Regional Transit Authority Gwinnett County Transit 	<ul style="list-style-type: none"> Intergovernmental Agreement Good Neighbor Policy 	<ul style="list-style-type: none"> Local Express Reverse Commute
Boston, MA to Washington, DC	<ul style="list-style-type: none"> Coordinated regional service Information coordination Shared infrastructure Shared commuter rail Common fare smart card 	<ul style="list-style-type: none"> Metro Boston Transit Authority Washington Metro Transit Authority Virginia Railway Express County Transit Fairfax Connector Arlington Transit Northern Virginia Transportation Commission Loudoun County 	<ul style="list-style-type: none"> Joint Use Agreement Joint Powers Authority Joint Fares Good Neighbor Policy 	<ul style="list-style-type: none"> Bus Commuter Rail
Dallas/ Fort Worth, TX	<ul style="list-style-type: none"> Coordinated regional service 	<ul style="list-style-type: none"> Dallas Area Rapid Transit Fort Worth T Denton County Transportation Authority City of Cleburne Northeast Transportation Service City of Mesquite 	<ul style="list-style-type: none"> Joint Powers Authority Interlocal Agreement 	<ul style="list-style-type: none"> Commuter Rail Regional bus service Specialized service for seniors
Phoenix Tempe/Mesa, AZ	<ul style="list-style-type: none"> Regional transit provider created (common fare and branding) Coordinated regional service (buy and sell revenue miles) Assistance to local business to meet local trip reduction goals 	<ul style="list-style-type: none"> Valley Metro Regional Public Transportation Authority City of Phoenix City of Mesa City of Tempe City of Scottsdale 	<ul style="list-style-type: none"> Consolidated Transit Service Interlocal Agreement 	<ul style="list-style-type: none"> Light Rail Local Express LINK Bus Rapid Transit Circulators Para-transit Carpool Vanpool
Central Puget Sound (Seattle), WA	<ul style="list-style-type: none"> Regional transit provider created (Sound Transit) Common fare smart card Shared stops and stations 	<ul style="list-style-type: none"> Sound Transit Community Transit King County Metro Pierce Transit City of Auburn Metro Transit Everett Transit Kitsap Transit 	<ul style="list-style-type: none"> Contract Good Neighbor Policy Interlocal Agreement 	<ul style="list-style-type: none"> Express Light Rail Commuter Rail Feeder Service
San Diego, CA	<ul style="list-style-type: none"> Regional transit provider created Common fare Shared structures "511" Information sharing 	<ul style="list-style-type: none"> San Diego Metro Transit System North County Transit District Chula Vista Transit 	<ul style="list-style-type: none"> Consolidated Transit Service Revenue Sharing Agreement 	<ul style="list-style-type: none"> Commuter Rail Express Bus Rapid Transit Light Rail

Source: TTI Analysis

BEST PRACTICES FROM CASE STUDIES AND LITERATURE

TTI reviewed literature and case study findings to identify best practices for successfully implemented regionally coordinated transit services; the four elements below summarize the key findings.

Regional Service Coordination

As transportation demand leads to longer commutes across county lines, the coordination of services between agencies becomes increasingly important for regional sustainability, efficiencies, and inter-jurisdictional mobility. Examples of coordination include jointly provided service, consolidated service, and aligned routes. Agencies generally formalize jointly provided services through contracts and various types of interlocal agreements.

Shared Infrastructure

The “Good Neighbor Policy” proved to be a widely used tool to maximize infrastructure and resources among agencies coordinating regional transit services. The good neighbor policy is an agreement among two or more providers to use each other’s transit stops or stations. The transit provider that owns the stop and or station is responsible for posting the route numbers of the other provider using the stop or station, and vice versa.

Common Fare

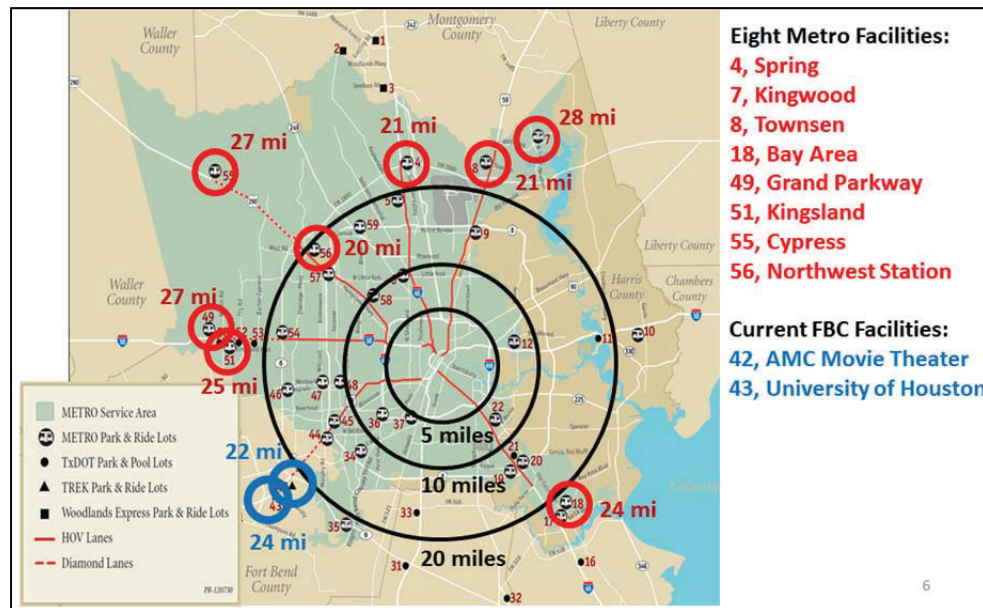
A common fare, or single payment method for riders that all participating regional agencies accept as fare media, is a hallmark of regionally coordinated transit services. In an effort to unify and modernize the fare collection process, many agencies have switched to an electronic pass system or “smart card” method of implementing a common fare. The option to use a single payment method aids in the ease of system use by riders, is easier to administer for bus operators, and can increase on-time performance. Agencies also often develop a revenue sharing agreement, tailored to operational differences, in conjunction with a common fare.

Park and Ride

Park and ride facilities and the associated services facilitate an integrated transportation network by attracting commuters to leave single occupant vehicles and use public transportation services. Customers are attracted to the seamless service and limited stops. Commuters traveling long distances to and from employment are the primary park and ride rider; park and ride facilities and services are, therefore, often evident in instances of regionally coordinated services.

ESTIMATED DEMAND FOR COMMUTER SERVICE FROM FORT BEND COUNTY TO DOWNTOWN

TTI analyzed METRO Park & Ride service along all major freeway corridors. TTI selected services that are about the same distance to downtown Houston as the existing FBC Transit Park and Ride lots at the AMC Movie Theater and University of Houston Sugar Land. TTI identified eight METRO Park & Rides that met the above listed criteria in the area, including Spring, Kingwood, Townsen, Bay Area, Grand Parkway, Kingsland, Cypress, and Northwest Station (Figure 2). For comparison to the Sugar Land area, the Katy, Cypress, and Kingwood Park & Ride markets have the most similar demographics.



Source: TTI Analysis; (locations labeled with miles to downtown Houston)

Figure 2. Location of METRO Case Study Facilities

The Houston- focused park and ride case study included the eight METRO Park & Rides shown in Figure 2. A summary of findings from the Houston-focused park and ride case study is below:

- Average distance to downtown Houston: **24.3 miles**
- Average A.M. peak inbound riders to downtown: **726**
- Average number of inbound bus trips: **25**
- Average boardings per bus trip at park and ride: **27.9**

TTI combined METRO route and ridership data with the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) data to estimate the latent demand for commuter service connecting FBC residents to downtown Houston. In short, TTI compared known ridership for each peer facility to known worker flows to downtown to generate a park and ride mode share rate:

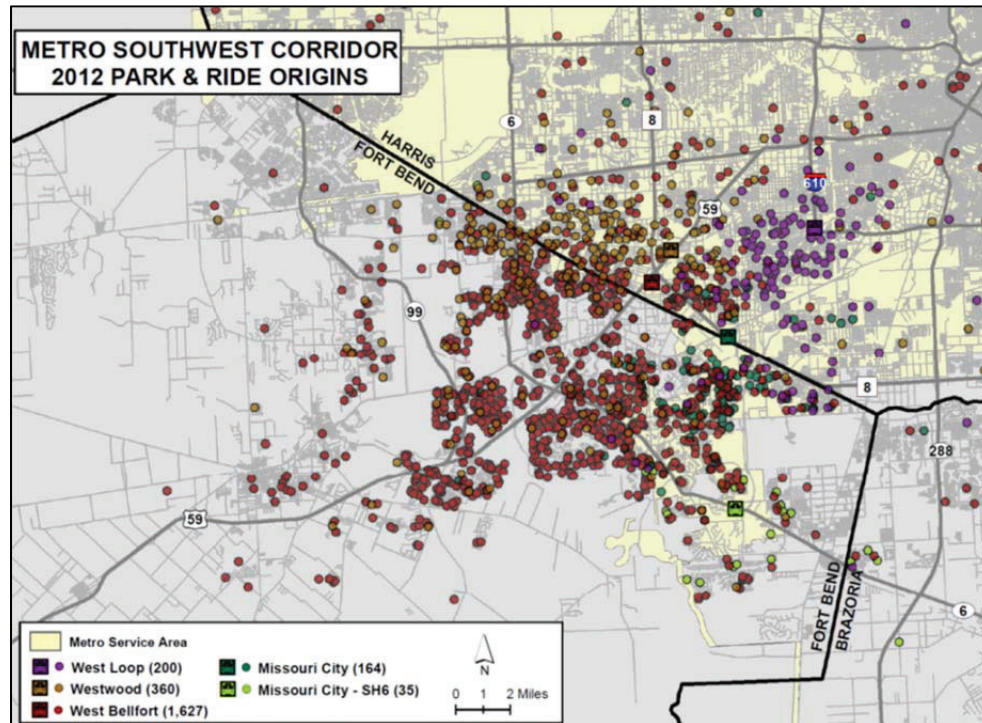
- Average METRO A.M. peak inbound riders to downtown from each park and ride: **726 riders**
- Number of workers in catchment area that work downtown (2010 LEHD): **4,087 workers**
- TTI divided ridership by total workers to calculate estimated mode share rate for METRO-like commuter service to downtown:
 - Low estimate of mode share capture **10.7 percent (lowest three case study facilities)**
 - Medium estimate of mode share capture **17.8 percent (average of all eight facilities)**
 - High estimate of mode share capture **28.2 percent (highest three case study facilities)**

The Central Houston – Fort Bend Commute Working Group decided that in order to estimate potential demand for commuter service from Fort Bend County to downtown Houston, TTI should assume a hypothetical park and ride located near the University of Houston Sugar Land. Using LEHD data from the Census Bureau in 2010, approximately 3,100 workers traveled from the catchment area of the hypothetical new facility to downtown Houston each day. If every commuter used the park and ride in the future, the target market would translate to about 6,200 transit trips per day. However, only a portion of the population will decide to use commuter transit service for their commute. TTI used the METRO case study mode share rates to estimate total latent demand for METRO-like commuter service from Fort Bend County to downtown Houston:

- **Low:** 10.7% capture rate X 6,200 transit trips = demand for 665 commuter trips per day
- **Medium:** 17.8% capture rate X 6,200 transit trips = demand for 1,100 commuter trips per day
- **High:** 28.2% capture rate X 6,200 transit trips = demand for 1,747 commuter trips per day

The population and demographic characteristics of Fort Bend County in the capture area most closely resemble the three METRO Park & Rides in the high scenario, suggesting a latent demand of 1,700 commuter trips per day.

TTI also reviewed the data from a 2012 license plate survey of cars parked at METRO Park & Ride facilities, provided courtesy of METRO. The Westwood and West Bellfort Park & Ride facilities are located along the US 59 corridor. Both Park & Rides afford FBC residents the opportunity to drive several miles, park, and ride an express route into downtown Houston. Figure 3 depicts the general distribution of existing METRO Park & Ride users' home origins. The majority of origins are in Sugar Land or the surrounding neighborhood communities.



Source: METRO

Figure 3. 2012 METRO Park & Ride Origins along US 59 Corridor





The METRO 2012 license plate survey of West Bellfort and Westwood Park & Ride corroborate the estimate of latent demand in FBC. A substantial share of current METRO Park & Ride users, nearly 50 percent, drive from Sugar Land in FBC (e.g., First Colony, Commonwealth, North Sugar Land) or from the city's extra-territorial jurisdiction (e.g., New Territory, Greatwood) to METRO's Westwood and West Bellfort Park & Ride facilities in order to ride transit to downtown Houston.

The Working Group agreed with TTI's estimate of latent demand and decided to assume the high scenario during the development and evaluation of service options. The working group relied on both the METRO license plate analysis from 2012 and the TTI analysis of the similarity demographics in the Sugar Land/FBC capture area as compared to the three METRO Park & Ride services in the high scenario. The commuter service (schedule, vehicle, amenities, etc.) influences residents' willingness to use of the service; the estimate of demand detailed in the service options section assumes similar, high-quality commuter service to the METRO Park & Ride sites studied.

SERVICE OPTIONS

Currently, the FBC Transit-operated Greenway Route stops at METRO West Bellfort Park & Ride to allow for passenger transfers to METRO Route 265. Riders pay FBC Shuttle fare and then pay METRO's Route 265 fare to travel to downtown Houston. TTI and the Working Group developed and evaluated four options for peak-hour commuter service between Fort Bend County and downtown Houston. Table 3 details the key elements of each option.

Table 3. Options for Analysis

<i>Options</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Description</i>	<i>Fort Bend Shuttle</i>	<i>Extension METRO 262</i>	<i>New Fort Bend Route</i>	<i>New METRO Route</i>
Type of Vehicle				
Operator	FBC (Contractor)	METRO	FBC (Contractor)	METRO
Type of Service	Shuttle from FBC to West Bellfort Park & Ride	Commuter Express with stops at Westwood Park & Ride	Park and ride	Park and ride
Service Description	Buses operate from park and ride in FBC on a schedule to meet METRO Route 262 West Bellfort Park & Ride	Selected bus trips on the METRO Route 262 start/end at park and ride in FBC	Buses operate from park and ride in FBC directly to downtown Houston	Buses operate from park and ride in FBC directly to downtown Houston
Average Travel Time per Trip	60 minutes	50 minutes	40 minutes	40 minutes
Required Transfers	1	0	0	0
Estimated Daily Passenger Boardings in Year 4	299	667	1,708	1,708
Assumed Vehicle Fleet	7	18	28	17
Cost Model	Current FBC contract with First Transit	METRO cost model for Baytown Park & Ride	Current FBC contract with Contractor	METRO cost model for Planned Brazoria Park & Ride
Fare Assumptions	\$1.00 for shuttle to West Bellfort Park & Ride, \$3.25 METRO fare	\$4.50 METRO fare from Sugar Land to downtown	\$4.00 FBC fare from Sugar Land to downtown	\$4.50 METRO fare from Sugar Land to downtown

Source: TTI Analysis

Working with METRO and FBC Transit, TTI designed service levels and schedules for each option. Detailed schedules are on the shared website under *Descriptions and Analysis of Service Options*. Morning peak hours are 6:01 a.m. to 8:30 a.m. and afternoon peak hours are 3:31 p.m. to 6:30 p.m.

The options comparison includes an assessment of route alignments, stops, schedules, target markets, operating costs, and required capital costs (if any). TTI used the previously described ridership estimations to determine required revenue hours, miles and vehicles to meet expected demand. Additionally, each transit agency's cost structure was used to calculate operating costs and federal, state, and local funding strategies.

Option 1 Current FBC Transit Service

The FBC Transit-operated Greenway Route stops at METRO West Bellfort Park & Ride to allow for passenger transfers to METRO Route 265. Riders pay FBC Shuttle fare and then pay METRO's Route 265 fare to travel to downtown Houston.

FBC Transit is currently testing a smart card fare collection system. The vendor believes that METRO's smart card (Q Card) readers will also be able to read FBC Transit's smart cards, but the assumption is not verified. The options below assume that FBC Transit has purchased its new system and that interoperability with METRO's Q Card system is possible. Under the current fare collection system, riders pay two separate fares—a \$1.00 fare on the FBC Transit portion of the trip and a Zone 2 fare of \$3.25 on the METRO portion of the trip. Without smart card integration, riders would need two smart cards (one for METRO and one for FBC Transit). The total fare would be the same as it is under the current system. To achieve a seamless fare for riders of the current service, FBC Transit would need smart card readers on all buses used for Uptown and Greenway services. One smart card would be used and the fare would be collected on the FBC buses. Riders transferring to the 265 West Bellfort would tap their cards and the transfer would not require another passenger fare. Fare allocation would require negotiation between METRO and FBC.

Another alternative is to treat the first part of the trip like a local bus trip, wherein a transfer to an upgraded service only requires paying the differential. In that case, \$1.00 would be deducted at the FBC Transit lots when a passenger boards and the difference between Zone 2 and \$1.00 (\$2.25) would be deducted when the transfer is made. In this case, the total fare would be \$3.25 per trip.

Option 2 Additional Trips on Existing Service, Operated by FBC Transit (Revise Existing FBC Transit Service)

Service from Fort Bend County to downtown would be provided by a transfer between FBC Transit buses and METRO buses at either METRO's 265 West Bellfort or 262 Westwood Park & Ride lot. The option assumes use of existing Park and Ride sites in FBC and 32-seat "shuttle" vehicles, similar to the vehicles currently operated by FBC Transit. The transfer between FBC Transit service and METRO routes will require riders to pay two fares, as they would be using two different transit systems or one fare if a unified fare system exists in the future. Seamless fare collection would require smart card readers on all FBC Transit buses used to provide the shuttle service. Again, fare levels and revenue allocation between METRO and FBC Transit would need to be determined.

Option 3 Extension of METRO Route 262 into Fort Bend County (Extend METRO Service)

METRO Westwood Route 262, the existing route connecting riders from their transfer point at the West Bellfort Park & Ride to downtown Houston, would extend to provide commuter service from existing FBC Transit Park and Ride lots into downtown Houston under contract to FBC Transit. A transfer is not required. The option assumes adequate park and ride spaces in an undetermined location along the US 59 corridor in Sugar Land—approximately 24 miles from downtown Houston. The service would use vehicles similar to current METRO Park & Ride vehicles. Riders would pay one fare to METRO and travel into and out of downtown. Since Option 3 uses METRO buses that already have Q Card readers, riders would simply pay with a Q card. The agencies would need to negotiate fare levels and revenue allocation.

Option 4 FBC Transit-Owned and Operated Commuter Service (New Service)

Option 4 service connects riders from Fort Bend County into downtown Houston on a service operated by FBC Transit. The option assumes adequate park and ride spaces in an undetermined location along the US 59 corridor in Sugar Land—approximately 24 miles from downtown Houston. The service would use vehicles similar to the current 32-seat vehicles in the FBC fleet. Riders would pay one fare and travel directly into and out of downtown. Since no transfer or interconnection with METRO service is needed, no fare system interoperability is required. FBC would need to establish what fare it would charge from each lot and how it planned to collect the fares. FBC would use its own smart card fare collection system to collect fares.

Option 5 Fort Bend County-Owned, METRO-Operated Commuter Service (New Service)

Option 5 service connects riders from Fort Bend County into Downtown Houston on a service operated by METRO. The option assumes adequate park and ride spaces in an undetermined location along the US 59 corridor in Sugar Land—approximately 24 miles from Downtown Houston. METRO would use FBC Transit's Park and Ride lot and would therefore enter into a contract with FBC Transit for this purpose. The service would use vehicles similar to current METRO Park & Ride vehicles. Riders would pay one fare and travel directly into and out of downtown. Option 5 is similar to what METRO is proposing to operate from the park and ride lot under consideration in Pearland to the TMC. Since Option 5 option uses METRO buses that already have Q Card readers, riders would simply pay with a Q card. The agencies would need to negotiate fare levels and revenue allocation.

COST ESTIMATIONS

Researchers made careful assumptions to estimate the costs associated with each option. Costs considered included the vehicle capital, maintenance, supervision, and marketing costs of each service option. Researchers also estimated each option's potential daily passengers, fare revenue and recovery, and the amount of local funds required to match the federal contribution. The Working Group ultimately decided that the local share element was the most important factor. Detailed operating cost estimations, including the local share requirements, for each option is on the project website under the heading *Comparative Summary: Local Share and Advantages/Disadvantages*. Researchers also include a summary of operating and capital cost scenarios in Table 20.

RISK ANALYSIS OF SERVICE OPTIONS

TTI developed a comparative summary of the local share required for each option. From there, TTI performed a comprehensive risk analysis to evaluate all options independently and against each other. The risk analysis examined the risk of operating costs rising by 25 percent and passenger ridership (or revenues) decreasing by 25 percent, or both, using constant dollars over a four year period of service starting and reaching ridership maturity. Table 4 details the effect of the risk analysis on local share dollars in years 1 and 4 of service operation for each option. In terms of total local share, option 2 is always the least costly because it adds the least amount of additional service, as compared to the other three options.

Table 4. Local Share in Total Annual Dollars

Option	Description	Year 1		Year 4	
		Low	High	Low	High
Option 2	Additional trips on existing FBC Transit service, operated by FBC Transit	\$69,000	\$92,500	\$69,000	\$102,250
Option 3	Extension of METRO Route 262 into Fort Bend County	\$428,000	\$735,025	\$413,000	\$861,488
Option 4	FBC Transit owned and operated commuter service	\$212,000	\$708,630	(\$88,000)	\$662,160
Option 5	FBC Transit Owned, METRO operated commuter service	\$414,000	\$1,038,705	\$161,000	\$1,093,435

Source: TTI Analysis

Table 5 details the effect of the risk analysis on local share funding needed per boarding passenger in years 1 and 4 of service operation for each option. In terms of local share/boarding, any of the four options could be the most cost-effective service, depending on the year and the risks encountered. Option 3 is generally the least cost effective as it has the higher cost of METRO service without the higher ridership generated by Options 4 and 5.

Table 5. Local Share per Boarding

Option	Year 1		Year 4	
	Low	High	Low	High
Option 2	\$2.16	\$3.85	\$1.30	\$2.57
Option 3	\$4.20	\$7.21	\$2.44	\$5.10
Option 4	\$0.81	\$2.70	\$0.00	\$1.53
Option 5	\$1.58	\$3.96	\$0.37	\$2.52

Source: TTI Analysis

Comparison of Service Options

Researchers considered several elements in the review of the proposed options and their respective advantages and disadvantages, including:

- Current riders (convenience, comfort, cost)
- Future riders (ability to attract new riders)
- Transit operator (supervision of service quality, time and effort to manage, marketing)
- Operating cost (operating cost/unit, local share required)
- Capital cost (vehicle investment, park and ride)
- Other (parking capacity at FBC lots; midday bus capacity downtown)

Tables 6, 7, and 8 list all known advantages and disadvantages of each proposed service option.

Table 6. Current Service Option 1: Advantages and Disadvantages

Option	Advantages	Disadvantages
Option 1– Current service	<ul style="list-style-type: none"> • No additional oversight by transit agencies • No additional operating cost • No additional vehicles • No capital investment • FBC Transit stop at West Bellfort Park & Ride adds opportunity for riders to board for destinations at Greenway Plaza 	<ul style="list-style-type: none"> • Requires riders to transfer to reach downtown • Requires passenger to pay two fares (\$1 to FBC and \$3.25 to METRO) • Capacity for riders transferring to downtown ~50 each peak period without adding additional service; some FBC Transit bus trips to/from Greenway reach seated capacity with transfers • Riders may be required to wait for transfer to FBC Transit bus at West Bellfort Park & Ride in afternoon due to less frequent FBC Transit bus trips • Not marketed as Fort Bend County to downtown service • No standardized commuter amenities onboard FBC Transit vehicles

Source: TTI Analysis

Table 7. Short Term Options, 2 & 3: Advantages and Disadvantages

Option	Advantages	Disadvantages
Option 2– Additional trips on existing service, operated by FBC Transit	<ul style="list-style-type: none"> • Increases Option 1 passenger capacity for transfers from FBC Transit vehicles to METRO at West Bellfort Park & Ride • Provides more frequent service to METRO West Bellfort Park & Ride than Option 1 • Lower operating cost/hour for FBC Transit-operated service than Option 3 • Lower local share than Option 3 due to lower unit costs and FBC Transit's ability to draw down additional federal funds 	<ul style="list-style-type: none"> • Requires riders to transfer to reach downtown (No improvement as compared to Option 1) • Requires passenger to pay two fares (No improvement as compared to Option 1) • Lower projected ridership than Option 3 • Requires additional FBC Transit operating supervision to ensure timely performance • Requires additional FBC Transit vehicles to operate the shuttle; vehicles are small buses with seated capacity 32-riders • Increased demand may exceed available parking capacity at existing FBC Transit parking lots • No standardized commuter amenities onboard FBC vehicles • METRO would likely incur costs to meet increased demand
Option 3– Extension of METRO Route 262 into Fort Bend County with service operated by METRO	<ul style="list-style-type: none"> • One seat ride for riders from Fort Bend County to Downtown Houston (no transfers) • Passenger pays one fare (to METRO) • Vehicles are METRO commuter buses with additional passenger amenities and comfort • Higher projected ridership than Option 2 • METRO price based on incremental revenue hours at direct operating cost • Minimal incremental management and supervision by METRO • Marketing and customer service shared responsibility of FBC Transit and METRO • Recognizable, branded as service from Fort Bend County to Downtown 	<ul style="list-style-type: none"> • Higher operating cost per hour for METRO service as compared to FBC operation in Option 2 • Higher local share as compared to Option 2 due to higher METRO unit costs and FBC Transit cannot apply additional federal funds • Increased demand may exceed available parking capacity at existing FBC Transit parking lot at UH • Requires METRO to assign more buses in peak periods • Requires space to park midday buses near downtown; METRO midday lot at or near capacity

Source: TTI Analysis

Table 8. Long Term Options, 4 & 5: Advantages and Disadvantages

Option	Advantages	Disadvantages
Option 4– Newly-created, FBC Transit-owned and - operated commuter service	<ul style="list-style-type: none"> • One seat ride for riders from Fort Bend County to downtown Houston (no transfers) • Passenger pays one fare (to FBC Transit) • Higher projected ridership than Options 2 and 3 • Lower operating cost/hour for FBC Transit-operated service than Option 5 • Lower local share than Option 5 due to lower unit costs and FBC Transit ability to draw down additional federal funds • Recognizable, branded as service from Fort Bend County to downtown 	<ul style="list-style-type: none"> • Vehicles operated by FBC Transit; small bus with 32-seats and fewer passenger amenities, less comfortable bus for longer distance commute • Requires more peak buses than Option 5 due to smaller capacity • Significant expansion of service requires additional FBC Transit management, supervision, marketing, and customer service • No facility to park midday buses downtown Houston; operating costs includes miles/hours for buses to return to Fort Bend County midday • Long-term project to develop park and ride facility (same as Option 5)]
Option 5– Newly-created, Fort Bend County-owned, METRO-operated commuter service	<ul style="list-style-type: none"> • One seat ride for riders from Fort Bend County to downtown Houston (no transfers) • Passenger pays one fare (to METRO) • Vehicles are METRO commuter buses with additional passenger amenities and comfort • Higher projected ridership than Options 2 and 3 • METRO price based on revenue hours at direct operating cost • Incremental increase in management and supervision by METRO • Marketing and customer service shared responsibility of FBC Transit and METRO • Recognizable, branded as service from Fort Bend County to downtown 	<ul style="list-style-type: none"> • Higher operating cost/hour for METRO service as compared to FBC Transit operation in Option 4 • Higher local share as compared to Option 4 due to higher METRO unit costs and FBC Transit cannot apply additional federal funds • Requires METRO to assign more buses in peak periods than Option 3 • Requires space to park midday buses near downtown; METRO midday lot at or near capacity • Long-term project to develop park and ride facility (same as Option 4)

Source: TTI Analysis

PHASE 1 SUMMARY

Phase 1 findings indicate significant demand for commuter service from Fort Bend County to downtown Houston and as detailed in the preceding sections, each of the four options proposed is financially viable given the assumptions during the study. Based on the above evaluation and discussions with other stakeholders regarding the risks, advantages, and disadvantages associated with each option, the Working Group preferred a phased implementation of Option 4 with certain assumptions.

Option 4 has many advantages, most notably the development of a one-seat, single fare ride connecting the most commuters from Sugar Land residents to downtown Houston (as compared to Options 2 and 3). The current operating environment has changed since research began. METRO is “re-imagining” current services and possible changes in priorities may affect the viability of Options 3 and 5. Specifically, METRO may limit its service levels in jurisdictions outside of the current service area due to cost recovery concerns.

Additionally, FBC Transit’s funding has changed under the new federal authorization MAP-21. Funding changes likely limits FBC Transit’ ability to contribute to the local share cost of operating new service. Under any option implemented, FBC Transit will need a plan to mitigate new restrictions on the use of funds for operating. Such a plan may affect a local share contribution to the implementation of Option 4 from stakeholders.

PHASE 2 RESEARCH

PHASE 2 OBJECTIVES

Since the project began in June 2012, several developments have changed the financial climate. In particular, federal funding authorization MAP-21 changed the eligible use of federal funds for operating for Fort Bend County. MAP-21 and other local financial and policy considerations also affect METRO funding. The original scope did not include a task to evaluate the cost of a park and ride facility for the long-term.

Fort Bend County Transit and Central Houston agreed to expand the scope of work for the Fort Bend downtown Commute Study to include additional tasks. Phase 2 objectives included:

- Documenting the provisions of MAP-21 and how the new federal authorization impacts the options for funding transit in the Houston urbanized area with focus on effects on commuter service between Fort Bend County and downtown Houston.
- Documenting a financial plan for capital and operating costs for a commuter service between Fort Bend County and downtown Houston to support applications for additional sources of funding.

MAP-21

MAP-21 is the two-year federal transportation authorization that approves funding for U.S. public transportation and highway projects through Fiscal Year (FY) 2014 (September 30, 2014). MAP-21 funds transit at \$21.27 billion over two years, effective July 6, 2012 (A Summary of Public Transportation Provisions, 2012).

The FTA distributes transit funding and provides technical support and oversight for the Department of Transportation. The FTA distributes funds through formula and discretionary (competitive grant) programs. The portion of funding allocated via formulas increased under MAP-21 and now exceeds 80 percent of transit funds distributed through formulas.

Major Transit Programs

In a briefing paper on MAP-21 (available on the project website), researchers address the purpose, eligible activities, and changes under MAP-21 for four major transit programs which affect transit funding in the Houston UZA. Table 9 summarizes the four programs and presents the FY 2013 Houston UZA apportionment. Shading in Table 9 indicates discretionary funding.

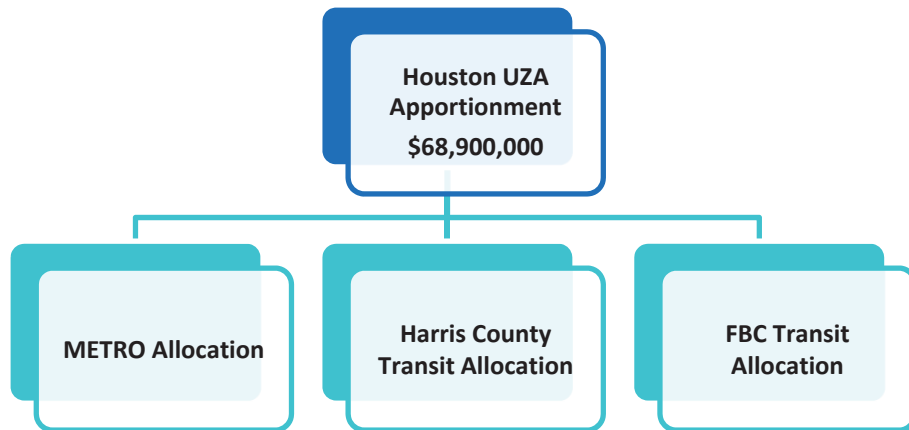
Table 9. Four Major Transit Programs in MAP-21 Effecting Houston UZA

Section	Program	Description	Houston UZA Apportionment FY 2013 (\$M)
5307	Urbanized Area Formula Program	Formula funding to urban areas for capital costs, Job Access Reverse Commute (JARC), maintenance, and some operating expenses.	\$68.9
5337	State of Good Repair	Formula funding for fixed guideway systems more than seven years old and high intensity motorbus programs.	\$9.3
5339	Bus and Bus Facilities	Formula funding for states and transit agencies for purchase, rehabilitation, and repair of buses and bus related facilities.	\$7.5
5309	Fixed Guideway Capital Investments	Discretionary funding for Core Capacity, Bus Rapid Transit, Fixed Guideway, and Small Starts projects.	\$189

Source: FTA, TTI Analysis

The Urbanized Area Formula Program (Section 5307) is the largest source of transit funding and uses a formula to authorize transit funds to 497 UZAs in the U.S. An UZA is a contiguous urbanized area of 50,000 or more population that meets criteria administered by the U.S. Census Bureau. FTA apportions UZA formula funds to designated recipients, which then allocate funds to state and local governmental authorities, including public transportation providers (Fact Sheet: Urbanized Area Formula Grants).

The FTA apportions 5307 funds to the Houston UZA as shown below in Figure 4. The designated recipient for the Houston UZA is METRO. The metropolitan planning organization (MPO), Houston-Galveston Area Council (H-GAC), must approve METRO's intended use of funds. FBC Transit and Harris County Transit are direct recipients. The three parties negotiate distribution.



Source: TTI Analysis

Figure 4. Allocation to Local Operators

Changes under MAP-21

Table 10 highlights how MAP-21 modifies the four programs and the subsequent effects on Houston transit operators. Changes to the Urban Area Formula, the new State of Good Repair (SOGR) program, Fixed Guideway Capital Investment, and Bus and Bus Facilities program have the greatest effect on transit funding in Houston.

Table 10. MAP-21 Program Changes and Effects on Houston UZA

New Program	Change to the Program	Funding under MAP-21
<i>UZA Formula</i>	Small fixed route operators (with fewer than 100 buses) can use only a portion of transit funds for operating	FBC Transit can only use 75% of its 2% attributable share of formula funds based on revenue hours for operating expenses; results in operating deficit to FBC Transit as a small provider in a large urban area
<i>SOGR</i>	Fixed guideway definition no longer includes high occupancy vehicle (HOV); HOV funds in new State of Good Repair category “High Intensity Motor Bus”	\$1.4 M less in formula funds; METRO receives approximately \$4 million less in SOGR funds
<i>Bus and Bus Facilities Formula</i>	Smaller, formula program; Transit agencies can no longer pursue discretionary funds for specific projects	METRO receives \$3.6 million less in 2013 than 2012 for bus related grants
<i>Fixed Guideway Capital Investments</i>	Discretionary, subject to national competitive process for New Starts. More competition due to addition of Core Capacity Projects and fewer funds	METRO faces increased competition for New Starts

Source: MAP-21, TTI Analysis

As a small fixed route operator in a large region, FBC Transit is negatively impacted by provisions of MAP-21 for eligible uses of Section 5307 funds. MAP-21 limits the Section 5307 funds that FBC Transit can use for operating expenses at 75 percent of FBC Transit’s attributable share of Section 5307 funds. Fort Bend County’s attributable share (2 percent) is based on its percent share of all revenue hours by all transit operators in the UZA. The restriction on use of Section 5307 funds for operating creates an \$857,000 deficit for FBC Transit in FY 2013 given existing service levels.

METRO received \$4 million fewer dollars under the MAP-21 SOGR program than under the previous Fixed Guideway Modernization program due to the exclusion of HOVs from the Fixed Guideway definition. METRO also received \$3.6 million fewer dollars under the new, smaller Bus and Bus Facilities Formula Program, which was previously discretionary funding. The competitive Fixed Guideway Capital Investment Program (formerly New Starts) is reduced under MAP-21 with more flexible project eligibility meaning less money available and more competition.

Changes to the programs listed in Table 10 reduced formula funds for transit to the Houston urbanized area and reduced the local flexibility for how local operators can use funds.

POPULATION

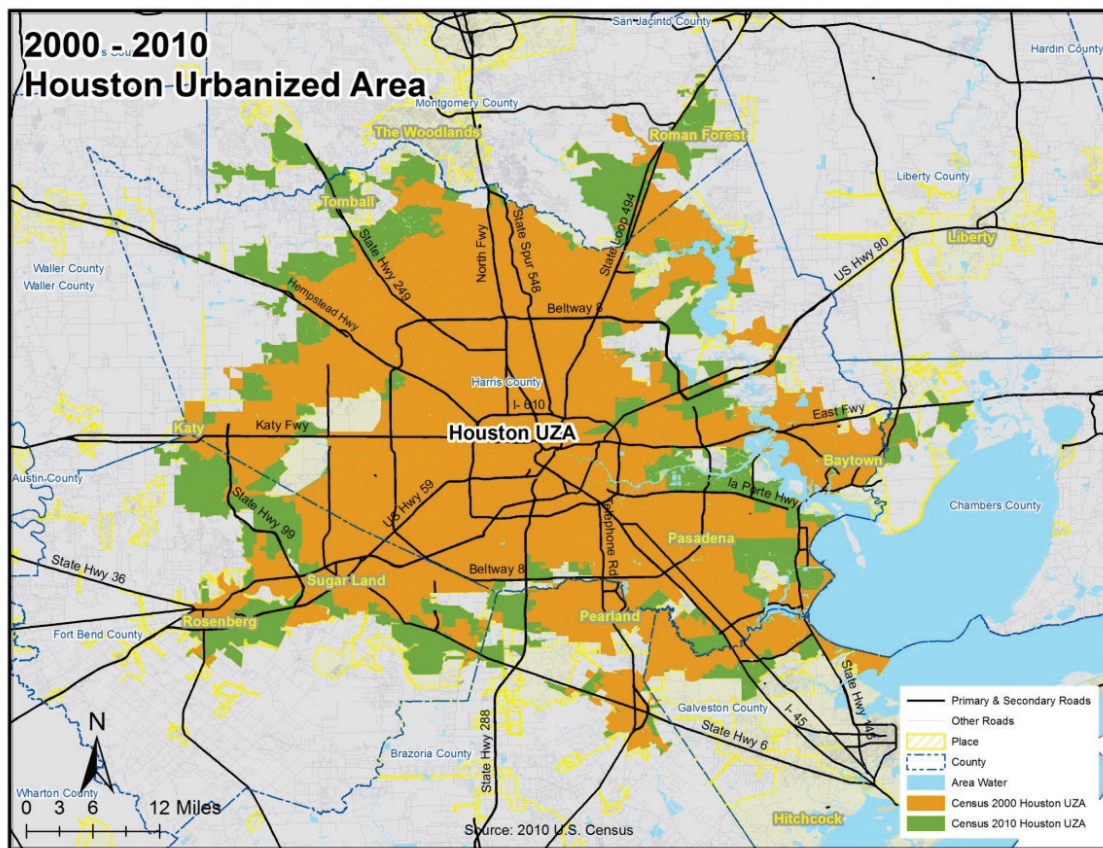
The Census Bureau defines urbanized and non-urbanized (rural) areas after each decennial census. The FTA apportions 5307 funds by formula to UZAs and 5311 funds to rural areas. Table 11 shows that the population in the Houston UZA increased from 3.8 million in the 2000 Census to 4.9 million in 2010 (29 percent increase). The Houston UZA is the seventh largest UZA in the U.S.. The FTA distributes more than 91 percent of Federal urban transit funding through the Urbanized Area Formula program to UZAs with populations over 200,000.

Table 11. Houston UZA Population and Size

UZA	2000 Population	2010 Population	Growth from 2000 to 2010	2000 Area (Sq Mi)	2010 Area (Sq Mi)	Area Change from 2000 to 2010 (Sq Mi)
Houston	3,822,509	4,944,332	1,121,823	1,295	1,660	365

Source: U.S. Census

Figure 5 shows the growth in the Houston UZA change from the 2000 to the 2010 Census.



Source U.S. Census Bureau. TTI Analysis

Figure 5. 2000 to 2010 Houston Urbanized Area

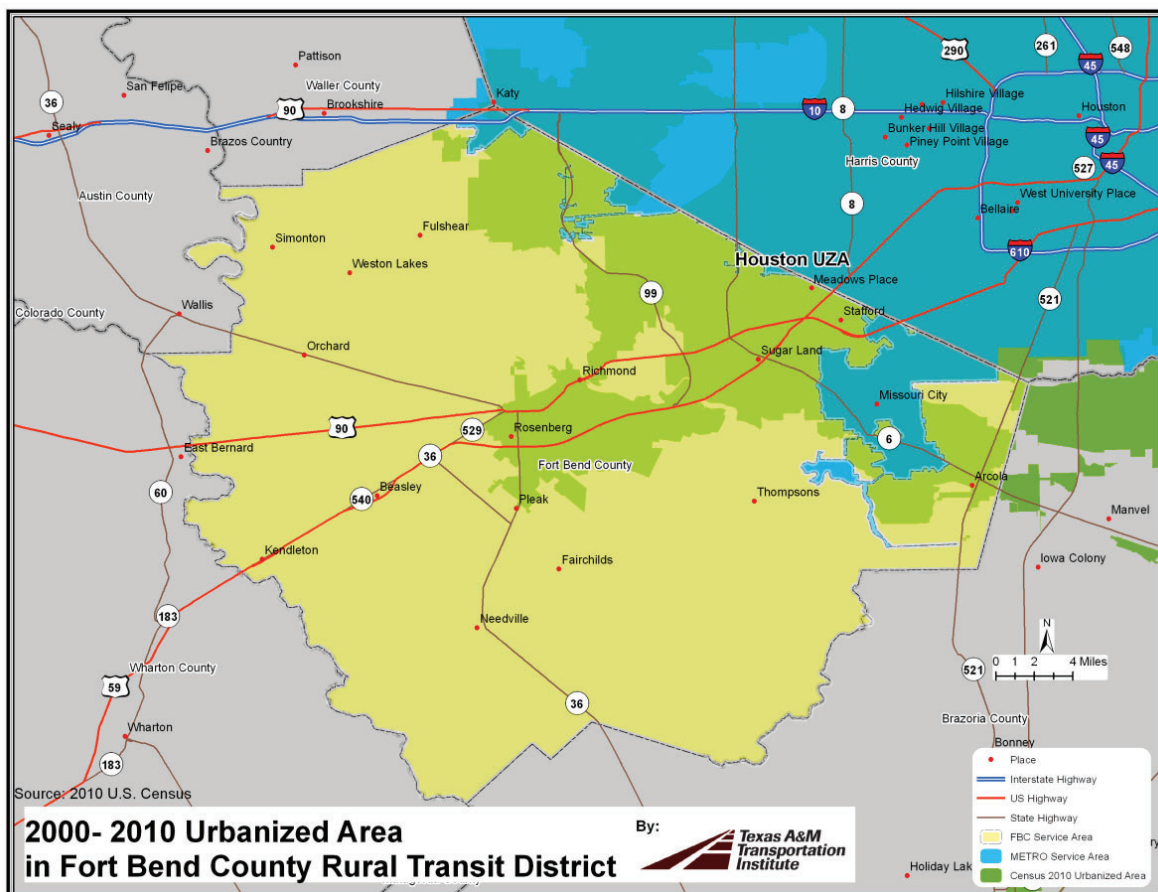
There was significant growth in Fort Bend County's UZA land area and population between 2000 and 2010 (Table 12). Fort Bend County UZA population accounted for 8 percent of the Houston UZA total in 2000 and increased to 11 percent in 2010. The overall county population, urban and rural, increased from 354,452 in 2000 to 585,375 in 2010—a 65 percent increase.

Table 12. Houston UZA and FBC Growth 2000 to 2010

Houston UZA		Census 2000		Census 2010		Change 2000 – 2010	
		Number	Percent of County Total	Number	Percent of County Total	Number	Percent Change
		3,822,509	-	4,944,332	-	1,121,823	29.3%
FORT BEND COUNTY	Houston UZA	316,561	89.3%	547,198	93.5%	230,637	72.9%
	Percent of UZA	8.3%	-	11.1%	-	-	-
	Non-urbanized	37,891	10.7%	38,177	6.5%	286	0.8%
	County Total	354,452	100%	585,375	100%	230,923	65.1%

Source: Census 2000 and 2010; TTI analysis.

Figure 6 shows the FBC Transit service area (in yellow) and the Census 2010 urbanized area (in green). The blue portion represents the METRO service area.



Source: U.S. Census Bureau. TTI Analysis

Figure 6. 2000-2010 Urbanized Area in Fort Bend County

VEHICLES

Researchers estimate that Option 4 service requires 28 medium duty, small, 32-passenger buses to accommodate ridership. TTI estimates that FBC Transit will need 34 total vehicles, including six spares. However, if FBC Transit uses larger transit buses (Option A) the service would require 21 vehicles, including spares, due to greater seating capacity. Researchers present two vehicle options below in Table 13. All costs are in 2013 dollars.

Table 13. Vehicle Options for Option 4 Service

Option	Vehicle Type	Passenger Seating	Purchase Cost	Fuel Economy (Commuter)	Useful Life	Maintenance and Servicing
A	Over the road, heavy duty commuter bus	55	\$600,000	5.92	12 years, 500,000 miles	Propulsion system, engine, axles, transmission, suspension, and brakes may need major servicing and or/replacement one or more times over the life of the vehicle
B	Small, medium duty bus	32	\$146,000	14.21	7 years, 200,000 miles	Servicing is simpler than a heavy duty transit bus, can be performed on smaller shop equipment

Source: Greater Lynchburg Transit Company Comparison of Large and Small Buses, Altoona Vehicle Test Reports, METRO and FBC Transit vehicle cost data, FTA Useful Life

Option A:



Option B:



Option A is a heavy duty, commuter transit bus. METRO estimates that the capital cost of one heavy-duty diesel bus is \$600,000, based on METRO's most recent purchase. Capital costs include all on-board equipment such as cameras, farebox, and other communications systems. A 21-vehicle fleet (including spares) would cost \$12.6 million dollars.

Option B is a medium duty small bus, similar to the vehicle currently operated by FBC Transit. FBC Transit estimates the capital cost of one medium small diesel bus is \$146,000. Capital costs include all on-board equipment including cameras, farebox, and the vehicle “wrap” for branding. A 34-vehicle fleet (including spares) would cost \$5.0 million dollars.

Table 14 contains amortized vehicle costs. A \$600,000 Option A bus amortized over a 12-year service life is \$50,000 per bus per year for the full vehicle cost. The annual cost for the 21-bus fleet is \$1.1 million for the full vehicle cost. The 20 percent local share investment cost is \$10,000 per bus per year. The annual cost for the 21-bus fleet is \$210,000 for the local investment.

A \$146,000 Option B bus amortized over a 7-year service is \$21,000 per bus per year for the full vehicle cost. The annual cost for the 34-bus fleet is \$710,000 for the full vehicle cost. The 20 percent local share investment cost is \$4,171 per bus per year. The annual cost for the 34-bus fleet is \$142,000 for the local investment.

Table 14. Amortized Costs

Option	Per Bus Cost	Number of Buses	Service Life	Annual Full Vehicle Cost per bus	Annual Full Vehicle Fleet Cost	Annual (20%) Local Share Vehicle Cost per Bus	Annual Local Share Fleet Cost
A	\$600,000	21	12 years	\$50,000	\$1,100,000	\$10,000	\$210,000
B	\$146,000	34	7 years	\$21,000	\$710,000	\$4,171	\$142,000

Source: TTI Analysis

Life Cycle Costs

Researchers estimate each bus will operate 139 miles per day (35,000 miles per year), including non-revenue mileage. Researchers used data from the Greater Lynchburg Transit Company Comparison of Large and Small Buses study to determine annual operating costs. The buses used in the Greater Lynchburg study operate 33,000 miles per year, similar to Option 4 service. Though FBC Transit’s Operations and Maintenance Contractor builds the cost of maintenance, parts, labor, fuel, and insurance into the hourly operating rate, the Contractor passes maintenance costs through to FBC Transit.

Options

Table 15 compares the life cycle cost of the Option A (transit bus) and Option B (small bus) vehicle. All costs are presented in 2013 dollars. FBC Transit provided commuter service require 21 Option A buses and 34 Option B buses. Using FTA Useful Life Standards, the Option A bus has a 12-year useful life and the Option B bus has a seven-year useful life.

Capital Costs

The Option A bus purchase cost is \$600 and the Option B bus purchase cost is \$146,000. The Option A bus is \$50,000 per year, amortized over a 12-year useful life. The Option B bus is \$21,000 per year, amortized over a seven-year useful life. The 21-bus Option A fleet is \$12.6 million and the 34-bus Option B fleet is \$5 million. The Option B 34-bus fleet replacement cost is \$5 million in year seven, based on a seven-year useful life. The Option A fleet total capital investment is \$12.6 million and the Option B total capital investment is \$10 million. The Option A total fleet service life is 12 years and the Option B total fleet service life is 14 years (two, seven-year fleets due to useful life replacement in year seven). The Option A fleet amortized cost per year is \$1 million and the Option B fleet amortized cost per year is \$700,000.

Operating Costs

An Option A bus costs \$29,000 per year to operate and an Option B bus costs \$21,000 per year to operate. Operating costs include:

- Maintenance labor cost per mile
- Parts cost per mile
- Tire cost per mile
- Outside repair cost per mile
- Fuel cost per mile

The cost to operate the 21-bus Option A fleet is \$609,000 and the cost to operate the 34-bus Option B fleet is \$714,000 per year.

The Option A bus total cost (capital and operating) is \$79,000 per year. The Option B bus total cost is \$42,000 per year. The Option A total fleet cost per year is \$1.7 million and the Option B total fleet cost per year is \$1.4 million.

Table 15. Life Cycle Cost Comparison (2013 Dollars)

OPTION	A	B
Type of vehicle	Transit bus	Small bus
Number of vehicles	21	34
Service life in years	12	7
Capital		
Purchase cost per bus	\$600,000	\$146,000
Amortized cost per bus per year	\$50,000	\$21,000
Fleet purchase cost	\$12,600,000	\$4,964,000
Fleet replacement cost (Year 7)		\$4,964,000
Total capital investment	\$12,600,000	\$9,928,000
Total fleet service life in years	12	14
Fleet amortized cost per year	\$1,050,000	\$709,000
Operating		
Cost per bus per year	\$29,000	\$21,000
Fleet cost per year	\$609,000	\$714,000
Total Cost (Capital and Operating)		
Total cost per bus per year	\$79,000	\$42,000
Total fleet cost per year	\$1,659,000	\$1,428,000

Source: TTI Analysis

MAINTENANCE FACILITY

FBC Transit currently maintains, fuels, washes, and parks 47 vehicles daily at a leased facility. The existing FBC Transit maintenance facility is at capacity and cannot accommodate the additional 34 buses required for Option 4 service. In addition, the existing maintenance facility cannot accommodate larger, heavier duty commuter buses vehicle (bay size, lift capacity, etc.).



Researchers explored three options to maintain and park the expanded fleet as shown in Table 16. All costs are in 2013 dollars.

Table 16. Maintenance Facility Options

Option	Description	Construction Assumptions	Facility Sq Ft	Site Area	Facility Cost
A	Expand existing maintenance facility	<ul style="list-style-type: none"> Add 40 bus capacity to existing 45 bus facility Add 3 new maintenance bays (16,000 sq ft) Expand Administration and Operations space (6,000 sq ft) Add bus parking area for new fleet vehicles (110,000 sq ft; 2.5 acre minimum) Add 40 space employee parking area (16,000 sq ft) 	22,000 addition	3.4 acres	\$9.2M
B	Build new satellite facility	<ul style="list-style-type: none"> 40 bus capacity with future expansion capabilities 3 maintenance bays (16,000 sq ft) Chassis wash (2,500 sq ft) Wash bay (2,000 sq ft) Administration and Operations (12,000 sq ft) Bus parking for 40 (110,000 sq ft) Fuel island (included in bus parking area) Car parking for 40 (16,000 sq ft) 	32,500 new, stand-alone facility	3.6 acres	\$11.8M
C	Build new consolidated facility	<ul style="list-style-type: none"> 85 bus capacity with future expansion capability 7 maintenance bays (34,000 sq ft) Chassis Wash (2,500 sq ft) Wash bay (2,000 sq ft) Administration and Operations (18,000 sq ft) Bus parking for 85 (230,000 sq ft) Fuel Island (included in bus parking) Car parking for 85 (42,500 sq ft) 	56,500 new, stand-alone facility	7.6 acres	\$20.2M

Source: TTI

*Square footage and cost estimates provided to TTI by LHB Architects and Engineers

Each option requires other recurring costs, including:

- Facility maintenance
- Permits
- Insurance
- Utilities
- Landscaping and irrigation
- Security

PARK AND RIDE FACILITY

As a short term parking solution for Option 4 service, the AMC First Colony has offered to lease FBC Transit up to an additional 1,000 spaces per month. Researchers provide short-term park and ride facility costs below. Costs assume leased space is \$7,000 per month or \$84,000 per year. Fort Bend County Transit assumes an unlimited contract term at the end of the lease.

Researchers analyzed three options for a long-term park and ride facility. Assumptions in Table 17 include the need for 1,500 spaces. Researchers present all costs in 2013 dollars. LHB Architecting and Engineering firm provided cost estimates and noted that construction costs increase an average of six percent per year.

Researchers estimated land cost at \$7,728 per acre using the 2012 nominal price data from the Texas A&M Real Estate Center's Rural Land Database. Costs represent an average of the regional size-adjusted averages of medians weighted by the percentage of land in each area in Austin, Brazoria, Chambers, Fort Bend, Galveston, Hardin, Harris, Jefferson, Liberty, Montgomery, Orange, San Jacinto, Walker, and Waller Counties. Data is accessible at <http://www.recenter.tamu.edu/data/rland/rlt28.asp>.

Table 17. Park and Ride Facility Options

Option	Description	Components	Parking Capacity	Details	Estimated Acres	Estimated Land Cost	Estimated Facility Cost	Total Estimated Cost
A	Surface parking lot	<ul style="list-style-type: none"> Surface lot Lighting Cameras 	1,500 surface lot spaces	<ul style="list-style-type: none"> 1,500 stalls @ 325 = 487,500 sq ft 15% open space factor (73,125 sq ft) 	13	\$100,000	\$15.5M	\$15.6M
B	Multilevel parking structure	<ul style="list-style-type: none"> Above grade parking structure Bus canopy and loading berths Transit island (passenger waiting) Lighting Elevator Cameras Operator restroom Fare vending 	1,500 structured parking spaces	<ul style="list-style-type: none"> 1500 stalls @ 325 = 487,500 sq ft Three story structure = 162,500 per floor 5% circulation factor in the building for stairs, elevators, amenities, access ramp, custodial, mechanical, electrical spaces = 24,375 sq ft Total building footprint = 186,875 sq ft 15% open space factor (28,031 sq ft) 	5	\$39,000	\$31M	\$31.4M
C	Combination surface lot and multilevel parking structure	<ul style="list-style-type: none"> Bus loading berths Transit waiting area (island) Restrooms Driver layover Surface lot Above grade parking structure Open space 	500 space surface parking lot 1,000 space garage	<ul style="list-style-type: none"> 122,745 sq ft building (including transit berths and amenities) 9.6 acres of site area developed 4.6 ac. surface lot parking – 500 spaces 1 ac. transit island and bus circulation 4 ac prep for building & green space 	10	\$77,000	\$25M	\$25.7M

Source: METRO, LHB Architects and Engineering, and the Texas A&M Real Estate Center's Rural Land Database¹

¹ Estimates are guidelines only to be used for basic planning purposes.

Option A



Missouri Department of Transportation Surface Lot

Option B



METRO Cypress Park and Ride

Option C



Downtown Minneapolis

Ongoing Facility Maintenance Costs

TTI worked with Foothill Transit to estimate monthly and annual and monthly park and ride facility maintenance costs. The costs listed in Table 18 correspond to the long-term, multilevel structured facility (Option B). A surface parking lot would have lower monthly maintenance costs.

Table 18. Monthly Park and Ride Facility Maintenance Costs

Item	
Landscaping	
Pest control	
Elevator maintenance	
Exterior maintenance	
Security cameras	
A/C maintenance	
Building insurance	
Fire alarm monitoring	
Fire sprinkler test	
Fire pump inspection	
Fire alarm inspection	
Sprinkler test	
Fire extinguisher maintenance	
Electricity	
Water	
Total Monthly	\$7,000
Total Annual	\$86,000

Source: Foothill Transit

Other park and ride facility amenities affect cost and include:

- Seating
- Covered or enclosed waiting areas
- Canopy
- Information kiosk
- Bike Racks
- Vending machines
- Telephone
- Bus operator restrooms
- Public restrooms
- Security booth
- Fare kiosk
- Lockers
- Water fountains
- Climate controlled waiting areas
- Trash/recycling receptacles

Facility Location

The City of Sugar Land's staff proposed two long-term site options, subject to formal approval.

The first option is shared use of the City's Regional Festival Site. The Regional Festival Site would serve parking needs of festival visitors during events (primarily on weekends), and UH students and Option 4 Park and Ride users on weekdays. The planned site is along the Brazos River located along the Northbound Frontage Rd. of US 59 at the Brazos River U-Turn. The Regional Festival Site will have a surface parking lot with 2,600 spaces.

The second option is a transit oriented development (TOD) in Sugar Land's Tract 5 Area. The City is working with the developer to turn the Tract 5 Area into a high-density, mixed-use area. The City plans to build a 7,000 seat Performing Arts Center and a parking structure or combined structure/surface lot could serve visitors (primarily in the evenings and on weekend) and Option 4 commuter service customers on weekdays. Texas Instruments is building a parking structure for its employers, and there is space to develop an additional parking structure or surface lot.

Bus Stop Amenities

Option 4 service will require new bus stop signs and shelters. For shelters, costs depend on construction complexity. If sidewalks need minor repairs, construction costs per bus stop are estimated at \$7,000 to \$12,000 per stop (VOLPE, 2011).

As complexity increases, so does the cost. Enhanced bus stops include lighted shelter, a bench, and trashcans. The electricity requires coordination with the utility and increased monthly maintenance costs but also enhances safety. "Trenching to provide electricity, permits, replacing and fixing portions of sidewalks and installing signs and posts, can cost over \$30,000 per stop for construction (VOLPE, 2011)."

Bus stop signs are also required for new service. Bus stop signs typically include information about routes that service the stop, frequency, and agency contact information. Researchers estimate bus stop signs will cost \$100 per sign.

FINANCIAL PROJECTIONS

Federal funds may be available to help the cost of new commuter service from FBC to downtown Houston. This section describes federal funding sources, eligible use of funds, restrictions, and the local match requirement in five difference scenarios, given different funding constraints.

Federal Funding Sources

Federal sources FBC Transit may use to pay for the cost of commuter service include:

- FTA formula funds for transit investment in the Houston UZA
- Congestion Mitigation and Air Quality (CMAQ) funds from the Federal Highway Administration to the Houston-Galveston region to implement new transit service
- Transportation Development Credits (TDCs)

FBC Transit may use Urbanized Area Formula Program (Section 5307) funds for the Houston UZA. FBC Transit is a direct recipient, subject to funding approval by H-GAC and METRO, the designated recipient. Eligible uses of the funds may include:

- Capital cost of vehicles (80 percent); and
 - Maintenance cost eligible for reimbursement at the capital rate (80 percent).
- Or
- Capital Cost of Contracting for a turnkey contract (50 percent of 80 percent).

The Congestion Mitigation and Air Quality program may be a source of operating funds for Option 4 service and vehicles. The CMAQ program provides a flexible funding source for transportation projects and programs to address air quality; the Federal Highway Administration and the FTA jointly administer the program. Funds are apportioned to State Departments of Transportation and MPOs. H-GAC administers CMAQ funds through several programs, including the Commute Solutions program, Clean Vehicles Program, and a new Pilot Transit Program. Evaluation criteria are established and administered by H-GAC and subject to Transportation Policy Council approval.

Three broad transit project categories are eligible for CMAQ funding including new transit service. CMAQ cannot be a permanent source of funding. The general guideline for determining eligibility is whether the agency expects an increase in transit riders and decrease in emissions.

Option 4 service must meet several general conditions to be eligible for operating assistance under the CMAQ program. Operating assistance can include all costs related to ongoing provision of new transportation services including, but not limited to, labor, administrative costs and maintenance.

Operating assistance is limited to new transit services and new or expanded transportation demand management strategies for a maximum of three years. CMAQ funding for operating costs is estimated at 70 percent in year one, and 50 percent in years two and three. CMAQ funding for capital costs is estimated at 50 percent of 80 percent of the federal share.

Local Match

All projects require a “local match” to leverage federal funds. The normal matching ratio for capital projects is 80 percent federal, 20 percent “local match.” Operating grants have a 50/50 ratio and if eligible, are limited.

One potential source of local match is Transportation Development Credits (TDCs). States earn TDCs from the federal government when states use local and state funds to develop, construct, implement, improve, or maintain toll facilities. TDCs are a credit, not cash, so a federal project that uses TDCs as match effectively becomes 100 percent federally funded.

Phase 1 financial projections included the hourly rate (\$60.24) for a FBC Transit Contractor owned vehicle, operated by the contractor. All dollars are 2013 dollars. Phase 2 financial projections include many scenarios with the FBC Transit hourly rate (49.54). In Phase 2, researchers analyzed five scenarios (A-E) to estimate service costs and local share requirements given different funding scenarios. The following service assumptions are the same for all five scenarios. Researchers list any other varying assumptions in Table 19 under the respective scenario.

Table 19. Service Assumptions used in Financial Scenarios

Vehicle Type	32 passenger bus
Peak vehicles used	28
Inbound trip length	23 miles
Inbound service trips	56
Outbound trip length	24 miles
Outbound service trips	57
Service miles per day	2,679
Service hours per day	150

Source: TTI Analysis

Operating and Capital Cost Scenarios for Service

Researchers analyzed five scenarios within funding source constraints shown in Table 20. Depending on assumptions about eligible funding from FTA formula funds or CMAQ, researchers estimate FBC Transit operated commuter service requires an annual local match between \$296 thousand (highest federal contribution) and \$3.2 million (lowest federal contribution), including vehicles and the short-term park and ride facility lease.²

² Excludes long-term park and ride facility

Table 20. Summary Operating and Capital Cost Over Five Years

	SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E	
ASSUMPTIONS										
Basis for Operating Cost	FBC provides Vehicles		FBC provides Vehicles		Contractor Operated/Vehicles 70% Year 1, 50% Years 2 & 3 after 5307/Capital Cost of Contracting (CCC)		Contractor Operated/Vehicles		Contractor Operated/Vehicles	
CMAQ Operations	70% Year 1, 50% Years 2 & 3		70% Year 1, 50% Years 2 & 3				\$0		70% Year 1, 50% Years 2 & 3	
CMAQ Capital	50% of 80% of vehicle		\$0				\$0		\$0	
Section 5307 Capital	50% of 80% of vehicle		80% of vehicle		CCC 80% of 50% of operating		CCC 80% of 50% of operating			
	Dollars	%	Dollars	%	Dollars	%	Dollars	%	Dollars	%
Total Operating Cost	\$9,911,000		\$9,911,000		\$11,800,000		\$11,800,000		\$11,800,000	
Vehicle Capital Purchase	\$4,964,000		\$4,964,000		\$0		\$0		\$0	
TOTAL COST	\$14,875,000		\$14,875,000		\$11,800,000		\$11,800,000		\$11,800,000	
Total FBC Local Share	\$2,907,800	19.5%	\$2,907,800	19.5%	\$296,000	2.5%	\$716,000	6.1%	\$3,204,000	27.2%
Fares	\$6,825,000	45.9%	\$6,825,000	45.9%	\$6,825,000	57.8%	\$6,825,000	57.8%	\$6,825,000	57.8%
Total CMAQ	\$3,156,600	21.2%	\$1,171,000	7.9%	\$420,000	3.6%	\$0	0.0%	\$1,771,000	15.0%
Total Section 5307	\$1,985,600	13.3%	\$3,971,200	26.7%	\$4,259,000	36.1%	\$4,259,000	36.1%	\$0	0.0%
TOTAL REVENUE	\$14,875,000	100%	\$14,875,000	100%	\$11,800,000	100%	\$11,800,000	100%	\$11,800,000	100%

Source: TTI Analysis

PHASE 3 RESEARCH

PHASE 3 OBJECTIVES

TTI will continue to provide technical assistance and stakeholder facilitation to the Working Group for additional tasks as needed, beginning February 2014. Additional tasks may include:

- Develop a phased implementation plan
- Expand financial plan for costs including: vehicles, park and ride, and maintenance facility
- Develop financial plan for layover locations
- Determine additional research needs for advertising revenue potential
- Research alternative fueled vehicles



ENVISION THE CHOICES

MAKING MOBILITY MATTER

NOVEMBER 2017

WSP, TRAFFIC ENGINEERS, INC., NANCY EDMONSON CONSULTING, THE LENTZ GROUP

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1.0 INTRODUCTION

The Fort Bend County Transit (FBCT) Long Range Plan is a 20-year plan designed to help meet the growing transportation demands within the county and the region.¹ It is the culmination of a planning process that included public input, interviews with a variety of stakeholders and analysis of future transit demand. The plan identifies strategies to improve and build on the county's existing transit services. It is intended to be a flexible plan that allows for modifications as conditions and services change over time.

1.1 Background and Context

1.1.1 About Fort Bend County

Economic opportunities, climate, cost of living, and a business-friendly environment have long attracted both immigrants and U.S. natives to the Houston-Galveston region and Fort Bend County. Thus, in addition to being the most diverse, Fort Bend is one of the youngest, wealthiest and fastest growing counties in the region and the state.

Fort Bend County's 17 cities and unincorporated areas have a combined population of approximately 733,000. Between 2000 and 2010, the county grew more than 65 percent, adding more than 230,000 residents. Based on the latest projections by Houston Galveston Area Council (H-GAC), by 2040, Fort Bend County is expected to have almost 1.3 million people and 280,000 jobs. This trend suggests that the county is reaching the critical mass for higher capacity transit, meaning the types of service that can carry more people, with faster, more frequent service.

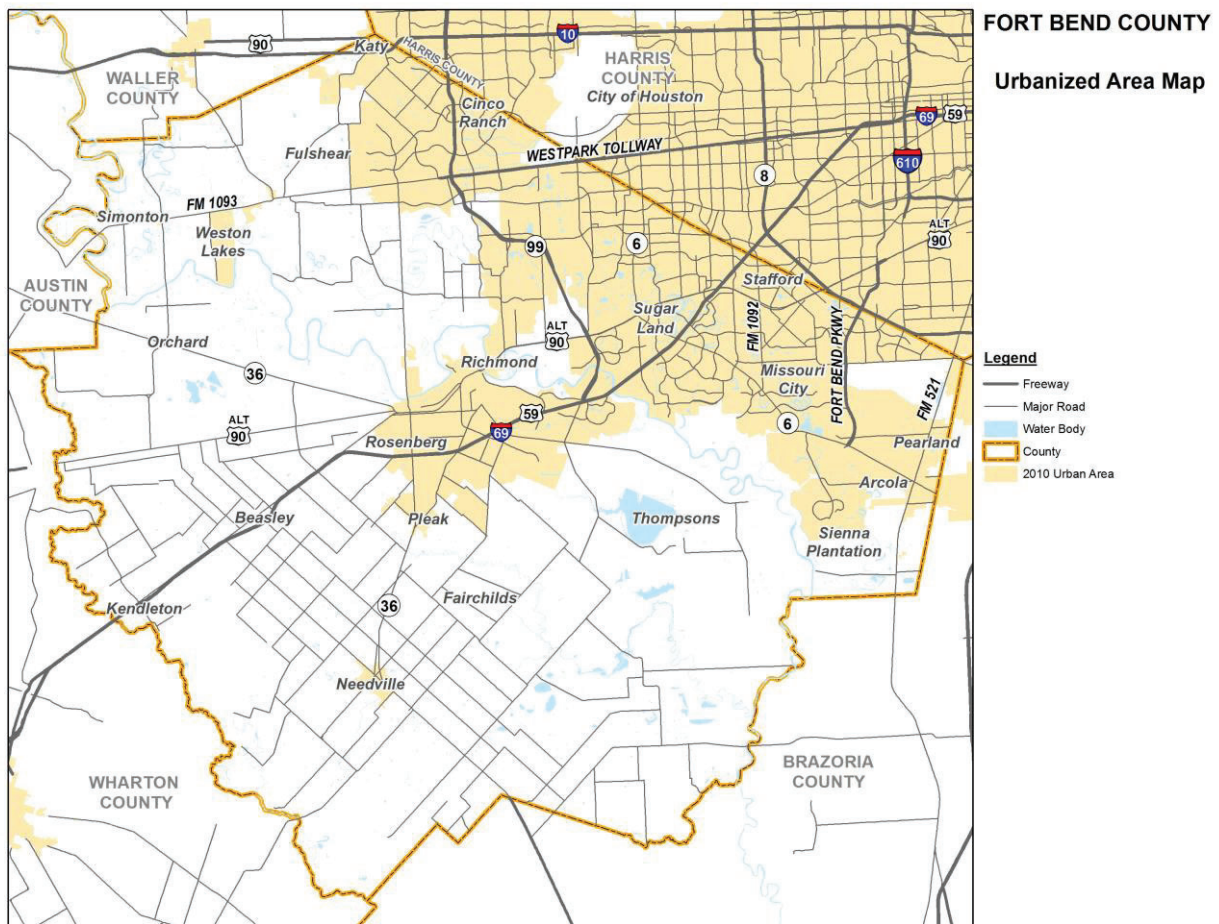
About Fort Bend County Transit

The Public Transportation Department of Fort Bend County was established in 2005 to provide rural and urban transit services to residents of Fort Bend County. Its service area covers 875 square miles and provides over 380,000 passenger trips on an annual basis from operating three types of transit service – Demand Response, Commuter Park & Ride and Point Deviation Route Service.

¹ Fort Bend County is located the Houston Transportation Management Area comprised of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller Counties.

Significant demographic shifts that will impact travel needs of the county are expected in the next few decades as more and more baby boomers retire and millennials reach peak driving years. It is more important than ever to establish a near and long term plan to meet the growing transportation needs of the county.

Figure 1: Fort Bend County Study Area



Purpose of the Long Range Plan

The Long Range Plan provides a strategic look at the county's growth projections — where the growth is occurring and how demographics will shift in the percentage of youth, elderly and minority population — to develop a roadmap for future transit needs. The Plan examines ways to optimize and expand existing services as well as add new ones, along with the related maintenance, technology and operations needs to deliver those services. **Figure 1** shows the study area and the portions of the county in the Houston Urbanized Area and the rural area.

This plan is an important step toward defining the future needs and transit strategies to address the rapid growth projections and various challenges that impact the future of transit in Fort Bend County. In short, the main purpose of this Plan is to:

- Establish a vision based on future needs
- Serve as a guide for future capital and operating programs
- Be used as a programming tool that feeds into the Financial Plan

The Long Range Plan recommends projects, strategies, and funding options to improve transit quality and delivery for Fort Bend County.

This report takes stock of Fort Bend County's current conditions, assesses future indicators of demand, and identifies short and long term strategies and funding options that best match the goals of the Long Range Plan.

1.1.2 Previous Long Range Planning Efforts

Why update the plan?

- Fort Bend County continues to grow
- Transit ridership continues to grow
- Transit funding is insufficient
- Travel behaviors and demand are changing
- Community values should be part of the planning process

A long range plan is a living document that requires regular updates as priorities change, new opportunities arise, or funding capacity changes. FBCT completed a long range plan in 2011 that proposed a series of potential service improvements for future consideration; however, the plan did not recommend a prioritized list of projects due to the lack of community input. Consequently, to foster an inclusive planning process, this long range plan

included a targeted and successful outreach effort that shaped the goals and priorities and informed the recommendations.

1.2 Plan Development Process

The framework for future transit in Fort Bend County began with an analysis of the demographic and travel trends to understand the transit needs and opportunities in the county. Based on the analysis, combined with stakeholder input, goals and priorities to guide the plan were established. Then, a set of capital and operations strategies that support the goals and priorities were identified. These strategies were further defined and prioritized based on stakeholder input for inclusion in the short-term implementation plan and long range plan.

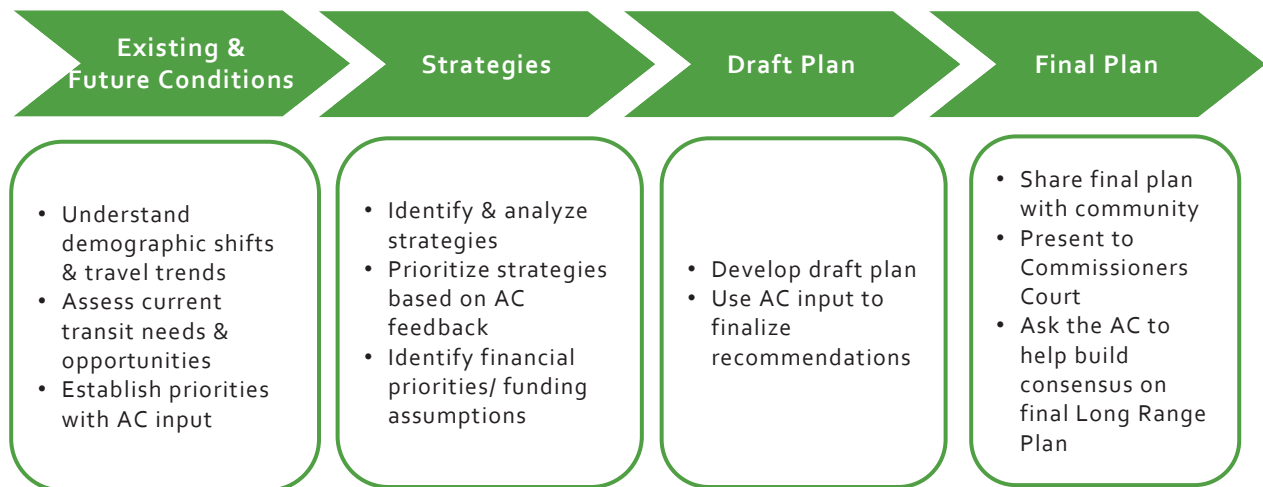
The plan's outreach effort included engaging with an Advisory Committee (AC), conducting a series of interviews with elected officials and key stakeholders, and developing a public opinion

survey. The following provides an overview of the outreach effort. Refer to the *Public Involvement Summary Report (Appendix B)* for additional details.

Advisory Committee

To ensure that the plan was developed with strong input from the stakeholders in the county, an Advisory Committee was formed with various representatives from county departments, precincts, cities, senior centers and advocacy organizations. The AC convened at major milestones for feedback and building consensus around the Plan, as illustrated in **Figure 2**.

Figure 2: Long Range Plan Development Process and AC Engagement



Stakeholder Interviews

A series of ten interviews with elected officials and key stakeholders was also conducted for a more thorough understanding of local context and transit issues facing communities in Fort Bend. Findings from the interviews highlighted the growing need for improved transit service in the county, particularly in the following areas:

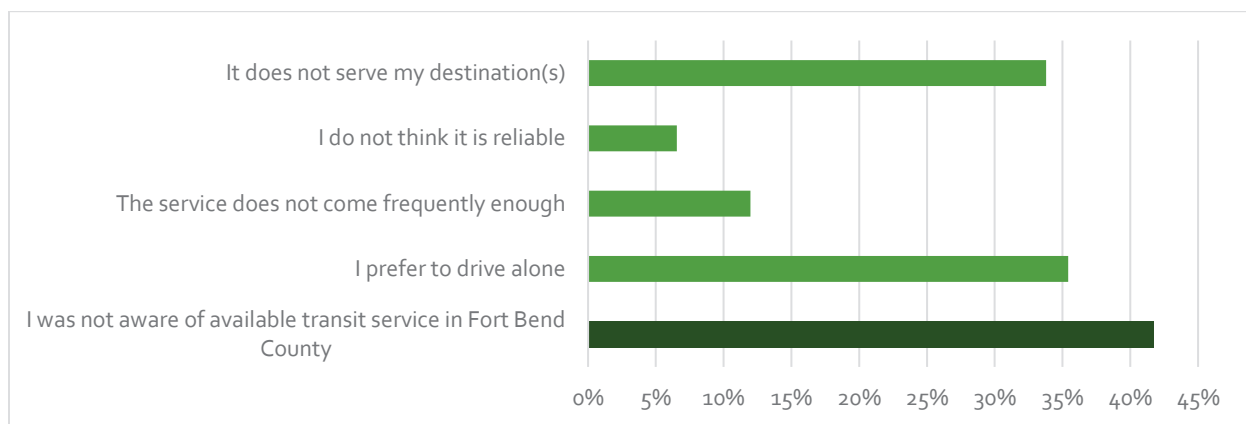
- Better marketing for current services;
- New commuter service to Downtown;
- Transit coverage for low-density, rural, western part of county;
- Improved job access for low-skilled workers;
- Reverse commute opportunities for those working in Fort Bend County;
- Shuttle service for special events and major destinations within the county to serve those without vehicle access, particularly the youth and elderly; and
- Commuter rail along US 90A that would provide access to jobs and economic development opportunities.

Long Range Plan Survey

A public opinion survey was made available to residents and employees of Fort Bend County to gain a broader understanding of transit priorities in the county, particularly among the current riders. The survey was intended to better understand why people in Fort Bend County use transit, how they access transit service, and what improvements they would like to see. The survey was active October to December 2016 and received 690 responses. Key takeaways from the survey include:

- A significant share of respondents was unaware of the transit service provided by FBCT (see **Figure 3**).
- Downtown Houston and Sugar Land Town Square were the top requested destinations for transit service by both riders and non-riders.
- Most desired service improvements include expanded service hours and increased frequency in the current transit system.
- People who use transit do so for a variety of reasons that relate to the type of service they use. Riding experience, such as convenience or being less stressed, is especially important to many riders of the commuter service. Local and demand response riders also placed importance on convenience, but also have higher rates of no vehicle access.

Figure 3: Why Survey Respondents Do Not Use Transit



Source: FBCT Long Range Plan Survey Oct 2016

1.3 Goals of the Plan

The Long Range Plan is intended to provide a roadmap for decision making about transit investments in Fort Bend County over the next 23 years.

FBCT works to create a transit system that facilitates mobility and connectivity while recognizing the need to achieve financial stability. The following goals for the Long Range Plan were set based on the current challenges facing FBCT and consistent with goals identified in the 2011 Plan:

- Improve access to work, services and recreation
- Improve customer experience
- Increase cost efficiency

The Plan established overarching strategies that support these goals based on community input and assessment of transit needs:

- **Communicate** and market transit services offered by Fort Bend Transit
- **Optimize** and improve the quality of existing service
- **Grow** and expand opportunity for new service

The transit improvements under these strategies were developed using a phased approach and in a manner that is scalable to ensure that the near and medium term improvements can be redefined or upgraded easily over time. These strategies are further detailed in Section 3: Recommendations.

2.0 EXISTING AND FORECAST CONDITIONS

The current and projected demographic trends play a critical role in determining the travel patterns and transit needs of the county residents. Fort Bend County's population and employment are growing. At the same time, the county is also becoming older and more diverse. The trends and conditions outlined in this report are the backbone on which the recommendations in the Long Range Plan rely.

2.1 Demographic Trends

In the next few decades, significant demographic shifts that will impact travel needs across the Houston region, including Fort Bend County, are expected as baby boomers continue to retire and millennials reach peak driving years (35 to 54 years of age)². It is more important than ever to establish a near and long term plan to meet the growing transportation needs of the county.

2.1.1 Population and Employment

This section provides relevant demographic findings that will affect the travel trends and transit needs of Fort Bend County. For the full *Demographic Trends Report*, refer to **Appendix D**.

Fort Bend County, home to almost 733,000 residents, is the second most populous county in the Houston-Galveston region behind Harris County, and ranks 10th most populous in Texas. As one of the fastest growing counties in the region and the state, Fort Bend County gained more than 230,000 residents between 2000 and 2010. By 2040, Fort Bend County is expected to grow by 70 percent, to approximately 1.3 million people, per projections by the Houston-Galveston Area Council (H-GAC). During the same period, Fort Bend County is projected to emerge as a regional employment center with a 50 percent growth in jobs to over 280,000 jobs.

Table 1 presents Fort Bend County's forecasts compared to Harris County and the region.

Table 1: Population and Employment Forecasts

Geographical Area	Population			Employment		
	2015	2040	Growth	2015	2040	Growth
Fort Bend	732,812	1,255,598	71 %	188,447	283,161	50%
Harris	4,366,726	6,254,220	43 %	2,517,770	3,553,890	41%
Region	6,517,739	10,018,623	54 %	3,112,045	4,465,474	44 %

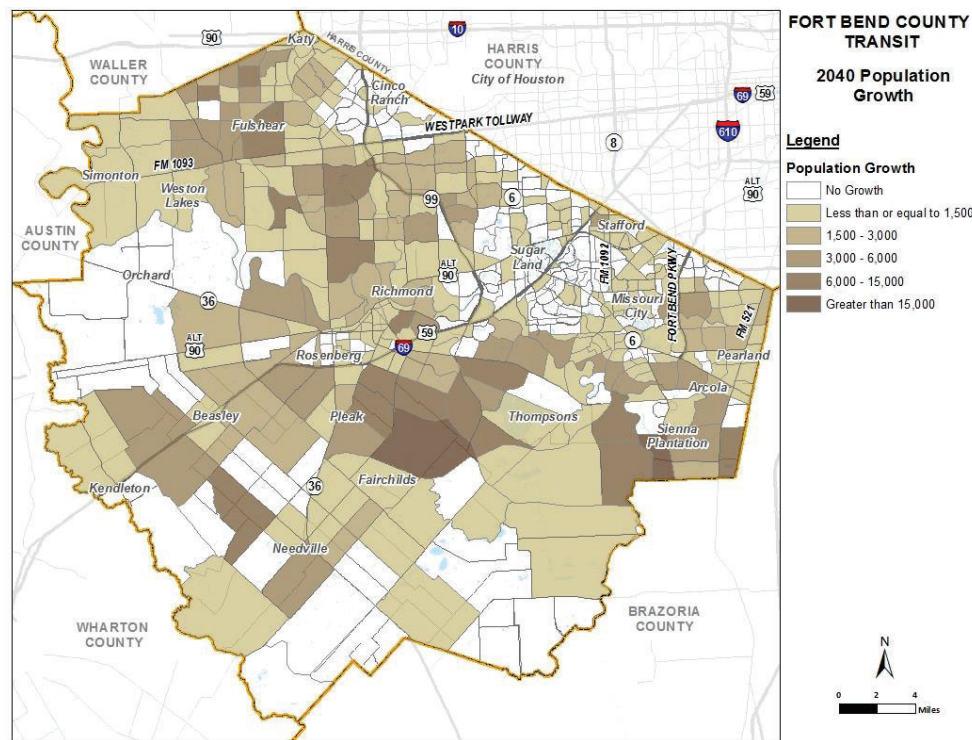
Source: H-GAC 2016 Quarter 1 Forecast

² U.S. PIRG Education Fund (2013): *A New Direction - Our Changing Relationship with Driving*
<http://uspirg.org/sites/pirg/files/reports/A%20New%20Direction%20vUS.pdf>

Areas with the highest population densities are in the urbanized eastern part of the county, particularly in and around City of Houston limits, with up to 25 persons per acre. Other incorporated areas such as Meadows Place, Stafford, Missouri City, Richmond and Rosenberg, have population densities of 12 persons per acre or higher. As these areas continue to densify, Fort Bend County is moving closer to reaching critical mass for higher capacity transit.

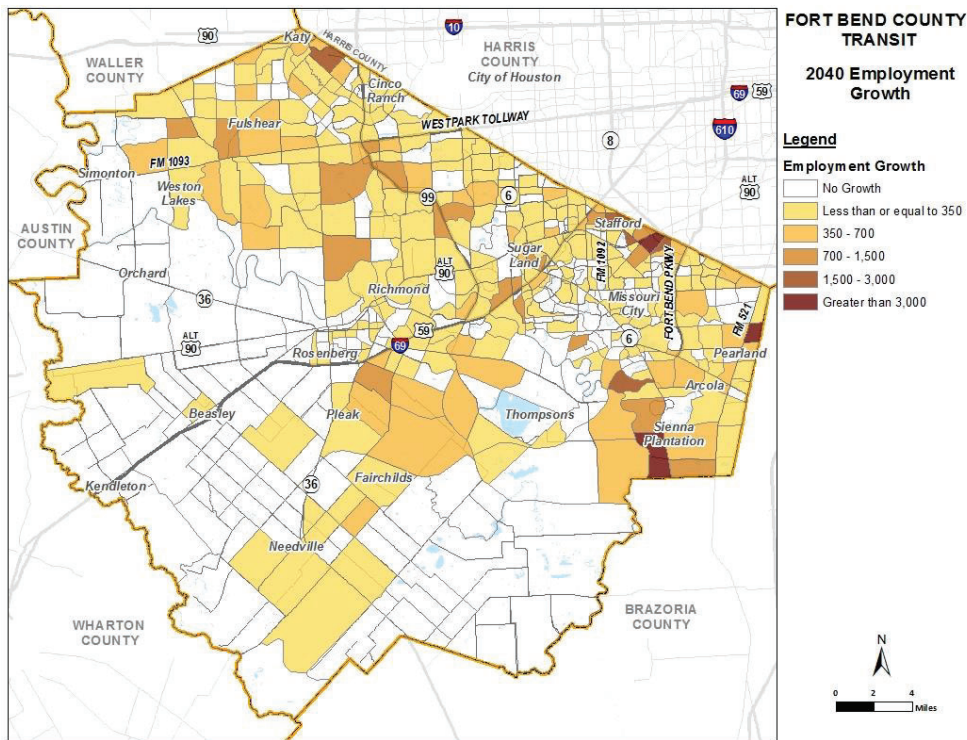
In general, population is expected to grow westward to the more rural parts of the county (Figure 4), while employment growth will likely intensify in the existing urbanized areas (Figure 5). Sienna Plantation and Cinco Ranch, large, master-planned communities in the eastern and western corners of the county, respectively, are major growth areas for both population and employment.

Figure 4: Population Growth, 2015-2040



Source: H-GAC 2016 Quarter 1 Forecast

Figure 5: Employment Growth, 2015-2040

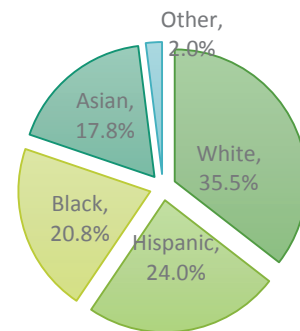


Source: H-GAC 2016 Quarter 1 Forecast

2.1.2 Other Demographic Characteristics

Fort Bend County is the most ethnically diverse county in the country, according to an annual report published by the Kinder Institute. As illustrated in **Figure 6**, approximately 65 percent of county residents are part of a minority group - 24 percent of residents are Hispanic, 21 percent are Black or African American and 18 percent are Asian. Consistent with national trends, millennials in the county are even more diverse than the county as a whole, with a higher share of Hispanic population.

Figure 6: Race and Ethnicity, 2014

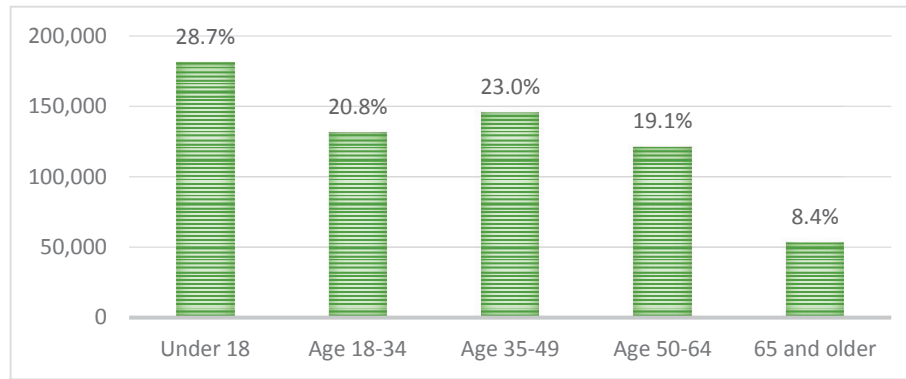


Source: 2010 – 2014 ACS 5-Year Estimates

Fort Bend County is the youngest county in the region with half of its residents under 35 years of age (**Figure 7**). The county currently has the lowest share of seniors (over the age of 65), but this cohort is the county's fastest-growing age group, consistent with national trends. By 2040, there will be over 225,000 seniors, making up

roughly 20 percent of the population. Currently, the highest concentrations of seniors can be found in and around the cities of the Sugar Land, Richmond, and Rosenberg along with outlying areas in the western parts of the county.

Figure 7: Fort Bend County Age Groups, 2014



Source: U.S. Census Bureau, 2010 – 2014 ACS 5-Year Estimates

Fort Bend County is by far the wealthiest county in the region with a median household income of \$86,400. Although pockets of poverty exist - 8 percent of residents live under the poverty line - the majority of households make between \$50,000 and \$100,000, which reflects a strong middle to upper-middle class. City of Sugar Land, Missouri City, Cinco Ranch and Sienna Plantation have the highest median household incomes. Lowest median incomes can be found in the Rosenberg and Richmond areas along with the unincorporated rural areas to the south near Needville and to the west near Kendleton.

Consistent with its high-income levels, Fort Bend County is also the most educated county in the region, with 42 percent of its adults having earned at least a bachelor's degree. This represents the third highest education attainment rate in Texas and the highest in the region. Accordingly, Fort Bend County also has one of the lowest unemployment rates (4.3 percent) in the region and the state based on the 2015 Texas Workforce Commission data.

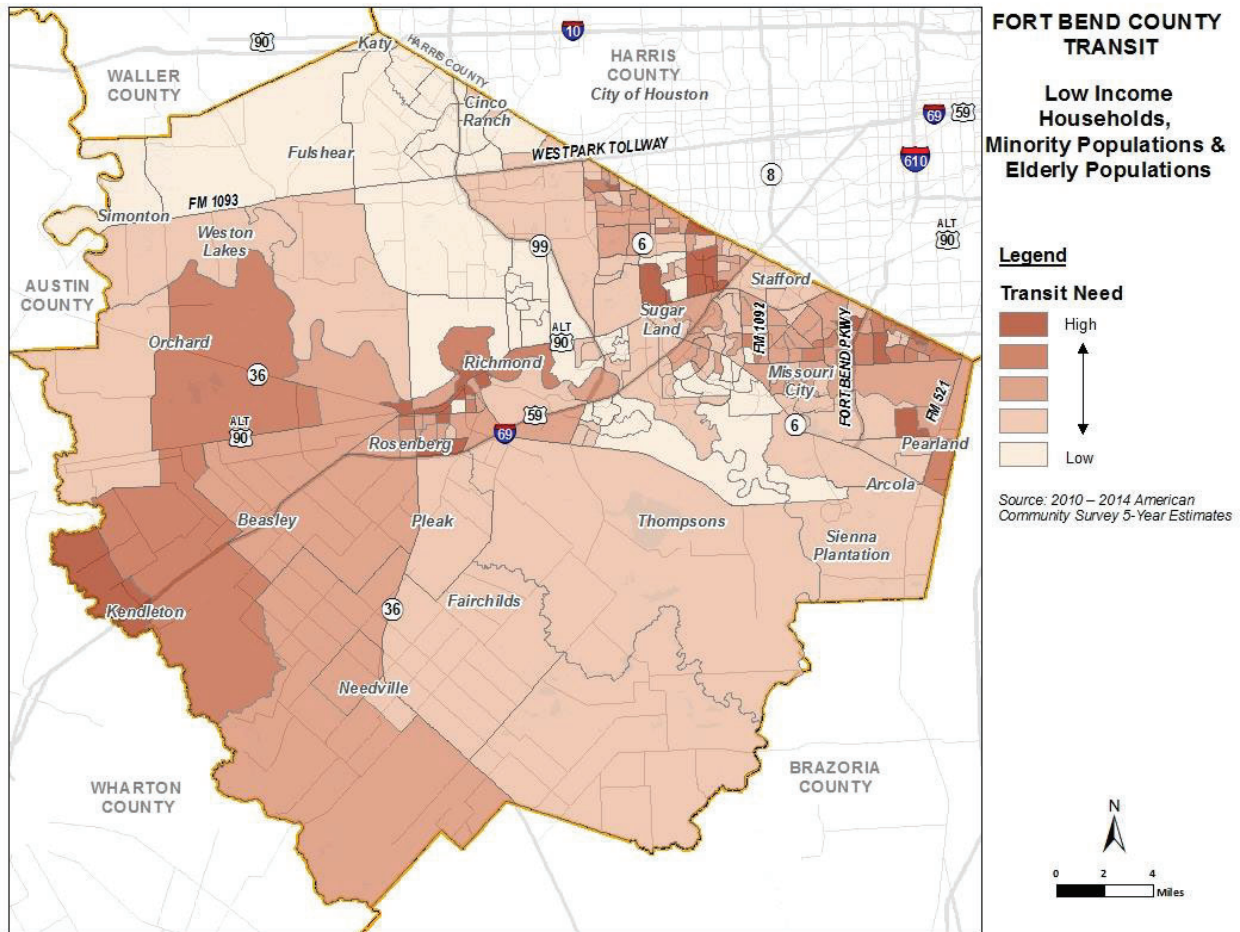
2.1.3 Areas with High Transit Need

Given its status as the youngest, wealthiest and fast-growing county in the region, it is easy to overlook the few but growing pockets of disadvantaged communities in the county. As illustrated in **Figure 8**, the communities surrounding Kendleton, areas along US 90 between Richmond and Rosenberg, and the northeastern corner of US 90 at SH 6 in Sugar Land, have the highest concentrations of elderly, low-income and minority residents in the county. The Kendleton area is home to some of the lowest income and oldest residents, and almost 100 percent of them belong to a minority group. Many of these residents are patrons of FBCT's demand response service. This community could truly benefit from having access to convenient reliable transit to access employment and meet other transit needs.

The following key takeaways are particularly important in future planning for communities and individuals who are most in need of transit:

- Areas of highest minority concentrations are generally located within incorporated areas in the eastern parts of the county and along major highway corridors. As such, transit investments along major highway corridors in the urbanized areas in the county would better serve the growing number of minority residents.
- Approximately 3 percent of households in Fort Bend County (5,200) do not have access to a personal vehicle. High concentrations of zero-auto households can be found within the cities of Richmond, Rosenberg, and in the western rural part of the county. There is a clear overlap between areas with high concentrations of low income households and zero-auto households.
- There are approximately 48,000 people living with a disability in Fort Bend County, representing 8 percent of the total non-institutionalized population. The areas with the highest percentage of disabled persons (31 percent) can be found in the cities of Richmond and Rosenberg, followed closely by the rural southern and western parts of the county.
- Richmond and Rosenberg are currently served by FBCT's first point deviation route service (to be discussed further in Section 2.3.3). As the concentrations of these demographic groups (minority, elderly and low-income) intensify in the next few decades, offering improved service with upgraded amenities would provide greater convenience to customers and encourage ridership.

Figure 8: High Transit Need Areas



2.2 Travel Trends

While the existing activity centers in Fort Bend County will continue to increase the demand on the overall transportation network, one of the dynamics in fast-growing Fort Bend County is the densification of rural areas over an extended period. Shifting patterns of housing development have resulted in some new and emerging travel patterns that require different types of transit solutions.

2.2.1 Travel Demand Model

The H-GAC utilizes a travel demand model (TDM) to forecast future travel patterns in the eight-county region. The model assumes 2015 as the base year and 2040 as the future forecasted year. Understanding current travel patterns for all types of trips (transit and auto) can help identify opportunities for new or expanded transit services. Because local trips internal to the county are likely to have transit needs that differ from external, commuting trips, analysis was

conducted for trips that begin and end within Fort Bend County, as well as for trips originating within Fort Bend County traveling to activity centers in other areas within the Houston region. Details on the Travel Demand Analysis is available in the *Existing Conditions and Future Trends Report* in **Appendix A**.

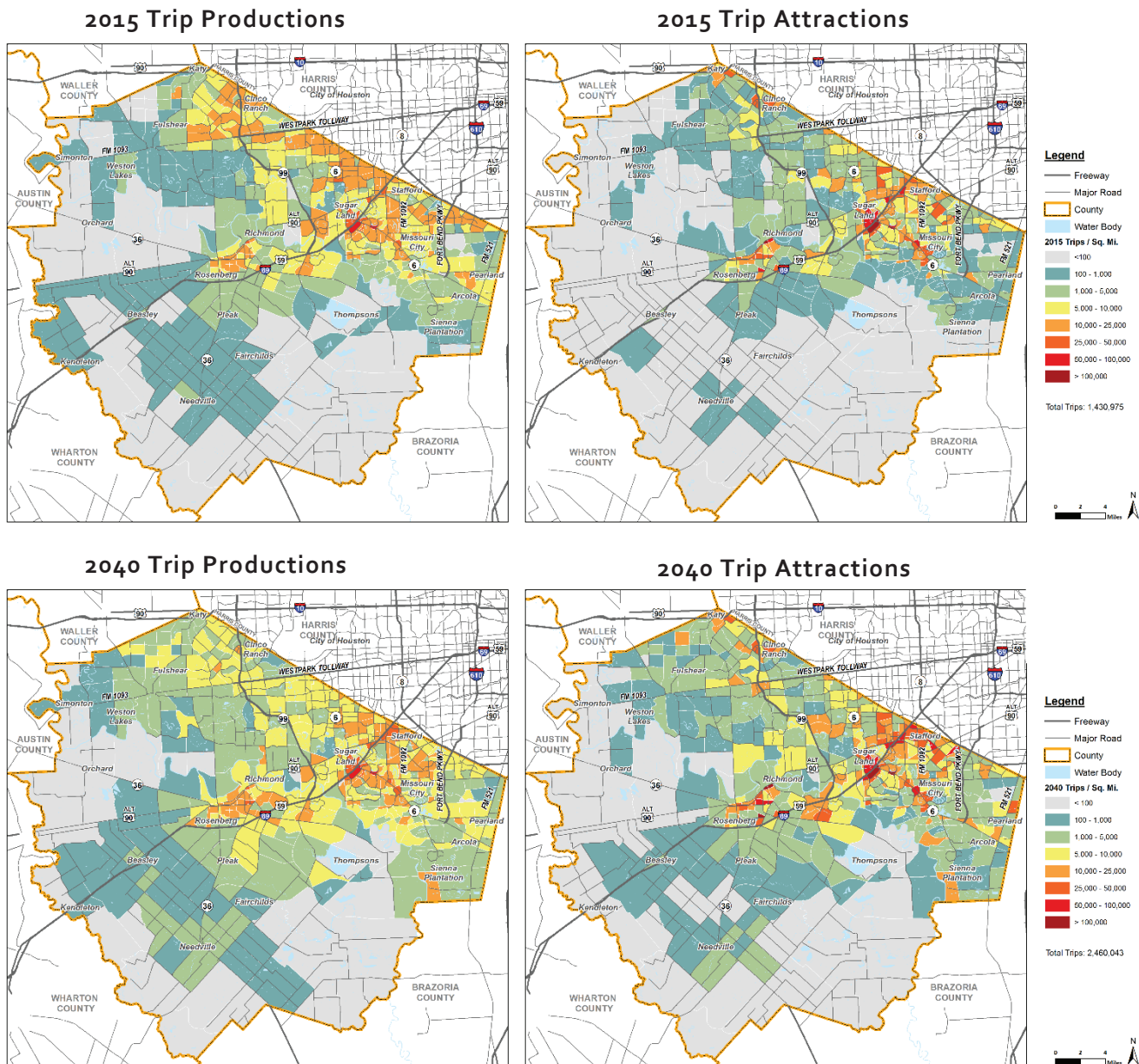
2.2.2 Travel Within County

The county's more urbanized and densely populated areas produce the highest number of trips to destinations within the county. As illustrated in **Figure 9**, these areas include Sugar Land, followed by Missouri City, Richmond, Rosenberg, and much of the areas around Fulshear and Cinco Ranch. Trip attractions in the county are more concentrated than the trip origins. Top destinations are in Sugar Land and Missouri City along US 59 (Sugar Land Town Square) and SH 6, and along US 90A in Missouri City and Richmond.

By 2040, H-GAC estimates that Fort Bend County will experience a 72 percent increase in the number of daily trips – from 1.4 million in 2015 to 2.5 million in 2040 – due to the significant projected growth and development anticipated in the county. The more rural areas in the center and southern areas of the county are projected to experience increases in travel resulting from growth and increased density. This trend is consistent with the population growth patterns in Fort Bend County. **Figure 9** also illustrates 2040 trip productions and attractions.

Top destinations in 2040 are projected to be concentrated in existing activity centers that currently attract high number of people, particularly in Sugar Land, Missouri City, Stafford, Richmond and Rosenberg. Pockets in the north and east parts of the county near Katy, Fulshear, Sienna Plantation, and Arcola also show significant increases in the number of people traveling to those areas. Additionally, much of the increases in trip volumes will also occur in areas with greater transportation access, particularly roadways like US 59, SH 99, SH 6, and SH 36. This will likely increase congestion on these roadways, possibly providing an opportunity for new transit service.

Figure 9: Daily Trip Productions and Attractions in Fort Bend County



2.2.3 Travel Outside of County

Analysis of travel to concentrated activity and employment centers outside of Fort Bend County was undertaken to assess opportunities for enhanced or new commuter transit service. This analysis was conducted for travel to the following areas: Downtown Houston, Texas Medical Center (TMC), Greenway Plaza, Uptown/Galleria, Westchase, and the Energy Corridor.

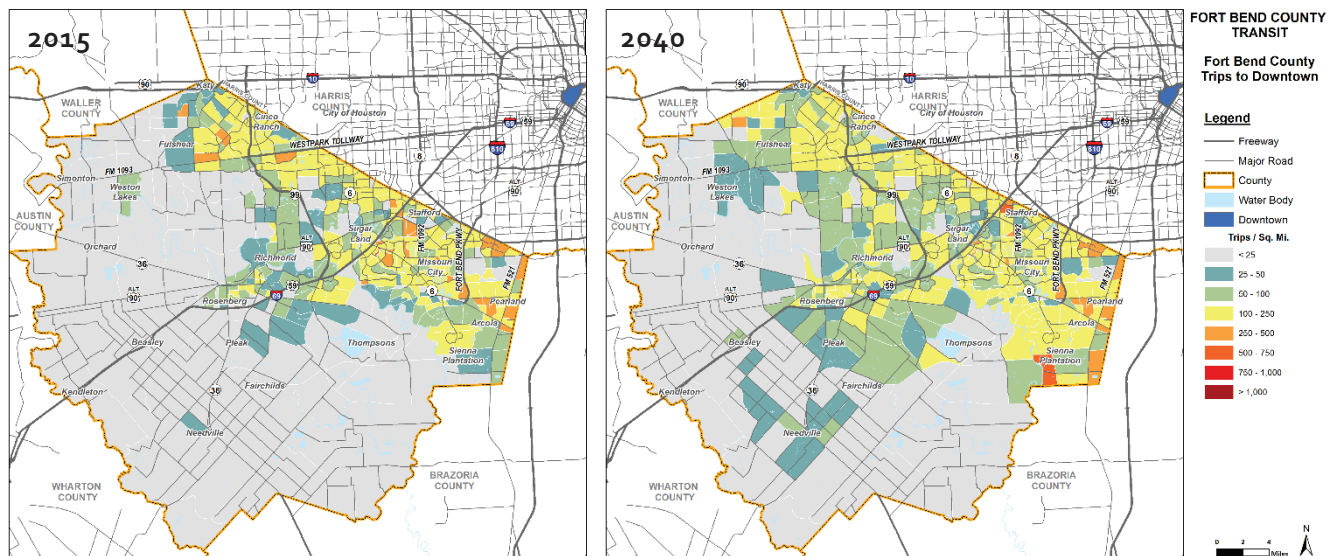
Findings from the analysis demonstrate that there is significant demand for new service from Fort Bend County to Downtown Houston, Energy Corridor and Westchase. However, services to Westchase and the Energy Corridor face barriers within the existing transportation network as there are currently no high-occupant vehicle (HOV) lanes on the roadways that directly serve those activity centers from Fort Bend County. The existing HOV lanes on US 59 provide the greatest the opportunity for service to Downtown Houston.

The following analyses identify where trips originate within Fort Bend County that travel to those areas, the volume of trips, and the opportunity for commuter transit service.

Downtown Houston

Downtown Houston is a large driver of trips for the entire region. In 2015, Fort Bend County residents made over 32,000 trips per day to Downtown Houston. That number is projected to increase by 43 percent to over 46,000 trips per day in 2040. As shown in **Figure 10**, in 2015 these trips largely originate in the north and northeast parts of the county (Sugar Land, Missouri City, Fulshear, and other areas around Westpark Tollway). Other areas with high concentrations of Downtown Houston trips include SH 6, FM 521 and US 59 corridors.

Figure 10: Daily Trips to Downtown Houston



In 2040, trips to Downtown are expected to disperse within the county, causing a growing number of trips to originate in Richmond and Rosenberg, particularly along the US 59 corridor. Other notable areas include pockets of northern and eastern parts of the county, particularly Sienna Plantation and along FM 521.

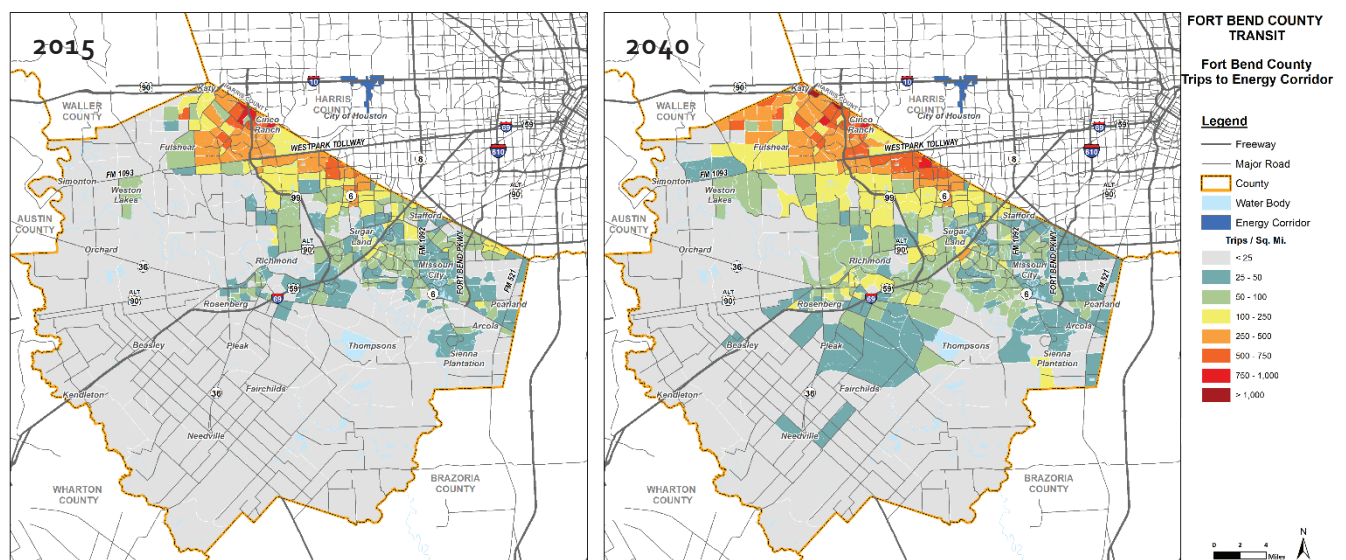
Areas surrounding US 59, Westpark Tollway and FM 521 corridors should see especially high concentrations of trips as they provide direct access to Downtown Houston. These areas may offer an opportunity for commuter transit service.

FBCT's existing transit connection to Houston consists of a stop on the Greenway Plaza route at Metropolitan Transit Authority of Harris County (METRO)'s West Bellfort Park & Ride lot where riders may transfer a METRO bus to Downtown Houston. The 2014 study, *Seamless Regional Transit: Fort Bend County to Downtown Houston*, found significant demand for commuter service from Fort Bend County to Downtown Houston. The study recommended the development of a new commuter service operated by FBCT from the Sugar Land area to capture the highest ridership potential.

Energy Corridor

The Energy Corridor is a rapidly growing employment center in western Harris County. In 2015, over 29,000 daily trips were made from Fort Bend County to the Energy Corridor. That number is expected to increase by 77 percent to more than 51,000 daily trips in 2040. As illustrated in **Figure 11**, in 2015 these trips largely originate in the northern part of the county along Westpark Tollway, near Fulshear, and Cinco Ranch.

Figure 11: Trips to Energy Corridor



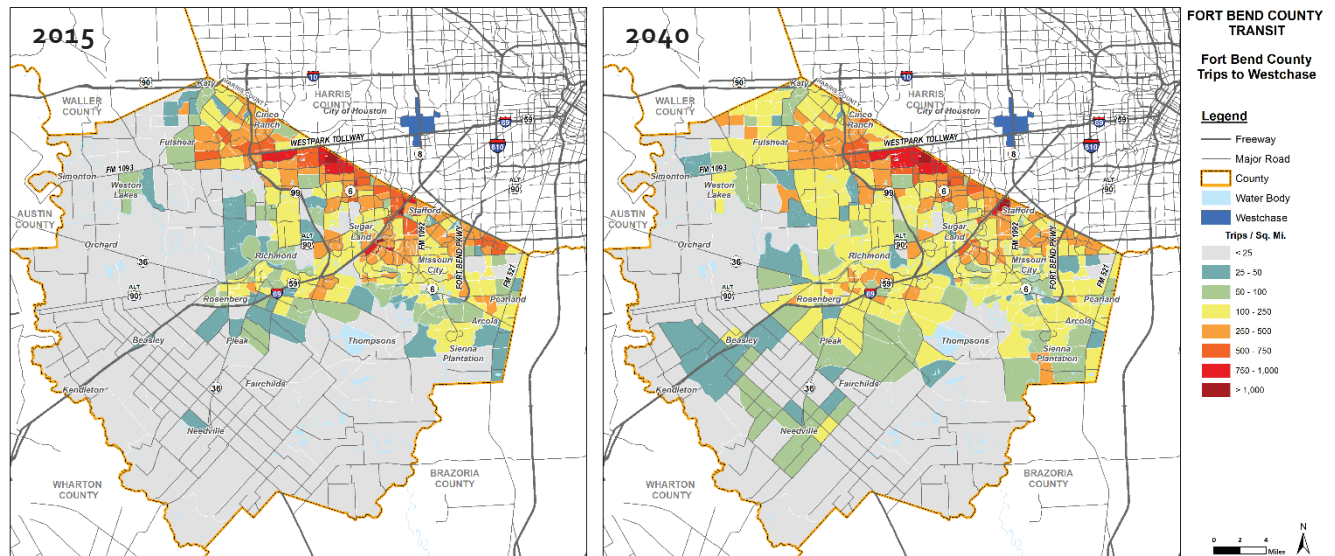
In 2040 the trip demand from these areas and further west on FM 1093 is anticipated to increase significantly. There is an opportunity for new commuter transit service to the Energy Corridor along Westpark Tollway and FM 1093. FBCT is coordinating with the Energy Corridor to provide future commuter service from the Westpark Park & Ride lot currently under development

Westchase

Westchase is a growing employment center near Beltway 8 and Westpark Tollway. In 2015, approximately 61,100 daily trips were made from Fort Bend County to Westchase. In 2040, the

trips are expected to increase to 82,600, a growth of 35 percent. As shown in **Figure 12**, in 2015 these trips largely originate in the northern and eastern parts of Fort Bend County, most notably in the areas of surrounding Westpark Tollway near Fulshear and Cinco Ranch. Significant trip demand also exists along US 59 in Sugar Land and Stafford.

Figure 12: Daily Trips to Westchase



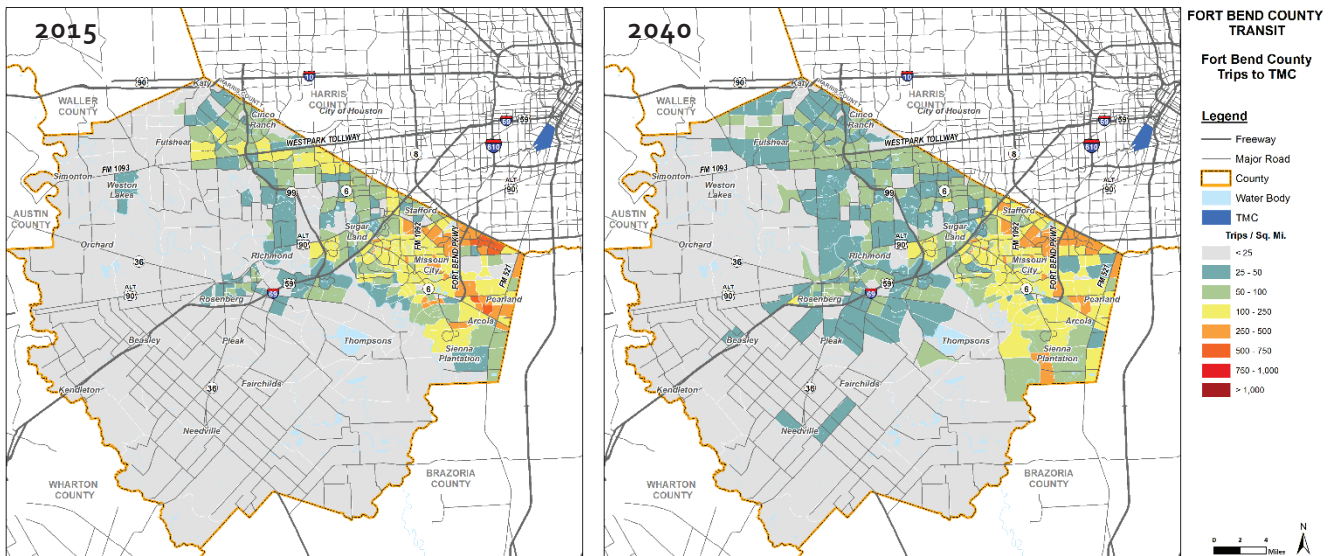
In 2040, trip demand from these areas are expected to intensify; at the same time, some of the trip demand is expected to spread out further west along Westpark Tollway and US 59. The analysis indicates that there is a significant opportunity for new commuter transit service to Westchase along Westpark Tollway and US 59.

Texas Medical Center (TMC)

The Texas Medical Center (TMC) is the second largest employment center in the region and is a significant driver of trips for employees living in Fort Bend County. In 2015, nearly 26,600 daily trips were made from Fort Bend County to TMC. That number is expected to increase by 22 percent to just over 32,400 trips in 2040. As shown in **Figure 13**, in 2015 these trips largely originate in the eastern part of Fort Bend County in the Missouri City and Arcola areas, particularly around US 90A, Fort Bend Parkway Toll Road, and FM 521 as those areas offer direct access to TMC. In 2040 trip demand is expected to spread further south to Rosenberg and Richmond areas and to north along Westpark Tollway and SH 99.

Fort Bend County is home to a significant share of TMC employees. This, in addition to the lack of free parking at TMC, is the reason that FBCT's TMC route is the highest ridership route in the system. Additionally, METRO's West Bellfort and Missouri City Park & Ride lots also offer commuter services to TMC.

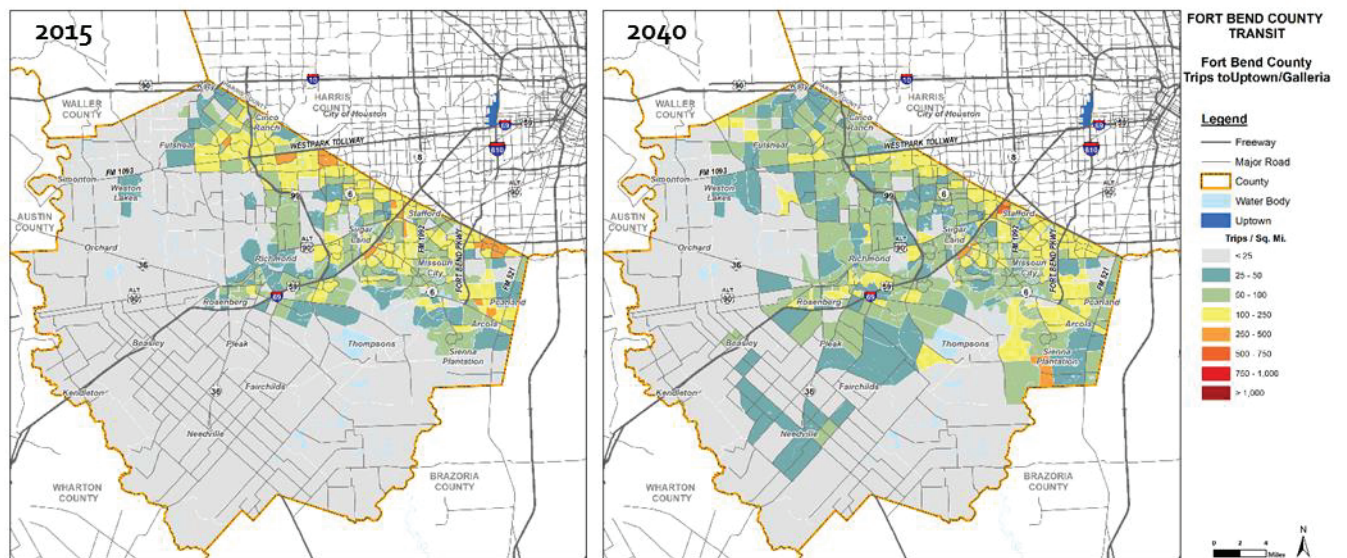
Figure 13: Daily Trips to TMC



Uptown/Galleria

Uptown/Galleria is an employment and activity center along the IH 610 Loop just north of US 59. In 2015, Fort Bend County residents made nearly 25,000 daily trips to Uptown/Galleria. That number rises to approximately 31,300 trips in 2040, an increase of 26 percent. As shown in **Figure 14**, in 2015 these trips largely originate in the northeastern part of the county near Harris County with pockets of travel along Westpark Tollway near Cinco Ranch and US 59 in Sugar Land.

Figure 14: Trips to Uptown/Galleria

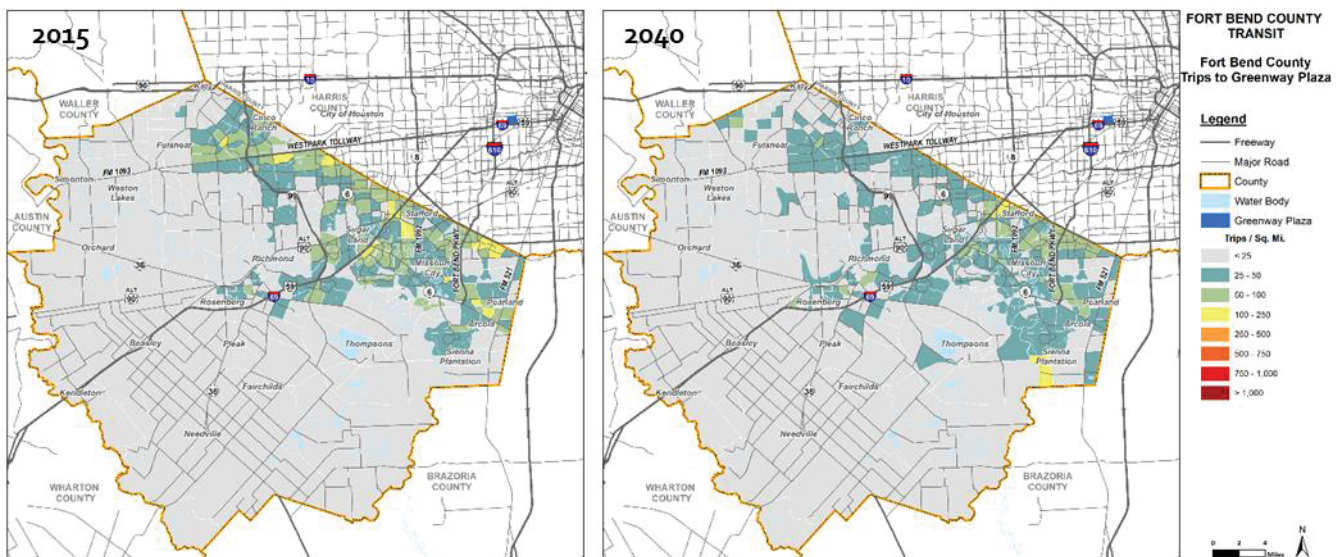


In 2040 trips to Galleria/Uptown will increase throughout the county, most significantly in Sugar Land and Stafford, followed by Sienna Plantation and the eastern part of the county. FBCT currently operates commuter service to Galleria/Uptown and the need for this service is expected to continue into 2040.

Greenway Plaza

Greenway Plaza is an employment center within the I-610 Loop along US 59. In 2015, approximately daily 10,600 trips were made from Fort Bend County to Greenway Plaza. That number is expected to increase by 11 percent to approximately 11,800 trips in 2040. As shown in **Figure 15**, in 2015 these trips largely originate near Westpark Tollway, US 59, and along Fort Bend Parkway Toll Road, near Missouri City.

Figure 15: Trips to Greenway Plaza



In 2040 there are few areas that show a significant increase in trips as they are expected to disperse, spreading out mostly in the northern, central and eastern parts of the county. While the Sienna Plantation area shows a significant increase, many other areas show a slight decline in trips. Currently, FBCT operates commuter service to Greenway Plaza. While TDM data do not show strong future growth in trip demand to Greenway Plaza relative to other activity centers, demand for service to Greenway Plaza is expected to remain in the future.

2.3 Existing Transit Service

Defining future transit service relies on an understanding of existing conditions and current services provided by FBCT, upon which new services can be built. In 2005, Fort Bend County created the Public Transportation Department to provide urban and rural transit services to the residents of Fort Bend County. In FY 2015, Fort Bend County Transit provided over 380,000

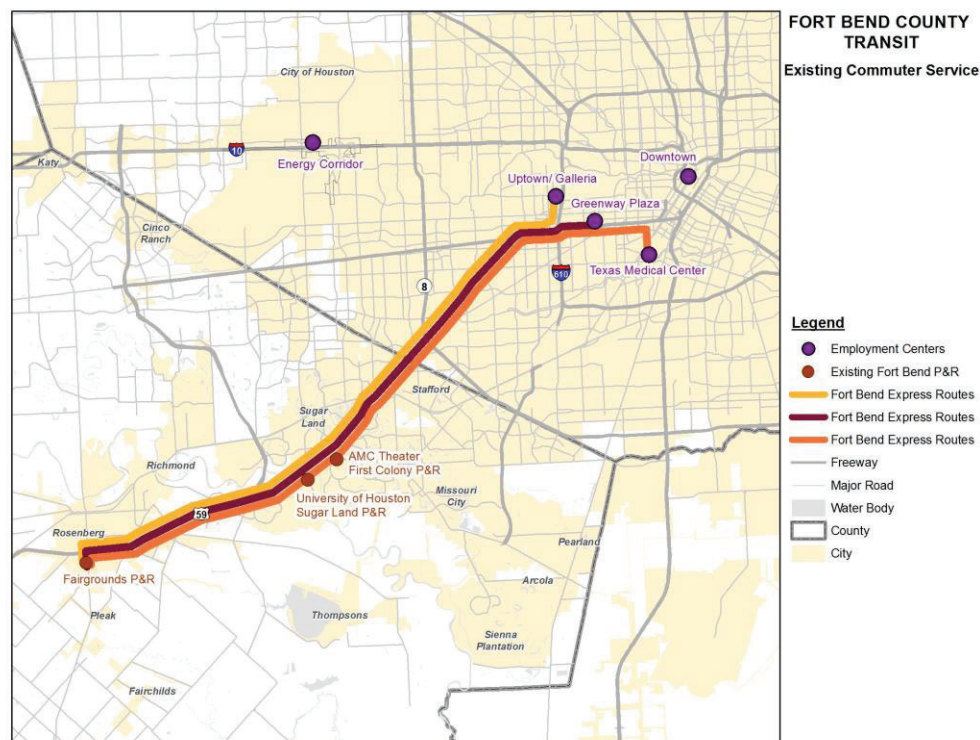
passenger trips from operating three types of transit service –Commuter Park & Ride, Demand Response, and Point Deviation Route Service. An overview of each service is provided in the subsequent discussions.

2.3.1 Commuter Park & Ride Service

FBCT currently provides commuter service along the US 59 corridor for those who commute long distances to employment centers outside the county –TMC, Galleria and Greenway Plaza. Commuter service operates only during weekday peak periods, generally on 15 to 25 minute intervals. Limited mid-day service is available on the TMC route. Reverse commute is only accessible during certain times.

Commuter service is provided from three locations within the county. FBCT currently provides customer parking through shared arrangements with First Colony AMC and University of Houston in Sugar Land and maintains a permanent facility at the FBC Fairgrounds in Rosenberg (see **Figure 16**). Passenger amenities at these locations consist of basic bus shelters and tents for waiting customers.

Figure 16: Existing Commuter Park & Ride Service



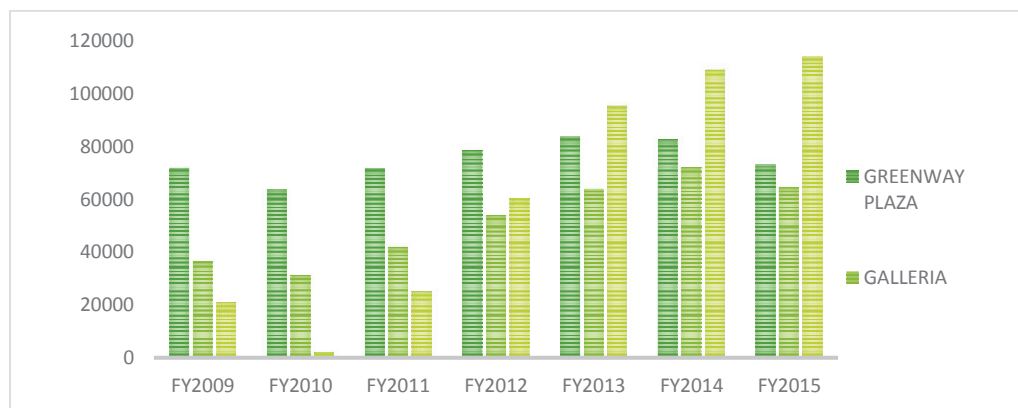
FBCT is developing a new Westpark Park & Ride facility to address the growing travel demands associated with increasing growth in Cinco Ranch and Fulshear area. The new facility will be located on Mason Road near Westpark Tollway.

The Greenway Plaza route is operated by TREK Express but funded by Fort Bend County. This route operates out of all three Park & Ride locations in the county and makes a transfer stop at METRO's West Bellfort Park & Ride, which offers service to downtown Houston. Passengers who board the Greenway Plaza bus at the Fort Bend County Fairgrounds must transfer at either UH Sugar Land or AMC Theatre to continue their trip to their final destinations.

The Galleria and TMC routes are operated directly by FBCT. These two routes operate out of UH Sugar Land and AMC Theatre, but neither make a stop at the METRO West Bellfort Park & Ride. The TMC route is the only route that operates directly out of the Fairgrounds Park & Ride. Customers headed to Galleria and Greenway Plaza must transfer at one of the Sugar Land Park & Rides to complete their trip.

FBCT's commuter ridership has been increasing at a considerable rate of 15 percent per year during the last 10 years. There were 251,000 commuter trips made by FBCT in FY 2015, with an average of 1,000 boardings per day. The TMC route, with an average of 490 boardings per day, is by far the highest and fastest growing of all the routes - Greenway Plaza has an average ridership of 285 and Galleria, 240. Ridership for Greenway and Galleria in the recent years appears to have leveled off, due to low fuel prices and economic dips, but demand for commuter services to these activity centers is expected to grow in the long term. **Figure 17** illustrates the historic ridership for each commuter service provided by FBCT.

Figure 17: Commuter Park & Ride Ridership, FY 2009 – FY 2015

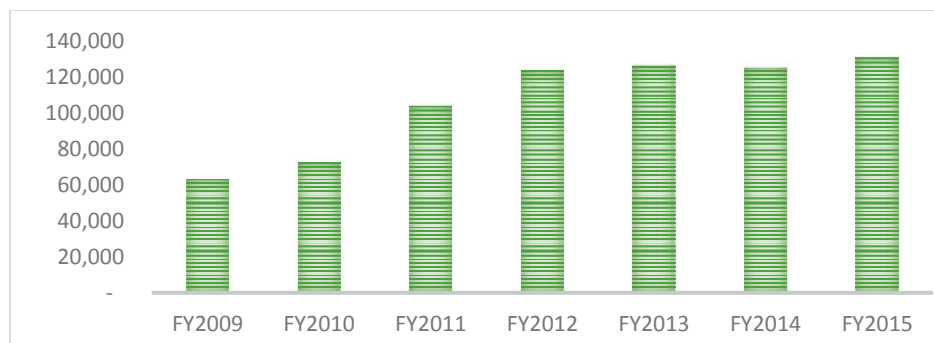


2.3.2 Demand Response Transit Service

Demand response transit service provides transportation of individuals through advance scheduling and requests from passengers. Demand response service does not operate over a fixed route or fixed schedule. In areas with lower density and lower demand for fixed route transit service, demand response service is a crucial means of providing transportation and mobility for those who have disabilities, are seniors, or do not have access to a vehicle. However, demand response requires significant operating resources.

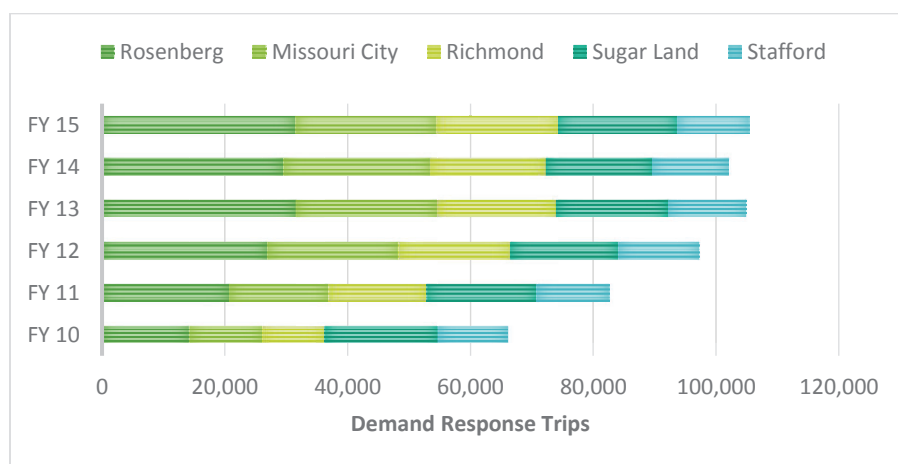
FBCT provided 131,300 demand response trips in FY 2015, with an average of 530 trips per day. It is important to recognize that the current demand response service is over capacity and behind schedule. Each day, the call center denies/turns away over 160 appointment requests. FBCT has not expanded the demand response service in over three years due to lack of vehicle storage capacity. The new administration and operations facility, currently under construction, will provide the additional storage capacity necessary for the demand response service to expand to meet the growing demand.

Figure 18: FBCT Demand Response Ridership



Historic trip origins were reviewed to better assess the need for increased demand response service. Demand has been increasing at a rapid rate, with 85 percent of the demand response trips originating from the five biggest cities in the county. The highest ridership originates from the Rosenberg/Richmond area (45 percent), followed by Missouri City. The growing number of demand response trips originating from the cities of Rosenberg and Richmond paved the way for the County's first point deviation route service. **Figure 19** illustrates the trend of top five trips by origin from FY 2010 through FY 2015.

Figure 19: Demand Response Trips by Origin, FY 2010 – FY 2015



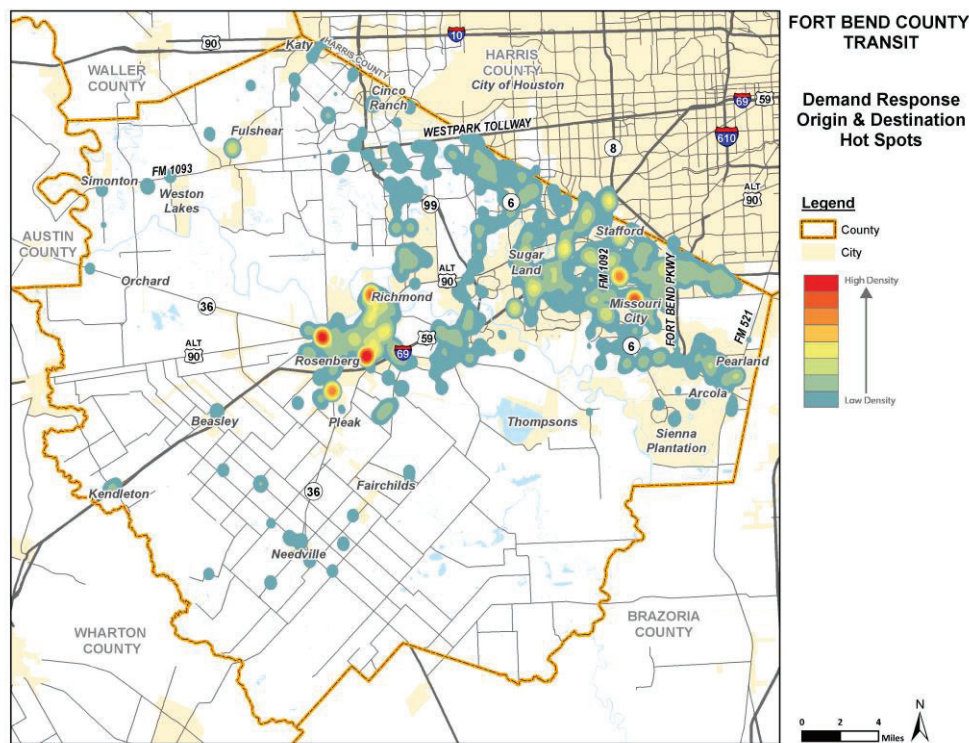
Origin and Destination Analysis

An origin and destination analysis was conducted to identify key areas where current demand response rates are concentrated to understand the level of demand for existing and potential future fixed route service. For the complete Demand Response Data Analysis Technical Memo that outlines methodology and all findings, please see **Appendix C (Demand Response Trip Analysis – Origins and Destination)**.

In the twelve-month period from November 2015 to October 2016, FBCT provided 136,368 trips through their demand response service. The actual demand for service was greater than that with 48,936 trips³ denied due to a lack of capacity.

Analysis shows that while trips originate and end throughout Fort Bend County, there are a handful of locations that provide a significant number of origins and destinations. The greatest demand areas for trips are shown in **Figure 20**.

Figure 20: Demand Response Origins and Destination Hot Spots



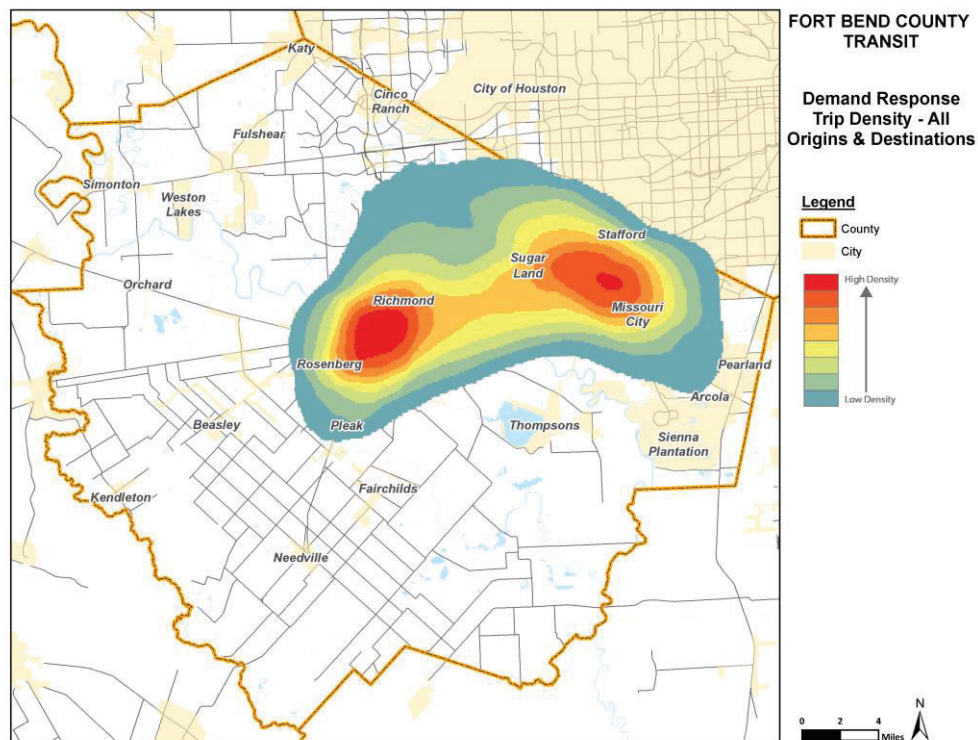
³ Denied trips are utilized as a proxy for demand not currently met. However, this data can be misleading if looked at individually as denials could be indicative of repeated attempts to schedule a trip from a single customer.

Many of these demand hot spots are due to a significant number of trips to the following senior centers and medical facilities:

- Caring People senior center near FM 723 and US 90A, Fort Bend Seniors (Bud O'Shieles Community Center) near the Fairgrounds, and Texana Learning Center located on the southeast side, north of US 59;
- Houston Catholic Charities in the northern part of Richmond;
- Pockets along US 59 through Sugar Land and Stafford;
- Stafford and Missouri City community center facilities near FM 1092; and
- Medical facilities and shopping opportunities along SH 6, near Sugar Land Town Square and Missouri City

Understanding average trip length and hot spots location is crucial to determining opportunities to provide more efficient transit service. **Figure 21** illustrates the density of all trips mapped by their origin and destination pairs. Most notably, this map shows that a significant number of trips tend to be short and local, and so may be served more efficiently with alternative methods of transit. These trip types are found particularly in the high-density areas in Richmond/Rosenberg, as well as in the Missouri City area. Trips less than 5 miles represent the highest proportion of demand, followed by trips between 5 and 10 miles.

Figure 21: Demand Response Trip Density – All Origins and Destinations



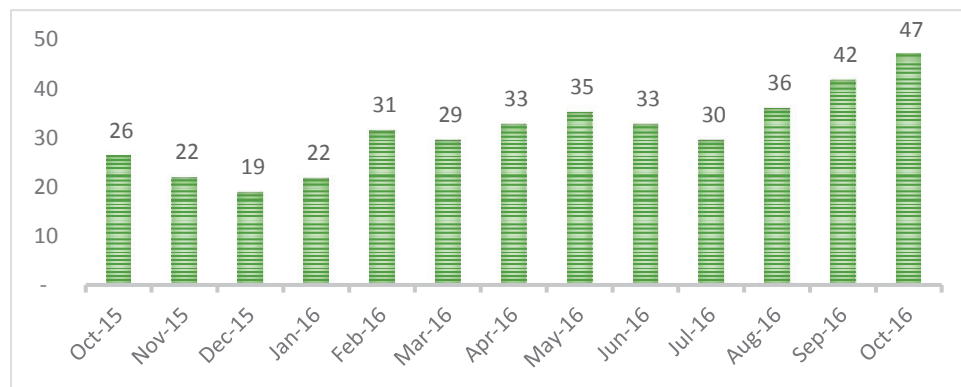
A high number of trips also occur between the Richmond/Rosenberg area and Sugar Land, Missouri City, and Stafford. This is most likely due to the locations of senior centers, health services, county offices, and shopping opportunities. The demand between cities is also an opportunity to identify where efficiencies in transit service can be made. The high-density areas also provide opportunity to identify locations of future operating facilities in the areas where buses can be most efficiently deployed and maintained.

2.3.3 Point Deviation Route Service

In response to rising demand for demand response service throughout the county and the high concentration of demand response trips in Richmond and Rosenberg, Fort Bend County began operating a point deviation service within the cities of Richmond and Rosenberg in 2015. Point deviation routes can deviate from their designated alignment to pick up or drop off passengers anywhere within $\frac{3}{4}$ mile of the route.

This new service was intended to convert a portion of the internal Richmond-Rosenberg demand response trips to the new point deviation service, thus reducing the burden on the demand response service. However, the point deviation routes thus far have not attracted enough ridership to generate a significant reduction in demand response service. As shown in **Figure 22**, the Richmond/Rosenberg point deviation routes had an average of 31 boardings per day in the period between October 2015 and October 2016. The service did experience a perceptible increase in ridership over this time period, with the highest number of boardings – 47 per day – occurring during the last month for which data was available; however, with 1.6 boardings per revenue hour in October 2016, the point deviation service still trailed the demand response service in productivity.

Figure 22: Richmond/Rosenberg Point Deviation Service – Average Daily Ridership

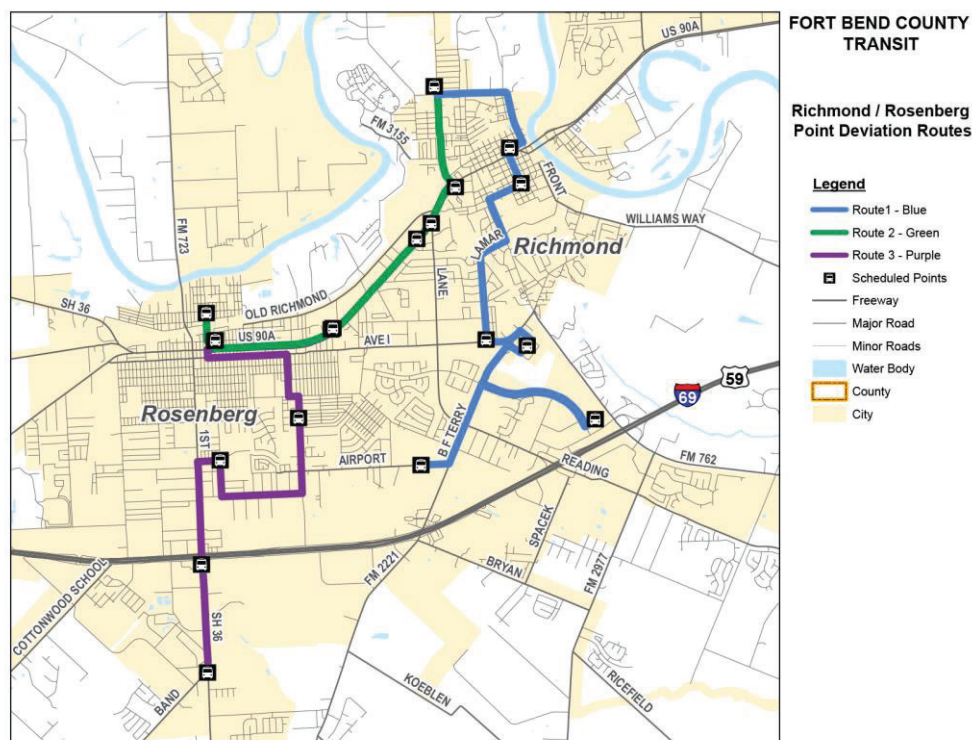


Despite the underperformance of the point deviation service to date, there are indications that the service has the potential to attract a higher level of ridership. For example, the Richmond-Rosenberg area has the population density to support the service, as well as high

concentrations of populations that tend to ride transit in greater numbers than the general population, including low-income and minority populations. Existing point deviation routes also might be improved to serve the demand response market and the potential market for riders who might be disinclined to use a transit service that requires an advance reservation.

Figure 23 depicts the existing point deviation service, which consists of three routes which are operated Monday through Friday from approximately 7AM to 5PM. While the routes are interconnected, they do not share a single hub or transfer location, and each route is operated at a different frequency. All three routes have multiple patterns and are operated at frequencies that vary throughout the day.

Figure 23: Richmond/Rosenberg Point Deviation Routes



Purple Route

The Purple Route has at least five distinct service patterns, but unlike the Blue Route, there is no specified time during which each pattern is operated. The Rosenberg Post Office and Rosenberg City Hall are served on every trip, the Fiesta Mart and the Fairgrounds Park and Ride are served on roughly half of all trips, and the Bud O'Shieles Community Center is served twice a day. The varying service patterns result in inconsistent headways, even for destinations that are served by every trip, and particularly for less-served destinations. For example, the Fiesta Mart is served every 40-45 minutes during the morning and late afternoon, but every 60-90 minutes during the midday period.

Blue Route

The Blue Route has two patterns. During the morning and late afternoon, the route is operated hourly between Houston Catholic Charities/Mamie George Community Center and Target in the Brazos Towne Center, serving Richmond City Hall, the Fort Bend Family Health Center, and the Walmart off FM 1640. During the midday period, the route is operated every half hour between Richmond City Hall and the Fort Bend County Justice Center only.

Green Route

The Green Route is operated primarily along US 90A/ Avenue H between north Rosenberg to and the Houston Catholic Charities/Mamie George Community Center in Richmond. The route is operated hourly all day and serves as the connecting link between the Purple and Blue Routes. While both Green and Purple routes include the Rosenberg Post Office and Fiesta Mart as timepoint locations, transfers between the routes are not coordinated at these locations due to the Purple Route's variable schedule. Neither are they coordinated at the Houston Catholic Charities/Mamie George Community Center, where the Green Routes share a timepoint location with the Blue Route during the morning and late afternoon hours.

Analysis of Existing Service

The existing point deviation system presents several challenges for passengers, one of which is the difficulty of transferring between routes. Without a single transfer hub, it may be necessary for a passenger to make two transfers to complete a one-way trip, and the inconvenience of those transfers is compounded by the lack of coordinated transfer times at shared timepoints. The variable service patterns on the Purple and Blue Routes also contribute to the difficulty of making transfers, as Blue-to-Green Route transfers are not possible during midday, and the ease of making Green-to-Purple Route transfers varies by trip and time of day.

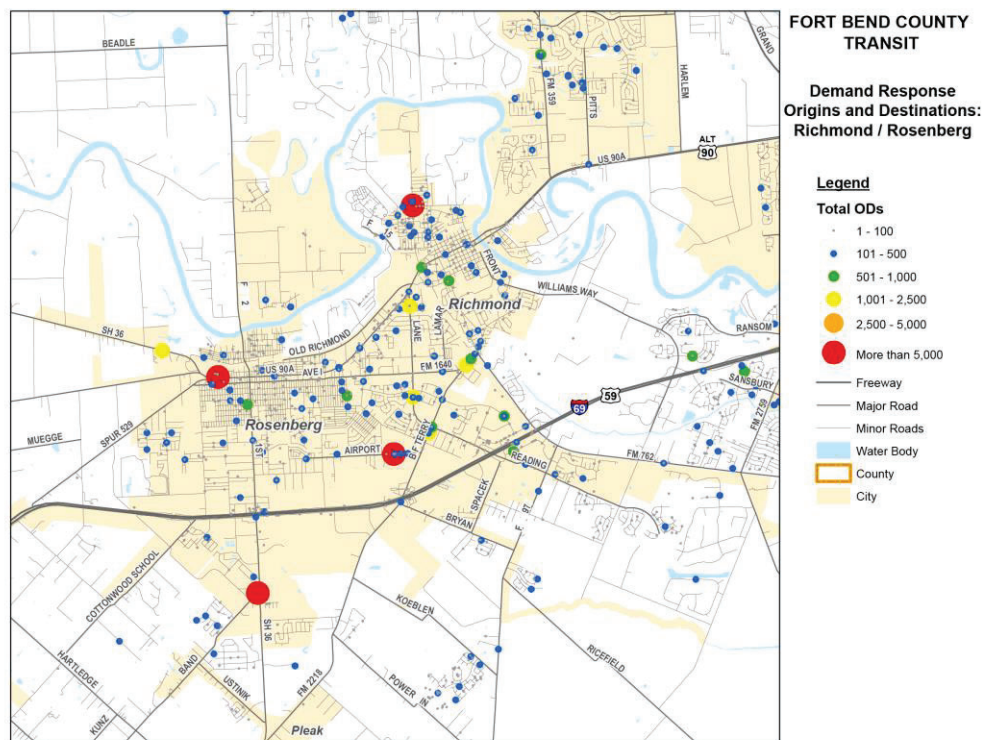
In addition to the impact on transfers, the variable service patterns and headways on the Blue and Purple Routes complicate the system other ways. The routes already have an inherent level of inconsistency by being able to deviate up to $\frac{3}{4}$ mile from the designated alignment; introducing additional variability is likely to create confusion for passengers and operators alike, particularly when the location of the $\frac{3}{4}$ mile buffer changes throughout the day. The variable service patterns also require that passengers constantly consult the schedules, and limited service to some destinations leaves little margin for error in missing a trip.

Analysis of the demand response origin-destination data for the Richmond/Rosenberg area indicates that many of the largest demand response trip generators are either not served, or served inconsistently, by the current system. As shown in **Figure 24**, there are four major demand response trip generators within the Richmond/Rosenberg area, each of which generated more than 10,000 demand response trip requests in the November 2015-October 2016 time period:

- Texana Learning Center
- Caring People
- Houston Catholic Charities/Mamie George Community Center
- Bud O'Shieles Community Center

Of these four destinations, only Catholic Charities is served directly and consistently. Caring People is within the $\frac{3}{4}$ mile buffer of the Green and Purple Routes, and the Bud O'Shieles Community Center is served only two times per day by the Purple Route. The Texana Learning Center is not served by the existing system.

Figure 24: Richmond/Rosenberg Demand Response Origins and Destinations



Another challenge is the focus of the existing route alignments on serving major destinations, such as county and municipal government services, medical services, social services, and retail destinations, with less consideration given to serving trip origins, such as large apartment buildings, low-income and public housing, and other residential areas that generate a significant number of demand response trips. Many of these locations are located within the $\frac{3}{4}$ mile buffer of the existing route alignments; however, these locations would generate more ridership if they were served directly rather than relying on deviations. Reducing the need to deviate from the route alignment would also improve the on-time performance and reliability of the route, and potentially support the transition from a point deviation service to a fixed route system in the future.

3.0 RECOMMENDATIONS

This Plan provides recommendations regarding how transit can help to support the mobility needs of the county. It recommends specific services in specific corridors with associated capital investments and suggested timeframes for implementation. This Plan provides the framework for future decisions, but more detailed planning by FBCT staff is required to carry out the recommendations of the plan.

3.1 Opportunities and Challenges

The following transit opportunities and challenges were identified through analysis of the trends and conditions presented in the previous section, and are addressed by the recommendations to follow in this document.

Fort Bend County is reaching critical mass for higher capacity transit. By 2040 Fort Bend County is expected to grow by 70 percent to approximately 1.3 million people. During the same period, the county is projected to emerge as a regional employment center with a 50 percent growth in jobs to 280,000 jobs. While today's most populous areas, such as the cities of Sugar Land and Missouri City, will continue to densify, a large portion of the population growth will stem from the rural western and central areas of the county.

Rural areas in the county are currently underserved but also the fastest growing. Parts of undeveloped rural areas in Fort Bend County are experiencing significant growth in population and new housing developments, particularly in Fulshear/Simonton and Sienna Plantation. As such, commuter needs from these areas to job centers in Harris County are also rapidly growing, overloading the county's transportation network. In particular, major highways such as US 59 and Westpark Tollway will become even more congested.

Fort Bend is an affluent county with a population that is both aging and growing more diverse, which could lead to increase in low-income, more transit-dependent residents. The communities surrounding Kendleton, areas along US 90A between Richmond and Rosenberg, and the northeastern corner of US 90A at SH 6 in Sugar Land have the highest concentrations of elderly, low-income and minority residents in the county. The Kendleton area is home to some of the poorest and oldest residents, and almost 100 percent of them belong to a minority group. These communities could truly benefit from having access to convenient reliable transit to access employment and other travel needs.

There is a general lack of awareness for transit services offered by Fort Bend County Transit. Many findings in the Long Range Plan survey directly reflect the need to better communicate the transit offerings in Fort Bend County. A significant share of non-riders (nearly 45 percent) in the survey stated they did not know that the County provided transit service. Riders also stated more online information would be helpful regarding available service and how to access service. Other challenges that point to the potential system benefits of increased communications of FBCT's services include:

- Lack of signage and wayfinding for existing park and ride facilities;
- Difficulty in navigating the Fort Bend Transit website for first time users;
- Lack of consistency in the way in which route maps and schedules are communicated; and
- Lack of consistency in branding and messaging displayed on buses.

There is a strong desire for transit access to major retail destinations in Sugar Land and Missouri City. According to survey responses, the top requested destination within Fort Bend County is Sugar Land Town Square, which is home to the highest concentrations of commercial and retail services in the county. The Riverstone shopping center, also highly requested, is near the SH 6 and FM 1092 corridors in Missouri City, which generate a significant number of demand response trips. The opportunity exists to more efficiently serve these trips using an alternative transit service to relieve demand response resources.

FBCT's commuter service ridership is on the rise but significant demand also exists for new service to job centers in Harris County. Existing commuter service has been successful, but as the county continues to densify and develop, there is a growing need to expand and add new services supported by new Park & Ride locations, particularly along the rapidly growing US 59, Westpark Tollway and Fort Bend Parkway/FM 521 corridors. An analysis of travel demand combined with the survey results demonstrate a significant demand for new transit service to Downtown Houston, notably from the Sugar Land area. New services to the Energy Corridor and Westchase are also in demand as a large share of Fort Bend County residents work in these job centers in the fast-growing central areas of the county. Furthermore, there is a significant desire for expanded service hours and increased frequency in the current commuter service, as reflected in the transit survey.

Demand response service is over capacity. FBCT is denying over 160 trips a day but has not expanded in over three years due to capacity constraints. Highest demand comes from the Richmond/Rosenberg area (45 percent), followed by Missouri City and Sugar Land. Service expansion is paramount given the anticipated population growth in the county, in particular that of the elderly demographic. Furthermore, a more cost-effective form of service is needed to reduce the burden on the demand response service and support the long term sustainability of FBCT.

The Richmond/Rosenberg service is underperforming. The existing point deviation route service in Richmond and Rosenberg is underutilized, and is largely duplicated by demand response service. The multiple required transfers required make a point deviation route service trip much less convenient than a demand response trip. Restructuring the existing services to reduce transfers would greatly enhance this service.

3.2 Recommendation Framework

The recommendations in the Long Range Plan apply a phased approach for developing a transit system that can evolve and grow through the years. They are organized around three broad principles that were identified through the analysis of trends and current services along with community input. The three organizing principles are:

- **Communicate** and market transit services offered by Fort Bend Transit
- **Optimize** and improve the quality of existing service
- **Grow** and expand opportunity for new service

The first step in improving transit in Fort Bend is to enhance and strengthen the current transit system. All the projects outlined under the strategy “Communicate” aim to better serve existing and potential customers through an increase in marketing and the introduction of easy to use maps, schedules, and online tools. Projects under the “Optimize” strategy are intended to make the existing system better, such as increasing the number of commuter service routes throughout the day and streamlining routes for faster travel times. Projects under the “Grow” strategy focus on new commuter and local services along major highway corridors that have the potential to transition to high capacity transit in the long term.

The subsequent discussions provide details on each of the strategies under consideration. The project recommendations are listed in **Table 2**.

Table 2: Long Range Transit Plan Strategies

	COMMUNICATE	OPTIMIZE	GROW
DEMAND RESPONSE		<ul style="list-style-type: none"> Service overlap <ul style="list-style-type: none"> Coordinate demand response & fixed route 	
LOCAL	<ul style="list-style-type: none"> Signage & wayfinding 	<ul style="list-style-type: none"> Scheduling Service overlap <ul style="list-style-type: none"> Coordinate demand response & fixed route Route design Stop amenities 	<ul style="list-style-type: none"> Expand Rich/Rosenberg route to Sugar Land New services along SH 6 & FM 1092
COMMUTER	<ul style="list-style-type: none"> Signage & wayfinding Targeted employer outreach 	<ul style="list-style-type: none"> Scheduling Route design - focus on travel time Reverse commute opportunities Stop amenities Coordination with METRO to reduce duplicate service 	<ul style="list-style-type: none"> New commuter services to: <ul style="list-style-type: none"> Downtown Energy Corridor Westchase Permanent P&R locations in Sugar Land, Missouri City and Fulshear High capacity transit service along US 59, Westpark Tollway, Fort Bend Parkway/FM 521 New commuter van service from Simonton, Kendleton, Needville
SYSTEM-WIDE	<ul style="list-style-type: none"> Branding strategy & Education campaign – consistent message <ul style="list-style-type: none"> How-to-ride videos New transit-only website <ul style="list-style-type: none"> Accessible consumer information System maps – online & print Staffing strategy 	<ul style="list-style-type: none"> Fleet strategy <ul style="list-style-type: none"> Purchasing & maintenance Staffing strategy 	<ul style="list-style-type: none"> Fleet strategy Staffing strategy

3.3 Communicate

Branding and passenger information are the fundamental communications strategies that should be implemented by every transit system. They are the essentials that identify FBCT services to the community and provide directions for using it. Customer perception of transit service is traditionally informed by the agencies' ability to run trains and buses frequently, on time and without disruption. Many of FBCT's patrons are elderly and disabled with a substantially greater need for information in all stages of travel. The following are specific strategies FBCT could adopt to communicate more effectively with its customer base and lay the groundwork for the optimization and growth of its services.

Branding Strategy

Effective branding will raise awareness and enhance a transit system's image. Currently, FBCT buses display varying degrees of branding on its buses. Many of the vehicles operated by FBCT use a unique yellow and green color scheme, but other buses operated by First Transit do not follow the same branding (**Figure 25**). The TMC commuter bus operated during the heaviest passenger loads is a large 41-seat bus without any FBCT logo or branding found in other commuter buses. These buses are typically only used for TMC service for additional seating capacity. Unless you are a regular rider this would undoubtedly lead to confusion and uncertainty for new riders of the system. The "look" of vehicles are essentially the public's introduction to the transit system. FBCT's name and logo must be used consistently on all vehicles operating FBCT service.

Figure 25: Fort Bend Transit Vehicles



Signage & Wayfinding

Good bus stop design and wayfinding can significantly improve customers' perception of a transit system. In addition to letting passengers know where they can catch the bus, bus stop signage creates visibility throughout the community. While FBCT employs uniform signage at all its existing bus stops, many of the FBCT's Park & Ride lots lack signage external to the facility and are not easily visible from the surrounding streets (see **Figure 26**). Additional signage for Park & Ride facilities are recommended on the surrounding streets. Wayfinding

signage that provides information on other connecting transit routes and directs passengers to nearby destinations like parks, hospitals or shopping are also recommended at FBCT's existing and future permanent Park & Ride facilities and other high pedestrian activity locations.

Figure 26: Signage at FBCT's Park & Ride Facilities



Revamp Website & System Maps

Assisting customers in trip planning is a major service of transit agencies; helping people get the best use out of the system is critical, not only for those that use the system regularly, but also for visitors. Currently, the FBCT website provides information and services that include system maps, transit schedules, and fare and reservation information. However, the layout of the website makes it difficult to navigate for first-time users. An effective transit website is as simple as possible, so the user can see what the site offers from a glance at the home page. Redesigning the website to make it more intuitive and presenting mapping and scheduling information in a more streamlined way will be critical to accommodate an increase in ridership.

Another tool FBCT should consider is taking part in the free Google Transit service, which allows fixed route information to be integrated into Google Maps. Google Transit helps avoid

the difficulty that many potential riders have understanding transit schedules and provides a seamless way of coordinating trips between the FBCT transit system and other connecting systems (METRO). It is also a useful tool for community partners (human service organizations, charities, medical institutions) for it is an easy way to plan and print trip information for their clients.

Targeted Outreach

Partner agencies can help support rider communication strategies. FBCT has a strong relationship with many of the major employment centers in the region such as the TMC, Greenway Plaza and Energy Corridor, among others. FBCT should take advantage of this opportunity to communicate to the public via brochures, schedule postings, and word of mouth to raise awareness of the commuter services provided by FBCT.

How-to-ride/Trainings/Education Campaign

Travel training can be a powerful tool for generating ridership as it takes the guesswork — and the apprehension — out of riding the bus for the first time. FBCT could solicit opportunities to conduct training sessions at partner organizations to help staff understand how transit works so they can pass the knowledge on to their constituents. These trainings would include an overview of the routes, how to use the schedules to plan trips, and information about demand response and point deviation services. FBCT may provide participants with a free ticket to encourage them to make their first solo trip.

Travel training also can be conducted by peer volunteers. For example, Lane Transit District's Bus Buddy program pairs trained senior volunteers with new riders to take them on their first bus trip, providing travel training along the way. Travel training could be particularly useful for the first-time users of the point deviation route service.

3.4 Optimize

Like the communication and branding strategies detailed above, service optimization strategies were also developed with the intention of enhancing the existing system to ensure it is meeting the needs of existing and potential riders.

3.4.1 Demand Response Service and Local Service Coordination

A need to unburden the demand response service has long been a challenge faced by FBCT. At the same time, the existing point deviation route service is underutilized due to the service overlap in the Richmond/Rosenberg area. While FBCT plans to acquire additional vehicles and resources to serve the growing demand response service needs, it is equally important to optimize and redesign the Richmond/Rosenberg service to attract more demand response riders to utilize the existing local service. The redesign would entail restructuring the existing service to reduce transfers and serve additional destinations. This recommendation is

described in further detail in Section 3.5 as part of a phased implementation approach for the Richmond/Rosenberg service under the “Grow” strategy.

3.4.2 Commuter Service

To maintain and grow ridership, the service must be convenient and attractive enough to get new potential customers on board. As such, various options were explored to redesign and optimize schedules of the existing commuter routes. Note that many of the recommendations presented herein are high-level and must be further developed based on a more detailed assessment.

Redesign Routes and Optimize Schedules

A review of the route design determined that the Greenway Plaza route makes time-consuming loops into individual driveways to circulate the Greenway Plaza area. Streamlining the route could free up service hours that could be reinvested in more trips.

Another component of the service design that may merit a detailed review is the variability in schedules. Initial observations of the current schedules indicated that the TMC and Galleria schedules are overly complicated with too many variations. The 36 trips on the TMC commuter service schedule operate using 13 variations of the route. The 19 trips on the Galleria route run 17 different stop patterns. Complexity can be manageable for customers who have the same schedule and routine every day, but that is not the case in many of today’s work environments. While there may be rationales for all the different routings, simplifying these routes could lead to greater convenience and peace of mind for patrons.

Similarly, better utilizing METRO connections could free up service hours. For example, over a third of peak direction revenue hours on the TMC commuter service is currently spent on TMC circulation. Offering closer connections to METRORail and METRO local bus routes in the TMC area could allow that route to be streamlined.

Reverse Commute Opportunities

The FBCT commuter routes offer reverse commute service utilizing the non-peak direction return trips of the buses. These services are not currently well patronized because they are only offered in certain return trips. As the employment centers in the county continue to grow, opportunities should be explored to better connect these reverse commute trips both to METRO service on the Houston end and to major employment locations in Fort Bend County. City of Sugar Land is also looking for ways to better serve this growing need.

The connections to employment locations on the Fort Bend end could take a variety of forms. Employers could be encouraged to provide shuttles from the bus stops or vanpools could be set up among employees. In Richmond and Rosenberg, the schedule of the local routes could be coordinated to connect with the commuter service, linking residents to both Sugar Land and Houston.

Modifying existing deadhead trips and adding them to the reverse commute schedules could also be examined. A market may exist for travel from Richmond and Rosenberg to Sugar Land and Houston outside of the peak commute direction. Currently there is only one morning trip outbound to Highway 36 on the schedule, one midday round trip, and no inbound afternoon trips. This will be especially relevant when FBCT moves its operations center to the Fairgrounds site, requiring more deadhead trips to and from this location.

Coordination with METRO

Both FBCT and METRO operate commuter bus service in the US 59 corridor to the TMC. METRO's TMC route (292) operates from West Bellfort Park & Ride to the TMC with an intermediate stop at Westwood Park & Ride. METRO operates fourteen inbound trips each weekday morning and sixteen outbound trips in the afternoon/evening using 55-passenger coach buses. METRO's 292 has relatively low ridership and operates with over 1,000 empty seats on peak direction trips.

FBCT's TMC service operates from the Fairgrounds, UH Sugar Land, and First Colony AMC Park & Ride locations into the TMC. FBCT operates sixteen inbound trips each weekday morning, one round trip in the midday, and fifteen outbound trips in the afternoon. FBCT operates smaller, 32-passenger buses and fills, on average, 16 of the seats on peak direction trips. However, demand on certain trips has outgrown the capacity of the 32-passenger vehicles and a larger bus has had to be substituted.

An opportunity exists for METRO and FBCT to operate a joint service from the US 59 corridor to the TMC, offering more service to customers while reducing costs for the agencies. Issues that would have to be resolved to operate the joint service include:

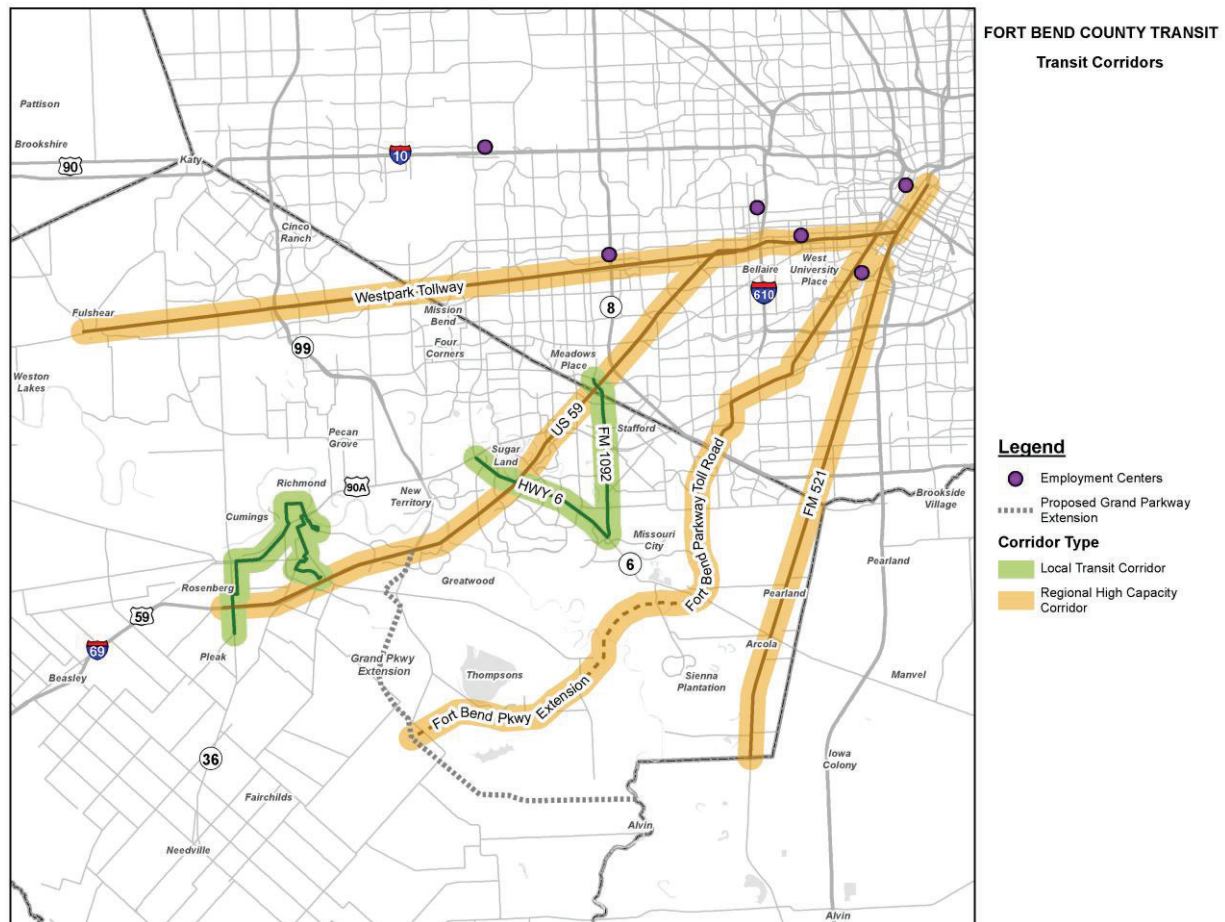
- Fare payment systems. METRO uses the Q Card while FBCT uses ticket books. Cross-honored or joint fares would have to be developed.
- Comfort expectations. METRO's over-the-road commuter coaches offer a superior rider experience to FBCT's vehicles. Either METRO riders on a joint service would need to accept the change or FBCT would need to upgrade its equipment.
- Operation outside METRO service area. METRO has revised its policy on providing service in areas where its sales tax is not levied. The proposed policy would require jurisdictions requesting service to pay the fully allocated cost. However, METRO could simply contract with FBCT to operate the joint service as a replacement for the 292.
- TMC routing. A common route that serves the TMC would need to be created.
- Park & Ride locations. A total of five different locations in Fort Bend and Houston currently have commuter service to the TMC. Stopping patterns would need to be designed to maintain service for current customers while not requiring all trips to make all five stops.
- Customer information and branding. While a customer is more concerned that the transit service meets his or her needs than what entity is operating it, consistent branding and customer information would help minimize confusion.

While more detailed service planning would be required, the operation of a joint TMC service could yield improved service with potential cost savings that could be reallocated to further enhancing service in the US 59 corridor or other corridors.

3.5 Grow

While FBCT has been successful in developing its commuter services, transit still serves a relatively small share of total trips made within, to, from, or through the county, and single occupant vehicles are the dominant mode of travel. For this reason, the recommendations to grow transit service focus on key transit corridors that have potential for higher ridership based on their alignment with projected job and population growth patterns. These corridors are illustrated in **Figure 27** and detailed along with the recommendations for expanded or new service in each.

Figure 27: Fort Bend County Transit Corridors



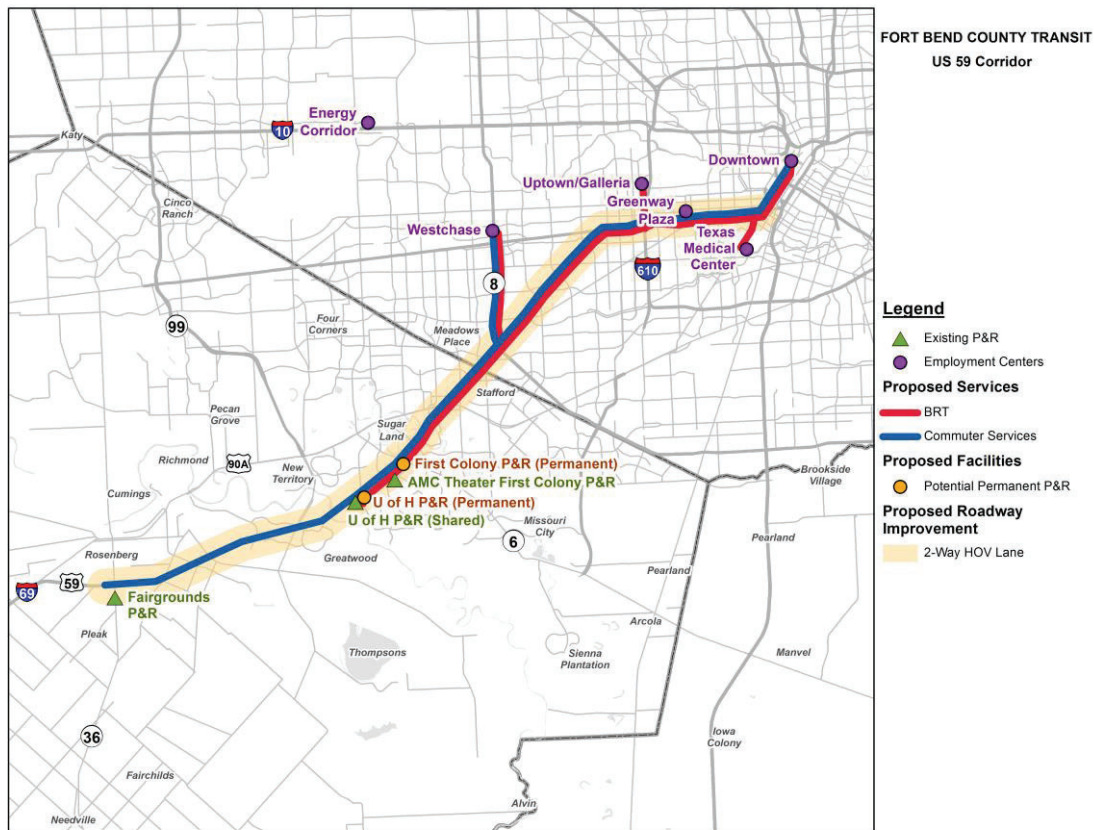
3.5.1 US 59 Corridor

The US 59 corridor is the main transportation spine for Fort Bend County and connects rapidly growing communities and activity centers in Fort Bend with regional job centers in Harris County. FBCT currently provides commuter services from three Park & Ride lots along the US 59 corridor to Uptown/Galleria, Greenway Plaza, and the TMC, with transfers available to Downtown Houston at METRO's West Bellfort lot. US 59's reversible HOV lane enables FBCT to operate a faster and more reliable service in Harris County during the peak travel periods. The reversible HOV lane transitions to approximately seven miles of bi-directional HOV lanes within Fort Bend County that terminate south of University Boulevard. TxDOT is currently extending the bi-directional HOV lanes to FM 762. Once completed, the HOV lanes will offer even faster transit travel through the heart of Fort Bend County.

Today, the US 59 corridor operates as a successful regional transit commuter corridor due to its provision of HOV lanes and connections to activity centers. FBCT has made major investments in transit service in the corridor with Park & Ride facilities and is currently developing a permanent bus operating and storage facility. The US 59 corridor is also home to the most densely populated communities in the county with the greatest opportunity for a sustainable transit system. 2040 population and employment forecasts show continued densification that extends further south along the corridor. As such, the US 59 corridor has the highest potential to transition to a high capacity regional transit corridor that provides frequent all-day services to all activity centers along the corridor. High Capacity Transit (HCT) service along US 59 will also allow for connections to other proposed transit corridors along Hwy 6 and FM 1092.

Recommendations for the US 59 corridor using a phased implementation approach are illustrated in **Figure 28** and detailed in the following discussions.

Figure 28: US 59 Corridor Recommendations



Proposed Services: In the near term (1–5 years), new commuter service to Downtown Houston is recommended along the US 59 corridor. Downtown Houston is the most requested destination for new commuter service by the Long Range Plan survey respondents. Commuter service to Westchase is also among the top destinations requested by the survey respondents, and thus, is recommended in the medium term (6-12 years). As ridership continues to grow and communities densify along the corridor, it is recommended that FBCT consider upgrading the current peak-only express service to all-day frequent bus rapid transit (BRT) to meet the future demand. This BRT service would offer larger, upgraded vehicles.

Bus Rapid Transit (BRT)

BRT can operate either in a completely independent corridor or on an existing roadway, either with or physically separated from regular traffic. BRT is designed to provide all the services and the same user experience as light rail, only in a more cost-effective way.

Proposed Facilities: Out of the three Park & Ride lots operated by FBCT, the Fort Bend County Fairgrounds is the only permanent facility. FBCT currently provides Park & Ride customer parking through shared arrangements with UH Sugar Land and the First Colony AMC. Passenger amenities at these locations consist of basic bus shelters and tents for waiting.

customers. Continued growth in ridership will outstrip the capacity of these lots, and thus the need for a permanent Park & Ride lot in Sugar Land is critical to ridership growth.

The ideal location for a permanent Sugar Land Park & Ride facility would be within walking and biking distance of employment destinations like Sugar Land Town Square and First Colony Mall that would help drive reverse commute, suburb-to-suburb commute, and all-day demand. Proximity to residential development would create the opportunity for some commuters to access the service without driving, a benefit to FBCT ridership without the cost of providing parking. A new garage on or near the existing Macy's garage at First Colony with a T-ramp into the HOV lane on the second level would allow buses to efficiently access the facility. This project would require cooperation and partnership with the property owner, City of Sugar Land and TxDOT.

Another option for a Park & Ride facility is at the vacant space at the corner of University Boulevard and US 59 frontage road adjacent to UH Sugar Land. The University has plans to expand its campus with additional student parking. In exchange for FBCT's current customer parking, there is an opportunity for a new FBCT Park & Ride facility to be located closer to the US 59 frontage road.

Furthermore, TxDOT plans to reconstruct its existing park and pool lots located inside the half cloverleaf interchange at FM 762 and US 59. FBCT is working with TxDOT to redesign these lots to serve as a potential future stop for Richmond residents wishing to utilize FBCT's commuter service.

Other Considerations: The critical aspect of this plan is the implementation of two-way HOV lanes along the US 59 corridor to maintain competitive speeds in Harris County. This project has been long considered by METRO, H-GAC and TxDOT for congestion relief as well as faster transit travel. FBCT should continue to engage in infrastructure planning processes at the regional level to advance projects that directly benefit transit operation. In addition, it is also important to leverage the existing corridor right-of-way wherever possible and to create transit station links at key activity centers and transfer points. Building transit along a freeway corridor has significant benefits if the existing right-of-way can be leveraged. But the drawback is that stations and stops must be carefully thought through to ensure that transit riders can access their destinations safely and conveniently and that the freeway itself does not act as a significant barrier to transit access.

US 59 Corridor Recommendation Summary: Table 3 presents the project recommendations within the implementation timeframe discussed above as well as planning-level capital and operating costs for each project.

Table 3: US 59 Corridor Recommendation Summary

Project Type	Project Name	Year	Capital Cost	Vehicle Needs	Annual O&M Cost	
					Low	High
Commuter Service	Sugar Land P&R to Downtown	1 - 5		34 buses	\$1,982,200	\$2,360,000
Facility – ROW	Land acquisition for Sugar Land P&R Lot	1 - 5	\$2,178,000			
Commuter Service	Sugar Land P&R to Westchase	6 -12		5 buses	\$476,000	\$577,000
High Capacity Transit	US 59 BRT Service to all activity centers	long		12 BRT buses	\$2,500,000	\$3,000,000
Facility	Sugar Land Park & Ride Lot (Garage)	long	\$31,000,000		\$86,000 for lot maintenance	
Roadway	T-ramp from Sugar Land Park & Ride to US 59 HOV	long	\$23,000,000			
Roadway	US 59 2-way HOV Conversion	long	\$240,000,000			

Note: High/Low operating costs based on county vs. contractor vehicle ownership. Vehicle requirements include 20 percent spare.

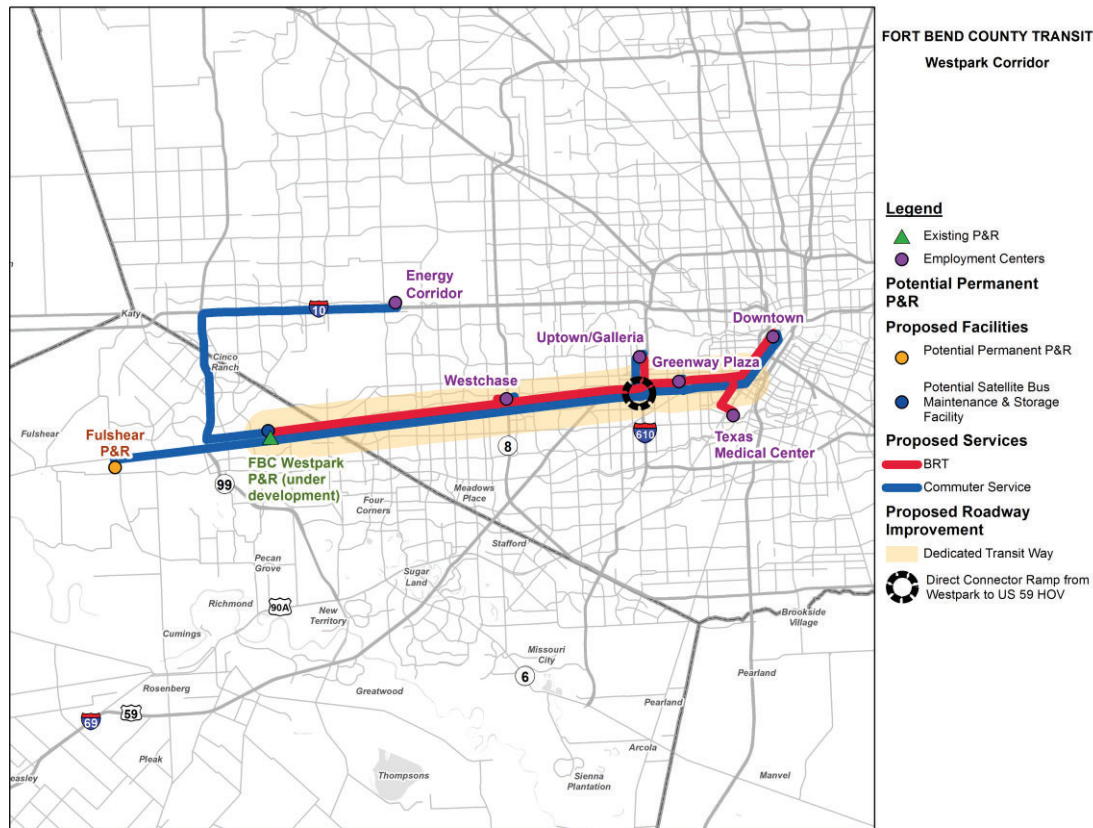
3.5.2 Westpark Corridor

The Westpark corridor is a major east-west artery that serves the rapidly growing areas in northern Fort Bend County. The area includes several large master planned communities, such as Cinco Ranch and Cross Creek Ranch, near the City of Fulshear which has seen thousands of homes constructed in the past decade. Westpark Tollway, running parallel to FM 1093, connects the Grand Parkway to Loop 610 in Harris County. It is the main highway link from these communities to regional job centers including Westchase, Uptown/Galleria, Greenway Plaza, Downtown and TMC. Access to Downtown and TMC is available through a connection with US 59.

FBCT is currently designing a permanent Park & Ride facility to be constructed in the Westpark corridor just east of Grand Parkway. Several options for future service from the Westpark Park & Ride lot have been explored as part of the Long Range Plan by identifying destinations that could generate demand for commuter bus service. Commuter service along the Westpark corridor will provide a transit option for residents who use Westpark Tollway as their main corridor for driving to and from employment. The Westpark corridor is envisioned to begin and grow as a commuter corridor and eventually transition to a HCT corridor in the long term.

Recommendations for the Westpark corridor using a phased implementation approach are illustrated in **Figure 29** and detailed in the following discussions.

Figure 29: Westpark Corridor Recommendations



Proposed Services: In the short term (1-5 years), a new commuter service to the Energy Corridor is recommended from the Westpark Park & Ride lot. The Energy Corridor District has expressed interest in partnering with FBCT to serve their commuters from Fort Bend County. Two potential routes for the Energy Corridor service have been considered – one via Hwy 6 and the other alignment taking advantage of Grand Parkway and HOV lanes on IH 10 West. In the medium term (6-12 years), commuter services to Westchase and Uptown, with limited stops in Greenway, are recommended. The commuter routes would include stops at METRO’s Westchase Park & Ride and Uptown Transit Center to better facilitate transfers to METRO’s transit network. Commuter services to Downtown and TMC is recommended are the long term; however, there are some factors that need to be considered before these services would be feasible and sustainable. These factors will be detailed under the “Considerations” discussion.

Once the commuter service ridership has been proven and established, the ultimate long term vision for the Westpark corridor is to function as a HCT corridor with all-day frequent BRT service to all the activity centers along the corridor. The intensity of development occurring along the Westpark corridor will ultimately make high capacity transit a necessity. The METRO-owned right-of-way along Westpark Tollway could allow for transit service that is protected

from traffic congestion in an exclusive or semi-exclusive right-of-way. This right-of-way, coupled with the location of so many activity centers along the corridor, presents the opportunity to serve multiple destinations with one transit line, a promising factor for success. For example, a BRT bus leaving the Westpark Park & Ride could make stops at Westchase, Uptown, and Greenway Plaza on its way to TMC or Downtown.

Proposed Facilities: In the medium term (6-12 years), the commuter services would be extended further west to Fulshear to serve the rapidly growing residential communities along FM 1093. An ideal location for a temporary Fulshear Park & Ride lot could be at the Parkway Fellowship Church at the southeast corner of FM 1093 and FM 359 through a shared parking arrangement. Minor roadway improvements at the intersection, such as a right turn lane on FM 359 northbound approach, would better facilitate bus access to the Park & Ride. Additionally, the proximity to many trails in the area would create the opportunity for enhanced first and last mile connectivity for some commuters to walk or ride their bikes to access the Park & Ride. FBCT could offer bike amenities such as covered racks and repair stations at the Park & Ride lot to encourage more riders to bike to transit. As ridership increases, FBCT may want to pursue a permanent Park & Ride facility near FM 1093. A location for a permanent facility should be identified and acquired early should FBCT wish to operate the facility in the next 10 years.

In addition to new passenger facilities along the Westpark corridor, FBCT should consider developing a satellite bus storage and maintenance facility in the county-owned land adjacent to the Westpark Park & Ride. This facility might not be a full-service garage, but one in which buses could be stored and a limited staff could perform minor maintenance, fueling and cleaning of buses, with buses in need of more significant maintenance or repair being returned to the Fairgrounds facility. Developing a Westpark facility could be a cost-effective alternative to extending all the services to and from Fairgrounds.

Other Considerations: For the Westpark corridor to become a successful HCT corridor, several challenges must be addressed given that the tollway is notoriously congested during the peak periods. A key challenge for this corridor is the lack of transit priority or HOV lanes that would allow buses to bypass congestion which limit travel time benefits when compared to driving alone. The METRO-owned right-of-way along Westpark Tollway would provide the best opportunity for transit service in an exclusive or semi-exclusive right-of-way.

Plans for the METRO Westpark right-of-way are not currently defined. One possibility could be to use the corridor for an extension of METRO's proposed University Line light rail project. The Gulf Coast Rail District is also considering this right-of-way for a future commuter rail service. Another possibility could be to construct a dedicated transitway that would host both BRT service as well as potential rail service, as explored in the 2016 Westchase Mobility Plan. This plan recommended building a transitway along the Westpark right-of-way that would allow both rail and bus operation for maximum capacity and flexibility. The BRT would have the flexibility to deviate from the corridor and circulate within activity centers, while rail would provide higher capacity service along the corridor.

Another challenge for efficient transit operation along this corridor is the lack of direct connector ramps that provide access from Westpark Tollway to US 59 HOV lane. Without this connection, commuter buses to Downtown and TMC must travel in the general-purpose lanes of US 59 during congested peak periods, resulting in increased transit travel times and decreased reliability. As such, a transit connection to Downtown and TMC from the Westpark Park & Ride lot is not recommended until this connection to US 59 is improved.

Other infrastructure challenges could also result in much longer travel times for buses as access to and from the tollway at METRO's Westchase Park & Ride can be difficult due to the lack of direct ramp connection. Future Uptown Transit Center, located at Westpark and US 59, will have a good connection to the US 59 HOV lane via a T ramp, but a stop is not currently possible at Greenway Plaza without exiting the freeway completely.

Due to growing development pressure and congestion along the corridor, TxDOT is currently extending Westpark Tollway to the west of Grand Parkway and widening FM 1093 to serve as four lanes of frontage road. A later phase would widen FM 1093 farther west beyond Fulshear. HCTRA is currently performing a planning study for the Westpark Tollway. METRO is in the beginning stages of a new long range plan. FBCT should engage with infrastructure planning processes underway by HCTRA, TxDOT, and METRO to ensure that the improvements planned for the Westpark corridor will benefit FBCT's ability to operate efficient transit in the future.

Westpark Corridor Recommendation Summary: Table 4 presents the project recommendations within the implementation timeframe discussed above as well as planning-level capital and operating costs for each project.

Table 4: Westpark Corridor Recommendation Summary

Project Type	Project Name	Year	Capital Cost	Vehicle Needs	Annual O&M Cost	
					Low	High
Commuter Service	Westpark P&R to Energy Corridor	1 - 5		12 buses	\$865,000	\$1,085,000
Facility - ROW	Land acquisition for Fulshear P&R Lot	1 - 5	\$2,178,000			
Commuter Service	Westpark P&R to Uptown and Greenway	6-12		5 buses	\$413,000	\$494,000
Commuter Service	Westpark P&R to Westchase	6-12		5 buses	\$379,000	\$494,000
Facility - ROW	Construction of Fulshear P&R Lot	6-12	\$2,000,000		\$86,000 for lot maintenance	
Commuter Service	Extension of commuter service to Fulshear P&R	6-12		4 buses	\$306,000	\$364,000
Facility	Satellite bus maintenance/storage facility at Westpark	6-12	\$500,000			
Commuter Service	Westpark P&R to Downtown	long		6 buses	\$528,000	\$632,000
Commuter Service	Westpark P&R to TMC	long		6 buses	\$529,000	\$633,000
Commuter Service	Extension of all commuter services to Fulshear P&R	long		2 buses	\$287,000	\$408,000
High Capacity Transit	Westpark BRT Service to all activity centers	long		12 BRT buses	\$2,500,000	\$3,000,000
Roadway	Dedicated transitway along Westpark Toll	long				
Roadway	Westpark Toll ramp connection to US 59 HOV	long				

Note: High/Low operating costs based on county vs. contractor vehicle ownership. Vehicle requirements include 20 percent spare.

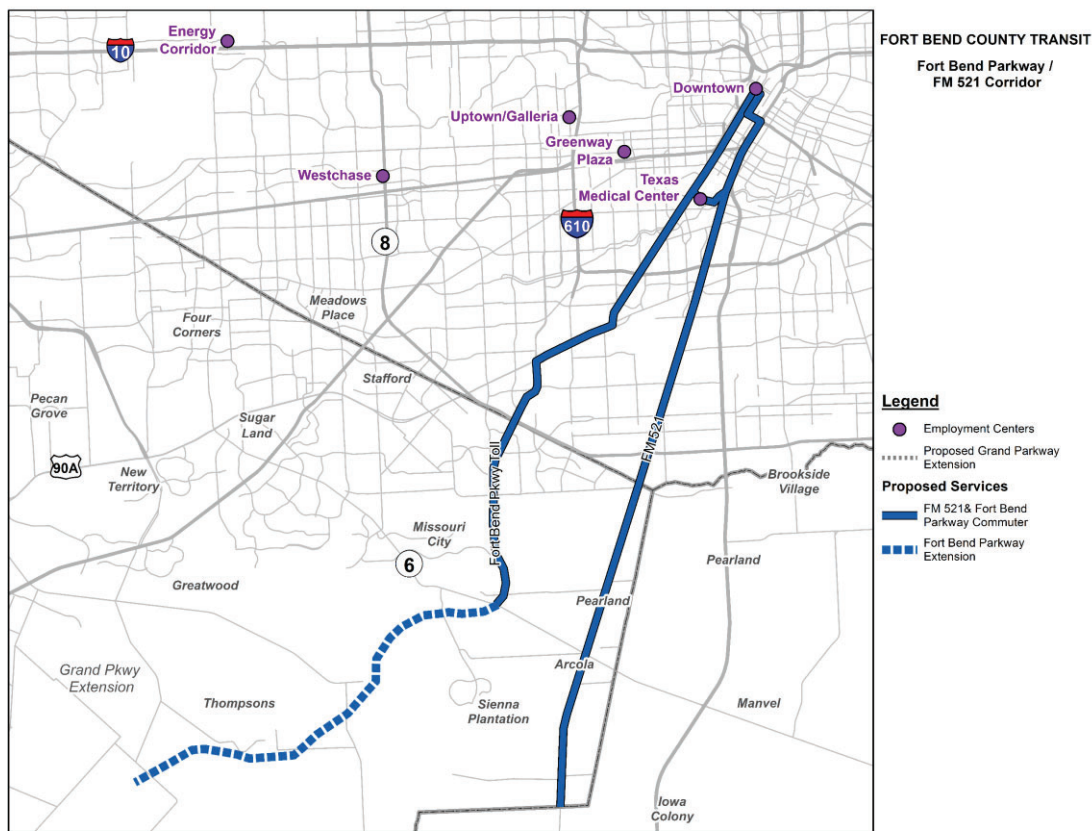
3.5.3 Fort Bend Parkway Toll/FM 521 Corridor

The Fort Bend Parkway Toll/FM 521 corridor serves the fast-growing eastern part of the county, most notably Sienna Plantation, a 10,000-acre master planned community in Missouri City. Fort Bend Parkway Toll Road connects Sienna Parkway on the south end to US 90A (South

Main) on the north end. FM 521 (Alameda Road) is a four-lane road that connects the southeast corner of Sienna Plantation, Arcola and Fresno to the TMC and Downtown Houston. It runs parallel to the Union Pacific Rail Road right-of-way. These roadways provide the most direct access to the TMC and Downtown Houston for the communities on the east side of Fort Bend County.

Recommendations for the Fort Bend Parkway Toll/FM corridor are illustrated in **Figure 30** and detailed in the discussions that follow.

Figure 30: Fort Bend Parkway/FM 521 Corridor Recommendations



Proposed Services: The Fort Bend Parkway Toll/FM 521 corridor is envisioned to serve as a Commuter corridor in the long term providing fast, nonstop services to the TMC and Downtown. METRO currently operates commuter service to the TMC from the Kroger parking lot near the junction of Hwy 6 and the Fort Bend Parkway, but parking demand is exceeding the availability of spaces. There is a growing need to provide commuter service in this area as Sienna Plantation builds out and development moves southeast into the heart of Fort Bend County.

Proposed Facilities: A permanent Park & Ride facility near Fort Bend Tollway in Missouri City has been considered by both METRO and FBCT for some time; however, this project is currently

not advancing. A permanent Park & Ride location could be located south of Missouri City in the unincorporated part of the county either along FM 521 or the planned extension of Fort Bend Tollway. Another possible location is at the intersection of SH 6 and South Post Oak Boulevard located between Fort Bend Parkway Toll Road and FM 521.

Other Considerations: Fort Bend Parkway Toll Road currently ends at Sienna Parkway. Ultimately, Fort Bend Parkway will be extended southwest to terminate at Grand Parkway. The first stage of this extension will likely be from Sienna Parkway to Sienna Ranch Road West. The remaining segment of the extension will require navigating over the Brazos River to connect to FM 2759/FM 762 and the George Foundation property. Extending the Toll Road across the Brazos River would stimulate commercial and residential development in the southeast sector of Fort Bend County and the need for reliable and relatively fast access to activity centers in Harris County.

FM 521 could be considered as an alternative route for commuter transit because it directly connects to the TMC and to Downtown areas via Crawford Street. There is available right-of-way along much of the road, however, grade separations would be needed at major intersections to maintain reliable travel times. Initially a pilot program for an express service from SH 6 to TMC could be initiated to gauge demand prior to making major investments along FM 521. The caveat is that an investment in FM 521 only makes sense if growth and development increases sufficiently in southeast Fort Bend County and TMC continues to be a strong travel market for the area.

Fort Bend Parkway Toll/FM 521 Corridor Recommendation Summary: Below summary Table 5 presents the project recommendations within the implementation timeframe discussed above as well as planning-level capital and operating costs for each project.

Table 5: Fort Bend Parkway Toll/FM 521 Corridor Recommendation Summary

Project Type	Project Name	Year	Capital Cost	Vehicle Needs	Annual O&M Cost	
					Low	High
Facility ROW	- Land acquisition for Fort Bend Toll/FM 521 P&R Lot	1 - 5	\$2,178,000			
Facility	Construction of Fort Bend Pkwy/FM 521 P&R Lot	6 - 12	\$2,000,000		\$86,000 for lot maintenance	
Commuter Service	Fort Bend Pkwy/FM 521 P&R to Downtown	6 - 12	\$581,000	6 buses	\$528,000	\$632,000
Commuter Service	Fort Bend Pkwy/FM 521 P&R to TMC	6 - 12	\$580,000	6 buses	\$529,000	\$633,000

Note: High/Low operating costs based on county vs. contractor vehicle ownership. Vehicle requirements include 20 percent spare.

3.5.4 Richmond/Rosenberg Service

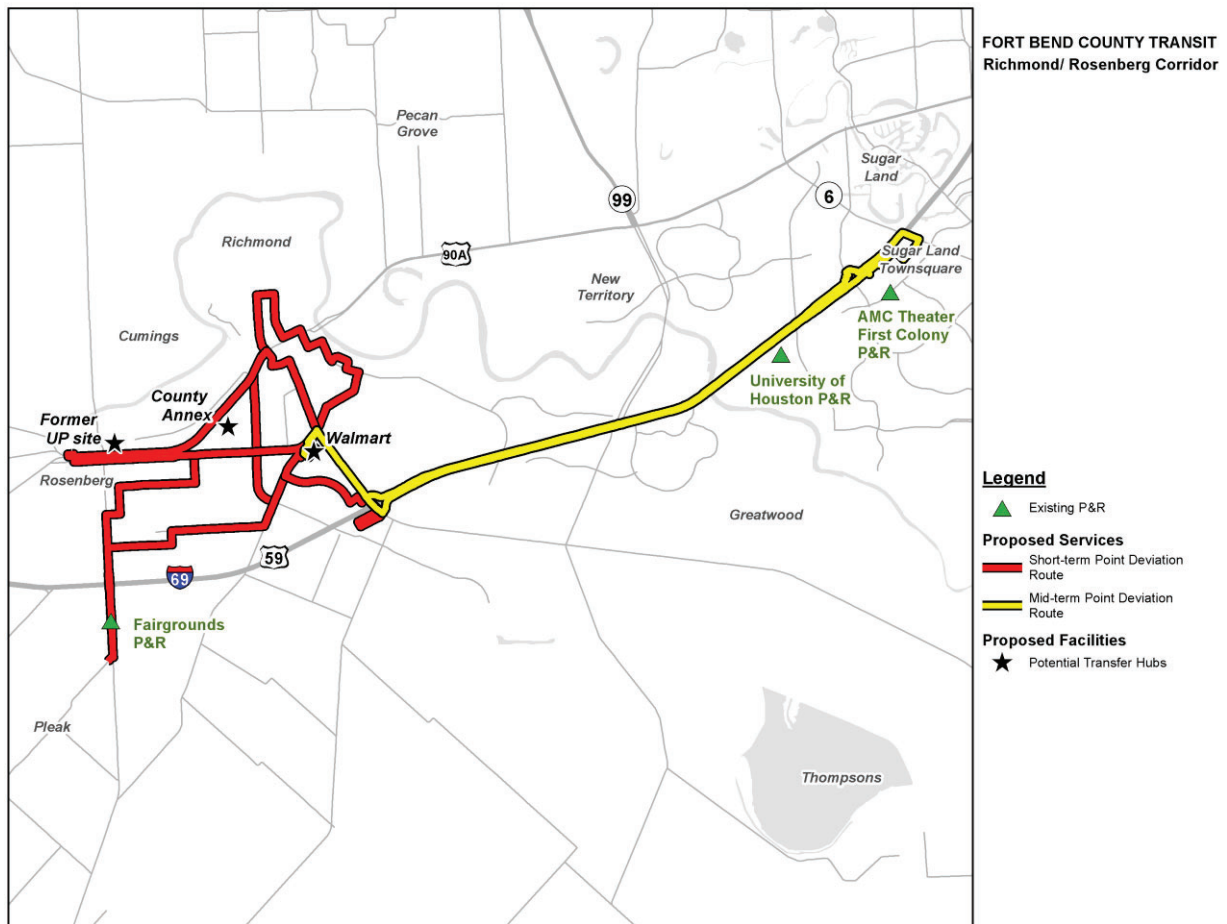
In 2015, Fort Bend County began operating a point deviation service within the cities of Richmond and Rosenberg in a response to rising demand for demand response service throughout the county and the high concentration of demand response trips in Richmond/Rosenberg area. The intended purpose of this service was to reduce the burden on the demand response service in the Richmond/Rosenberg area by shifting a portion of these demand response trips to the point deviation service. However, as detailed in the Existing Conditions Report, the point deviation routes thus far have not attracted enough ridership to generate a significant relief to the demand response service.

While the point deviation service has not reduced the number of demand response trips in the area to date, there are indicators that the service has the potential to attract a higher level of ridership. The Richmond/Rosenberg area has the population density to support the service, as well as high concentrations of populations that tend to ride transit in greater numbers than the general population, including low-income and minority populations. The Long Range Plan explored several ways that the existing point deviation routes might be improved to serve the demand response market and the potential market for riders who might be more inclined to use a transit service that does not require an advance reservation.

The existing point deviation service consists of three routes which are operated Monday through Friday from approximately 7AM to 5PM. The current system faces challenges, including:

- While the routes are interconnected, they do not share a single hub or transfer location, and each route is operated at a different frequency. All three routes have multiple patterns and are operated at frequencies that vary throughout the day.
- The largest demand response trip generators - Texana Learning Center, Caring People, Houston Catholic Charities/Mamie George Community Center, and Bud O'Shieles Community Center - are either not served by the point deviation system, or not served consistently.
- Focus is given to major destinations but less focus is given to locations where trips are likely to originate, such as large apartment buildings, low-income and public housing, and other residential areas that generate a significant number of demand response trips.
- There are a limited number of identified locations where passengers can board or alight a route without requesting a deviation.

Figure 31: Richmond/Rosenberg Service Recommendations



Proposed Services: In the short term, the Richmond/Rosenberg service is recommended to be redesigned to operate on a pulse basis, in which all routes would come together at a single transfer location on a regular basis, or every hour. This single hub pulse system facilitates transfers among routes, so that passengers can travel to any destination served by the transit system with a single transfer. It is also recommended that service hours be expanded 5 am to 9 pm to match the commuter service operating from the Fairgrounds Park & Ride.

The proposed service includes three routes which would be operated hourly from a designated hub with one bus operating on each route. The redesigned routes would ensure the four major destinations for demand response service in the Richmond/Rosenberg area are served consistently. Moreover, the redesigned routes will also directly serve locations where trips are likely to originate with permanent stop locations, rather than relying on deviations to generate more ridership. Reducing the need to deviate from the route alignment will also improve the on-time performance and reliability of the route, and potentially support the transition from a point deviation service to a fixed route system in the future.

Currently, the existing point deviation routes do not serve the Brazos Town Center on every trip. Access to the center is difficult due to ongoing construction of the FM 762 interchange with US 59. Access is further hampered by a crossing of two at-grade rail intersections, requiring a lengthy deviation. As such, it is proposed to be served on request only in the short term. Eventually, the Brazos Town Center should be added as permanent stop location.

In the medium term, it is recommended that a fourth route be implemented to provide service between the Richmond/Rosenberg area and the major destinations in and surrounding the Sugar Land Town Square. The proposed route would be operated as a point deviation, or flex service, on US 59 between the established hub at the Walmart on FM 1640 and Sugar Lakes Drive/Williams Trace Boulevard. The route would be operated hourly with two vehicles and would pulse with the other three routes at the Walmart hub.

Proposed Facilities: The Walmart on FM 1640 was selected as an ideal transfer location because it is the most centrally located major trip generator and an existing scheduled stop location with sufficient space to facilitate transfers. Furthermore, Walmart operations in other parts of the country have often been amenable to permitting transit operations on its sites, and Walmart stores have been shown in other markets to be an attractive and much-requested destination for transit users. However, other locations, such as the County Annex property near US 90A or the former UP site now owned by the City of Rosenberg, could potentially serve as a transfer hub for the future system.

Other Considerations: It is important to recognize that while the proposed US 59 to Sugar Land route will provide an important link between communities and major destinations in Fort Bend County, it will be very challenging to operate as a point deviation service. The major difficulty will be providing deviated service to areas that are within $\frac{3}{4}$ mile of the proposed alignment, but may be located far from highway interchanges or in developments that are not well connected to the surrounding development or street network. Accounting for these variable deviations will require a substantial amount of additional running time to be built into the schedule, which necessarily increases the cost of providing the service. Providing this service as a fixed route may save operating costs, however, it would also require complementary ADA paratransit, at a minimum, within $\frac{3}{4}$ mile of the route alignment. Therefore, it is likely that the fixed route service on US 59 would not actually represent a cost savings over the point deviation service, except in a longer-term scenario in which Fort Bend County might move toward providing ADA paratransit service at a larger scale (see **Figure 31**).

Richmond/Rosenberg Service Recommendation Summary: The following summary **Table 6** presents the project recommendations within the implementation timeframe discussed above as well as planning-level costs for each project.

Table 6: Richmond/Rosenberg Service Recommendation Summary

Project Type	Project Name	Year	Capital Cost	Vehicle Needs	Annual O&M Cost	
					Low	High
Local Service	Redesign Richmond/ Rosenberg Service	1 - 5		No additional vehicle needs	\$570,000	\$690,000
Local Service	Richmond/ Rosenberg Service to Sugar Land Town Center	6 - 12		2 buses	\$380,000	\$470,000

Note: High/Low operating costs based on county vs. contractor vehicle ownership. Vehicle requirements include 20 percent spare.

3.5.5 FM 1092 and SH 6 Corridors

FM 1092 is the main north-south corridor through the City of Stafford connecting SH 6 and Missouri City on the south with major regional roadways such as US 90A and US 59. To the north of the corridor is METRO's West Bellfort Park & Ride which provides frequent commuter and local bus connections as well as access to the HOV/HOT lane system on US 59. Despite its relatively short length (6.5 miles), FM 1092 plays a particularly important role as there are limited alternative north-south corridors in eastern Fort Bend County.

There are several good indications that FM 1092 and SH 6 could potentially support a regular, corridor-based service in the future. The FM 1092 corridor is bookended by two major destinations – West Bellfort Park & Ride on the north and the Riverstone Shopping Center on the south. It is also home to many businesses and other key destinations, including the Stafford Centre, Houston Community College campus, Walmart, and Stafford Community Center. Many of these places are also major generators of FBCT's demand response trips. Moreover, population density along the corridor is high relative to other areas in the county, particularly in the section between US 90A and Cartwright Road, where there are many apartment complexes and higher density residential areas.

The SH 6 corridor is a highly developed commercial corridor that extends from Missouri City to the Energy Corridor and provides connections to all the major east-west regional highways in the county. The corridor is home to many of county's top employers, largest shopping centers, and medical facilities, particularly within the segment between US 90A and FM 1092. As such, this stretch of the corridor currently generates a significant number of FBCT's demand response trips. Moreover, Sugar Land Town Square and First Colony Mall area, located on SH 6 at US 59, is the most requested destination for new service by the Long Range Plan survey respondents. METRO's Missouri City Park & Ride, operating out of a Kroger parking lot along SH 6 near Fort Bend Parkway, also generates a high number of demand response trips for those wishing to take METRO's Park & Ride service to TMC.

The Long Range Plan considered the potential for FM 1092 and SH 6 to serve as a point deviation or fixed route service corridors to reduce the demand response trips along this corridor. Despite the opportunities described above, the FM 1092 corridor presents a number of challenges to providing point deviation or fixed route service in the near future.

- The area between the West Bellfort Park & Ride and Cash Road is largely industrial and is unlikely to generate much ridership.
- Many of the largest trip generators in the corridor are not located within a short walking distance of FM 1092, but are rather connected to FM 1092 by side-streets or long driveways.
- A point deviation service would need to include scheduled deviations to reach these destinations, in addition to the on-demand deviations, which would increase the overall running time and cost of the route.
- Fixed route service would require a similar number of deviations to provide safe access to major trip generators, and rapid or limited stop service (with fewer deviations) could only be implemented in conjunction with substantial improvements to the pedestrian environment in the corridor.

The SH 6 corridor faces even greater challenges to providing a point deviation or fixed route service even within the densely-developed section of the corridor. The largest obstacle to providing fixed route service in the corridor is the nature of the road itself.

- In the most densely developed area near US 59 and the Sugar Land Town Square, the road is expanded to comprise nine lanes of traffic at major intersections, and the speed limit is 45 miles per hour.
- Some segments of the route lack safe locations for bus stops to allow passengers to board or alight along the roadway without constructing bus pull offs to remove the buses from the traffic stream.
- Most destinations along the corridor feature very large setbacks from the road, creating long and often challenging walks for passengers. Any service operating along SH 6 would need to include scheduled deviations to serve the major destinations in the corridor, which would significantly increase the running time and cost of operating the service.
- Many of the largest demand response trip generators in the corridor are not located directly on SH 6 and would require deviations that have the potential to be very time consuming due to the limited connectivity between individual developments. A point deviation service in the corridor would require a substantial amount of additional running time to account for the variable, on-demand deviations, which would increase travel times for passengers and significantly increase the cost of providing the service.
- Due to the long travel time of the route and the likely necessity for some disabled passengers to ride the route to its end and then back partway to avoid crossing SH 6, it

is unlikely that the proposed service would be time-competitive with the demand response service, particularly if there is no price differentiation between the services.

Proposed Recommendations: Given the challenges outlined here, no immediate transit service recommendations for FM 1092 and SH 6 corridors are included in the Long Range Plan. Instead, these corridors are recommended for future study to identify the appropriate strategies to address these challenges to provide effective transit service in the corridor. The study will need to consider a range of potential transit treatments including bus lanes, traffic control (e.g., transit signal priority), bus stop infrastructure, and technology strategies to provide safe and reliable service in the corridors.

4.0 FINANCIAL PLAN

This financial plan outlines the anticipated operating and capital costs associated with the Long Range Plan recommendations for FBCT. The purpose of developing a financial plan is twofold: it allows FBCT to determine how much service and how many of the recommendations can be funded giving operating constraints, and it provides FBCT with a forecast of the operating and capital funding needs necessary to support those transit services. The planning period covers the years 2017 through 2040.

4.1 Existing Conditions

To assist in the projection of the revenues and expenditures over the next 20 years, the actual financial activity at FBCT over the past three years and the projected activity for the current fiscal year were compiled and examined.

Operating and capital expenditures as well as operating and capital revenues by mode for FY 2014-FY 2017 are shown in Section 4.3. The modes and the classifications of various revenue sources follow the National Transit Database (NTD) definition. As described earlier, FBCT provides three modes of service:

- General public demand response (DR) – This service is a reservation-based, shared-ride operation wherein FBCT transports passengers from their origin to destination on small transit vehicles. Many of the trips provided under this program are provided under contract with Fort Bend County Senior Services to carry their clients to and from activities.
- Point deviation/fixed route (MB) – The service listed under MB were point deviation routes that were provided under a JARC grant (defined later). In FY 2016 this mode included three point deviation routes in Richmond and Rosenberg.
- Commuter (CB) – This service carries residents from three park & ride lots in Fort Bend County to three activity in centers in Harris County (TMC, Greenway Plaza). The projections for FY 2017 include new commuter service from the new Westpark Park & Ride lot to the Energy Corridor and potential future service to Uptown Houston, Greenway Plaza, or METRO's Mission Bend Transit Center.

4.1.1 Expenditures

FBCT's service has expanded significantly in recent years, and both operating and capital expenses have grown accordingly. In FY 2011, FBCT provided about 52,000 vehicle hours of demand-response and point deviation service and nearly 21,000 hours of commuter service. By the end of FY 2017, FBCT will provide nearly 72,000 hours of demand response and point deviation service plus over 43,000 hours of commuter service to three activity centers (Uptown, Greenway Plaza, and TMC).

As service has increased, expenses have increased as well. Total operating costs were about \$4.7 million in FY 2011, increasing to over \$9 million in the FY 2017 budget. So, over this six-year period, service increased by nearly 60 percent while operating costs increased by about 90 percent.

A growing operating budget requires increased capital investment as well - to buy and replace vehicles, build park and ride facilities, invest in technology, and other costs. In FY 2017, FBCT has budgeted over \$2 million for its capital program, its largest capital investment in many years. Most of the FY 2017 capital budget is for new and replacement buses.

Service growth has been the primary driver of budget growth at FBCT. But unit costs have risen as well because of inflation and higher growth in the higher cost service (commuter service). All of FBCT's service is provided by a private contractor through a competitive bid process. Healthy competition among local and national providers has helped contain unit costs for service, but some growth in unit costs is unavoidable. FBCT will rebid the operating contractor at the end of 2017.

4.1.2 Revenue Sources

Fort Bend County uses many revenue sources to fund its transit service. With no dedicated funding sources and in an era of declining federal support for transit, FBCT has managed to support its growing program through a creative revenue strategy, capturing funds from diverse federal, state, and local sources. Each of the revenue sources and how FBCT used it in the period FY 2014-FY 2017 is described below, along with an assessment of whether the source is likely to continue. Those years were chosen because they represent a more complete and comparable data set relative to earlier periods.

Federal Revenues

FBCT's recent sources of federal funds are discussed individually and then summarized in **Table 7**.

FTA's Section 5307 Program –The Urbanized Area Formula Grant Program is the Federal Transit Administration's (FTA) largest federal funding source for most urban transit agencies, FBCT included. It is a formula program that allocates funds to each urbanized area (UZA) in the country based on population, population density, amount of transit service provided, and other factors. METRO is the designated recipient for the Houston UZA. A portion of Fort Bend County covering more than 80 percent of the county's population is in the Houston UZA; the remainder is rural.

In general, Section 5307 grant funds cannot be used to fund operations in large UZAs (such as the Houston UZA). But the legislation has carved out some exceptions for smaller operators within large UZA, of which FBCT is one. The funds allocated to FBCT are not based on the formula; instead, FBCT negotiates with METRO each year for this funding based on its identified operating needs and capital projects. FBCT first applies as much of its Section 5307

allocation as allowed under the small operator cap to operating assistance, with any remaining allocation applied to capital needs.⁴ In 2016, in an arrangement developed through the regional planning process, FBCT could use excess operating cap allocated to Harris County Transit.

Special Rule for Operating Assistance in Large Urbanized Areas

- Transit systems in large urbanized areas (population of 200,000 or more) that operate 100 or fewer buses in fixed-route services during peak periods may use Section 5307 funds for operating within certain specifications. The Fixing America's Surface Transportation (FAST) Act expanded the eligible modes to include fixed-route and demand-responsive transit. Demand-responsive transit excludes ADA complementary paratransit.
- Transit systems operating between 76 and 100 buses in fixed-route or demand-responsive service during peak service hours may use up to 50 percent of the attributable share of funding for operating expenses.
- Transit systems operating 75 or fewer buses in fixed-route or demand-responsive service during peak service hours may use up to 75 percent of the attributable share of funding for operating expenses.

-Final FTA Circular 9030.1E

The funds allocated to each UZA area include additional amounts under a program called the Growing States and High Density States Formula Program (Section 5340), which was established by the Moving Ahead for Progress in the 21st Century (MAP-21) to apportion additional funds to the Urbanized Area Formula and Rural Area Formula programs. Recipients of funds are existing Urbanized Area (Section 5307) and Rural Area (Section 5311) formula fund recipients. With a few exceptions, Section 5340 funds may be used as Section 5307 funds or Section 5311 funds. When METRO currently calculates what it considers to be the appropriate allocation of Section 5307 funds to FBCT, it does not include any of the Section 5340 allocation for FBCT. In FY 2016, the formula allocation for Section 5340 for the Houston area was nearly \$5 million.

In FY 2016, FBCT received \$3.8 million in Section 5307 operating funds, by far the largest source of income for its operations. This figure has grown steadily over the past few years as FBCT service has grown. In addition, FBCT received about one-half million dollars in FY 2016 in Section 5307 capital funds and is slated to receive nearly \$1.4 million in FY 2017 to support the replacement of a significant number of buses. It also used some of the Section 5307 capital funds to pay for preliminary engineering for its new Westpark P&R lot.

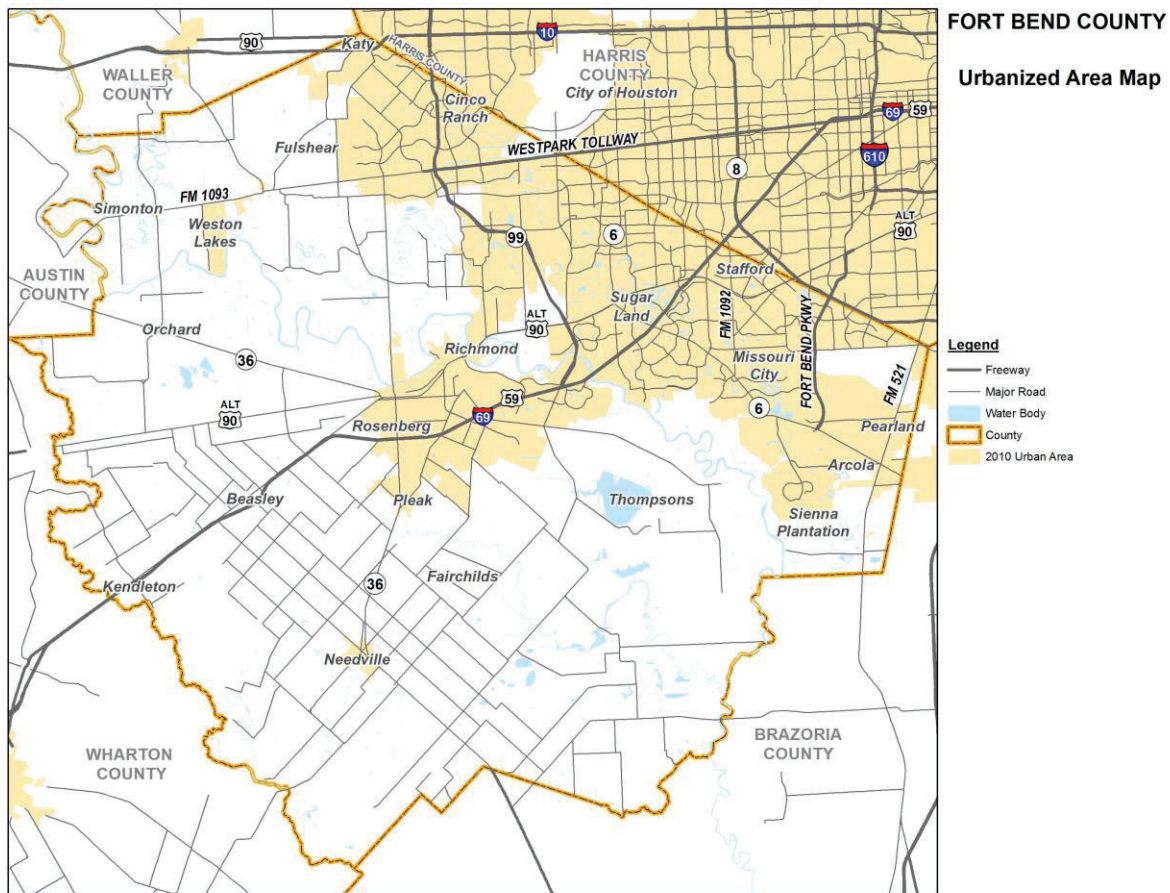
⁴ The amount available (operating cap) is calculated by dividing the UZA's apportionment by the total number of vehicle revenue hours reported in the UZA from all public operators and multiplying this quotient by the number of total vehicle revenue hours operated in the UZA by the eligible system, and then by either 50 or 75% depending on the number of buses (75 or less at 75%, 76 to 100 at 50%) operating fixed route service during peak hours.

While there are no guarantees that any federal funding for transit will continue, the Section 5307 program is the backbone of the FTA's support of local transit and will likely continue in some form into the foreseeable future. The risk to FBCT comes instead in two areas. First, it must compete for its share of the allocation with other area providers (METRO and Harris County Transit, currently), who also have significant funding needs. And second, FBCT needs operating funds and the exception that allows it to use at least some Section 5307 funds for operating support could be changed in the future. The details of how that operating cap works has changed over the last few years under intense pressure from small operators, but it could easily change again in the future.

FTA's Section 5311 Program – The Rural Area Formula Funding Grant Program is the rural counterpart to the Section 5307 Program. It provides capital (80 percent federal share), planning (80 percent federal share), and operating (50 percent federal share) assistance to support public transportation in rural areas and in cities with less than 50,000 in population. While the program is federal, the State of Texas administers the program on behalf of the FTA.

In Fort Bend County, the portion of the county that is not in the Houston UZA is considered rural. This area of the county covers over 300,000 people spread out over $\frac{3}{4}$ of the county. But the part of the county that is considered urbanized grows with each census, shrinking the area eligible for Section 5311 funds. In FY 2016 FBCT received just over \$200,000 from this program for operating assistance and almost none for capital expenditures. FBCT does, however, plan to use nearly \$700,000 in capital grants from this program in FY 2017 to support its bus replacement program.

Figure 32: Fort Bend County Urbanized Area



As with the Section 5307 program, the Section 5311 program is likely to continue in the future. FBCT's primary risk in planning on the continued use of funds from the program is in identifying eligible services. FBCT already does not use as much money from this program as it is eligible for, because so little of its service is considered rural. Currently, only 8 percent of its service (including demand response, point deviation, and commuter services) is considered rural, based on those trips that originate in the rural parts of the county. FBCT is currently examining how it categorizes trips as rural or urban to see if a different allocation methodology could allow it more use of Section 5311 funds.

But despite some help from a new rural/urban allocation scheme, the difficulty of using available Section 5311 will increase with the release of the 2020 Census figures. The portion of Fort Bend County that is considered rural will assuredly decrease, further decreasing the services eligible for funding under the program.

FTA's Section 5309/5339 Program – These two FTA programs provide funds for buses and bus facilities (Section 5339) and other major transit capital investments, such as rail and bus rapid transit systems (Section 5309). The programs are competitive rather than based on formulas.

Over the past few years, FBCT has used funding from the Section 5309 program to help pay for the development and construction of its new Westpark P&R lot and funding from the Section 5339 program (through TxDOT) to purchase buses for its rural demand-response service.

Future use of this program depends on the capital projects that FBCT plans to develop. The projects would need to be eligible and competitive with similar projects across the country.

FTA's Section 5310 Program – The Enhanced Mobility of Seniors and Individuals with Disabilities Program provides formula funds for operating assistance to meet the needs of these groups. Funds for the urban areas are allocated by the regional designated recipient (in the Houston UZA, it is METRO) and for the rural areas by the state (TxDOT).

In FY 2016, FBCT received \$1.06 million dollars through this program for operating assistance for its urban demand-response service. In general, it receives \$1.05 million per year per agreement with METRO; any amount over that would be for specific projects deemed eligible and competitive. FBCT is not currently applying for or using any rural Section 5310 funds. Since it cannot even use its allocation of Section 5311 rural funds, there is no point in applying for Section 5310 rural funds from TxDOT.

Risks for continued funding from this program for FBCT are two-fold—whether and how much the FTA continues to support this program and how the region's providers choose to allocate the funds across providers.

FTA's Section 5316 (JARC) Program - The Job Access and Reverse Commute (JARC) program was established to address the transportation needs of welfare recipients and low-income persons seeking to obtain and maintain employment. These funds may be used to cover up to 80 percent of eligible capital and planning expenditures and up to 50 percent of eligible operating expenditures.

FBCT has used funds from this program to help pay for its Richmond/Rosenberg point deviation service and two demand response routes in Sugar Land and Missouri City/Arcola; the County received over \$600,000 in operating assistance in FY 2016. The County also used the program to help pay for the buses it purchased for the JARC routes. While the program has expired, there are some unallocated funds left for the Houston region. These funds may last through FY 2018. METRO was the designated recipient for the Houston area.

Since the program has expired, FBCT cannot program for future use of these funds (other than the potential use of unallocated funds).

FTA's Section 5317 (New Freedom Program) - The New Freedom Program (Section 5317) was a formula grant program created by the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) legislation to support capital and operating costs of services and facility improvements for person with disabilities in excess of those required by the Americans with Disabilities Act (ADA). As with JARC, this program has now expired and funds designated for the Houston area have been fully allocated. METRO was the designated recipient for the Houston area.

FBCT used New Freedom funds in support of its demand-response service from FY 2014 to FY 2016. However, these funds are no longer available for use in future years.

ARRA - The American Recovery and Reinvestment Act of 2009 (ARRA) was a stimulus package passed by Congress in 2009. FBCT received nearly \$1 million in FY 2015 for new buses and related ITS equipment under an ARRA grant. This program has now expired and additional funds are not available.

CMAQ Grants – The Congestion Mitigation and Air Quality (CMAQ) program provides funds to areas in nonattainment for ozone, carbon monoxide, or particulate matter. Funds can be used for any transit expenditures if they have an air quality benefit. H-GAC is the designated recipient for the Houston non-attainment area and apportions the funds based on a competitive call for projects.

FBCT is currently receiving CMAQ funds to help pay the operating costs of the recent expansion of its TMC commuter bus service. The funds will last three years (FY 2016-FY 2018). FBCT also used about \$100,000 in FY 2015 from CMAQ to help pay for the development of its new Westpark Park & Ride lot. It also has an agreement in place for use of CMAQ funds to help pay for the first three years of operation of the new Westpark/Energy Corridor commuter service.

The CMAQ program is active. Whether FBCT gets additional CMAQ funds is a function of it identifying projects that have demonstrable air quality benefits that compete well against other projects in the Houston region. In general, CMAQ funds can be used for a given project for only up to three years, so the program cannot be a source of long term funding for established service. CMAQ funding can be extended if new service is added, including new stops or route extensions.

Table 7: Recent Federal Funding Sources for FBCT

Program	FY 2016 Revenues	Urban/Rural	Operating/ Capital	Risk as Funding Source
Section 5307	\$4,229,706	Urban	Both	Limitation on use for operating; competition for funds with other area providers
Section 5311	\$209,760	Rural	Both	Declining applicability as rural parts of the County shrink
Section 5309/5339	\$0	Both	Both	Need eligible, nationally competitive projects
Section 5310	\$1,060,213	Urban	Operating	Competition for funds with other area providers
Section 5316 (JARC)	\$618,824	Both	Both	Program has expired; limited unallocated funds remain in region
Section 5317 (New Freedom)	\$105,896	Both	Operating	Program has expired; no unallocated funds remain in region
ARRA	\$0	Both	Capital	Program has expired
CMAQ	\$58,760	Both (in non-attainment area)	Both	Need eligible, regionally competitive projects; operating assistance capped at three years per project
Total	\$6,283,159			

State Revenues

FBCT's recent sources of State funds are discussed individually and then summarized in **Table 8**.

Section 5311 Matching Program – TxDOT provides matching funds for the federal Section 5311 rural program. FBCT's ability to use this program is, therefore, contingent on its ability to use federal Section 5311 funds.

TCEQ Grants – The Texas Commission on Environmental Quality (TCEQ) provides grant funds to non-attainment areas for projects and programs that improve air quality. H-GAC manages the program for the Houston non-attainment area, including its Commute Solutions program. FBCT uses TCEQ funds as match for Section 5307 operating funds for certain commuter services. This program does not have an expiration date, and the funds can be used for an indefinite period on a service.

FBCT currently uses these funds to support TMC service that was funded through a CMAQ grant of about \$100,000 in FY 2016. TCEQ funds can be used for any new commuter services but not for existing services. FBCT plans to use TCEQ funds to help pay for its new services at the Westpark P&R lot.

This program may be a source of at least some additional local funding for FBCT as it expands its commuter service and other services that could reduce air pollution by removing cars from the road. It is a competitive program, and funding availability would be subject to the other projects and services competing for the funds.

Transportation Development Credits (TDCs) - Use of TDCs is a financing tool where the federal government credits states for local and state investment in toll projects. TDCs are earned when local and state funds are used to develop, construct, implement, improve, or maintain toll facilities. TDCs are a credit, not cash, so a federal project that uses TDCs to substitute a cash match effectively becomes 100 percent federally funded. TDCs in Texas are awarded by TxDOT, so they are included here under State revenues. In general, TxDOT looks to award TDCs to maximize the use of available federal funds, particularly in situations in which federal funds otherwise would be unused because of the inability to provide the non-federal share, and to support public transit.

Since 2006, Texas public transit providers have received TDCs to match federal public transit program funding including: Section 5307 Urbanized Area Public Transportation, Section 5311 Other Than Urbanized Area Public Transportation, Section 5310 Special Needs of Elderly Individuals and Individuals with Disabilities, and Section 5316 Job Access Reverse Commute FTA funding programs. TDCs have been heavily used to fund replacement of depreciated rolling stock. TDCs have also been used to expand fleets, to operate ongoing JARC projects, to build new transit facilities, for information technology investments, for preventive maintenance, to purchase service, for fuel and for other equipment.

Table 8: Recent State Funding Sources for FBCT

Program	FY 2016 Revenues	Urban/Rural	Operating/Capital	Risk as Funding Source
Section 5311 Matching	\$95,095	Rural	Both	Declining applicability as rural parts of the County shrink
TCEQ	\$212,466	Both (in non-attainment area)	Operating	Need eligible, regionally competitive projects
TDCs		Both	Both	
Total	\$307,561			

Local Revenues

FBCT's recent sources of local funds are discussed individually and then summarized in **Table 9**.

George Foundation – The George Foundation is a private foundation based in Richmond, Fort Bend County (Richmond). The George Foundation is currently a funding partner on the point deviation service in Richmond and Rosenberg. It is currently providing about \$22,000 annually to help defray operating expenses for the service. FBCT expects that the grant will likely last for three years, but is not likely to be renewed after that initial period.

Local Government (and Contract) Contributions – FBCT has several local funding partners—public and private—as follows:

- City of Richmond - \$75,000 annually in support of the Richmond/Rosenberg point deviation service
- City of Rosenberg - \$75,000 annually in support of the Richmond/Rosenberg point deviation service
- City of Sugar Land - \$70,000 annually in support of public transportation in general (no restrictions) but their primary interest is in supporting the commuter services from Sugar Land
- Catholic Charities - \$35,000 for service for their clients through FBCT's demand-response service
- Lakewood Church - \$18,000 annually in support of the commuter services that stop at its campus in Greenway Plaza
- Fort Bend County Seniors - \$118,000 annually for demand-response service for their clients
- Fort Bend County General Fund – The amount provided annually is negotiated each year as FBCT develops its budget. The funds from the County are, in essence, the funds of last resort—whatever expenses are not covered by other sources must come from the County. As such, the amount contributed varies widely as grant funds ebb and flow.

George Foundation

The George Foundation invests in Fort Bend County, Texas to enhance our community and the quality of life of those in need. Through grants to local nonprofits and scholarship opportunities for aspiring local students, the Foundation strives to positively impact the lives of our neighbors.

-www.thegeorgefoundation.org

The contributions of the cities of Richmond and Rosenberg are contingent on the continuation of the services in those cities and the annual budget process at the cities. The contribution by the City of Sugar Land has been in place for many years and is less dependent on the provision of a particular service, but the amount is still subject to the City's annual budget process. Predicting the amounts provided by not-for-profit organizations such as Catholic Charities and Lakewood Church is even harder. These contributions are provided annually and subject to change or elimination at any time.

Fares – FBCT charges fares to the public for the use of its services. Its demand response and point deviation services cost \$1.00 per one way trip. Its commuter fares vary based on destination and range from \$1.00 per trip to the nearby METRO Park & Ride lot, to \$2.25 per trip to Greenway Plaza and the Galleria, and \$3.50 per trip to the TMC. In FY 2016, FBCT collected about \$775,000 in fares, almost all of which came from its commuter services.

It is not likely that fares will ever become a primary source of operating funds for FBCT. But it can increase its fare revenues through implementation of a new fare policy, as proposed in a study for FBCT in 2015 by the Texas A&M Transportation Institute (refer to **Appendix D1**).

Other – The only funding source that does not fit in any of the above categories is a small amount of interest income (less than \$10,000) generated from TCEQ funds provided to FBCT for its commuter service. The funds were received by the County before they were used for the service, generating interest income in FY 2015. The funds have now been expended.

Table 9: Recent Local Funding Sources for FBCT

Program	FY 2016 Revenues	Urban/Rural	Operating/ Capital	Risk as Funding Source
George Foundation	\$22,518	Urban	Operating	Limited period grant; unlikely to be renewed after three-year term
City of Richmond	\$75,000	Urban	Operating	Tied to the provision of certain service and subject to annual City budget
City of Rosenberg	\$75,000	Urban	Operating	Tied to the provision of certain service and subject to annual City budget
City of Sugarland	\$70,000	Urban	Operating	Subject to annual City budget
Catholic Charities	\$35,000	Both	Operating	Subject to annual agreement
Lakewood Church	\$18,000	Urban	Operating	Tied to the provision of stop on certain service and subject to annual agreement
Fort Bend County Seniors	\$118,000	Both	Operating	Subject to annual County budget
Fort Bend County General Fund	\$0	Both	Both	Varies widely from year to year based on inflow of other revenue sources; subject to annual County budget
Fares	\$773,722	Both	Operating	Subject to ridership and fare policy
Total	\$1,187,240			

4.2 Financial Capacity

Fort Bend County Transit needs to understand its available revenues and anticipated expenditures over the life of the Long Range Plan. In the first five years, it is important to ensure that expenditures can be met with reasonably anticipated revenues. In short, FBCT must be able to pay for the services it offers. Since the county is the stop-gap revenue resource for expenses incurred by public transportation, the Long Range Plan must present a fiscally responsible program of capital projects and services.

To determine the County's fiscal capacity to support public transportation services, three scenarios were developed. Each of the scenarios is financially constrained in the first five years (2018-2022), meaning that revenues are sufficient to cover expenses. No new revenue sources are applied in any of the scenarios. Fare box revenue is anticipated to increase in all of them. Detailed assumptions for each of the scenarios is provided in **Appendix D**.

Scenario 1 – Status Quo: operating expenses increase with inflation, no growth in bus fleet

Scenario 1 represents the worst-case scenario in terms of FBCT's ability to provide new services. It assumes that transit operating costs grow with inflation but most revenue sources are flat. Aside from committed improvements, such as the new administration and maintenance facility, no new capital or service projects are undertaken.

Scenario 2 – Modest Growth: operating expenses increase with inflation and population, bus fleet grows with population

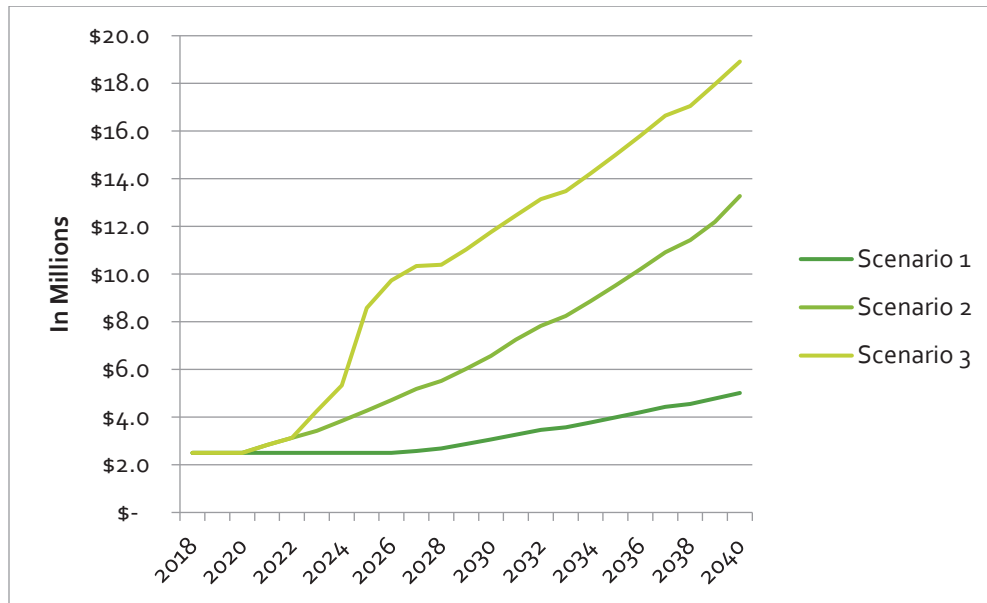
Scenario 2 is much more representative of FBCT's current approach to funding new services. It assumes that new services can be added as revenues increase based on inflation plus growth in population in the county. Scenario 2 includes specific new capital and operating projects identified as financially feasible in the five-year planning horizon. This recommended program of projects is included later in this chapter in **Table 10**. After 2022, the scenario does not specifically identify new capital or operating projects, but assumes that they will be added as funding becomes available.

Scenario 3 – More Aggressive Growth: Demand Response operating expenses increase with inflation and population, Demand Response bus fleet grows with population; Point Deviation and Commuter bus operating expenses grow with inflation and specific projects through 2029, grow by inflation and population thereafter; and, Point Deviation and Commuter bus fleet grows with projects and by population thereafter

Scenario 3 is the most aggressive of the three scenarios. It assumes that several project recommendations from the Long Range Plan will be implemented and that revenues will grow with inflation and population. The first five years of the plan are the same for Scenario 3 as for Scenario 2. More projects beyond those in Scenario 2 are then included from 2023 through 2029.

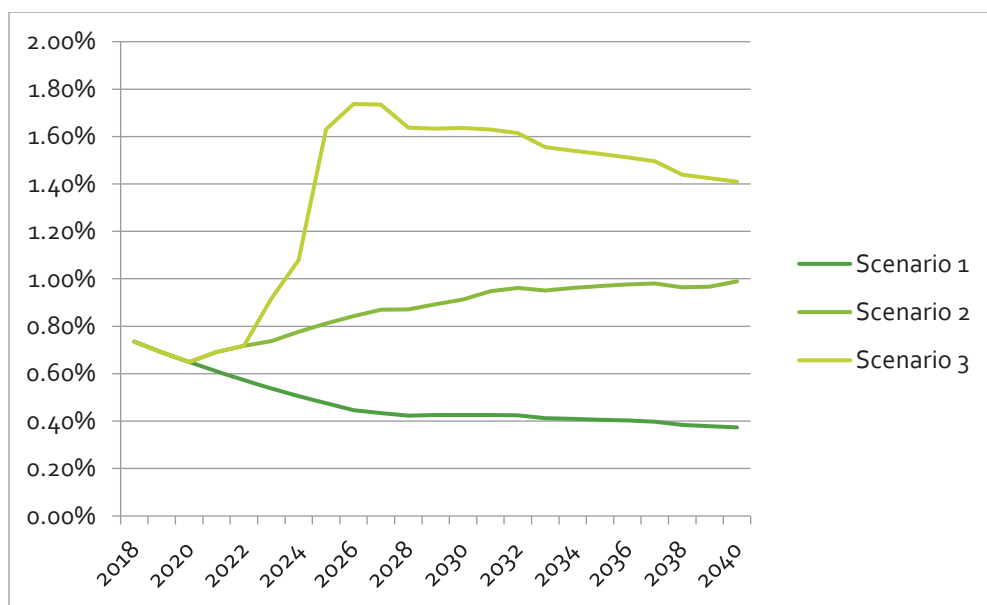
Figure 33 demonstrates the contribution from the county's general revenues for each scenario by 2040. **Figure 34** demonstrates the impact of each scenario on the county's budget through the year 2040.

Figure 33: Potential County Contribution, 2018-2040



By 2022 (five-year time horizon), the County contribution needed for Scenario 1 and 2 is \$2.5 million compared to \$3.1 million for Scenario 3. By 2040 (long range time horizon), the County contribution needed for Scenario 1 is \$5.0 million compared to \$11.4 million for Scenario 2 and \$18.9 million for Scenario 3.

Figure 34: County Contribution as a Percentage of County Budget



Scenario 1 results in a declining contribution to public transit as a percentage of the projected County budget. Scenario 2 results in an increased contribution to public transit as a percentage of the projected County budget, but the percentage remains under 1 percent. The contribution to public transit as a percentage of the County budget for Scenario 3 peaks at about 1.7 percent but declines to about 1.4 percent by 2040.

Based on conversations with county officials, Scenario 2 was chosen as the reasonable and likely scenario to use as the basis for the Long Range Plan.

4.3 Anticipated Revenue and Expenditures

Using the assumptions incorporated into Scenario 2, revenues and expenditures for the period 2018 through 2040 were calculated. It is important to note that the projections described in this section are based on conditions observed today. By the year 2040, many of the factors that impact revenue and expenditures may change.

Revenues

Total revenues for the period from 2018 to 2040 are projected at \$242.5 million. Of that amount, \$170.6 million is operating revenue (70 percent) and \$71.8 million (30 percent) is capital revenue (**Figure 35**).

Figure 35: Total Revenues by Type of Expenditure, 2018 -2040

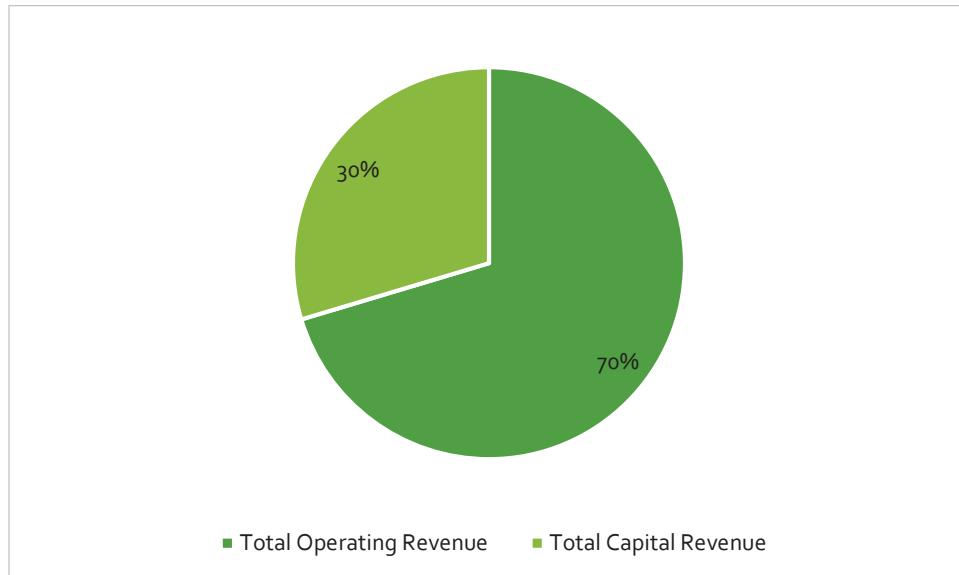
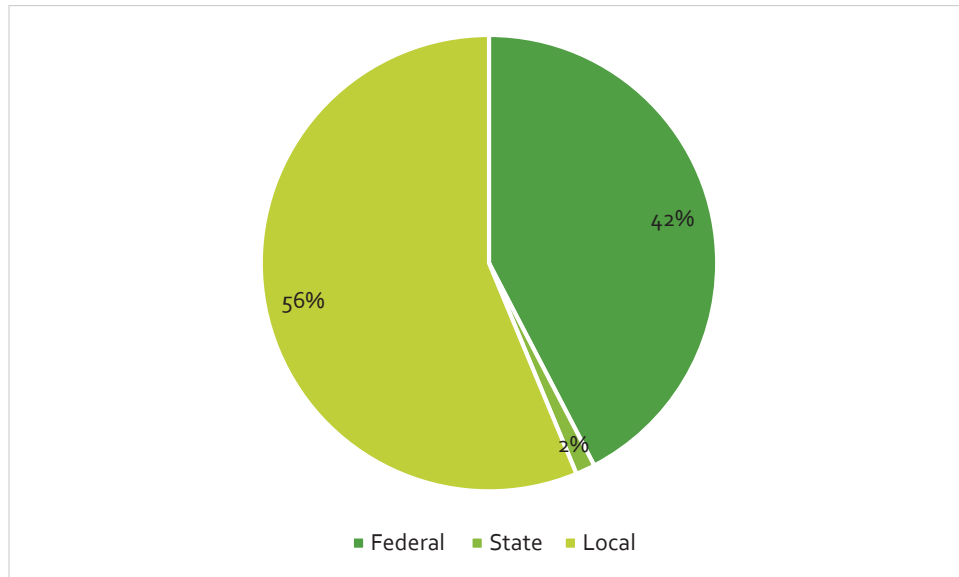
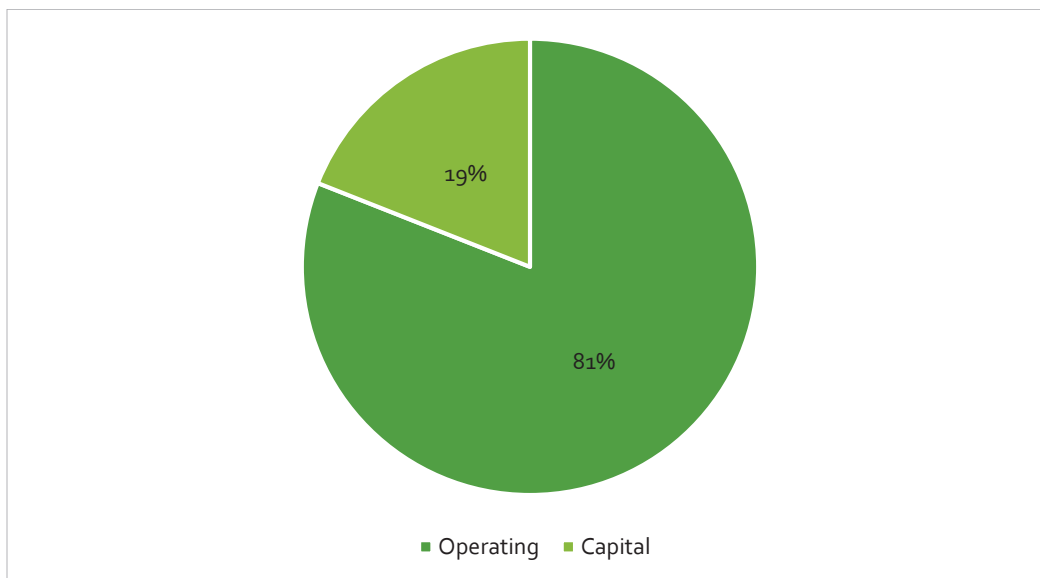


Figure 36 shows the projected revenue by source. The local share, \$242.5 million, represents close to 60 percent of all revenue. Local revenue consists of contributions from the County, cities within Fort Bend County and not-for-profit organizations.

Figure 36: Total Revenues by Source, 2018-2040

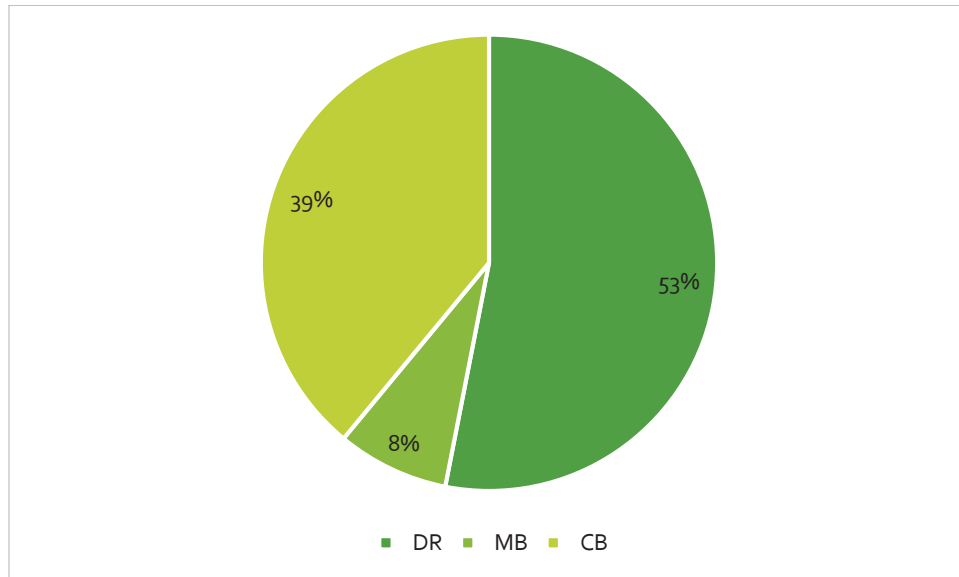
Expenditures

Scenario 2 projects total expenditures for operating and capital at close to \$378 million through 2040, averaging \$16 million annually over the period. Of that amount, \$306 million (81 percent) is attributed to operating expenses and \$72 million in capital expenses as shown in **Figure 37**.

Figure 37: Projected Expenditures, 2018 - 2040

Demand response service accounts for more than half of the operating expenses over the period (see **Figure 38**). The total projected expenditure for demand response service, including contracted services, is projected to be more than \$162 million. Scenario 2 assumes that the demand response service will continue to operate as it does today. Future policy changes may limit the number of people eligible for the service, but that is likely to be offset by increased demand due to increases in population.

Figure 38: Operating Expenses by Type of Service, 2018-2040



4.4 Fiscal Constraint

The Long Range Plan is fiscally constrained for the first five years (**Figure 39**). That is, revenues do not exceed expenditures in years 2018 through 2022. Fiscal constraint allows Fort Bend County to develop the project recommendations for the first five years using reasonably anticipated revenue sources, including about \$2.5 million annually from the County's general revenues. **Table 10** shows the projects contained in the first five years of the plan that could be constructed and operated with current funding sources, including new service to the Energy Corridor. A detailed summary of the recommended projects is provided in **Appendix E**. The Plan is unconstrained in the following years due to the level of uncertainty surrounding funding sources. The plan should be updated within the next five years to reassess the assumptions for financial capacity and constraint.

Figure 39: Total Revenue and Expenditures for First 5 Years, 2018-2022

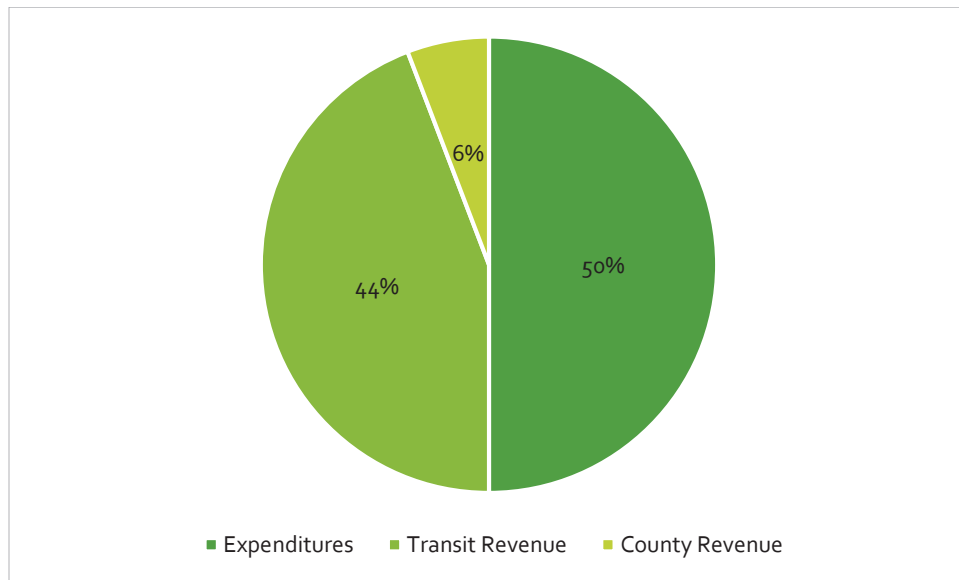


Table 10: Recommended Program of Projects, 2018 – 2022

	Project Type	Project Name
Communicate	Communication	New website and marketing/education materials
	Communication	Signage and wayfinding
Optimize	Local Service	Redesign Richmond/Rosenberg Point Deviation Service
	Commuter Service	Redesign and optimize commuter service
Grow	Commuter Service	Westpark P&R to Energy Corridor Commuter Service
	Facility - ROW	Land acquisition for Sugar Land P&R Lot
	Facility - ROW	Land acquisition for Fort Bend Toll/FM 521 P&R Lot
	Facility - ROW	Land acquisition for Fulshear P&R Lot

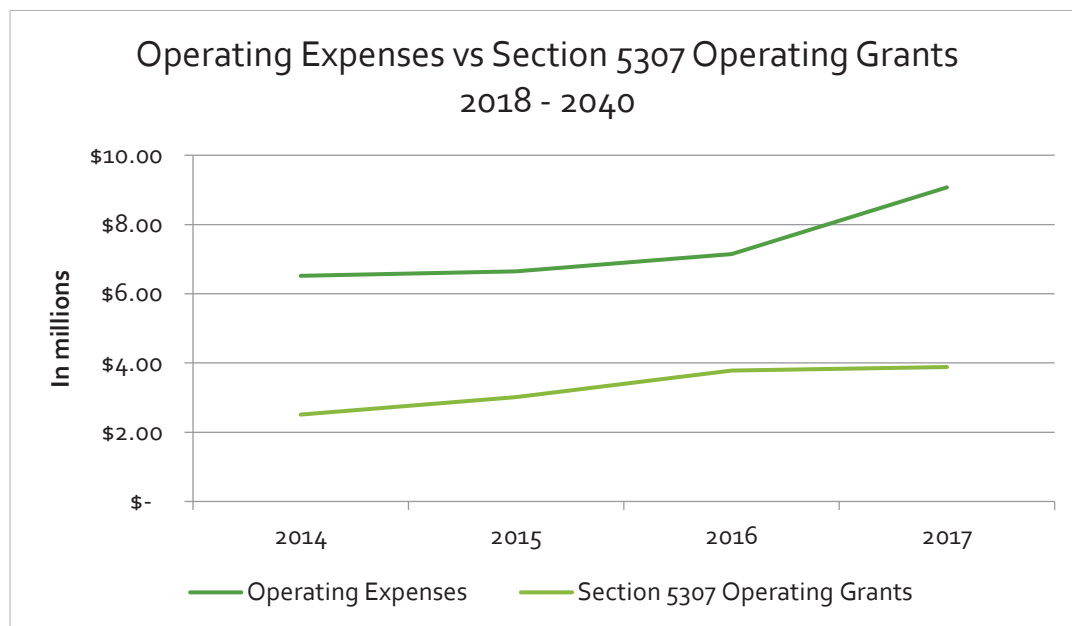
4.5 Summary of Findings

Fort Bend County's public transportation services have grown significantly since 2005 due to the commitment of the County to provide transportation serves for its growing population. The next twenty years will be a period of continued population growth for the County, bringing with it increased demand for public transportation. The most urgent issues for the County are

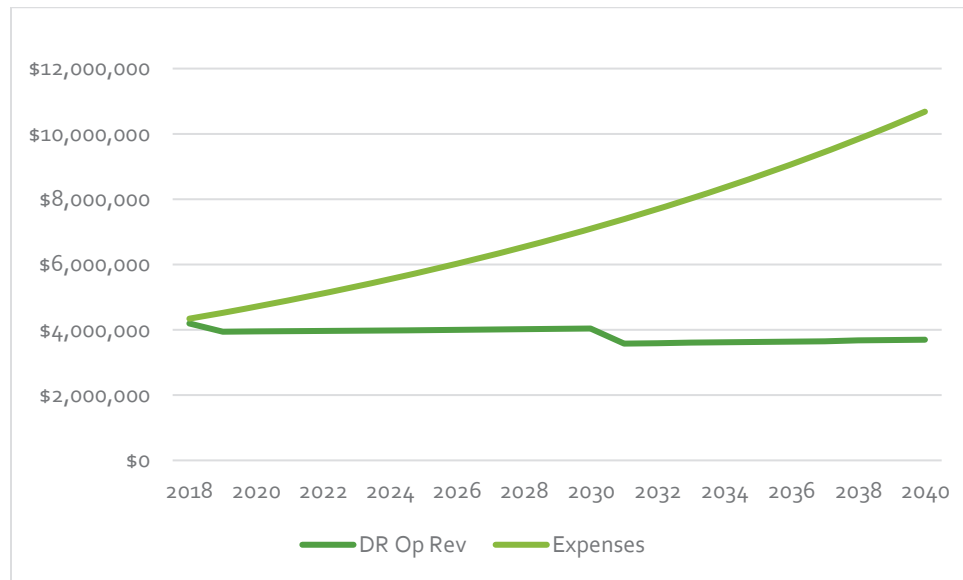
the increasing costs for delivery of demand response service and the urbanization of the County that threatens eligibility for federal operating assistance.

Each of the scenarios assumes that revenues for operations are flat due to the operating cap limitation described earlier and the decreasing proportion of rural area in the county. Without additional revenues, it will be increasingly difficult for transit services and coverage to keep pace with the county's population growth. **Figure 40** shows the trend in operating revenues since 2014.

Figure 40: Recent Trend in Operating Expenses and Federal Revenues



Demand response service that represents FBCT's most costly service per boarding (**Figure 41**). The county is exploring policy changes that may limit the growth in demand but would be unlikely to reduce the overall demand. As the county continues to grow, so will the number of people with special needs, including those without access to other means of transportation. The Richmond-Rosenberg service provides a good opportunity to see if some of the demand service could operate more like fixed route service that would replace the demand response service in the area.

Figure 41: Demand Response Expenses and Revenues, 2018-2040

The assumptions included in this report regarding the FBCT's financial capacity should be revisited within the next five years to see if they remain valid.

5.0 CONCLUSIONS

FBCT has seen rapid growth in demand for its services in recent years. It has responded with new and expanded services as fast as its revenue sources would allow. Continued growth in service will be a function of whether FBCT can continue to find funding to pay for the services. Federal funds are limited for the Houston UZA (in which much of Fort Bend County's services operate) and it has no dedicated funding source to provide local match for federal and state grants.

5.1 Risks/Challenges with Existing Funding Structure

Since its creation in 2005, FBCT has done a remarkable job of delivering transit services to the county. It has been creative and determined in accessing all available revenue sources and forging local partnerships to fund the current services. FBCT will continue to pursue those opportunities, but in the absence of a dedicated local funding source, securing the necessary funding to expand and enhance service will continue to be a primary challenge.

The most consequential challenge to FBCT may be federal funding legislation referred to as the Special Rule, created under MAP-21 Act, and continued (with some modifications) under the FAST Act, signed into law in 2015. As shown by the financial scenario analysis, the Special Rule operating cap is one of the most significant risks to the ability of FBCT to continue to develop and deliver new services. In the absence of Section 5307 operating funds, FBCT would struggle to meet its operating costs. The most likely replacement for the federal funds would be county general revenues.

5.2 Considerations for Moving Forward

As FBCT moves into its second decade of service, several issues will need to be addressed as it continues to expand services for county residents. Those include:

5.2.1 Technological Changes

One of the biggest unknowns for transit agencies today is how future technology will impact the demand and delivery of transit services. Much attention is directed at autonomous vehicles and their potential to provide more flexible, lower cost options for providers and users as well as opportunities to improve first and last mile connectivity. **Appendix F** explores a variety of technological innovations that may impact the delivery of transit services in the future.

5.2.3 Fixed Route Service and Complementary Paratransit

Federal guidelines require the provision of paratransit service for persons with disabilities who are unable to use fixed route service. Service must be provided within 3/4 mile on either side of a fixed transit line during all hours the fixed route service is provided. While this plan does

not recommend fixed route local service in the next twenty years, as transit demand grows, FBCT's ability to provide fixed route service may be limited by the additional expense of providing complementary paratransit service.

5.2.4 Coordinating Agency Partner Roles and Responsibilities

The reality of FBCT and metropolitan areas throughout the country is that jurisdictional boundaries and institutional requirements exist, and that issues, priorities, capabilities, and responses vary by agency and area. In terms of regional connectivity, the result of this reality is often inconvenience at best, and barriers to implementation at worst. There are seven public transit providers in the Houston region. While each provider is responsible for services within its service area, as population and employment grow, overlap in services will become increasingly common.

In 2016, the H-GAC held a transit symposium billed as "The Power of Transit." Some of the key recommendations from that symposium include the following ideas:

- Establish a One Call/One Click system for regional transportation information, coordination and reservations
- Develop a regional coordinated fare structure
- Utilize advances in technology to improve communication and access to information
- Set up transit information booths (or kiosks) for transit related information in multiple languages
- Coordinate transportation infrastructure improvements to include wheelchair and pedestrian access where feasible
- Encourage regional partnerships and collaboration between public and private entities
- Replicate best practices by expanding local transit success stories
- Coordinate strategic transportation planning activities to include multiple disciplines
- Focus on strategies to improve access to and from higher capacity transit corridors.⁵

As regional transit demand by all sectors of the population continues to grow, the recommendations from the symposium will be warranted to provide optimal transportation infrastructure and service across the Houston region. To move the recommendations and strategies forward, collaboration among agencies will be essential.

⁵ *Gulf Coast Regionally Coordinated Transit Plan Update, Final Report, Houston-Galveston Area Council, August 2017.*