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### Appendix A: Survey Analysis by Age Cohort

### Appendix B: Streetlight Data Results
Chapter 1: Introduction

New Braunfels and the Alamo Metropolitan Planning Organization requested consultant assistance to assess the viability of public transit, and ultimately to develop a plan for effective transit services within New Braunfels and to major commuter destinations along the I-35 corridor and also to Seguin.

New Braunfels: A Growing City

New Braunfels has a population of nearly 71,000 people and is one of the fastest growing cities in the Alamo region. It is located approximately 35 miles northeast of San Antonio. Growth projections anticipate that New Braunfels will have a population of nearly 110,000 by 2040. The city is within the I-35 corridor from Austin to San Antonio. It is one of the larger outlying cities in the corridor, yet it is the only city of over 40,000 (population) between San Antonio and Dallas that does not have a fixed route public transit system.

The city encompasses 45 square miles and is a local and regional visitor destination with attractions including downtown, Landa Park, Historic Gruene, the Faust Street Bridge and water activities focused on the Schlitterbahn Waterpark and floating on the Comal and Guadalupe Rivers. Further, the city has a number of out-of-season festivals including Wurstfest in November. These destinations call for a public transportation system that is flexible and can meet peak seasonal needs. These tourist-based services are also potential candidates for sponsorship programs as a source of local revenue.

New Braunfels is a growing city that is far from homogenous: part old city of New Braunfels and part new suburban development, both requiring specific approaches to addressing transit. With its population and tourism growth, it is crucial for the city’s transportation system to grow to meet the needs of its residents and visitors.

A Realistic Approach to Transit Planning in Suburban and Small Urban Areas

Suburban and small urban transit, while on the face may seem similar to larger urban transit, in reality are considerably different. Differences include unique service planning, standards and parameters, different service designs, and at times a need to be truly innovative; all hallmarks of successful small urban transit.
The challenges of suburban and small urban transit are many. Yet at the same time cities such as San Marcos, Round Rock and Georgetown have all managed to implement fixed route service. The greatest challenges moving forward will be in reaching an agreement related to funding service; producing a service design that will be successful and ensuring that service can be developed quickly as the city is growing at a rate of about 4% per year.

Regional Service

In addition to the service in the City of New Braunfels, the study team also reviewed potential service on the I-35 corridor from San Antonio to Austin and to Seguin. These services will require the cooperation and contribution from multiple governmental entities.

The Service Plan

This transit service plan includes seven chapters. In addition to the introduction the chapters include:

- **Chapter 2: Study Goals and Objectives** – This chapter formulates the goals, objectives and key issues which guided the planning process.

- **Chapter 3: Detailed Findings of the Outreach Efforts** – There was extensive outreach with direct contact with hundreds of residents, surveys, focus groups and many one-on-one meetings.

- **Chapter 4: Review of Existing Services** – The existing service funded by New Braunfels is reviewed as well as the services provided by private entities for specific purposes typically related to tourism.

- **Chapter 5: Demographics, Land Uses and Travel Patterns** – The city’s origins and destinations are detailed and coupled with travel patterns.

- **Chapter 6: Unmet Needs and Potential Travel Demand** – Based on the review of existing services and the demographic/land uses chapter, the study team determined the unmet need.

- **Chapter 7: Strategies for Implementing Public Transit in New Braunfels** – This final chapter discusses in detail the potential options for the city, now and in the future.
Chapter 2: Study Goals and Objectives

Based on the input received during the public input stage where the study team met with stakeholders, conducted meetings, focus groups and surveys, a consensus was reached on the direction of the study.

First, the consultant team would like to point out the overarching goal for this study:

**The Overarching Goal for Transit**

For each of our projects we have one overarching objective which we believe is shared by all of our clients:

*Help provide for more trips for more people while providing cost effective, high quality, and safe transportation for our community.*

This goal attempts to maximize ridership, with an emphasis on local residents, while at the same time ensuring the service is one that the City of New Braunfels can be proud to have.

The study goals and objectives follow, with further refinement of objectives in the third section – Key Themes.

**Study Goals**

The study goals relate to the New Braunfels area and includes both local service as well as regional service to Seguin and San Antonio.

1. **Determine the feasibility of a fixed route public transit system in the New Braunfels Area**

- Conduct extensive outreach and engage all level of stakeholders.
- Conduct a detailed analysis of existing conditions both within New Braunfels and connecting to both Seguin and San Antonio.
- Detail the needs and potential for transit both for local and regional service.
Chapter 2: Study Goals and Objectives

**Key Themes**

- **Flexible Plan** – The use of microtransit allows for greater flexibility for the service and allows the future planners to see where origins and destinations are in planning new fixed routes.

- **Local Needs** - The focus of this planning process is on local residents, while at the same time generating visitor ridership and reducing traffic in town.

- **Support from All Jurisdictions** - Each jurisdiction should support the service or not receive service.

---

**Develop an organizational, operational and financial plan that will ensure safe, effective and sustainable transit.**

- Meets the needs of the local community
- Looks at service between New Braunfels and both Seguin and San Antonio
- Supports local businesses
- Support the private sector transportation services - no competition.
- Develop a range of organizational, service and financial strategies for selection by the study committee.
- These strategies should start with a status quo level of service and end with the full level of service that could be provided to maximize ridership.
- Review sustainability options

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**Develop an implementation plan for the strategies selected.**

- Marketing and Branding
- Start-up issues and needs
Bus Stops, Bicycles and Pedestrians – All bus riders are either pedestrians or bike riders and all stops should be accessible. Buses should have bike racks.

Ensure Seamless Connectivity of Service Modes- Passengers do not care about boundaries, all modes and providers should act as one network.

Building Ridership – As with any business it takes a few years to build ridership. Marketing, quality service and a proper fare structure build ridership.

Sponsorships and Partnerships – Businesses benefit from transit. There are a variety of public/private partnerships that can be developed.

Marketing – Marketing efforts need to encompass the wide range of potential riders and businesses.
Chapter 3: Detailed Findings of the Outreach Efforts

Introduction

This chapter details the findings of the outreach efforts for the New Braunfels Transit Study. As part of this study the project team and its partners have conducted a wide variety of outreach activities to better understand the mobility and transportation needs of the community and gauge their level of interest in the expansion of public transit services in New Braunfels. Outreach activities included:

- **Public meetings and open houses** – Public meetings included interactive mapping exercises, and survey distributions and provided ample opportunity for community members to provide feedback on mobility needs.

- **Focus groups** – The project team conducted two focus groups, one for human service groups and one for business groups. These groups provided excellent information on transportation needs in New Braunfels.

- **Individual interviews** – The project team interviewed several stakeholders, project committee members, transit riders, and community members to gain insight on the mobility issues facing the New Braunfels area.

- **Web Sites and social media** – The study team and the project partners helped develop a transit specific web page to relay information on project activities including work progress, links to online surveys, and locations and times of meetings. The project team also worked with partners to relay information on social media and monitored social media chatter regarding the project on sites like Facebook and Nextdoor.

- **Surveys** – This project included a significant survey effort with surveys for the general public, transit riders, human service representatives, and businesses. Surveys were distributed online and via hard copy to community organizations.

This chapter is broken into the following sections:

- **Outreach Activities** – describes the outreach events held and an account of those who participated.
• **Outreach Summary** – details the input received throughout the outreach effort, and is organized by theme.

• **Survey Results** – details the results of the survey effort.

# Outreach Activities

This section details the various activities conducted as part of the outreach effort including the public open houses, focus groups and interviews. A summary of the input received is in the Outreach Summary section.

## Open House Public Meetings and Intercepts

Two open house meetings were held as part of the outreach effort. In addition to the open house meetings, there were also two meetings where the consultants met with residents at a booth at two different farmer’s markets. These meetings and intercepts included several displays of local and regional transportation information and activities designed to solicit substantive input from participants. Maps of existing transit services, major destinations and regional services were displayed along with links to surveys and maps presented so that participants could use stickers and markers to identify major nodes and corridors of need in the community. Meetings were held on:

- Wednesday October 16, 2019 from 11:00 a.m. to 1:00 p.m. at the Comal County Senior Citizens Foundation
- Saturday October 26, from 9:00 a.m. to 1:00 p.m. at the New Braunfels Farmers Market
- Wednesday October 30, from 3:00 p.m. to 7:00 p.m. at the Freiheit Village Farmers Market.
- Thursday November 7, from 10:00 a.m. to 1:00 p.m. at the Westside Community Center

In total over 200 individuals participated in the open house and intercept events including senior citizens, residents with limited English proficiency, current transit users, local business owners, visitors and the general public. Overall, the attitude of participants towards an increase in transit services in New Braunfels was positive and almost every participant supported the idea of fixed route service of some kind in the area.
Comal County Senior Citizens Foundation

At the open house at the senior center, participants included mostly people over the age of 65 and veterans. Approximately 50 individuals attended the meeting (including patrons and staff). The input received revolved mostly around service for seniors and included:

- There was a desire to see improved access to the Comal County Senior Citizens Foundation.
- Current service takes advanced scheduling and is unavailable on the weekends. Participants noted that regularly scheduled service that did not require advanced scheduling was preferable for fully ambulatory persons.
- There will be a need for reliable ADA complementary paratransit for those residents that cannot get to a bus stop.
- A fixed route along Elliot Knox Boulevard was suggested.
- Many seniors and lower income residents live in the Landa Apartments and this location could use improved transportation access.
- A desire for connection to the Greyhound station in San Antonio was expressed in addition for the need for regional connections to San Antonio in general.
- Weekend service for access to shopping is needed.
- A $1 fare was deemed appropriate for local service.
- A desire to see a functional fixed route system with sensible route alignment and timed connections between routes was articulated.

New Braunfels Farmers Market

This was an expanded farmer’s market event with additional vendors and a Dia de los Muertos celebration. The transit booth was set up near the DownTowner Restaurant and was visible to all pedestrians along Castell Avenue. 64 individuals were engaged including school children and teens, parents, local residents, visitors, business owners and farmer’s market vendors. The input received was generally positive in regards to increased transit options in the community and included:

- A desire was expressed to see a fare free trolley-type service that connects downtown to Gruene.
- As the central part of New Braunfels continues to develop, parking is becoming a more common issue. Transit is seen as part of the solution mix for limited and decreasing parking availability in the downtown core.
• Access to high schools and middle schools is desired particularly for several hours after school lets out. Students are often stranded when participating in afterschool activities and parents have to scramble to find transportation.

• Corridors identified for fixed route service included San Antonio Street, Seguin Avenue, Landa Street, and Walnut Avenue.

• Several business owners expressed the potential for partnerships to help keep a downtown/Gruene circulator fare free. Parking in Gruene and downtown has become more of an issue and patrons would rather stay in one location than have to struggle with parking twice. A trolley or bus service might allow these customers to travel to additional places that are currently inconvenient to get to.

• The public library and the three HEBs in the city were the top destinations identified for needed transit service.

Freiheit Village Farmers Market

This open house was located at the Freiheit Village convention space and was part of a Halloween celebration. Approximately 40 individuals participated in the transit discussions. Many of these individuals were parents of school-aged children, local residents, business owners and farmer’s market vendors. All participants supported the idea of improved transit service in the community and gave substantive input including:

• Fixed route transit service was the desired mode for the future by participants at this event.

• A few participants were originally from similarly sized cities in Europe and North America that have substantial transit service and were confounded as to why New Braunfels does not have a higher level of transit service.

• Some individuals expressed concern that new service would be mostly geared toward tourists and noted that there are many residents with mobility needs that could be met by improved transit service.

• Freiheit Village, New Braunfels Town Center at Creekside, and Gruene were noted as destinations that need service.

• It was noted that traffic congestion around the area schools during drop-off and pick-up times may make scheduling transit routes difficult.

• Areas along Loop 337, particularly near Common Street, Gruene Road, Borchers Boulevard., Walnut Avenue, and Landa Street are places that resident frequent.
Westside Community Center

This well attended open house included members of the general public, students attending training programs at the community center, community center staff and members of the local press. Approximately 40 individuals participated in this event. All participants had a desire to see a robust fixed route service in New Braunfels. Input highlights for this meeting included:

• The desire to see both local and regional scheduled service. Many participants have relocated to New Braunfels from other areas that have robust transit service and have found the lack of mobility options difficult. The desire to see local service to access shopping and appointments during the day, evening service to access the entertainment district on Friday and Saturday evenings, and regional commuter service along Interstate 35 between Austin and San Antonio were all stated.

• The current transit service in New Braunfels is not adequate for the participants at this meeting. The service requires advanced scheduling and is often denied.

• Intercity and commuter service between Austin and San Antonio was a need identified.

• It was noted that access to the major airports in San Antonio and Austin is very difficult without a personal automobile.

• Students attending Texas State University and living in New Braunfels expressed frustration with getting to campus; many do not have full time access to a car. In addition, parking availability at Texas State is limited.

• Fixed route services should have timed connections to both local and regional routes.

• Fares for local service were suggested to be up to $2 for local service and $3-$5 for regional service. The idea of having discounted rates for local residents, seniors and students was also discussed.

• Access to employment and training was a major theme at this meeting. Vanpools were discussed to get to major employers such as Amazon, CAT and Walmart. Additionally, access to educational facilities such as high school after school programs and workforce training locations was a noted need.
Focus Groups

The study team conducted two focus groups that were productive and informative. The focus groups targeted individuals that may have particular insights in the mobility and transportation needs of the community. Participants were introduced with a short presentation regarding the project process and work completed to date and then were led in a discussion about community transportation needs and how public transit might be able to meet those needs in the future. Before the closing of the focus group, attendees were encouraged to participate in a mapping exercise where stickers were placed to identify areas of need including trip origins and destinations, and markers were used to identify high need corridors and annotate information on the map. These maps were used in the open house meetings as well. The two focus groups were:

- Human Service Focus Group, October 23, 2019 from 11:00 a.m. to 1:00 p.m. at the McKenna Foundation.
- Business Focus Group, November 4, from 1:30 p.m. to 3:30 p.m. at the New Braunfels Chamber of commerce.

There were more than 23 participants in total between the two focus groups, with the human service focus group having the majority of attendees (18). Organizations representing senior citizens, health care advocates, workforce agencies, adult daycare, food assistance, shelters, and social work were all in attendance. See Appendix A for the names and organizations represented (as appropriate). At the business focus group, representatives of tourism businesses, private transportation providers, local industry leaders and chamber of commerce representatives were all in attendance. All participants indicated a need for robust public transit service options in New Braunfels.

Human Service Focus Group

This focus group was well attended by a variety of human service organizations and representatives. All attendees were strong proponents of increased transit service in the area, particularly regularly scheduled service. Highlights of the discussion include:

- These organizations have been talking about the need for a city bus service for over a decade.
- Participants noted that their clients often have difficulty with the current transit service. Non-Medicaid transportation trips are difficult to schedule. Clients have difficulty booking trips and there is often no availability for the trip desired. Additionally, attendees noted that the current service segregates trips and has a hard time grouping trips for medical and shopping purposes even though the clients may be going to similar places at similar times.
- It was noted that major bus stops will need shade from the sun in the summer months.
- Vehicles should be low-floor city transit vehicles equipped with bike racks.
• Safety is a major concern in the implementation of a fixed route service. Lack of pedestrian infrastructure and high speeds of vehicles will make safe bus stops and marketing of the new service essential to potential riders.

• Transit informational materials will need to have a Spanish language version.

• There is a need for regional human service access to San Antonio for medical trips, and to shelters, as well as to Alamo College.

• There is a need for more reliable service to the low-income areas around Canyon Lake into the New Braunfels area. It was noted that the fixed schedule service similar to what is run by CARTS in the Austin area may be appropriate to meet this need.

• Operating hours for local service should be from 6:00 a.m. to 7:00 p.m. on weekdays and there should be a late-night service for the entertainment district on Friday and Saturday evenings.

• Major destinations that need service in the community discussed at this meeting include: all three HEBs, Walmart, Central Texas Technology Center, Food Bank, Senior Center, Gruene, medical facilities, major corridors in the city, the public library, Canyon Lake, Solms Road, affordable housing locations, community parks, the State Highway 46 corridor, Bulverde, Seguin, San Marcos, Startzville and Canyon Lake.

**Business Focus Group**

The business focus group was attended by five individuals representing the business and economic development interests in the community. Like the human service focus group, the attendees at this meeting highlighted the need for transportation services in the community and surrounding areas. The input from this group included:

• The observation that over 70 percent of the labor force in New Braunfels comes from outside the city was stated several times. Additionally, many of the residents in town work in places like San Antonio and San Marcos. The need for regional commuter service was expressed at multiple points during the meeting.

• Participants working on economic development issues in the community noted that transportation and mobility needs are a major concern. Transit is seen not only as a mobility solution but also as a way to improve economic development efforts in New Braunfels.

• It was noted that as gas prices increase, mobility concerns for lower income employees increase. Transit is seen as a way to provide affordable transportation to employment sites in the community.

• It was noted that younger generations are much less likely to own a personal vehicle and may depend on other transportation options such as public transit.

• Fixed route service to major employment sites is desired where possible. Participants stated that
businesses may be able to work with the city by buying transit passes for employees in exchange for curtailing some parking requirements.

- Rockin’ R River Rides, which is a popular tubing outfitter and charter transportation service in New Braunfels, mentioned that they and other local businesses would benefit from public/private partnerships with a transit service.

**Individual Interviews**

Individual interviews are an excellent way to get targeted input on specific mobility issues facing New Braunfels. Several individuals and organizations were contacted and offered a chance to provide input one-on-one with project team members. Additionally, some community members and stakeholders contacted the study team subsequent to outreach events to offer additional input on project solutions to meet community mobility needs. Most of the individual interviews were conducted during July 2019 with a few interviews occurring after the major outreach events in November 2019. The following groups represented in individual interviews are detailed in this section.

**Human Service Organizations**

The project team met with representatives of the McKenna Foundation to discuss community mobility needs. Of importance to the group is increased access to health care, and employment opportunities, as well as basic goods and services. The McKenna Foundation supported the idea of fixed route service.

**Educational Organizations**

The administration at the Westside Community Center was interviewed. This organization helps residents with training, food and health assistance, and parental assistance. Lack of transportation is a major issue for the people this group works with and they are in full support of a regularly scheduled fixed route service in the community.

**Senior Citizen Advocates**

Representatives at the Comal County Senior Citizens Foundation were interviewed. This organization fully endorses a robust fixed route transit service that can help seniors improve their access to doctors’ offices, pharmacies, special events and shopping. They noted that many of their members that currently use the ART service have ambulatory disabilities and will still require demand response service; and that other members would like a fixed route service.

**Current Transit Users**

Current transit users were interviewed while onboard the ART service returning from the senior center. These riders are very pleased with the service ART provides. All of these riders support a fixed route system in the New Braunfels area however many are frail and have ambulatory disabilities that would
not allow them to use a fixed route service. ADA complementary paratransit and demand response service will be needed to continue to serve these individuals. Those that can use a fixed route would like to see increased access to grocery shopping and big box retailers, particularly on weekends.

**City and County Officials**

The consultants met with Comal County Commissioner Kevin Webb, New Braunfels Mayor Barron Casteel and City Manager Robert Camareno. All of these officials continued to express their support for public transit and in particular fixed route bus service.

**New Braunfels Chamber of Commerce**

In a meeting with the Chamber President Michael Meek and Vice President of Economic Development Chester Jenke, the Chamber expressed support for the concept of a fixed route public transit service.

**Private Transportation Providers**

As part of this outreach effort, private transportation providers, including all tubing and river rafting outfitters that shuttle tubers and Rockin’ R River Rides (which is a large charter transportation provider in the community), were interviewed. Importantly the project team wanted to convey that public transit solutions will not compete with private transportation services provided in the community. Many of the interviewees noted that employees might take a fixed route bus, and that increased transportation options would likely help customers gain access to areas that have limited parking near the outfitter locations.

**Community Residents**

Contact information for the project team was distributed on the project website and at outreach events. As a result, several community members contacted the project team to provide additional information. Residents were confused as to why there is such limited transit service in New Braunfels when so many other cities of similar size (in Texas and other states) have substantial transit service. Additionally, residents noted that at one point there was a bus service and three taxi services in town. Currently, there are no locally based taxi or transit services. Community members would like to see additional resources dedicated to transportation options in the community including transit, taxis and vanpools.

These interviews provided significant input for the process which is expanded upon in the Outreach Summary section. The Outreach Summary summarizes comments organized by themes and condenses similar comments that were made across all outreach events. There was a consensus among all those interviewed that there is need, demand and support for a regularly scheduled bus service in New Braunfels. Overall, the stakeholders interviewed were excited about the prospects of fixed route transit service in New Braunfels and are willing to support efforts to implement such service.
Website and Social Media

As part of this process the study team worked with the City of New Braunfels to help develop and provide content for a web page. The City secured the nbtransit.org domain and is currently using it as the project webpage. The web page has a short introduction:

“The City of New Braunfels is currently developing a Public Transit Study for the community. This effort will be looking at developing and expanding public transit service in New Braunfels in ways that will improve mobility for residents and visitors to our community. This planning effort will include strong community and stakeholder outreach to help assess transportation and mobility needs in the community. Additionally, the City and its partners will be analyzing existing services in New Braunfels, completing a detailed demographic and travel patterns analysis, and developing a report on unmet transportation needs in the community. With the foundation of this information and analysis, service alternatives and strategies will be developed. The public and stakeholders will be engaged throughout this process and it is essential that community members provide input on needs and proposed services.”

The website also has sections for surveys and outreach, reports, technical memoranda, comments and questions.

The project team is also working with the AAMPO to post updates to Facebook regarding outreach events. In addition, the project team monitored social media sites such as Facebook, Twitter and Nextdoor for comments in regards to the project. Commentary on social media will be detailed in the Outreach Summary section. Overall, the social media response was positive in regards to improved transit service in New Braunfels. Any comments of concern revolved around the prospect for increased taxes to fund new service.
Outreach Summary

This section summarizes all of the input received at the community outreach events. The input is organized by themes.

As part of each outreach event there was a mapping exercise where participants were encouraged to mark on a map of New Braunfels to indicate which areas and corridors were in need of service. Figure 3-1 shows the two completed maps from the outreach events.

Attendees at the Freiheit Farmers Market Participate in the interactive Mapping exercise.
Figure 3-1: Mapping Exercise Outcomes
As shown, participants were able to identify areas of need. These areas are shown by the clusters of dots; and the corridors of need can be seen as attendees drew corridors needing service with markers.

Major areas with significant clusters of dots include:

- HEB on Walnut Street
- HEB on FM 306
- HEB on State Highway 46
- Walmart
- Foodbank
- Comal County Senior Citizen Foundation
- City Hall
- Rec Center
- Downtown
- Cristus Santa Rosa
- Public Library
- Walmart Distribution Center
- Gruene
- Creekside including the adjacent medical facilities and Freiheit Village
- State Highway 46 and BUS 35
- New Braunfels Middle School
- New Braunfels and Canyon High School
- San Marcos
- San Antonio
- Austin
- Canyon Lake
- Bulverde
- Startzville
- Solms

Major corridors of need identified included:

- Interstate 35 from Austin to San Antonio
- Walnut Avenue from County Line Road to beyond Loop 337
- Seguin Avenue/Landa Street from County Line Road to the south to Loop 337 to the West
- Elliot Knox Blvd./BUS 35
- San Antonio St. from Walnut Ave continuing to Common Street to Gruene
- FM 137/Creekside Crossing/FM 306 from Central Texas Tech Center to Gruene

Attendees and participants in the outreach events provided a wealth of knowledge related to mobility and transportation issues in the community. Many comments were repeated by different participants. Below is a summary of the input received, organized by theme: service type, local service, regional service, infrastructure, fares, vehicles, marketing, and technology.

**Service Type**

- Many participants noted that the current demand response service is not appropriate for most of the transportation needs in the community. Current service seems geared toward seniors and dialysis patients. The general public does not use the service often.

- Fixed route service for local trips and regional commuting trips is desired.

- There is a concern and an expressed need for services for people that may not be able to use fixed route service such as people with disabilities. Paratransit service is desired.
• Some residents expressed the desire to see a reliable taxi service in New Braunfels.

• Some residents expressed concern that service would be geared toward tourists, and that local needs might come second.

• First mile/last mile concerns for residents in the subdivisions east of the Interstate 35 corridor were expressed.

**Local Service**

• Many participants expressed the need for fixed route access to major employment sites in New Braunfels, many of which are large shopping destinations as well (HEB, Walmart).

• Fixed route service to the Comal County Senior Citizen Foundation is desired.

• Fixed route service along Business Route I-35/Elliot Knox Boulevard is desired.

• Service to the Landa Apartments would provide lower income residents with a new mobility option.

• Local services should run on the weekends for visitors as well as for locals to access shopping. This is particularly true for the peak tourism months in the late spring, summer and early fall.

• Participants expressed the desire to see increased transportation options to HEB and Walmart.

• Service should run from 6:00 a.m. to 7:00 p.m. with a late-night service on Friday and Saturday evenings.

• Tubes should be prohibited on the bus. Also, there should be a code of conduct in regards to proper attire for riding the bus and prohibiting alcoholic beverages and excessive drunkenness on public transit vehicles.

• High schools and middle school students need regularly scheduled public transit access particularly for times after school bus service has ended.

• The need for fixed route service on Walnut Avenue, Landa Street, Seguin Avenue, San Antonio Street, Common Street, and the Barbarosa Road/Saur Lane/Creekside Crossing/FM 306 corridor was identified by several participants.

• Service should have timed connections and run on frequencies no longer than one hour.
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Regional Service

- Many people that live in New Braunfels work in San Antonio, San Marcos and Austin and would like a commuter mobility option for access to work.

- 70 percent of the labor force in New Braunfels comes from outside the city. There is need for commuter service into New Braunfels as well as service from New Braunfels to other areas.

- There is a need for connections to the Greyhound station in San Antonio.

- There is a need to connect to medical, educational and human service locations in San Antonio.

- Fixed schedule service coordinated with human service agencies should be considered particularly connecting the low-income areas around Canyon Lake into New Braunfels.

- Texas State students living in New Braunfels would like to see service connecting to San Marcos for access to education.

- Access to major airports in the region is difficult without a personal automobile.

Infrastructure

- Pedestrian infrastructure is lacking on many of the major corridors in town. Corridors like Elliot Knox Boulevard need fixed route service but do not have the pedestrian infrastructure to support such service. The development of bus stops will need to include pedestrian improvements.

- Special events can create parking issues in town. Having service to intercept parking lots can help. Private providers can help run this service.

- Major bus stops should have shade structures to protect riders from intense summer heat.

- Many major streets will need improved pedestrian crossings and traffic calming to make bus stops safe.

- Bus stops should be accessible and have accessible connections to adjacent land uses.

- As development of the central core of New Braunfels continues, parking will become an issue. Transit should be part of the parking solution for continued downtown development.
Fares

- There is a consensus that $1-$1.50 is an appropriate fare for local service. $3-$5 for regional commuter service was a range that participants found appropriate.
- Many participants expressed the desire to see a downtown/Gruene service be fare free. Local businesses expressed a willingness to partner and help cover the fare box revenue for this service.
- Monthly passes should be available with discounted fares for students and seniors.
- Some residents would like to explore the possibility of local and non-local fare structures.

Vehicles

- Low floor city transit vehicles between 30’ and 40’ long is desired for local service.
- Participants expressed the desire to see a downtown circulator use a trolley vehicle typology; many remembered the Dillo downtown circulator service in Austin that used these vehicles.
- All vehicles should be equipped with bike racks.
- New buses should be distinguished from current services.
- All vehicles need to have air conditioning.

Marketing

- Current transit users expressed support of scheduled service but might need some travel training. The Comal County Senior Citizen Foundation could be a travel training partner.
- Marketing materials, schedules, and maps will need to be printed in Spanish as well as English.
- Buses can be wrapped for additional advertising revenue.
- Local and regional service should be distinguishable.
- Any new services should be introduced with an aggressive marketing campaign.
- Working with hotels and other tourism-oriented business to market service is important.

Technology

- A mobile application for fare payment, scheduling, ticketing and next bus information was an idea presented by participants in focus groups.
Survey Results

Five surveys were conducted as part of the New Braunfels Transit Study in an effort to better understand transit preferences of stakeholders. One survey was distributed to the general public, a second was administered on transit services. The last three were given to businesses and human service providers around New Braunfels. They were distributed between October 24 and November 18, 2019. Primarily, the surveys were administered online via SurveyGizmo, however, some hard copies of the surveys were made available at community centers for those without access to a computer or smart device. Survey distribution was completed with the help of project partners. Survey links were sent out to list serves for human service agencies and the Chamber of Commerce, and were also provided on the project webpage. A link via QR code to all surveys was displayed at every outreach event. Hard copy surveys were delivered to community centers and distributed by staff to clients at these locations. Table 3-1 summarizes the number of responses from all five surveys.

Table 3-1: Survey Responses

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Public</td>
<td>378</td>
</tr>
<tr>
<td>Onboard</td>
<td>27</td>
</tr>
<tr>
<td>Tourism Businesses</td>
<td>8</td>
</tr>
<tr>
<td>Non-Tourism Businesses</td>
<td>14</td>
</tr>
<tr>
<td>Human Services</td>
<td>12</td>
</tr>
</tbody>
</table>

The number of responses from the Business (tourism and non-tourism) and Human Services surveys was low, therefore the responses from these three user groups were combined to help improve the analysis. The onboard survey also had a low response so many of the results were compared to the General Public survey. The surveys were voluntarily administered which means they are subject to self-selection bias. In other words, people who had a pre-existing interest in responding are likely to be highly represented. Still, the results of the survey can highlight some important considerations for fixed route bus transit in New Braunfels. Following are the major insights:

- Service should focus within New Braunfels
- $2.00 is a popular fare option
- Daytime weekday service is a minimum
- Bus headways should be at most 30 minutes
- Prepay options are desired but should not be the only option
- Many people own a personal vehicle and prefer to drive over using public transportation

General Public Survey

The General Public survey was primarily administered via a link on the City of New Braunfels webpage. A QR code with links to the survey was prominently displayed at all outreach events. Additionally, links
were sent via various list serves from project partners including the McKenna Foundation and the Chamber of Commerce. Links were also displayed on social media managed by AAMPO and the City of New Braunfels. The survey asked 26 questions in four categories: background demographics, new service preferences, new service operations, and current transportation preferences.

Most of the respondents (79%) were from the New Braunfels zip code, 78130. The second most represented (18%) zip code was 78132. The age of respondents was distributed across the defined brackets with 31% of respondents over 61 years of age. The second most represented age bracket was between 34-45 years of age, accounting for 23% of respondents. Seventy-three percent of respondents made more than $50,000 a year. Finally, most respondents owned at least one car (Figure 3-2).

**Figure 3-2: Age and Vehicle Availability of Respondents**

![](image)

**New Service Preferences**

The overwhelming majority of respondents (82%) thought fixed route bus service was important. Only 58 of the 370 respondents thought it was not important.

Of the 370 respondents, the majority said that they would use fixed-route bus service if it were available in New Braunfels (Figure 3-3).
The most common reason for not using bus service was preferring to drive (53% of those that were not likely to use bus service; 61 respondents). The second most popular reason was that personal schedules vary (21%) and the third reason was that it would take too long (13%). “Other” reasons included, living too far from New Braunfels, living downtown and preferring to walk and bike, and having multiple children or small children. There was a concern that fixed route service would fail because it is too sparse. There were also several disparaging comments that public bus service will bring crime to the area and that it is not clean.

For those that were likely to use bus service, most stated they would use it multiple times a week; 90 respondents said they would use it three to five times a week (Figure 3-4).

Respondents felt that they would most likely use bus service to run errands, go shopping, or go to daycare. Going to school ranked last, but it is worth noting that only 22 respondents were under age 25. Table 3-2 presents this data.
Table 3-2: Trip Purpose

<table>
<thead>
<tr>
<th>Activity</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run errands, go shopping, daycare</td>
<td>386</td>
</tr>
<tr>
<td>Meals, other social activities</td>
<td>324</td>
</tr>
<tr>
<td>Access to San Antonio</td>
<td>317</td>
</tr>
<tr>
<td>Access to water recreation along the Comal or Guadalupe River</td>
<td>291</td>
</tr>
<tr>
<td>Go to/from work</td>
<td>242</td>
</tr>
<tr>
<td>Medical/dental appointments</td>
<td>224</td>
</tr>
<tr>
<td>Go to/from school</td>
<td>21</td>
</tr>
</tbody>
</table>

Forty-eight respondents were interested in training or assistance in using public transit.

Destinations within New Braunfels were most popular for potential bus service. San Antonio was the second most popular response (see Table 3-3).

Table 3-3: Top Destinations

<table>
<thead>
<tr>
<th>Destination</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destinations within New Braunfels</td>
<td>753</td>
</tr>
<tr>
<td>San Antonio</td>
<td>438</td>
</tr>
<tr>
<td>Water recreation/tubing along the Guadalupe or Comal rivers</td>
<td>239</td>
</tr>
<tr>
<td>Austin</td>
<td>181</td>
</tr>
<tr>
<td>San Marcos</td>
<td>174</td>
</tr>
<tr>
<td>Schertz/Cibolo</td>
<td>51</td>
</tr>
<tr>
<td>Seguin</td>
<td>36</td>
</tr>
</tbody>
</table>

Paying in advance was desired for payment options. This could be through a mobile phone application (47%) or through a tap and go card (35%). Many who responded “other” would prefer all of the options (Figure 3-5).
Figure 3-5: Payment Option Preferences

New Service Operations

The top ranked operational characteristic for new bus service was affordable fares. Frequent service was a close second (Table 3-4).

Table 3-4: Desired Transit Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable fares</td>
<td>370</td>
</tr>
<tr>
<td>Frequent bus service</td>
<td>345</td>
</tr>
<tr>
<td>Express connections to key destinations with limited stops</td>
<td>284</td>
</tr>
<tr>
<td>Weekend service</td>
<td>244</td>
</tr>
<tr>
<td>Readily available schedule information</td>
<td>189</td>
</tr>
<tr>
<td>Early morning and late evening service</td>
<td>187</td>
</tr>
<tr>
<td>Park and ride lot access</td>
<td>135</td>
</tr>
<tr>
<td>High quality bus stop shelters/benches</td>
<td>104</td>
</tr>
<tr>
<td>Busses with bike racks</td>
<td>64</td>
</tr>
<tr>
<td>Free Wi-Fi</td>
<td>43</td>
</tr>
</tbody>
</table>
Most respondents (approximately 75%) preferred bus frequency of 30 minutes or less. Many that replied “other” thought the headways should be sensitive to the route (Figure 3-6).

**Figure 3-6: Frequency Preferences**

![Desired Headway](image)

Although close to 50 respondents were willing to pay up to $4.00 for the fare, $2.00 was the most popular fare option. Interestingly, of those who ranked affordable fares as the top operation characteristic (70 respondents), 20 were willing to pay up to $2.00 and 15 were willing to pay $3.00 or more (Figure 3-7).

**Figure 3-7: Fare Preferences**

![Maximum Fare](image)
Respondents generally thought service should be available during the day and on weekends. Less than half of all respondents thought there should be service on weeknights (Table 3-5).

**Table 3-5: Service Hour Preferences**

<table>
<thead>
<tr>
<th></th>
<th>Weekday</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>☀️</td>
<td>65%</td>
<td>61%</td>
</tr>
<tr>
<td>🌙</td>
<td>46%</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Current Transportation Preferences**

Nearly 200 respondents are dissatisfied with current transit options in New Braunfels. The respondents that are satisfied tended to not experience difficulty finding transportation, still some who never experience difficulty finding transportation were also dissatisfied (Figure 3-8). The most common form of transportation is the personal car. Some of the businesses surveyed provide shuttle/bus service. Five of the respondents used these services (Table 3-6).

**Figure 3-8: Satisfaction of Current Transportation Options**

![Satisfaction and Transportation Difficulty chart](chart.png)
Table 3-6: Most Common Transportation Modes

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal car</td>
<td>1,011</td>
</tr>
<tr>
<td>Car of family member or friend/carpool</td>
<td>310</td>
</tr>
<tr>
<td>Taxi/Uber/Lyft</td>
<td>250</td>
</tr>
<tr>
<td>Bike or walk</td>
<td>224</td>
</tr>
<tr>
<td>Alamo Regional Transit dial-a-ride service</td>
<td>21</td>
</tr>
<tr>
<td>Privately operated bus or shuttle system</td>
<td>7</td>
</tr>
<tr>
<td>Vanpool</td>
<td>0</td>
</tr>
</tbody>
</table>

Ride sharing, like Uber, Lyft and taxis, was used by 212 respondents (58%). Over half (56%) of these riders use the services less than once a month; 29% use it 1-3 days a month (Figure 3-9).

Figure 3-9: Frequency Using Transportation Networking Companies (TNC)
Onboard Surveys

Surveys were also administered on board transit vehicles. They were distributed via web link to customers riding ART services in New Braunfels, and links to the survey were provided at all outreach events. Respondents of the onboard survey were most frequently making a home-based trip (16 respondents) and seven were going to or coming from a medical appointment. The use of ART for medical transport was underscored by medical and dental appointments which ranked highest (and was tied with work) as the primary use of ART for respondents. Other trip purposes included access to school, shopping and employment.

To get to the bus, respondents either walked or got dropped off. This was mirrored for how they intended to get to their final destination. More than half of the respondents had access to a car but some could not use their car for medical reasons.

Forty-eight percent of respondents use ART between one and five times a week and nearly half responded that they have taken more than five trips in the last month (Figure 3-10).

Figure 3-10: Current Transit Usage

The average rating for service revealed that although overall satisfaction was high (8.3 out of 10) travel time (5.1 out of ten) and scheduling (5.3 out of ten) were relatively low.

The onboard survey posed the same questions about new service preferences as did the general public survey, and the responses revealed the same trends with a few notable exceptions:
Chapter 3: Detailed Findings of the Outreach Efforts

- Access to water recreation was a low priority.

- Frequent service out ranked affordable fares as the most important operational characteristic.

- Although a similar percentage favored a $2.00 fare option, few were willing to pay more than that and more preferred free service. Interestingly, satisfaction with cost of ART service was high (8.4).

- There was a preference for lower headways, with 10 minutes being the most desired option (Fare and frequency preferences shown in Figure 3-11).

- Daytime weekday service was highly desired (70%) and other timeframes received less response (11%-30%) than in the General Public survey.

**Figure 3-11: Fare and Frequency Preferences**

![Fare and Frequency Preferences](image)

**Business and Human Service Survey**

Three of the surveys focused on businesses and services in the New Braunfels area. These were broken into three categories: Tourism Businesses, Non-Tourism Businesses, and Human Service Agencies. Surveys were available online with the assistance of project partners. List serves of the McKenna Foundation and the Chamber of Commerce were used to reach human service agencies and the business community. Links to the survey were also provided at the human service and business focus groups respectively. Of the respondents that answered (23 of 34 answered the question), restaurants and cafes (4 respondents), retail (3 respondents), and professional services (3 respondents) were the sectors most represented; many respondents replied “other” (8 respondents, shown in Figure 3-12).
Most respondents thought fixed route transit was important. Of the seven respondents in the tourism sector, three did not have an opinion on fixed route transit; however, nearly all of the respondents in the human services sector (9 respondents, Figure 3-13) thought fixed route was very important. This was underscored by the fact that six respondents in the tourism sector thought fixed route transit would not impact their business, while ten respondents in the human services sector thought it would have a positive impact. This suggests that different sectors view fixed-route transit differently and they expect to be impacted differently.

“A lack of transportation is one of the top three contributing causes to why our families become homeless and need our services in the first place. Once they leave the shelter component of our program, they again have to rely on private transportation and break-downs of their vehicles can send them spiraling back into homelessness.”
Geographically, most businesses and services surveyed are in New Braunfels and serve people within New Braunfels. Some businesses and services within New Braunfels are also served within the San Antonio region (Table 3-7).

**Table 3-7: Geographic Areas of Service**

<table>
<thead>
<tr>
<th>Zip Code of Service/Business</th>
<th>78070</th>
<th>78130</th>
<th>78132</th>
<th>78133</th>
<th>78135</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within New Braunfels</td>
<td></td>
<td>15</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Within the San Antonio region</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Outside of the San Antonio region</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Twelve respondents said that their operations did not have seasonal fluctuations. Of the 19 respondents that reported their busiest months operations, they stated that the busiest months are typically between March and June.

**New Service Preferences**

Questions were posed about potential service including willingness to pay, desired headway, and useful destinations. Many of these questions overlapped with the questions asked in the General Public survey.

Most respondents desired a fare under $2.00. It is worth noting that $2.00 was also the most popular response for maximum fare from respondents to the General Public and the On-Board surveys (Figure 3-14).
Every 30 minutes was the most popular response for headway (15 respondents). Few suggested below a half hour; ten said an hour. For the general public, 30-minute headways were also the most popular, however, much fewer suggested headways greater than 30 minutes. For those surveyed on transit, 10 minutes was the most desired headway (Figure 3-15).
Daytime service is favored. Weekday service was slightly favored among businesses and services. While the General Public survey showed a slight preference for daytime service, there was not a substantial difference between weekday and weekend service preferences (Table 3-8).

**Table 3-8: Service Hour Preferences**

<table>
<thead>
<tr>
<th></th>
<th>Weekday</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime</td>
<td>28</td>
<td>21</td>
</tr>
<tr>
<td>Night</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>

The most desired operational characteristic was affordable fares. Frequent service and direct connections followed. Park and ride access were ranked at the bottom. Although, all sectors ranked affordable fares the highest, tourism prioritized direct connections at the same level of fares highest and non-tourism ranked frequent service at the same level. The general public also ranked affordable fares and frequent service the highest (Table 3-9).

**Table 3-9: Transit Preferences**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable fares</td>
<td>48</td>
</tr>
<tr>
<td>Frequent service</td>
<td>35</td>
</tr>
<tr>
<td>Direct connections to key destinations</td>
<td>29</td>
</tr>
<tr>
<td>Early morning and late evening hours of service</td>
<td>21</td>
</tr>
<tr>
<td>Weekend hours of service</td>
<td>17</td>
</tr>
<tr>
<td>High quality bus stop shelters/buses</td>
<td>10</td>
</tr>
<tr>
<td>Readily available service information</td>
<td>7</td>
</tr>
<tr>
<td>Park and ride lot access</td>
<td>6</td>
</tr>
</tbody>
</table>

Respondents overwhelmingly felt it was most important to serve destinations within New Braunfels; destinations to San Antonio and San Marcos followed (Table 3-10).
### Table 3-10: Destination Preferences

<table>
<thead>
<tr>
<th>Destination</th>
<th>Top Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destinations within New Braunfels</td>
<td>83</td>
</tr>
<tr>
<td>San Antonio</td>
<td>34</td>
</tr>
<tr>
<td>San Marcos</td>
<td>25</td>
</tr>
<tr>
<td>Seguin</td>
<td>19</td>
</tr>
<tr>
<td>Austin</td>
<td>15</td>
</tr>
<tr>
<td>Water recreation/tubing along the Guadalupe or Comal rivers</td>
<td>15</td>
</tr>
<tr>
<td>Schertz/Cibolo</td>
<td>7</td>
</tr>
</tbody>
</table>

### Survey Summary

The survey effort of this project highlighted several transit characteristics that are important to the citizens, transit customers, human service agencies and business owners in New Braunfels. Figure 3-16 shown the level of importance fixed route bus service has to the respondents by age group. As shown the vast majority of all respondents felt that fixed route bus service is important to the community, but it is of particular importance to the age groups of 18-25 and individuals over 60 years of age. A full analysis of survey responses by age group is available in Appendix A.

**Figure 3-16: How important is it for New Braunfels to have fixed-route bus service? (by age)**

Additionally, New Braunfels respondents are not satisfied with the current level of transportation services in the community. This is particularly true for those 18-25 years old (Figure 3-17).
Figure 3-17: How satisfied are you with the current transit options in New Braunfels? (by age)

Of all the reasons respondents would use fixed route transit the most important were running errands, social activities and accessing San Antonio. Medical trips were also very important to individuals over the age of 60 (Figure 3-19).

Figure 3-19: Rank the top three reasons you would use fixed-route bus service in New Braunfels (by age).
Across all the survey tools implemented as part of this process accessing destinations within New Braunfels (95 percent of respondents) was the most important location of service. The second most important destination for service was San Antonio (55 percent of respondents). No other destination received over 20 percent in response to most needed destinations in the region.

Overall respondents would like to see affordable and reliable transit service in the New Braunfels area. The most important transit characteristics for respondents in order are: Affordable fares, direct connections to key destinations, readily available schedule information and frequent bus service. These responses are shown in detail in Figure 3-20 broken out by age group.

**Figure 3-20: Rank the top three characteristics for a new bus service in New Braunfels in order of your preference/need (by age).**
Chapter 4: Review of Existing Services

Introduction

This chapter is part of the broader Existing and Future Conditions and Needs Analysis task of this planning effort. This chapter details the existing transportation services in and around New Braunfels (including connecting services) and will include:

- Public Transit Providers
- Human Service Transportation
- Private Transportation Service
- Regional Connectivity
- Peer Review

This chapter will be coupled with the Demographic, Land Use and Travel Pattern analysis, as well as the results from the public and stakeholder outreach effort in order to develop the full and detailed analysis of unmet need and service gaps. This analysis will be the foundation of any recommendations and strategies developed in the subsequent phases of this planning project.

The City of New Braunfels is a rapidly growing community with a significant amount of regional travel and seasonal tourism. With assets like the Comal and Guadalupe Rivers, Gruene, Schlitterbahn and many downtown attractions New Braunfels has become a popular destination for Central Texas residents and visitors alike. Figure 4-1 depicts many of the most popular destinations in New Braunfels.
Figure 4-1: New Braunfels Base Map
Public Transit Providers

Alamo Region Transit (ART)

ART serves 12 rural counties in South-Central Texas surrounding the greater San Antonio Area. ART primarily provides rural transit service with the assistance of FTA section 5311 grants in Atascosa, Bandera, Comal, Frio, Gillespie, Guadalupe, Karnes, Kendall, Kerr, Medina, McMullen, and Wilson counties. In rural areas ART contracts with the regional Medicaid Non-Emergency Medical Transportation (NEMT) transportation broker to provide Medicaid transportation however staff state that they do not provide NEMT service with their vehicles in New Braunfels. In Seguin ART operates a fixed route bus service.

In Comal County ART provides demand response service in the entire City of New Braunfels and surrounding communities through contracts with VIA (the urban transit provider in the San Antonio urbanized area) and the City of New Braunfels. New Braunfels is a census designated urban area and cannot be served using the FTA section 5311 funding reserved for rural areas. As a result, VIA and the City of New Braunfels allocated $454,606 and $395,854 respectively (for a total of $850,460) to contract with ART to provide demand response service in New Braunfels in 2018.

Ridership and Service Levels

Normally, this section would review the existing ridership, service hours and miles (key operational data) of ART’s New Braunfels service. Operational data generally available for services of this type are not available for this particular service. ART does not separate out service miles, hours and ridership paid for by the City of New Braunfels. ART management states that their software was not able to pull out mileage and hours. Along with the service provided within New Braunfels, ART vehicles in Comal County often serve destinations in Seguin, Canyon Lake, Cibolo and Schertz primarily for human service and medical trips.

A total of eight transit vehicles are kept in the storage lot at the Comal County Senior Center. Looking at the origin and destination data provided by ART, peak vehicle requirements for Comal County is
generally five vehicles for a short period of time. For service solely in New Braunfels (excluding trips paid by other entities such as the school district) three to four vehicles are used during the majority of the day with one short period where five vehicles were in service.\(^1\) ART provides service to the school district under a separate contract using the same vehicles at the same time. Since these educational trips are not public transit and are paid separately, they are excluded from the City of New Braunfels ridership and performance.

Ridership in New Braunfels has grown steadily according to the data provided by ART. Table 4-1 depicts monthly and daily average ART ridership in New Braunfels for FY 2014 – FY 2019. No reliable data was available for 2017 and that year was omitted. For the other years, most of the data had to be estimated from spreadsheets provided by ART. Using available data an estimation of school district trips was made. Using the 2016 ART New Braunfels Quarterly report which breaks down the New Braunfels Trips by type, we broke out educational trips (which are paid for separately by the school district). This estimation was extrapolated into monthly and subtracted from the monthly and daily averages. As shown, the monthly and daily averages are highest in 2018 and 2019 with an average of 75 one way trips a day for the two years. The lowest average daily trips were during the 2015 and 2016 time frame where ART averaged about 46 trips per day in New Braunfels.\(^2\)

Table 4-1: Average Monthly and Daily ART Ridership in New Braunfels\(^3\)

<table>
<thead>
<tr>
<th>Year</th>
<th>Monthly Average</th>
<th>Daily Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2014</td>
<td>1,379</td>
<td>63</td>
</tr>
<tr>
<td>FY 2015</td>
<td>1,042</td>
<td>47</td>
</tr>
<tr>
<td>FY 2016</td>
<td>1,007</td>
<td>46</td>
</tr>
<tr>
<td>FY 2018</td>
<td>1,636</td>
<td>74</td>
</tr>
<tr>
<td>FY 2019</td>
<td>1,675</td>
<td>76</td>
</tr>
</tbody>
</table>

Origins and Destinations

As a part of this report the study team conducted an analysis of ART’s demand response trip data to identify popular origins and destinations within the city of New Braunfels. Five different days combined from the months of March, April and May in 2019 were selected for analysis. These sample days were selected because they recorded a high number of one-way trips in the month to provide the broadest dataset for origin and destination analysis. The selected days account for every weekday (Monday through Friday) to give a complete full week of analysis; ART does not provide service on weekends. Trip data suggests that over one-third of the total one-way trips in the sample week were dialysis trips, mostly going to DAVITA dialysis and Fresenius Kidney Care. Trips to the Senior Center are the second

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\(^1\) Data Source: May ART Trip Data. Alamo Regional Transit, 2019

\(^2\) Please note that this data was estimated based on information supplied by ART.

\(^3\) Data Source: ART Fiscal Year Data Files for annual total ridership numbers. FY 2016 and FY 2017 New Braunfels Quarterly Report and March, April and May 2019 Data Verification files for educational trip extrapolation and estimates. Alamo Regional Transit
most common trips in the system (22%). Almost 10 percent of the total one-way trips in the sample week either start or end at various senior living facilities. Total percentages of trips in the sample week by trip type are shown in Figure 4-2. Trips to dialysis centers, hospitals and clinics constitute Medical trips; Nutrition trips comprise trips to Comal County Senior Center for nutritional purposes; trips to schools and Central Texas Tech Center are counted in School trips; Shopping trips include trips to HEB, Walmart and other shopping centers; commuting trips to workplaces constitute Work trips; and Other trips include a variety of trip purposes e.g. trips to salon, rec center, church, museum, hospice etc.

**Figure 4-2 Percentage of Trips by Trip Types**

<table>
<thead>
<tr>
<th>Trip Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>44.6%</td>
</tr>
<tr>
<td>Nutrition</td>
<td>20.8%</td>
</tr>
<tr>
<td>School</td>
<td>19.5%</td>
</tr>
<tr>
<td>Shopping</td>
<td>10.2%</td>
</tr>
<tr>
<td>Work</td>
<td>1.5%</td>
</tr>
<tr>
<td>Other</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

Total activity and trip flows for the sample week are depicted in Figure 4-3. Majority of the trip origins and destinations are located to the North of I-35 or along it. Total trip activity for the week was spatially analyzed to detect the clustering pattern of origin and destination points within a radius of quarter mile from each other in the city. This concentration of activity points is visualized in the form of a heat map, shown in Figure 4-4.

The heat map confirms the trip type data set showing the areas of the most transit activity are the dialysis clinics and the senior center. Additionally, it helped in identifying the locations of residential clusters, both single family dwellings and multi-family apartments, which are major trip generators. Residential clusters with moderate trip activity are located in:

- Southern New Braunfels-Stonehaven apartments along W County Line Road;
- Northern New Braunfels along N. Veramendi Avenue and Lakeview Boulevard; Edenhill senior living community is located at Lakeview Boulevard
- Central New Braunfels along I-35 corridor:
  - W San Antonio Street, Ashberry Avenue and Huisache Avenue to the north of I-35
  - S Walnut Avenue, Loma Vista Street, and Linde Avenue to the south of I-35
- Eastern New Braunfels along Fairwood Drive and Cedar Glen Drive
- Southwestern New Braunfels -Comal and Greentree Apartments
- Northeastern New Braunfels along Sundance Parkway which is a combination of senior living, single family villas and a rehabilitation center.

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4 Data Source: March, April and May 2019 Data Verification files. Alamo Regional Transit
Figure 4-3: Origin Destination – Total Activity and Trip Flow in a Week
Figure 4-4: Origin Destination Heat Map
Some of the moderate activity clusters exhibit a concentration of various land use types, e.g., a large activity cluster in Central New Braunfels along I-35 and N Business I-35 contains senior living, nursing and a rehabilitation center, Walmart Supercenter, HEB, single family houses and multi-family apartments close to one another. Another major trip activity cluster is found along Landa Street which highlights a concentration of various kinds of moderate to high activity destination spots including Comal County Senior Center and City Hall.

Figure 4-5 depicts the origins and destinations for medical trips entirely within New Braunfels. As shown, the dialysis clinics are the most frequented destinations with locations such as Resolute Hospital and River City Rehabilitation Center also receiving trips. Many of the trip origins were from senior housing. Figure 4-6 shows nutrition trips to the Comal County Senior Center. Trip origins are dispersed throughout the city. Figure 4-7 details employment trips showing a variety of employment sites and other commuting trips to various locations throughout the city. Figure 4-8 shows shopping trips connecting residences (most often senior housing or residences) to the two HEBs and the Walmart along the I-35 corridor. Popular destinations include Rio Terra Memory Care, Colonial Manor Rehabilitation Center and Walgreens.

The most significant origins and destinations that account for nearly 40 percent pickups and drop off locations are provided in Table 4-2 and 4-3 respectively. The Comal County Senior Center has the highest percentage of stop activity of any destination in the New Braunfels service. Similarly, many of the most active residential origins are senior living apartment complexes. Senior transportation is a large portion of ART service in New Braunfels not only for access to the Comal County Senior Center but also for many of the medical trips. Older adults are an important cohort for public transit to serve and any new services will continue to be coordinated with the senior center.
Figure 4-5: Total Activity and Trip Flow by Trip Type—Medical
Figure 4-6: Total Activity and Trip Flow by Trip Type - Nutrition

[Map showing activity and trip flow by trip type, with labels for Landa Place Apartments, Comal County Senior Citizens Foundation, and Sage Apartments.]

New Braunfels Nutrition Trips

Total Activity
- 0 - 3
- 4 - 7
- 8 - 13
- 14 - 25
- 50 - 80

Note: The map illustrates all one way trips made in a chosen sample week. A sample week consists of the following days in the year 2019: March 4, April 9, May 15, March 28 and April 9.

Data Source: ART demand response March-May, 2019 Origin Destination Trip Data
Figure 4-7: Total Activity and Trip Flow by Trip Type-Work

Note: The map illustrates all one-way trips made in a chosen sample week. A sample week consists of the following days in the year 2019: March 4, April 9, May 13, March 28 and April 5. Data Source: ART demand response March-May, 2019 Origin Destination Trip Data.
Figure 4-8: Total Activity and Trip Flow by Trip Type-Shopping
Table 4-2 Top 10 Non-Residential Destinations

<table>
<thead>
<tr>
<th>Top Non-Residential Destinations with more than 1% total weekly stop activity</th>
<th>Percentage of Total Weekly Stop Activity (Total Pick-ups and drop offs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comal County Senior Center</td>
<td>11.00%</td>
</tr>
<tr>
<td>Davita New Braunfels Dialysis</td>
<td>9.00%</td>
</tr>
<tr>
<td>Fresenius Kidney Care New Braunfels</td>
<td>5.41%</td>
</tr>
<tr>
<td>Resolute Hospital-Healthlink Fitness</td>
<td>1.30%</td>
</tr>
<tr>
<td>Rio Terra Memory Care</td>
<td>1.08%</td>
</tr>
<tr>
<td>Legend Oaks Healthcare And Rehab</td>
<td>1.08%</td>
</tr>
<tr>
<td>McCoy’s</td>
<td>1.08%</td>
</tr>
</tbody>
</table>

Table 4-3 Top Residential Origins generating more than 1% total Weekly Activity

<table>
<thead>
<tr>
<th>Top Residential Origins with more than 1% total weekly stop activity</th>
<th>Percentage of Total Weekly Stop Activity (Total Pick-ups and drop offs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residence in Central New Braunfels along W St Antonio St</td>
<td>1.73%</td>
</tr>
<tr>
<td>Stonehaven Apartment Homes</td>
<td>1.73%</td>
</tr>
<tr>
<td>Eden Heights Senior Living</td>
<td>1.41%</td>
</tr>
<tr>
<td>Balcones Haus Senior Housing</td>
<td>1.30%</td>
</tr>
<tr>
<td>Sage Apartments, Comal Apartments and few single family residences mostly located in Northwest and East New Braunfels</td>
<td>1.08%</td>
</tr>
</tbody>
</table>

Operating Costs and Funding

Through a cooperative agreement between VIA, the City of New Braunfels and the Alamo Area Council of Governments (AACOG), door to door service is provided in the City. AACOG’s transit system, ART operates this service.

Table 4-4 shows the funding levels and sources for the past two years. As can be seen, system costs have remained stable over Fiscal Years 2018 and 2019.
Table 4-4: New Braunfels Transit Funding Levels

<table>
<thead>
<tr>
<th></th>
<th>VIA Costs</th>
<th>New Braunfels Costs</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 18</td>
<td>$454,606</td>
<td>$395,854</td>
<td>$850,460</td>
</tr>
<tr>
<td>FY 19*</td>
<td>$331,170</td>
<td>$371,250</td>
<td>$702,420</td>
</tr>
</tbody>
</table>

*Data only available through May of 2019

Allocating Costs

Costs are determined through an agreement between VIA and ART. Actual costs for the specific service provided is not calculated (typically by the hour or mile). Instead there is an allocation model using one way trips as its only data point for calculation of monthly/annual costs. Costs are allocated as follows:

1. ART calculates the ridership for each of 12 categories of riders across its region. Section 5307/5310 (Comal County), is one of those categories.

2. Each ridership category’s percentage of the total ridership is calculated and each category is charged their percentage of ART’s monthly total system costs.

3. Based on this, New Braunfels is typically charged between 19 and 22 percent of ART’s total costs as it produced between 19 and 22 percent of the ridership (according to the data provided by ART in the 2019 Revised Metrics dataset)

This formula would be appropriate if the trips across categories were similar in distance or time. They are not even close. Comparing trips within New Braunfels (typically 2-4 miles) with rural trips (often averaging 8 – 30 miles or more) is an apples to oranges comparison. While many rural trips are in town, there are also many county wide services and regional service as well. Therefore, the average rural trip length (miles), hours of service and consequently cost per trip is considerably greater (perhaps three to four times) than New Braunfels trips. This makes allocation of costs based on one way trips to be fundamentally flawed.

Further, while New Braunfels pays a percentage of ART’s total costs, it has no control over those costs. For example, if there was an expansion of ART service in another county, increasing the total system costs, New Braunfels’s (and all the other categories/counties) costs would go up as well, as it would be paying about 20 percent of the other county’s added costs, based on the allocation formula.

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5 Data Source: ART supplied data tables including Allocation Model with VIA Methodology dataset and ART Metrics data tables.
Performance Measurement

As previously stated, ART does not have sufficient operating data to calculate most performance measures relevant to this study. The only key measure available is cost per one way trip.

Table 4-5 calculates the annual average cost per trip, showing a cost per one way trip to New Braunfels of between $42 and $46, or about $13 per mile (considering an estimated average trip length of 3.5 miles). Educational trips paid for by school districts were removed from the total one-way trip calculations as the school district pays for these trips. ART’s FY 2019 Metrics Report (Revised)\(^6\) indicates that system-wide costs average about $2.57 per mile for Fiscal Year 2019. This is one quarter the per mile rate charged to New Braunfels. This very high cost is due to the flawed formula discussed above.

Table 4-5: ART New Braunfels Cost Metrics\(^7\)

<table>
<thead>
<tr>
<th></th>
<th>Total Costs</th>
<th>Total One-Way Trips</th>
<th>Average Cost Per Trip</th>
<th>*Average ART Cost per Mile for New Braunfels</th>
<th>**ART System Average Cost Per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 18</td>
<td>$850,460</td>
<td>19,897</td>
<td>$42.74</td>
<td>$12.21</td>
<td>$3.06</td>
</tr>
<tr>
<td>FY 19***</td>
<td>$702,420</td>
<td>15,342</td>
<td>$45.78</td>
<td>$13.08</td>
<td>$2.57</td>
</tr>
</tbody>
</table>

* Based on an estimated trip length of 3.5 miles for trips in New Braunfels  
** Data from the ART Metrics and Revised Metrics Data Tables supplied by AACOG  
*** Data only available through May of 2019

VIA Transit

VIA provides regional multimodal transportation options in the San Antonio area. VIA provides regular fixed route bus service, complementary ADA paratransit service, vanpool service, special event service and Bus Rapid Transit (BRT) service. VIA is an urban transportation provider and their services do not extend to the New Braunfels area. As there is demand for transit service in New Braunfels, which is part of the San-Antonio-New Braunfels Metropolitan Statistical Area (MSA) urbanized area, VIA and the City of New Braunfels entered into an agreement with ART to supply just under $1 million in funding for public transit service in New Braunfels.

The closest major VIA stop to New Braunfels is the Randolph Park and Ride stop near the intersection of Interstate 35 and Loop 410 in Northeast San Antonio. A map of this service is depicted in the Regional

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\(^6\) Detailed Metrics Reports were not available for previous years.  
\(^7\) Data Source: ART supplied data tables including Allocation Model with VIA Methodology dataset and ART Metrics data tables.
Connection section below. This location would be a potential connection spot for services connecting San Antonio and New Braunfels. The location is served by the following VIA Routes:

- 17 IH-35 Express
- 550 Skip
- 551 Skip
- 8 Metro
- 21 Metro
- 502 Metro
- 505 Metro
- 509 Metro
- 629 Metro
- 630 Metro
- 631 Metro
- 632 Metro

A future park and ride lot is planned for Schertz, just south of New Braunfels. This facility will have service to destinations in San Antonio. Service to both facilities or just one will be considered.

**VIA Vanpools**

The level of vanpool usage in the New Braunfels area is very low according to VIA. There are 16 individuals that use 14 vanpools with stops in New Braunfels. Two vanpools start in New Braunfels with 2 riders each, picking up passengers on the way to San Antonio. Seven are bound for San Antonio, with Joint Base San Antonio being the most popular destination. The other seven go north to Austin.

**Capital Metropolitan Transportation Authority – Vanpools**

Capital Metro is a public transportation provider located in Austin, Texas. It operates bus, bus rapid transit, paratransit services and a commuter rail system known as the Capital MetroRail in Austin and several suburbs in Travis, Hays and Williamson counties. Of importance to this planning effort Capital Metro administers a vanpool program that brings regional residents that live outside of the service area into the greater Austin areas primarily for employment access. There is a total of 262 vanpools in the Capital Metro system.

31 New Braunfels residents use the service to go to the Capital Metro service area. Additionally users of the vanpool program live in and around New Braunfels in communities such as Canyon Lake, Cibolo, Converse, New Braunfels, San Antonio, San Marcos, Schertz, and Selma. This indicates that these vanpools could be available for others going to Austin. Table 4-6 breaks down the number of vanpool users in each city.
### Human Service Transportation

As noted in the previous section much of the current ART service in New Braunfels is health care and human service oriented. This is particularly true for senior citizen transportation services to access nutrition (at the Comal County Senior Center) and kidney dialysis. Sheltered employment access is also something that ART provides along with school trips.

Some of the senior living facilities have their own van or small bus for group activities, but for day-to-day travel ART is the primary older adult transportation provider in the community. Groups like the Salvation Army, mental health clinic and other social service organizations have vans to transport clients to medical appointments, job interviews, employment locations, shopping and other personal business. It is estimated that there are 13 vans used by human and social service organizations in the New Braunfels area.

### Medicaid Transportation

The Medicaid Non-Emergency Medical Transportation Program is far and away the single largest source of human service transportation funding. Medicaid transportation trips are brokered by a for-profit company, LogistiCare, and scheduled with providers in the New Braunfels area. On occasion LogistiCare will use ART as the transportation provider in the New Braunfels area\(^8\) but often for-profit private providers are used for these trips. Passengers eligible for Medicaid transportation can use these trips for medical purposes only. This service is changing to separate managed care organizations brokers, going from one broker to three in the region.

\(^8\) A specific number of trips was not available from ART
Private Transportation Service

There are a variety of private transportation services in New Braunfels ranging from taxis and ride sharing companies to shuttle buses for tourists in town to float the rivers. This section will review these services particularly as they relate to public transit service. As part of the public transit plan one of the first goals is to do no harm and not to compete with what the private sector transportation companies are doing. This is the primary reason it is important to identify these services and what they do.

Transportation Networking Companies (TNCs)

TNCs, commonly referred to as ride sharing companies provide demand response transportation, generally for a single individual or group through the use of a smartphone or web-based application (although there are often telephone voice options as well). Uber and Lyft are the two most common TNC services in the New Braunfels areas with several drivers each. Most of their services provided are recreation and leisure trips in the evening or trips to the regional airports. In town these trips can range from $5 to $25 depending on the level of service and distance traveled for a one-way trip. Trips to a regional airport can range from $30 to $100. There is very little if any accessible service through TNCs.

Taxi, Limo, Party Bus and Airport Shuttles

New Braunfels has a variety of taxi type services geared both toward residents and visitors alike. Taxi services within New Braunfels include:

- New Braunfels Taxi
- Curbside Taxi Cab Service
- Comal Cabs
- Whitewater Taxi
- Tri City Taxi Service
- Bella Luna Shuttles

There are also a variety of limo and party bus companies in New Braunfels that charter buses or limos for special occasions: These companies include:

- Lonestar Party Buses
- Affordable Chauffeur Services
- Bella Luna Shuttles

Many of these companies also provide airport shuttles to the regional airports in San Antonio and Austin.
Tubing Outfitters

Tubing the Comal and Guadalupe Rivers is one of the major summertime draws to the New Braunfels area. There are approximately seven tubing outfitters with over 15 locations in New Braunfels. These outfitters shuttle customers from their facilities to the rivers and back to their facilities from where the customers exit the river. It is estimated that there are 50 tube shuttle vehicles in the New Braunfels area.

Wurstwagen, Night Moves New Braunfels and Rapid Transit

Wurstwagen and Rapid Transit are services offered by Rockin’ R River Rides, a tubing outfitter in the New Braunfels area with seven locations. Wurstwagen is a charter type service that connects hotels and intercept park and ride lots to Wurstfest, a major Oktoberfest type celebration in early November. The fare is $20 for a wristband and is good for one day. This service can be chartered similar to the Rapid Transit service which offers door-to-door shuttle service. Rapid Transit will pick you up at your hotel or residence, drop you off at the riverfront with your tubes or rafts ready to go and then take you back to your hotel or residence once you are done. The cost including transportation and all equipment needed to float the river is $35 per person inside the city limits, with a minimum of 8 riders, and additional fares can be negotiated for service outside of New Braunfels.

Night Moves New Braunfels is a later night service on Friday and Saturday nights that costs $10 for a wristband for unlimited transit between downtown New Braunfels, Gruene and local hotels. Rockin’ R has partnered with several local hotels and much of their charter type service is geared toward hotel guests though available to anyone. Rockin’ R has a fleet of 40 vehicles approximately three of which are wheelchair accessible.
Regional Connections

Outside of private TNC and shuttle service or the occasional VIA Vanpool there are very few regional connections in New Braunfels without the use of a personal automobile. The most prominent regional connections through public transit is ART which connects New Braunfels to the more rural areas of Comal County primarily for medical and human service-related trips. Greyhound and Megabus have connections in San Antonio and San Marcos but no stops in New Braunfels.

As this process moves forward there is potential for regional connections between New Braunfels and communities like Seguin, Schertz and San Antonio. Figure 4-9 depicts the potential areas where connection might be made including existing and proposed park and ride facilities. This figure also details what existing service, if any, are available to connect to.

Existing Services Summary

Currently, the only public transit available in New Braunfels is the door to door service provided by ART. This service now provides about 75 trips per day. Most of the service is geared for the senior center and two dialysis clinics. This service costs New Braunfels and VIA $850,460 and provides about 22,000 trips annually at a cost of $46 per trip or about $13 per mile. This is a very high cost per mile and is due to the allocation model used to calculate the cost to VIA and New Braunfels.

ART also operates service to other communities in Comal County through the New Braunfels facility. In addition to the ART service, there is a variety of human service vehicles serving their clients. There are also a number of outfitters that provide transportation for persons tubing. These services are available mostly to shuttle people and their tubes. Medicaid transportation is also provided separately in a siloed manner. It is the intention of the study team not to interfere with these private sector services.

VIA service is available at the Randolph transfer center (20 miles from New Braunfels). Plans are in place for a new facility just south of New Braunfels on I-35 (11 miles from downtown New Braunfels). Other nearby services include San Marcos Urban Transit District and Seguin’s one bus system.
Figure 4-9: Regional Connections- New Braunfels
Chapter 5: Demographics, Land Uses and Travel Patterns

Introduction

This chapter assesses the existing demographic, employment, and travel conditions in New Braunfels, Texas that influence current transportation trends and needs. Throughout the chapter, we summarize results from data available from New Braunfels’ Open Data site and Alamo Area Metropolitan Planning Organization’s (AAMPO) Geoportal and develop a community profile based on data collected by the U.S. Census Bureau (2017 American Community Survey, 5-year estimates).

New Braunfels falls within two counties, Comal and Guadalupe. The city is located about 30 miles northeast of San Antonio and about 45 miles southwest of Austin, sitting on the I-35 corridor that connects the two major urban hubs in Texas. New Braunfels covers about 45 square miles and has a population of about 84,000 people. The city is serviced by several highways, including I-35, which bisects the city, and state highway TX-46, which connects to I-10, located 9 miles south of the city. The Texas State Highway Loop 337 circles the city to the north of I-35 and provides a vital transportation connection within the city.

Notably, New Braunfels has grown by 64 percent over the last ten years. In 2015, New Braunfels was the second-fastest growing city with a population of 50,000 or more in the nation, as ranked by the U.S. Census Bureau, and the city has continued to rank among the fastest growing cities in the nation in recent years. With this growth comes an increased burden and heightened expectations for the city’s transportation system, but also offers the opportunity to explore the potential for new transit services.

Population and Employment Growth Areas

As part of its Travel Demand Modeling process, AAMPO develops forecasts for factors such as population and employment. AAMPO’s Travel Demand Modeling process relies on a traditional four-step model, which includes trip generation, trip distribution, mode choice, and traffic assignment models. These forecasts are developed at the Traffic Analysis Zone (TAZ) level, which is defined based on the road network and socioeconomic factors. Employment is project to grow by 38 percent citywide by 2025, compared to 2015 values. Figures 5-1 and 5-2 detail existing and projected employment levels.

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1 American FactFinder
2 http://herald-zeitung.com/community_alert/article_1aedd33a-1e3e-11e6-8231-f3e477067632.html
for New Braunfels. Figure 5-3 demonstrates the percent change in employment between 2015 and the 2025 forecast in each TAZ. The largest increases in employment are forecasted in the following areas:

- The central core area bounded by the Comal and Guadalupe Rivers;
- South of FM-758 and along TX-46;
- South of W County Line Road and north of W Klein Road;
- East of Morningside Drive and west of FM-1044 (Mockingbird Heights neighborhood);
- North of Spur Street and west of S Live Oak Avenue;
- Along Krueger Canyon Road; and
- South of TX-46 and F-2722 interchange (Mission Hills Ranch neighborhood).

Figure 5-1: Employment Levels: 2015  
Figure 5-2: Projected Employment: 2025
Figure 5-3: Percent Employment Change: 2015 - 2025

Similar to the projected change in employment patterns, an overall citywide increase in population of 36 percent is forecasted. Figure 5-4 shows population in 2015, Figure 5-5 shows projected population in 2025, and Figure 5-6 shows the percent change between the two. Notable percent increases in population is forecasted in the following areas:

- The central core area bounded by the Guadalupe river and TX-337;
- South of I-35 and north of Freiheit Road;
• The New Braunfels Regional Airport and south of FM-758 along TX-46;
• South of W. Klein Road;
• East of Morningside Drive and west of FM-1044 (Mockingbird Heights neighborhood); and
• Northeast of the TX-337 and I-35 interchange, and south of Wald Road.

**Figure 5-4: Population of New Braunfels: 2015**
Figure 5-5: Projected Population: 2025
Figure 5-6: Percent Change in Population: 2015 - 2025
Employment and Population Growth Area Synthesis

The areas forecasted to experience the largest employment and population growth in New Braunfels are home to some of the city’s most pressing mobility challenges. These may be categorized into three challenges: joint population and employment growth; adjacent population and employment growth and isolated growth areas.

Joint Population and Employment Growth

There are two areas in New Braunfels that are forecasted to experience high percentage increases in both employment and population: 1) the Mockingbird Heights neighborhood, which is surrounded by Morningside Drive and FM-1044, and 2) the area south of FM-758, including the Avery Park neighborhood. Both of these areas present mobility challenges given their geographical location and existing infrastructure. However, since both employment and population growth are forecasted to occur in the same area, there will be an opportunity to capitalize on this growth, ensure the growth is sustainable, and encourage multimodal transportation use.

Adjacent Population and Employment Growth

In some areas of New Braunfels, employment and population are forecasted to grow in areas adjacent to one another. These growth areas will provide an opportunity to improve connectivity between the areas so that commutes between them can be reduced or taken by transit and multimodal transportation. There are three area-pairs where there is such an opportunity: 1) areas east and west of the Guadalupe River, 2) areas north and south of W. Klein Road, and 3) areas east and west of TX-337, north of I-35, on the western side of the city.

Isolated Growth Areas

Some isolated areas of New Braunfels are forecasted to experience either employment or population growth. These areas will require robust transit service to connect residents to employment and residential centers both nearby and around the region, particularly if they are not currently contiguous with areas that have high levels of activity or development. The largest of these areas is east of I-35 near Creekside Crossing, which is anticipated to experience a large percentage increase in population. While this area is home to the New Braunfels Town Center at Creekside and a Walmart Distribution Center, there is relatively little existing housing in the area.
Existing Travel Patterns

In order to determine travel patterns within and outside New Braunfels, we used a “big data” collection method that relied on anonymized cell-phone location services. This data is available through StreetLight Data, a company that creates metrics about traffic volume and trips based on archival location data. The analysis included in this memo is based on Location-Based Services data, which comes from smartphone apps that use opt-in location-based services.

Several zone sets were created to understand travel patterns within New Braunfels as well as between New Braunfels and the greater region. Zones within New Braunfels were largely based on TAZs, with some modifications based on land uses. A total of 31 internal zones were created within the city and five regional zones that represented regional population centers: San Antonio, Cibolo/Schertz, Seguin, Canyon Lake, and San Marcos. The analysis conducted for this memo includes data from March, April, September, and October 2018³, and the legend includes the estimated number of vehicle trips at or between each zone during the applicable time and day periods (all days vs. weekdays, peak AM, peak PM) during these months.⁴ Origin zones are the zones in which a trip starts, while destination zones are those in which a trip ends.

This section provides an initial summary of high-level StreetLight queries, but there will be the opportunity to refine queries, data parameters, and the type of analysis moving forward. For additional details on StreetLight Data analyses, including Origin – Destination Matrices and Origin as well as Destination Maps for each local zone, see Appendix B.

Travel Patterns within New Braunfels

Overall Patterns: Origin Zones

Figure 5-7 shows the overall volume of trips that start in each of New Braunfels’ zones, reflecting all days of the week and all time periods. The highest number of trips originate in Zone 17 (12% of all trips start here), Zone 28 (11% of all trips start here), Zone 19 (7% of all trips start here), and Zone 5 (7% of all trips start here). As expected, the largest number of trips originate in the area in the city’s central core along I-35. When isolating the time period to all hours on weekends only, similar patterns emerge (these patterns are not pictured here—see Appendix B).

³ For future analyses, these months can be changed. See Appendix A for more information.
⁴ Please note, the two lowest levels of the map legend are combined in Streetlight Data’s interface, with turquoise representing the lowest volume of trips.
Figure 5-7: Origin Zones: Daily, All Hours
During peak commuting hours, the same four Zones (17, 28, 19, and 5) have high rates of trips that start in them. Figure 5-8 shows the volume of trips that originate in each zone during peak AM hours (6 AM to 10 AM) on weekdays (Monday-Thursday).

Figure 5-8: Origin Zones: Weekdays (M-Th), Peak AM (6AM – 10AM)
In order to better understand the nuances of the two highest volume Zones, 28 and 17, finer grain analysis was conducted. Both of these zones were split up by the land use into smaller sub-zones (as identified from a visual inspection of Google Earth): commercial, residential, residential with school, etc. In addition, activity was reviewed for hourly time periods. When reviewing origin trips from 7 AM to 8 AM on weekdays (Figure 5-9), higher origin activity in zones more residential in nature is apparent (Zones 5, 29, 15, 25, and 4). Please note, although Zones 17 and 28 appear not to be high volume zones because of the way they are subdivided, in aggregate the trip volumes are unchanged.

**Figure 5-9: Origin Zones (fine grained zones): Weekdays (M-Th), 7AM – 8AM**
Figure 5-10 reflects a focus on these areas later in the morning, from 10 AM to 11 AM. This shows that the commercial portion of Zone 28 becomes a hub for origin trips. This could reflect people departing from their visits to the stores and restaurants in this area.

**Figure 5-10: Origin Zones (fine grained zones): Weekdays (M-Th), 10AM – 11AM**
Figure 5-11 details the volume of trips that originate in each zone during peak PM hours (3 PM to 7 PM) on weekdays. The same high-volume zones emerge (Zones 17, 28, 19, and 5), but Zones 10 and 12 also appear as zones with a high volume of trips that start in them.

**Figure 5-11: Origin Zones: Weekdays (M-Th), Peak PM (3PM – 7PM)**
**Overall Patterns: Destination Zones**

Generally, we see similar patterns when looking at destination zones (Figure 5-12), which are the Zones in which trips end. The same four zones are highlighted as high-volume destination zones: Zone 17 (13% of trips end here), Zone 28 (11% of trips end here), Zone 5 (8% of trips end here), and Zone 19 (7% of trips end here).

When we focus in on weekday peak AM trip destination zones (Figure 5-13), we begin to see more dispersed levels of activity, with Zones 10, 12, 9, 15, and 4 joining the four zones that have consistently high volumes of trip activity as the places with the highest volumes of trips ending within them. This can begin to help identify where commuters are traveling to during peak morning commute hours, which is more diverse than during the PM peak hours (see Figures 5-11 and 5-12).
Figure 5-13: Destination Zones: Weekdays (M-Th), Peak AM (6AM – 10AM)
Figure 5-14 isolates destination zones from 7 AM to 8 AM during weekdays. This reveals more nuances than the aggregate peak period analysis, highlighting more concentrated destination activity in Zone 10 and Zone 20, and different levels of activity in Zones 17, 12, 19, 20 and 9.

**Figure 5-14: Destination Zones: Weekdays (M-Th), 7AM – 8AM**
Figure 5-15 isolates destination zone activity from 10 to 11 AM during weekdays, which again shows activity shifting back to the same high volume zones, many of which are largely commercial in nature.

**Figure 5-15: Destination Zones: Weekdays (M-Th), 10AM – 11AM**
When we focus on weekday peak PM hours (Figure 5-16), we see a less diverse spread of destinations, and we only see notable levels of destination activity in the same four Zones (17, 28, 19 and 5) that show consistently high trip volumes.

Figure 5-16: Destination Zones: Weekdays (M-Th), Peak PM (3PM – 7PM)
High-Volume Zones

Figures 5-17 through 5-20 show origin and destination maps during weekday peak AM and peak PM periods for the four zones that have the highest volumes of trip origins and destinations in analyses conducted so far: Zones 17, 28, 19, and 5. These maps help to illuminate key trends for weekday commutes in New Braunfels. The origin maps show where trips that begin in the identified zone (those outlined in black) end. Conversely, the destination maps show where the trips that end in the identified zone (outlined in black) begin. A brief description of the key patterns are included for each map.

Figure 5-17: Zone 17

- Zone 17 includes the area around the I-35/TX-46 interchange, east of the Union Pacific railroad track, south of FM-306 (Creekside Crossing), and north of Freiheit Road. The area is characterized by several hotels, cafes and restaurants, and schools (Canyon HS, Memorial Early College HS, Church Hill MS, Vintage Oaks Area ES, and Goodwin Frazier ES).

- Map A (origin: weekday peak AM) highlights where the most trips that begin in Zone 17 end. In this case, most trips that originate in Zone 17 during weekday peak AM hours also end in Zone 17, followed by Zone 19.

- Map B (origin: weekday peak PM) shows that peak PM patterns are similar to peak AM patterns, with the addition of Zone 12 as a key zone for trip termini.

- Map C (destination: weekday peak AM) shows where the most trips that end in Zone 17 begin. Most trips that end in Zone 17 during weekday peak AM hours also begin in Zone 17, followed by Zones 19 and 12.

- Map D (destination: weekday peak PM) shows Zones 17, 19 and 28 as the most common trip origination zones for trips that end in Zone 17.
Figure 5-17: Travel Patterns of Zone 17

a) Origin: Weekday Peak AM (6 AM - 10 AM)

b) Origin: Weekday Peak PM (3 PM - 7 PM)

c) Destination: Weekday Peak AM (6 AM - 10 AM)

d) Destination: Weekday Peak PM (3 PM - 7 PM)
Figure 5-18: Zone 28

- Zone 28 is adjacent to Zone 17 along the I-35 corridor and includes a Walmart Super Center, Lowe’s Home Improvement Center, hotel, a number of commercial establishments, as well as some residential homes. Zone 5, which covers downtown New Braunfels, includes the Comal County Courthouse, the Civic Center, churches, and a number of neighborhood commercial establishments in addition to residential homes.

- Map A (origin: weekday peak AM) shows that most trips that originate in Zone 28 during weekday peak AM hours also end in Zone 28, followed by Zones 17, 5, and 10.

- Map B (origin: weekday peak PM) shows that most trips that originate in Zone 28 during weekday peak PM hours also end in Zone 28, followed by Zones 10, 17, 5, and 9.

- Map C (destination: weekday peak AM) shows, in red, the zone where the most trips that end in Zone 28 begin. Most trips that end in Zone 28 during weekday peak AM hours also begin in Zone 28, followed by Zones 10, 17, 19, 5, and 9.

- Map D (destination: weekday peak PM) shows that weekday peak PM patterns are less dispersed than peak AM patterns. Zones 28, 17, 5, and 10 are the most common trip origination zones for trips that end in Zone 28.
Figure 5-18: Travel Patterns of Zone 28

Origin: Weekday Peak AM (6 AM - 10 AM)

Destination: Weekday Peak AM (6 AM - 10 AM)

Origin: Weekday Peak PM (3 PM - 7 PM)

Destination: Weekday Peak PM (3 PM - 7 PM)
Figure 5-19: Zone 5

- Zone 5, which covers downtown New Braunfels, includes the Comal County Courthouse, the Civic Center, churches, and a number of neighborhood commercial establishments in addition to residential homes.

- Map A (origin: weekday peak AM) shows that most trips that originate in Zone 5 during weekday peak AM hours also end in Zone 5, followed by Zones 28, 17, and 4.

- Map B (origin: weekday peak PM) shows similar patterns to weekday peak AM trips, with the addition of additional dispersed activity to several zones that surround Zone 5.

- Map C (destination: weekday peak AM) shows that trip activity is dispersed in this time period. Most trips that end in Zone 5 during weekday peak AM hours also begin in Zone 5, however there are high levels of activity in several other Zones: 10, 17, 28, 4, and 3.

- Map D (destination: weekday peak PM) shows less dispersed trip activity than during weekday peak AM times. Zones 5, 28, 17, and 4 are highlighted.
Figure 5-19: Travel Patterns of Zone 5

Origin: Weekday Peak AM (6 AM - 10 AM)

Destination: Weekday Peak AM (6 AM - 10 AM)

Origin: Weekday Peak PM (3 PM - 7 PM)

Destination: Weekday Peak PM (3 PM - 7 PM)
Figure 5-20: Zone 19

- Zone 19 includes schools, a hotel, and the Resolute Health Hospital campus as well as residential homes.

- Map A (origin: weekday peak AM) shows that most trips that originate in Zone 19 during weekday peak AM hours also end in Zone 19, followed by Zone 17.

- Map B (origin: weekday peak PM) shows similar patterns to weekday peak AM trips, with the addition of additional dispersed activity to Zone 12.

- Map C (destination: weekday peak AM) shows that most trips that end in Zone 19 during weekday peak AM hours also begin in Zone 19, followed by Zones 17 and 20.

- Map D (destination: weekday peak PM) shows that most trips that end in Zone 19 during weekday peak PM hours also begin in Zone 19, followed by Zones 17 and 12.
Figure 5-20: Travel Patterns for Zone 19

Origin: Weekday Peak AM (6 AM - 10 AM)

Destination: Weekday Peak AM (6 AM - 10 AM)

Origin: Weekday Peak PM (3 PM - 7 PM)

Destination: Weekday Peak PM (3 PM - 7 PM)
Regional Travel Patterns

This section identifies regional patterns between New Braunfels and San Antonio, Cibolo/Schertz, Seguin, Canyon Lake, and San Marcos. Figure 5-21 shows the high to low destinations of trips originating in New Braunfels and travelling to regional zones daily, including all hours, and Figure 5-22 shows the same information for trips that end in New Braunfels. Regional maps that show origin and destination trips during weekday peak hours (AM and PM) as well as on weekends are included in Appendix B. Generally, travel volumes between New Braunfels and San Marcos and Cibolo/Schertz are high. However, there are some slight differences based on the time of the day.

Figure 5-21: Regional Trips that originate in New Braunfels: Daily, All Hours
Tables 5-1 and 5-2 include the percentage share of trips between each regional zone. As shown in Table 5-1, apart from the trips within New Braunfels, the trip rates indicate that while the Cibolo/Schertz region is consistently the top destination for trips originating in New Braunfels, the second-most common regional destination varies during different times of the day. During the AM peak hours, San Antonio and San Marcos are the second-most common destination for trips originating in New Braunfels, while during the PM peak hour the Canyon Lake region is the second-most common destination. For trips that remain in New Braunfels, the AM peak period sees more trips travel outside of the city while during the PM peak period, a larger percentage of trips stay within the city.

Table 5-2 shows the percentage of trips that end in New Braunfels. Similar to the patterns identified in Table 15-1, the Cibolo/Schertz region remains the top region where trips to New Braunfels originate, apart from the trips within New Braunfels. During the AM peak hour, Canyon Lake is the second-most common origin for trips to New Braunfels. This data indicates that a relatively high number of trips originate in Canyon Lake and end in New Braunfels during the AM peak hour. During the PM peak hour, San Marcos is the second-most common origin for trips to New Braunfels.
Table 5-1: Regional Origin Rates

<table>
<thead>
<tr>
<th></th>
<th>Within New Braunfels</th>
<th>To San Antonio</th>
<th>To Cibolo/Schertz</th>
<th>To Seguin</th>
<th>To Canyon Lake</th>
<th>To San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td>From New Braunfels, daily avg.</td>
<td>88.70%</td>
<td>2.20%</td>
<td>3.50%</td>
<td>1.70%</td>
<td>1.90%</td>
<td>2.50%</td>
</tr>
<tr>
<td>From New Braunfels, 6-10am, M-Th</td>
<td>85.50%</td>
<td>3.60%</td>
<td>4.50%</td>
<td>2.30%</td>
<td>1.10%</td>
<td>3.60%</td>
</tr>
<tr>
<td>From New Braunfels, 3-7pm, M-Th</td>
<td>89.90%</td>
<td>1.50%</td>
<td>3.10%</td>
<td>1.20%</td>
<td>2.30%</td>
<td>1.90%</td>
</tr>
</tbody>
</table>

Table 5-2: Regional Destination Rates

<table>
<thead>
<tr>
<th></th>
<th>Within New Braunfels</th>
<th>From San Antonio</th>
<th>From Cibolo/Schertz</th>
<th>From Seguin</th>
<th>From Canyon Lake</th>
<th>From San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td>To New Braunfels, daily avg.</td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.60%</td>
<td>1.20%</td>
<td>2.10%</td>
<td>2.50%</td>
</tr>
<tr>
<td>To New Braunfels, 6 –10am, M-Th</td>
<td>86.30%</td>
<td>2.50%</td>
<td>4.30%</td>
<td>1.50%</td>
<td>3.70%</td>
<td>1.70%</td>
</tr>
<tr>
<td>To New Braunfels, 3-7pm, M-Th</td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.90%</td>
<td>1.30%</td>
<td>1.40%</td>
<td>2.80%</td>
</tr>
</tbody>
</table>

Further Data Refinement

As a potential transit route is developed, StreetLight Data can be used to closely analyze different areas of the city, which can inform and refine routing so that it reflects the existing vehicle travel patterns and the areas of the city and region that people are most often travelling to. Transit that is designed to reflect existing travel patterns will have a higher likelihood of capturing trips currently made by vehicle. As routing and key areas of analysis are further defined, StreetLight Data can also be used to understand demographics of those travelling to and from specific zones.
Major Destinations

Figure 5-23 identifies community centers, major destinations (including Walmart, H-E-B, the Schlitterbahn, and Gruene Historical district), outdoor outfitters, senior centers, and Higher Density Residential Zones\(^5\), which are likely to be home to apartment complexes. Parks and schools are also mapped. These destinations will be key considerations for transit service. This map indicates clusters of destinations generally abutting the TX-337 Loop, near Landa Park and the Schlitterbahn, and along I-35. In particular, there is a dense cluster of hotels located along the I-35 Business Loop. Data for residential zones and parks is from New Braunfels’ Open Data GIS Portal, school data is from AAMPO’s Geoportal, hotels data is from OpenStreetMap\(^6\) and the remainder of destinations were manually researched and geocoded. Major employer data was informed by New Braunfels’ EDC 2018 Demographic Profile.

Figure 5-24 details additional places of interest obtained from OpenStreetMap. Clusters of places of interest can be found near the interchanges at FM 306 and I-35, the I-35 Business Loop, the Route 46 and I-35 interchange, the TX-337 Loop, and in the downtown area.

New Braunfels’ most recent comprehensive plan identified the location of existing employment, market, medical, civic, outdoor recreation, education, and tourist/entertainment centers. These places can be found in Figure 5-25, and more detail is available in Envision New Braunfels (pages 160 – 170 of that publication).

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\(^5\) Higher Density Residential Zones includes the following zoning categories from New Braunfels’ Zoning Shapefile, which were selected as a proxy for apartment complexes: Multifamily District; Multifamily High Density District; Multifamily Low Density District; Multifamily low density District; Multifamily District; and Townhouse Residential District.

\(^6\) OpenStreetMap is a worldwide collaborative open source mapping project.
Figure 5-23: Major Destinations and Land Uses
Figure 5-24: Open Streets Map Places of Interest
Figure 5-25: Envision New Braunfels Centers

Walking and Biking Today

Existing Infrastructure

Today, New Braunfels has a network of hike and bike trails used primarily for recreational opportunities. In addition, New Braunfels has 6.7 miles of on-street conventional bike lanes. Several major highways and interstates, as well as the Comal and Guadalupe Rivers, serve as barriers to bicycle network connectivity. Rates of bicycling and walking for commute purposes remain low, with a citywide average of 1 percent of commuters doing so via walking or riding a bicycle.

Adequate pedestrian and bicycle infrastructure is an important community amenity that, when strategically paired with transit improvements, can support a robust multimodal transportation network.

Figure 5-26 details Strava activity in New Braunfels, which shows routes used by existing bicyclists. While Strava has been found to be biased in terms of age and gender, it has still been found to be a fairly

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7 This mileage was calculated from the segments indicated as existing, on-street facilities in the “Hike and Bike Trails” shapefile from New Braunfels’ Open Data GIS Portal.
reliable representation of commuter cyclists.\(^8\) Strava shows high levels of activity on streets including Landa Street, Gruene Road, Comal Avenue, Mills Street, Post Road, and Landa Park Drive, among others.

**Figure 5-26: Strava Heatmap**

\(^8\) Jestic et al. (2016) and (Boss, Nelson, Winters, & Ferster, 2018; Turner et al., 2017)
Demographic Review

To better understand community demographics in New Braunfels, we reviewed U.S. Census data related to age, vehicle access, income, mode share, disability, limited English proficiency, and race. While there are myriad reasons for a person to take transit, certain demographic factors—whether a person lives owns a car, for instance—often correlate with transit use. Other demographic factors that correlate with transit use include older adults, youth and individuals with lower incomes. This section will map each of these characteristics as well as ether demographic characteristics that are important to consider as part of efforts to promote transportation equity. In terms of the attributes related to transit use, there are no census blocks that consistently emerge as ranking highly throughout all indicators, indicating a relatively dispersed concentration of individuals who may be more likely to use transit.

Age

Figure 5-27 depicts median age in New Braunfels, while Figure 5-24 demonstrates the areas of New Braunfels that have higher proportions of youth (under age 18). The median age in New Braunfels is about 36 years old, with 26 percent of residents being under the age of 18 years and 14 percent of residents being over age 65. Figures 5-27 and 5-28 indicate that the areas along the northern edge of the city have a higher median age. The northern edge of the city also has a notable concentration of senior-aged residents (not pictured in this memo).

Figure 5-28 highlights concentrations of younger populations in the areas along S Seguin Avenue, to the south of W County Line Road, along the western portion of I-35, and in the area bounded by Common Street and FM 306, as well as the area to the east of downtown, bounded by the Guadalupe River on the west.

Household Vehicle Access

People residing in households without a car are less likely to have their travel needs met compared to those in households with one or more vehicles, given the limited public transit options currently available in New Braunfels. Citywide, just under four percent of households do not have a car. Household access to vehicles is depicted in Figure 5-29. Areas of the city that have higher rates of zero-car households include the areas to the north and west of Landa Park as well as areas along the I-35 corridor, including those surrounding Elliot Knox Boulevard, those to the east of Highway 46, and those to the west of FM 306.
Figure 5-27: Median Age of Population
Figure 5-28: Percent of Population Under Age 18
Figure 5-29: Household Access to Vehicles

Legend:
- 0% zero car households
- 0-2%
- 2-5%
- 5-8%
- 8-20%
Lower Income Households

Research has indicated that individuals’ economic characteristics greatly influence mode choice, and more solo driving can be expected from those with higher incomes. In addition, as mentioned above, individuals and households with lower incomes may be less likely to afford a private vehicle and, as such, may depend more on transit, walking, or bicycling to get around. The median income in New Braunfels is $64,208, with 9.5 percent of households living under the Federal Poverty Level. Concentrations of households with incomes under the Federal Poverty Level vary across New Braunfels (Figure 5-30). Areas with the highest percentages of households under the poverty line include downtown New Braunfels, the area around City Hall, and the area to the south of I-35, bounded by S Walnut Avenue, the Guadalupe River, and W County Line Road.

Current Commute Mode Shares

It is helpful to consider areas with higher rates of non-Single Occupancy Vehicle (SOV) commute modes in planning for transit, as these areas are home to people who may be more likely to use transit services. Nearly 82 percent of New Braunfels residents drive alone for their commute and just over one percent walk, bike, or use transit. Carpooling is the most popular non-SOV commute mode.

Figure 5-31 details the combined walk and bike mode share in New Braunfels, highlighting areas of the city with the highest non-motorized commute modes. These areas are fairly dispersed throughout the city. A fixed route transit service would likely be useful to those that commute via walking or biking. These trends are also important when considering transit access.

Adults with a Disability

Adults with a disability may be unable to drive a private vehicle and thus may be more likely to rely on public transportation or assistance from others to meet their transportation needs. Citywide, 12 percent of adults are living with a disability. Areas that have a higher percentage of adults with a disability include the central core, the westernmost portion of the I-35 corridor, and the area south of W Klein Road (see Figure 5-32).

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11 ACS 2017 5-Year Estimate
Figure 5-30: Percent of Households Under the Federal Poverty Level

LEGEND
Percent of households under poverty line

- 0 - 3%
- 3 - 7%
- 7 - 10%
- 10 - 16%
- 16 - 39%

1 2 4 Mi
Figure 5-31: Combined Walk and Bike Mode Share
Figure 5-32: Percent of Adults with a Disability
Limited English Proficiency Households and People of Color

It is important for transit planning efforts to consider the needs of New Braunfels residents equitably. To aid in planning efforts and as a part of broader equity considerations, Limited English Proficiency households and areas with higher rates of people of color should be considered (see Figures 5-33 and 5-34). Citywide, just under 3 percent of households are limited English-speaking, just under 10 percent of the population are people of color, and 34 percent of the population is Hispanic or Latino. Areas with higher rates of Limited English Proficiency households are concentrated in the western areas of the city and the along western portion of I-35. Areas of the city with higher percentages of people of color include downtown New Braunfels, along the I-35 corridor on the west side of New Braunfels, and the eastern portion of the city.

12 ACS 2017 5-Year Estimates
Figure 5-33 - Households with Limited English Proficiency

Legend:
- 0.5 - 1%
- 1 - 2%
- 2 - 3%
- 3 - 6%
- 6 - 8%

Percent of households with Limited English Proficiency

Legend:
- 0.5 - 1%
- 1 - 2%
- 2 - 3%
- 3 - 6%
- 6 - 8%
Figure 5-34 - Percent People of Color
Summary

The key components of this existing conditions and travel patterns memo include a review of population and employment growth forecasts, a review of existing travel patterns, and mapping of key destinations and demographic factors.

New Braunfels has grown rapidly in recent years, which presents new challenges for the mobility of residents and visitors, but also offers the opportunity to explore the potential for new transit services. The population in New Braunfels has grown by 64 percent over the last ten years. In 2015, New Braunfels was the second-fastest growing city with a population of 50,000 or more in the nation, as ranked by the U.S. Census Bureau, and the city has continued to rank among the fastest growing cities in the nation in recent years. With this growth comes an increased burden and heightened expectations for the city’s transportation system.

Population and Employment Growth Areas

A review of AAMPO’s forecasts for employment and population in 2025, conducted as part of its Travel Demand Modeling process, reveals that employment is projected to grow by 38 percent and population by 36 percent by 2025 (compared to 2015 data). To understand the challenges that the forecasted growth poses to transit service, the trends were categorized according to three key trends:

1. **Joint Population and Employment Growth Areas:** There are two areas that are forecasted to experience high percentage increases in both employment and population: 1) the Mockingbird Heights neighborhood, which is surrounded by Morningside Drive and FM-1044, and 2) the area south of FM-758, including the Avery Park neighborhood. These trends provide an opportunity to ensure that growth is sustainable and to encourage multimodal transportation use.

2. **Adjacent Population and Employment Growth Areas:** There are three areas of New Braunfels where employment and population are forecasted to grow in areas adjacent to one another: 1) areas east and west of the Guadalupe River, 2) areas north and south of W. Klein Road, and 3) areas east and west of TX-337, north of I-35, on the western side of the city. These growth areas will provide an opportunity to improve connectivity between the areas so that commutes between them can be reduced or taken by transit and multimodal transportation.

3. **Isolated Growth Areas:** Some isolated areas of New Braunfels are forecasted to experience either employment or population growth. These areas will require robust transit service to connect residents to other employment and residential centers, particularly if they are not currently within areas that have high levels of activity or development. The largest of these areas is east of I-35 near Creekside Crossing, which is anticipated to experience a large percentage increase in population. Planners should carefully monitor growth in these areas to determine when it is appropriate to provide fixed route transit service.

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13 American FactFinder
14 [http://herald-zeitung.com/community_alert/article_1aed33a-1e3e-11e6-8231-f3e477067632.html](http://herald-zeitung.com/community_alert/article_1aed33a-1e3e-11e6-8231-f3e477067632.html)
Existing Travel Patterns

In order to determine travel patterns within and outside New Braunfels, we used a “big data” collection method that relied on anonymized cell-phone location services. This data is available through StreetLight Data, a company that creates metrics about traffic volume and trips based on archival location data. The analysis included in this memo is based on Location-Based Services data, which comes from smartphone apps that use opt-in location-based services. Thirty-one zones within the city, largely based on TAZs, were used as the basis of local analyses. Regional analyses were also conducted, focusing on travel patterns between New Braunfels and San Antonio, Cibolo/Schertz, Seguin, Canyon Lake, and San Marcos. Data was used from four months in 2018. Origin zones are the zones in which a trip starts, while destination zones are those in which a trip ends.

Travel Patterns within New Braunfels

Overall Patterns: Origin Zones

Figure 5-35 shows the overall volume of trips that start in each of New Braunfels’ zones, reflecting all days of the week and all time periods. The highest number of trips originate in:

- **Zone 17** (12% of all trips start here),
- **Zone 28** (11% of all trips start here),
- **Zone 19** (7% of all trips start here), and
- **Zone 5** (7% of all trips start here).

These zones are outlined in black in Figure 5-31. As expected, the largest number of trips originate in the area in the city’s central core along I-35.
Figure 5-35: Origin Zones: Daily, All Hours
Overall Patterns: Destination Zones

Generally, we see similar patterns when looking at destination zones, which are the zones in which trips end. The same four zones are highlighted as high-volume destination zones:

- **Zone 17** (13% of trips end here),
- **Zone 28** (11% of trips end here),
- **Zone 5** (8% of trips end here), and
- **Zone 19** (7% of trips end here).

These zones are highlighted in black in Figure 5-36.

**Figure 5-36 – Destination Zones: Daily, All Time Periods**
High-Volume Zones

Throughout the local analyses conducted, four zones had the highest volumes of trip origins and destinations: 17, 28, 19, and 5. A brief description of each zone is provided below:

- **Zone 17** - Zone 17 includes the area around the I-35/TX-46 interchange, east of the Union Pacific railroad track, south of FM-306 (Creekside Crossing), and north of Freiheit Road. The area is characterized by several hotels, cafes and restaurants, and schools (Canyon HS, Memorial Early College HS, Church Hill MS, Vintage Oaks Area ES, and Goodwin Frazier ES).

- **Zone 28** - Zone 28 is adjacent to Zone 17 along the I-35 corridor and includes a Wal-Mart Super Center, a Lowe’s Home Improvement Center, a hotel, a number of commercial establishments, as well as some residential homes. Zone 5, which covers downtown New Braunfels, includes the Comal County Courthouse, the Civic Center, churches, and a number of neighborhood commercial establishments in addition to residential homes.

- **Zone 19** - Zone 19 includes schools, a hotel, and the Resolute Health Hospital campus as well as residential homes.

- **Zone 5** - Zone 5, which covers downtown New Braunfels, includes the Comal County Courthouse, the Civic Center, churches, and a number of neighborhood commercial establishments in addition to residential homes.

Regional Travel Patterns

Analysis of regional patterns between New Braunfels and San Antonio, Cibolo/Schertz, Seguin, Canyon Lake, and San Marcos highlighted that in general, the highest travel volumes of regions studied were between New Braunfels and Cibolo/Schertz as well as San Marcos. However, there is some variation based on time of day. Other notable trends highlighted in Tables 3 and 4 include high morning peak volumes from New Braunfels to San Antonio and San Marcos and high morning peak volumes from Canyon Lake to New Braunfels.

Table 3: Regional Origin Rates

<table>
<thead>
<tr>
<th></th>
<th>Within New Braunfels</th>
<th>To San Antonio</th>
<th>To Cibolo/Schertz</th>
<th>To Seguin</th>
<th>To Canyon Lake</th>
<th>To San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td>From New Braunfels, daily avg.</td>
<td>88.70%</td>
<td>2.20%</td>
<td>3.50%</td>
<td>1.70%</td>
<td>1.90%</td>
<td>2.50%</td>
</tr>
<tr>
<td>From New Braunfels, 6-10am, M-Th</td>
<td>85.50%</td>
<td>3.60%</td>
<td>4.50%</td>
<td>2.30%</td>
<td>1.10%</td>
<td>3.60%</td>
</tr>
<tr>
<td>From New Braunfels, 3-7pm, M-Th</td>
<td>89.90%</td>
<td>1.50%</td>
<td>3.10%</td>
<td>1.20%</td>
<td>2.30%</td>
<td>1.90%</td>
</tr>
</tbody>
</table>
Table 4: Regional Destination Rates

<table>
<thead>
<tr>
<th></th>
<th>Within New Braunfels</th>
<th>From San Antonio</th>
<th>From Cibolo/Schertz</th>
<th>From Seguin</th>
<th>From Canyon Lake</th>
<th>From San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td>To New Braunfels, daily avg.</td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.60%</td>
<td>1.20%</td>
<td>2.10%</td>
<td>2.50%</td>
</tr>
<tr>
<td>To New Braunfels, 6 – 10am, M-Th</td>
<td>86.30%</td>
<td>2.50%</td>
<td>4.30%</td>
<td>1.50%</td>
<td>3.70%</td>
<td>1.70%</td>
</tr>
<tr>
<td>To New Braunfels, 3-7pm, M-Th</td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.90%</td>
<td>1.30%</td>
<td>1.40%</td>
<td>2.80%</td>
</tr>
</tbody>
</table>

Major Destinations

Major destinations, mapped in Figure 5-37, will be key considerations for transit service. The map indicates clusters of destinations generally abutting the TX-337 Loop, near Landa Park and the Schlitterbahn, and along I-35. In particular, there is a dense cluster of hotels located along the I-35 Business Loop.
Figure 5-37 – Major Destinations and Land Uses
Demographics

U.S. Census data was reviewed to better understand community demographics in New Braunfels. In particular, demographic factors that often correlate with transit use were reviewed—including zero-car households, older adults, youth, lower income households, and individuals with a disability. In terms of the attributes related to transit use, there are no census blocks that consistently emerge as ranking highly throughout all indicators, indicating a relatively dispersed concentration of individuals who may be more likely to use transit.

Other important attributes were explored, including mode share, Limited English Proficiency households, and people of color.

A few key findings from our demographic analysis include:

- **Age** - The areas along the northern edge of the city, near Gruene Road and the northern extents of Loop 337 and TX-46, have a higher median age. The northern edge of the city also has a notable concentration of senior-aged residents. There are concentrations of younger populations in the areas along S Seguin Avenue, to the south of W County Line Road, along the western portion of I-35, and in the area bounded by Common St and FM 306, as well as the area to the east of downtown, bounded by the Guadalupe River on the west. See Figures 5-27 and 5-28.

- **Household vehicle access** - Areas of the city that have higher rates of zero-car households include the areas to the north and west of Landa Park as well as areas along the I-35 corridor, including those surrounding Elliot Knox Boulevard, those to the east of Highway 46, and those to the west of FM 306. See Figure 5-29.

- **Lower Income Households** - Areas with the highest percentages of households under the poverty line include downtown New Braunfels, the area around City Hall, and the area to the south of I-35, bounded by S Walnut Avenue, the Guadalupe River, and W County Line Road. See Figure 5-30.

- **Commute Mode shares** - Nearly 82 percent of New Braunfels residents drive alone for their commute and just over one percent walk, bike, or use transit. Carpooling is the most popular non-SOV commute mode. Areas of the city with high non-motorized commute modes are fairly dispersed throughout the city. See Figure 5-31.

- **Adults with a Disability** - Citywide, 12 percent of adults are living with a disability. Areas that have a higher percentage of adults with a disability include the central core, the westernmost portion of the I-35 corridor, and the area south of W Klein Road. See Figure 5-32.

- **Households with Limited English Proficiency** - Citywide, just under 3 percent of households are.

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15 ACS 2017 5-Year Estimates
limited English-speaking. Areas with higher rates of Limited English Proficiency households are concentrated in the western areas of the city and the along western portion of I-35. See Figure 5-33.

- **People of Color** – Citywide, just under 10 percent of the population are people of color, and 34 percent of the population is Hispanic or Latino. Areas of the city with higher percentages of people of color include downtown New Braunfels, along the I-35 corridor on the west side of New Braunfels, and the eastern portion of the city. See Figure 5-34.

16 ACS 2017 5-Year Estimates
Chapter 6: Unmet Needs and Potential Transit Demand

Introduction

This chapter includes the background work necessary to make informed decisions regarding the design of a transit service both within New Braunfels and from adjacent communities. This memorandum follows the assessment of existing transportation services, a review of demographics and land uses and an extensive array of outreach activities/community input.

Estimating need (potential riders) and ridership (potential ridership based on a specific service design) for small urban areas is always part experiential and part analytical. Based on the above analysis and an extensive onsite review of the city, the study team can make reliable judgements regarding a new service.

Estimating Needs

Estimating needs in small cities requires looking at a variety of factors and making comparisons. Need will be expressed in terms of potential ridership and service level. There are no models calibrated for these cities. Currently, about one-half of the Texas cities of similar size to New Braunfels have public transit. The study team reviewed four comparable systems and looked at other systems to verify the results.

Our approach looks at a variety of factors. The results are summarized in this section and detailed in later sections of the memo:

- **Demographics** – Density and transit dependent populations are examined closely and compared to similar cities. New Braunfels demographic makeup is comparable to other cities with transit and is a candidate for a modest fixed route system.

- **Results of the Outreach Efforts** – The outreach effort was expansive. Support for transit was significant with few negative responses. While this does not translate into ridership, it does measure support for transit.
Comparable Communities – There were four comparable communities examined. In addition, the study team reviewed data from other cities to verify the results. While no two cities are alike, addressing their transit potential requires us to look at the various transit attributes to ensure an “apples-to-apples” comparison to the greatest extent possible. When all factors are examined, New Braunfels has a number of transit attributes that would place it in the middle of the comparables. These will be examined in detail below.

Overall, as is demonstrated in this memorandum, New Braunfels would be a good candidate for a modest public transit system with an equivalent of five fixed route vehicles and up to two paratransit vehicles. Please note that while the study team uses fixed route for this example, micro-transit remains a part of the potential solution. This level of service could generate between 100,000 and 180,000 trips annually (more with weekend service) with the latter ridership figure generated after the system has been in place for three or four years.

Demographics and Land Uses

One of the essential issues that must be dealt with is growth. New Braunfels has grown rapidly in recent years, presenting new challenges for the mobility of residents and visitors, but also offering the opportunity to explore the potential for new transit services. The population in New Braunfels has grown by 64 percent over the last ten years. With this growth comes an increased burden and heightened expectations for the city’s transportation system. Keeping up with the unmet need is critical to success. The service should conduct regular planning and analysis to determine when additional service is needed.

A review of AAMPO’s forecasts for employment and population in 2025, conducted as part of its Travel Demand Modeling process, reveals that employment is projected to grow by 38 percent and population by 36 percent by 2025 (compared to 2015 data). This suggests that by the time the service is implemented, service needs may shift and/or increase. Figure 6-1 illustrates where the projected growth should occur. Most of this growth will occur on the outer edges of the city and may require micro-transit solutions.

U.S. Census data was reviewed to better understand community demographics in New Braunfels. In particular, demographic factors that often correlate with transit use were reviewed—including zero-car households, older adults, youth, lower income households, and individuals with a disability.

In terms of the attributes related to transit use, there are no census blocks that consistently emerge as ranking highly throughout all indicators, indicating a relatively dispersed concentration of individuals who may be more likely to use transit. These often must be determined by field analysis.

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1 American FactFinder
A few key findings and patterns from our demographic analysis in Chapter No. 4 include:

- **Age** – The northern edge of New Braunfels has a notable concentration of senior residents.

- **Household vehicle access** – Areas of the city that have higher rates of zero-car households include the areas to the north and west of Landa Park as well as areas along the Interstate 35 corridor, including those surrounding Elliot Knox Boulevard, those to the east of Highway 46, and those to the west of FM 306.
• **Lower income households** – Areas with the highest percentages of households under the poverty line include areas around downtown New Braunfels, the area around City Hall, and the area to the south of Interstate 35, bounded by S. Walnut Avenue, the Guadalupe River, and W. County Line Road.

• **Commute mode shares** – Nearly 82 percent of New Braunfels residents drive alone for their commute and just over one percent walk, bike, or use transit. Carpooling is the most popular non-single occupancy vehicle (SOV) commute mode.

• **Adults with a disability** – Citywide, 12 percent of adults are living with a disability. Areas that have a higher percentage of adults with a disability include the central core, the westernmost portion of the Interstate 35 corridor, and the area south of W. Klein Road.

In addition, there are a reasonable number of annual visitors with a concentration in the summer, particularly on weekends. There is also a significant number of visitors to Gruene, which introduces weekend parking and traffic issues.

While the demographics necessitate a slightly lower level of service due to higher than average income levels, this is neutralized by the need for some level of service that can get visitors out of their cars.

**Regional Travel**

Commuter service would work most efficiently and effectively if planned as a single network, rather than depend on service solely to and from New Braunfels. Currently, Capital Metro, VIA and CARTS operate service in this corridor with CARTS providing service between San Marcos and Austin. At this time the gap in the corridor is between San Marcos and the Randolph Park and Ride facility near the intersection of Interstate 35 and Loop 410 in northeast San Antonio. While any service implemented does not have to be operated by one system, it should be planned to maximize connectivity in the corridor.

Currently the only commuter service between New Braunfels and other communities is with vanpools set up through either Capital Metro or VIA. In each case, one end of the trip must be based in that system’s service area. Chapter 5: Review of Existing Services indicated that there were about 31 commuters using vanpools to go to Austin and 16 going to San Antonio.

The study team used a one and two percent mode split for commuter service. Using data supplied by the Alamo Area Metropolitan Planning Organization (AAMPO), Table 6-1 depicts the potential home-based work trips from New Braunfels to: Bexar/Downtown, San Antonio 410, and Seguin, Guadalupe County (primarily Seguin and surrounding areas). Based on this, each mode split was calculated in Figures 6-2 (one percent) and 6-3 (two percent). For purposes of this example it is assumed that the same number of trips are in reverse in the afternoon, doubling the two-way usage.

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2 ACS 2017 5-Year Estimates
3 This does not include USAA’s fleet of over 100 vehicles
Tables 6-2 and 6-3 indicate the potential range of commuters. Given that home-based work trips occur at different times, the numbers generated here must be discounted to account for those that can go to work at the same time. It must be further discounted based on the fact that the trips will be dispersed at the destination. Under any circumstance, based on Table 6-3, the only corridor that can support even a modest level of commuter bus service would be the New Braunfels to Bexar County corridor (216 trips). Given that the 216 trips would be dispersed by time and geography, and would be reduced by 30 – 50 vanpool riders, regular commuter bus service will not be particularly effective.

To verify these numbers the study team looked at Capital Metro’s express commuter service from Round Rock to Austin. Using FY 2019 data, ridership on three buses between 5:40 and 7:40 AM, averaged about 35 one way boarding in Round Rock per day or about 12 riders per bus.

**Table 6-1: Daily Home-Based Work Trips – 2025**

<table>
<thead>
<tr>
<th>From</th>
<th>New Braunfels</th>
<th>Bexar, Downtown</th>
<th>San Antonio 410</th>
<th>Seguin, Guadalupe Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Braunfels</td>
<td>10799</td>
<td>4470</td>
<td>5128</td>
<td></td>
</tr>
<tr>
<td>Bexar/Downtown</td>
<td>2765</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Antonio 410</td>
<td>327</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seguin</td>
<td>1080</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6-2: Daily Potential Transit Usage at 1 Percent Transit Use 2025**

<table>
<thead>
<tr>
<th>From</th>
<th>New Braunfels</th>
<th>Bexar, Downtown</th>
<th>San Antonio 410</th>
<th>Seguin, Guadalupe Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Braunfels</td>
<td>108</td>
<td>44</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Bexar/Downtown</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Antonio 410</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seguin</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6-3: Daily Potential Transit Usage at 2 Percent Transit Use – 2025

<table>
<thead>
<tr>
<th></th>
<th>New Braunfels</th>
<th>Bexar, Downtown,</th>
<th>San Antonio 410</th>
<th>Seguin, Guadalupe Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Braunfels</td>
<td>216</td>
<td></td>
<td>88</td>
<td>102</td>
</tr>
<tr>
<td>Bexar/Downtown</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Antonio 410</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seguin</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carpools, Vanpools and Bus Pools

There are three significant vanpool programs in the New Braunfels area. Two are public services – Capital Metro and VIA and the third is a private service operated by USAA, with over 100 vanpools. None of these allow for vanpools to or from New Braunfels and another location outside of VIA and Capital Metro’s service areas.

The question for each corridor then becomes; how much of this service should be vanpools or buses? The decision point becomes one of:

- Expand vanpool efforts targeting New Braunfels (unlike the other two programs) trips that are outside either VIA or Capital Metro’s service area. This is a low cost option.

- Implement a commuter service that would supplement (or compete with) the vanpool program. This service could cost $100,000 - $200,000 annually per corridor.

Outreach and Public Engagement

As discussed in Chapter 3: Detailed Findings of the Outreach Efforts, the vast majority of respondents to surveys, meetings, focus groups and other public engagements were in support of public transit. This was found across all age groups, and most particularly between the ages of 18 to 25 and for ages over 65. These levels and types of support are part of a nationwide trend. This does not translate into ridership, but public support is important. Trip needs expressed at all ages included:

- Shopping, medical and recreational
- Work
- Human services
Overall, there was significant support from the human service and health care sectors and a number of businesses. Most thought that the service should address local resident needs first.

**Review of Comparable Transit Systems**

In reviewing service potential, it is important to look at the successes or failures of comparable communities. For purposes of this effort, the study team looked at four cities that implemented fixed route service – two in the Interstate 35 corridor (San Marcos and Round Rock), Tyler and Texarkana. While no two communities are alike, there is much we can learn from the experiences of others. For this review we look at:

- The size of the city,
- Location,
- Poverty rates,
- Number of fixed route peak vehicles.
- Fares are all between $1 and $1.25, making fare a non-factor in this analysis.

First is a description of the comparable systems, followed by four measures of comparability: Productivity - one-way trips per vehicle hour; Effectiveness – one-way trips per capita; Coverage - peak vehicles per capita; and Annual Ridership (Table 6-4).

**Comparable Systems**

Four systems were selected:

1. **San Marcos** – San Marcos is smaller than New Braunfels but has a large university, and there is a large competing service operated through the university. Demographically, San Marcos has a higher poverty rate than New Braunfels and therefore should see higher ridership rates. Also, the university system serves some of the same riders.

   In 2013, the system was averaging a respectable productivity of 9.2 one-way trips per revenue vehicle hour and 135,000 one-way trips. Two years after a system redesign in 2015, ridership dropped to 59,000 (52 percent). Some of this drop can be attributed to a new route that eliminated some transfers, but that alone would not account for a drop of 59 percent. Per capita ridership, a measure of effectiveness was a very good 2.6 annual trips per capita, but that is now down to about 1 trip per capita. Please note that for purposes of comparison we use 2013 numbers in Table 6-4.

2. **Round Rock** – Round Rock, with over 100,000 residents, is larger than New Braunfels and is currently underserved with a less than desirable service design. Round Rock is operating three in town fixed route buses (one bus for every 42,000 residents), about one-third the level of local service Round Rock’s size should be seeing. This low level of service suppresses ridership. The poverty rate in Round Rock is low.
Round Rock reports productivity on its three in-town routes (effectively) to be 6.2 one-way trips per hour with a per capita ridership of 0.37, indicative of the low service levels. Ridership is 52,000 one-way trips annually.

3. Texarkana – Texarkana operates six fixed route buses. It is similar in size to New Braunfels but has a much higher poverty rate and no visitor service. The two Texarkana’s and two other small cities formed a transit district over 20 years ago.

Texarkana reports a productivity of 13.1 trips per hour – very high for an urban area of its size. Reasons for high ridership and effectiveness (3.9 trips per capita) include an appropriate number of vehicles (one bus per 12,500 residents) and routes, an effective service design and years of experience and acceptance in the community. Ridership is over 305,000 one-way trips annually.

4. Tyler – Tyler is an example of a system that operates about half the service that it should for a service area of 110,000 persons (one bus per 22,000 population). It operates five fixed route buses on mostly long extended loop routes. Tyler’s poverty rate is 20 percent above the state average and at about the median and mean point among the comparables. The service level is well below the expected level of service for a city of its size. As a result, ridership is 149,000 one-way trips annually, about one half of Texarkana’s ridership. Productivity is about 6.5 one-way trips per hour and per capita ridership is 1.4, both reflecting the low service level.

New Braunfels

Looking at these other cities, we find that New Braunfels’s population is in the middle of the comparables. New Braunfels’s poverty rate is second lowest after Round Rock and New Braunfels has more visitors than any of the comparables. All cities have relatively similar population densities. Overall, New Braunfels has some transit advantages and some disadvantages and is well within the parameters of the comparables.

Table 6-4: Review of Comparable Cities⁴

<table>
<thead>
<tr>
<th>City</th>
<th>Population*</th>
<th>Ridership</th>
<th>Peak Vehicles</th>
<th>Ridership per Capita</th>
<th>One-way Trips per Hour</th>
<th>Residents per Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Rock</td>
<td>128,000</td>
<td>52,000</td>
<td>3</td>
<td>0.4</td>
<td>6.2</td>
<td>42,667</td>
</tr>
<tr>
<td>Tyler</td>
<td>108,000</td>
<td>149,000</td>
<td>5</td>
<td>1.4</td>
<td>6.5</td>
<td>21,600</td>
</tr>
<tr>
<td>San Marcos**</td>
<td>63,000</td>
<td>135,000</td>
<td>5</td>
<td>2.1</td>
<td>9.2</td>
<td>12,600</td>
</tr>
<tr>
<td>Texarkana</td>
<td>75,000</td>
<td>305,000</td>
<td>6</td>
<td>4.1</td>
<td>13.1</td>
<td>12,500</td>
</tr>
</tbody>
</table>

* US Census 2018
** Priori to change in 2015

⁴ Data Source: National Transit Database Transit Agency Profiles. 2017
Sizing the System

The size of the transit system will greatly influence the ridership. Undersized transit programs can see significantly lower ridership. Using an example of a city that operates six buses in service and generates 200,000 one-way trips annually. If that same city were to cut its service in half, ridership would drop to one-quarter of the six-bus ridership. When this occurs half of the origins are unserved and half the destinations are unserved, resulting in one-quarter of the ridership or 50,000 trips. This is borne out through the examination of the comparables and across the country.

Our research tells us that a full level of fixed route service for a community the size of New Braunfels is one fixed route vehicle for 8,000 – 12,000 residents. A lower level of service causes an exponential drop in ridership as not only is there fewer origins, but also there are fewer destinations available for service.

To better understand this, we looked at the four “comparable” service areas. Among the comparables, San Marcos (prior to the change) and Texarkana meet the above threshold while Round Rock’s transit system (one vehicle for 43,000 residents) and Tyler Transit (one vehicle for 22,000 residents) are considered to be significantly undersized for their communities, reflected by the very low ridership and productivity in these service areas. Ridership per capita (Figure 6-2) is an indicator of the level of service. Round Rock, with the lowest level of service also has the lowest ridership per capita by far. Residents per Vehicle depicts the level of service. Tyler and Round Rock have the lowest productivity (Figure 6-3) and highest number of residents per vehicle (Figure 6-4). In each case Texarkana is the leader.

Figure 6-2: Ridership per Capita in Comparable Cities
Figure 6-3: One-way Trips per Hour in Comparable Cities

![Bar chart showing one-way trips per hour for Round Rock, Tyler, San Marcos, and Texarkana.]

- Round Rock: 6,000
- Tyler: 8,000
- San Marcos: 12,000
- Texarkana: 14,000

Figure 6-4: Residents per Vehicle in Comparable Cities

![Bar chart showing residents per vehicle for Round Rock, Tyler, San Marcos, and Texarkana.]

- Round Rock: 45,000
- Tyler: 20,000
- San Marcos: 15,000
- Texarkana: 10,000
Summary of Comparable Systems

This comparison tells us three things about a fixed route service in New Braunfels:

1. Productivity and ridership are significantly affected by the level of service. Operating one-third of the level that should be in place means that one-third of the residents have access to one-third of the destinations, yielding about one-sixth the ridership of a fully implemented service. This is a recipe for low ridership and a failed system.

2. Income/poverty levels, youths, seniors and other transit dependent populations make a difference in ridership.

3. Some of the low productivity numbers are compounded by very poor route design, such as long meandering or looping routes that require an hour or more for any round trip.

4. Based on the ridership seen among comparables, New Braunfels with five to seven full-time peak vehicles and some visitor needs can generate a productivity of eight to ten one-way trips per hour or about 200,000 annual one-way trips. This will continue to grow as the population expands.

Summary - Need and Potential Size of Service

What is the estimated need and how much service is required to meet most needs? While there is no model that can predict transit usage in a city the size of New Braunfels, there is a variety of information available to help us estimate the need, potential ridership and service size. KFH Group concludes that a five to seven bus/van configuration can generate up to 200,000 trips annually in the community after 2 – 3 years.

Demographically, New Braunfels has the population to support a modest service. Transit dependent residents, most notably low-income residents and youths (many of whom may find transit an advantage over walking or having their parents take them to school), will use the service. While New Braunfels has a low level of poverty, it makes up for it with a significant visitor population, most notably in season and on weekends, with two major attractors: the river recreation and Gruene.

The extensive outreach including meetings, interviews and surveys clearly indicated a preference for public transit and as noted previously while most will not ride, they will likely support it.

The review of comparables places New Braunfels in the middle, indicating lower ridership than Texarkana, yet considerably higher than Tyler or Round Rock. While only four systems are included, we looked at a number of other systems in Texas and they confirm the findings from the review of comparables.
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

This is the final chapter of the New Braunfels Transit Study. It is designed to initiate a collaborative approach among stakeholders in order to select and prioritize alternatives and strategies that should guide development of a New Braunfels public transit system. This chapter is based on the previous five chapters produced over the course of the study:

- Chapter 2: Study Goals and Objectives
- Chapter 3: Detailed Findings of the Outreach Efforts
- Chapter 4: Review of Existing Services
- Chapter 5: Demographics, Land Uses and Travel Patterns
- Chapter 6: Unmet Needs and Potential Transit Demand

Introduction

The primary purpose of this chapter is to review service and organizational strategies and help guide the city in their decisions on the future of transit in New Braunfels. The decisions made by the City of New Braunfels will determine the direction of the final plan.

The organizational strategies review the various approaches that the city and perhaps Comal and Guadalupe County can take to form, administer and manage the transit system. It is important to give the city and the two counties enough information to make a decision on the organization of the service. The service strategies focus on major and minor decision points for determining the ultimate direction of the study. These strategies are not recommendations, rather, they are potential service alternatives that can be employed to address the need. The city should select the alternatives to be included in the plan. Selections can include alternatives as presented, modified alternatives or strategies not included here. Decisions made as a result of this chapter shall guide New Braunfels in the future.

Having established an understanding of existing conditions and need in the first five chapters, the alternatives for transit service in New Braunfels and connecting to San Antonio and Seguin, are presented in this chapter. This critical chapter addresses potential strategies to be employed to:

- Focus on unmet local New Braunfels needs now and in the future
- Ensure regional connectivity
- Ensure sustainability for the future
- Present a variety of service and organizational opportunities
Decision Points

This chapter starts with the information that decision-makers need to know before they can make a decision on the most appropriate strategies. The sections are summarized as follows:

- Introducing Key Concepts for Small urban Transit
- Service strategies (local and regional)
- Organizational Strategies
- Financial and Sustainability Strategies.

Key decisions points will be identified in the section on service strategies so that decision makers can focus on the step-by-step decisions to be made.

The front line staff of the transit industry – the vehicle operators - have been hit very hard by the Covid-19. Well over 100 VO’s and other transit workers have died during the pandemic. This has become a very dangerous occupation.

A Word about Post Covid-19

Clearly no one can predict the future with any degree of certainty. What will the post Covid world look like for transit in New Braunfels? The development of strategies will be based on a number of assumptions that put the safety of the customers and the front-line staff first:

- For New Braunfels the need will still exist once the country is functioning close to normal and the variety of strategies will still be relevant:
  - Some may now be hesitant to ride a bus – transit will have to prove itself.
  - On the other hand – transit ridership increases during a recession as people find ways to save money.
  - The assumption: In the 1.5 to 2 years it will take to implement service, the country will be at a reasonable level of normalcy, with some changes as outlined below.

- Some changes will allow for social distancing:
  - Larger buses with more space between seats is the new norm
  - Added costs for cleaning and disinfecting daily or more often.
  - Cost of basic PPE protection for the front-line staff.
  - Added hand washing stations
• Other activities that transit can take to ensure the safety of the customers, in the event that the pandemic continues:
  o Food delivery for those most affected by any future outbreaks
  o Ability to deploy a mobile food pantry – in conjunction with the appropriate local organizations

• Anticipate future stimulus calls: Be ready with a plan – think big!
  o Procuring vehicles
  o Transfer facility,
  o Operations and administrative facility
  o Bus stop accessibility, shelters, and other accoutrements

Introducing Key Concepts for Small Urban Transit

Before the study committee considers the service strategies directly, the consultant team presents a variety of key transit concepts that should be understood prior to selecting strategies. We will discuss the following:

1. Understanding Productivity
2. Service Designs: The Best Fit for New Braunfels
3. Fixed Route Guidelines
4. Seek Grant Funding for Facilities, Technology, and Vehicles
5. Existing Conditions – Change Is Needed

1. Understanding Productivity

To understand the rational for a particular service design, it is important to first understand the concept of system productivity and how it relates to cost.

More than anything else in the transportation world, productivity drives the cost per trip. Productivity is measured as one-way trips per vehicle service hour. Productivity, which must be balanced with providing a safe (social distancing is critical at the time of this report), timely and comfortable service, is critical to cost control.

For example, if the service costs $50 to operate one vehicle for one hour and the productivity is 1.5 passengers per vehicle hour (similar to the current service), then the cost per trip is $33.33. If productivity is increased to 3 one-way trips per hour, then the cost per trip is $16.67. Six trips per hour would yield a cost per trip of $8.33. The more trips, the lower the cost per trip. In essence, productivity drives cost per trip.
One of the best ways to lower transportation costs is through productivity improvements. The service design selected will determine, in large part, the productivity of the service. The end result will depend on the mode(s) selected.

### 2. Service Designs: The Best Fit for New Braunfels

With an understanding of the importance of productivity, the next step is to look at service design. The objective is to apply the most appropriate service design(s) for the transportation needs.

**Local New Braunfels Service**

All services will be accessible for persons with disabilities. The potential service designs for the local New Braunfels service include:

- **Fixed Route** – Virtually every urban area and many rural areas and smaller cities have fixed route service. San Marcos and VIA are two examples. This is the service type that is most effective in the denser areas of New Braunfels.

- **The Paratransit Family** – Paratransit takes many forms and goes by many names. Overall, paratransit is a family of door-to-door, curb-to-curb and corner-to-corner service, accessed by a request from the rider. Where many still access service by telephone, now many are using the internet. These services include taxis, demand response, transportation networking companies (TNC) - Uber and Lyft are examples, ADA complementary paratransit, microtransit, dial-a-ride and other names. Some still operate with a day in advance notice at a very low productivity (such as the current service), while the new microtransit options reduce that to 15 minutes up to one hour. Following includes the types of paratransit services and their terminology for the purpose of this study:
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

- **ADA Complementary Paratransit** – This door-to-door service is complementary to fixed route and is required by federal regulation, within ¾ mile of fixed routes, for persons who because of a disability can’t get to or can’t ride fixed route. Passengers must be certified as eligible for this service. This service can be part of a microtransit service as long as it meets the requirements for ADA complementary paratransit.

- **Microtransit** – This app based service (or telephone) is a general public shared ride service designed for lower density areas that are very difficult to serve, especially for fixed route. This service is basically “dial a ride” with an app. This service is used by passengers to connect to fixed route and also as a local circulator. These services are typically door to door or often the rider is required to go to the nearest intersection at one or both legs of the trip (corner to corner). Both VIA and Capital Metro are using microtransit successfully in suburban and lower density areas. This service can also be used for ADA complementary paratransit. This could also include service outside of the city limits to adjacent communities.

- **Demand Response** – The current service provided by Alamo Regional Transit (ART) is day in advance door to door service that has a very low productivity. This results in very high costs and low ridership. It is stated as general public, but much of the ridership is for dialysis transportation and the senior center.

These will be detailed in various configurations in a following section.

**Regional Service**

Regional service to Seguin, San Antonio and San Marcos should be considered, however as depicted in the Review of Needs in Chapter 5, most commuter services couldn’t justify fixed route bus service at this time. Service designs for regional service include:

- **Commuter Bus** – fixed route serving park and ride lots and connections to local service. Please note that based on the analysis in the previous technical memorandum, the only chance for success at this time is if it was integrated or had a direct meet with the CARTS service from San Marcos to Austin.

- **Subscription Bus, Vanpool and Carpooling** – The three levels of pooling. There is no entity functioning as a rideshare/pooling coordinator for trips that are outside of VIA and Capital Metro’s
service areas. For example, New Braunfels to Seguin or San Marcos. If over time, demand warranted it a subscription bus or bus pool may be effective.

### 3. Fixed Route Guidelines

Proper service design is paramount to any transit system. Improper service typologies and designs often result in lower ridership and lower productivity while applying the right service design can improve performance often at no extra cost.

As an introduction to the service strategies, the study team presents our guidelines for service design. The review of routes will look at these guidelines and it is important for the reader to understand the context for our recommendations.

Fixed route is generally the least expensive mode of transit on a per trip basis and also the most efficient and effective. Following are the guidelines:

1. **Maximize use of fixed route** – Fixed route should be the first option in many areas of New Braunfels, particularly in areas with higher densities and locations with significant transit attributes.

2. **Do it right or don’t do it** – Small cities can use at a minimum, about one fixed route bus per 8-12,000 population and one microtransit bus for every 6,000 persons. Providing two buses when six are needed to “see how it goes” is like opening a grocery store and only stocking one-third of the aisles. Providing half the residents with half of the destinations will yield one-quarter of the ridership and in all probability increase the potential for a failed service.

3. **Minimum density** – Fixed-route service works best in-town with communities of at least 1,000 persons per square mile, as well as areas with major destinations or tourism. Microtransit can function at much lower densities. Figure 7-1. Depicts densities in the service area.

4. **Minimum productivity** – Our research indicates that fixed routes with lower than five one-way trips per hour should look to alternative service designs such as microtransit as practiced by both VIA and Capital Metro.

5. **When is service provided?** – When the service is provided is as important as where service goes. For in town service at a minimum 6:30 or 7 a.m. to 6 or 7 p.m. Monday through Friday. Based on the surveys, interviews and meetings riders prefer later hours over earlier hours. Saturday service typically generates half the ridership of weekday service and Sunday service usually one-third. New Braunfels however, with its significant visitor population on the weekend (in season) could do better than the average. It is important to consider that commuters often need to arrive before 8 a.m. and leave after 5 p.m.

6. **Out and back / avoid the loopers** – Long (over 30 minutes) one-way loop routes kill ridership. Out and back is the normal form of fixed-route transit. If there is a stop on one side of the street there should be a stop on the other side (in most cases). Ride time on long loop routes is almost always
excessive. Loop routes do not pass the ice cream test, 10 minutes to get to the store, but 50 minutes to get home.

7. Simplicity in fixed route design – Avoid connecting the dots and keep the meandering of fixed routes to a minimum.
   a. In most cases let the riders walk to the bus stop rather than having the bus go to the riders. Major stops are an exception or those willing to pay for a meander.
   b. Do not try to do too much with one route.
   c. Some routes should be origin based and some should be destination based.
   d. Rather than having a one and a half hour looper, have three half hour routes.

8. Timed transfers and interlining – Fixed routes will meet at the designated transfer point at the same time and then often become a second route (interlining). This reduces the need for transfers. Origin based routes should be matched with destination based routes. Microtransit buses will also meet at the transfer point (or outlying designated transfer point). These services will also be timed to meet other buses.

9. Transfer locations – Major transfer points should be at major trip generators such as: big box stores, downtown, at a mall with proper access. This will reduce the number of transfers and decrease travel time. This is detailed in the next section.

10. Frequency and coverage – Frequency is the time between buses going in the same direction on the same route. Going from a frequency of an hour to ½ hour is great, but it doubles the cost. Service elasticities tell us that when service is doubled ridership will probably increase about 50 percent. While coverage is not good for ridership, as some parts of the service area will never be productive, but fairness and politics tell us that sometimes coverage is important. The key here is putting the best service design in place for each part of the service area.

11. Timing points – Timing points should be every 7 to 10 minutes. For in-town service, NEVER have every stop as a timing point as this will result is slow service and the bus sitting around.

12. Proper streets and turns – Routing should avoid unprotected left turns on busy streets as well as any other difficult maneuvers. The bus must be able to easily traverse a narrow street without impediment. Never back up as part of a route. Test the route with the bus you will use.

13. Accessible bus stops and pathways – The bus stop is transit’s front door. Care must be taken in selecting bus stops for location, safety and accessibility.

14. Vehicles – Are your vehicles appropriate for your ridership? Size/capacity – is the bus big enough or will you “need a bigger bus?” For fixed route bigger is usually better (to a point) unless there are maneuverability issues on the route. Note that in this pandemic, there is a distinct advantage to using bigger buses – the need to social distance.

15. Consistency of service – “Every weekday without fail, every time without fail.” Customers must have service every day. If they can’t count on the bus showing up, then they will only ride if
desperate. Try to have the bus come by the same location, in the same direction at the same time every hour (or half hour).

16. **Do not compete with yourself** – Do not operate a competing paratransit service covering the same service area. Microtransit should feed the fixed route.

17. **Looking good/marketing** – While services need to be professionally marketed and promoted, the best advertising is good looking buses with an attractive paint scheme and logo and professional drivers that the community can be proud of. Plain white vehicles will blend into the background and be invisible to the community, never good for ridership. As with any business it is important to be noticed (in a good way). Monitor the service to ensure everything is appropriate and performance measures are being met.

18. **Sometimes there are exceptions** – These guidelines are not universal. Context dictates the service design and provision.
Figure 7-1: Population Density New Braunfels


4. Seek Grant Funding for Facilities, Technology and Vehicles

There are two ways to secure capital assets for the system, typically, operations/administrative facilities, vehicles and technology. These assets can be secured through the transit entity or lead organization (in this case perhaps the City of New Braunfels) Having the transit system securing capital assets at an 80 percent federal match (or higher) can significantly reduce operating costs and is a standard practice in the transit industry. When using vendors to operate the service, they can typically supply a facility, vehicles and when needed technology. The costs of these capital assets are reflected in the contractor’s price (usually as part of the operating costs) and come out of operating funds at either no match or a 50 percent match, resulting in higher costs than if the assets were owned by the transit system.

With vehicle, facility and technology ownership by the New Braunfels entity, operating expenses go down. Further, by owning these assets the system will remain stable in the event of a contractor change. New Braunfels can have a direct line to FTA Section 5339 capital funds as well as certain Alamo Area Metropolitan Planning Organization funds.

5. Existing Conditions – Change is Needed

As discussed in detail in Chapter 3: Review of Existing Services, the only public transit available in New Braunfels is the door-to-door service provided by ART. This service now provides about 75 trips per day. Most of the service is geared for the senior center and two dialysis clinic. This service costs New Braunfels and VIA $850,460 and provides about 22,000 trips annually at a cost of $46 per trip or about $13 per mile, four times ART’s per mile cost. This is a very high cost per mile that is due to the allocation model used to calculate the cost to VIA and New Braunfels. ART also operates service to other communities in Comal County through the New Braunfels facility, these are funded through VIA. These services will still be available through ART with funds from VIA.

The Cost of Inaction

Unfortunately with the current arrangement, the cost of inaction is very high in terms of dollars and the inefficient use of resources. If nothing else, using the same level of funding can produce much more effective results when applying appropriate service strategies as discussed below.

Service Strategies

The service strategies address the type of services to be provided, the level and approximate cost of service, where the services will operate, infrastructure needs, vehicles/maintenance and a variety of other details.
Decision Points

Based on the analysis of data, the project team develop service options for the next five years that will address the identified goals and issues. There will be multiple sets of options based on local fixed route service, services for persons with disabilities (many can ride fixed route) and commuter service.

Local Service in and Around New Braunfels

The alternative strategies will be described, and will include route options, microtransit, ADA approaches, projected ridership, fare options, costs, and advantages/disadvantages. Vehicles will be discussed in detail as there are many options related to fueling (including electric buses), size, low floor and other features.

Navigating the decision-making process requires a network of decisions as discussed above. To guide the decision-making is a step-by-step process:

- First we will discuss potential service corridors, the number of which will vary by service level selected.
- Followed by a discussion of the potential transfer locations.
- The three service levels are presented.
- Regional service options are discussed.
- Capital needs are addressed.
  - Vehicles
  - Facilities
  - Technology
  - Capital costs
A Word about Bus Stops

Bus stops are typically placed every one-quarter mile unless there is no reason to have a stop. A stop with a pole and a sign, by itself does not have to be accessible, but if there are any improvements it should be accessible – with a pad for boarding and a connection to an intersection. In some cases where there is a grass verge a pad will be required to connect the sidewalk to the curb. There may be opportunities to partner with a local business to place a shelter at specific stops. The detailed discussion regarding stops and shelters will be in the next step as the routes are determined.

Fixed Route Service Corridors- Decision Point

The most effective corridors for fixed route bus are illustrated in Figure 7-2 (map of all of the corridors). In this illustration, the transfer point is in the downtown area and all buses will meet there every hour. All routes will be on one hour headways. This section highlights all of the practical fixed route corridors. Those areas beyond fixed route can be served by microtransit.

- All of these corridors combined would make for a full level of service.
- The low and mid-levels of service presented in the next section, can use different route combinations (with fewer routes) with microtransit.

The seven corridors are outlined as follows with the accompanying Figures 7-4 to 7-10.

Route 1 - Walnut Southeast

This corridor (Figure 7-3) starts at the Main Plaza and runs southeast along the W. San Antonio Street. It then turns south on S. Walnut Avenue and moves toward Klein Road Elementary School. From the school it heads back to the Main Plaza along the same path. It is a half hour round trip and connects residential neighborhoods located in the southern portion of the city with downtown, shopping centers and elementary schools along S. Walnut Avenue.

Pathways

This route has accessible pathways for most of the route. Walnut Avenue has accessible sidewalks throughout, although pads to cross the grass verge will be needed. The southern portions on the route have sidewalks but not all of those sidewalks are accessible or designed so a ramp can be deployed. The San Antonio Street portion is good with sporadic gaps. Downtown has excellent accessibility.
Figure 7-2: All Potential Corridors
Figure 7-3: Route 1 – Walnut Southeast Corridor
Major Origins and Destinations

This route is both origin and destination based and serves the following:

- School: Klein Road Elementary School, County Line Elementary School, Memorial Elementary School, Walnut Springs Elementary School
- Shopping: Walmart, HEB, Walgreens, CVS
- Downtown: McKenna Children’s Museum
- Multifamily Housing: Braunfels Place, Vista Del Sol, Siedel Apartments II, Waterford Place Apartments

Route 2 – Walnut Northwest

This is a destination-based corridor (Figure 7-4) that connects downtown with the northwestern portion of New Braunfels via Landa Street and N. Walnut Avenue. From the Main Plaza, the route heads northwest on the N. Seguin Avenue and meanders west along the Landa Street corridor leading down to Landa Place, a low income housing apartment complex. It then reverses its direction to move east on the Landa Street and turns northeast on N. Walnut Avenue to go up to Oak Run Parkway and then back to Main Plaza.

Pathways

This route has accessible pathways throughout the route with minor disruptions. For a one-half mile section on the north side of Landa Street bus stops should have a pad across the grass verge at each stop with a verge.

Major Origins and Destinations

This route takes half hour to complete one round trip and serves several major employers, shopping centers, medical facilities, and human services such as:

- Human service agency: Comal County Senior Center, New Braunfels Rec Center, Oaktree Assisted Living, Kirkwood Manor Nursing Home
- Shopping: HEB, Walgreens, CVS
- Civic: Comal County Courthouse, Comal County Vehicle Administration, New Braunfels Housing Authority
- Major employer: IBEX Global, City Hall
Figure 7-4: Route 2 – Walnut Northwest Corridor
Many multifamily housing apartments are located adjacent to this corridor that includes Braunfels Haus Apartments, Laurel Heights, Verandah at Landa and Landmark Garden Apartments. It also serves low income housing apartments such as Landa Place, Bavarian Manor and Laurel Plaza Apartments. New Braunfels High School is also located within a half mile corridor walkshed.

**Route 3 – Gruene**

This is a destination-based corridor (Figure 7-5) that connects downtown with the Christus Santa Rosa Hospital and Gruene historic district. From the Main Plaza this route travels northeast on E. San Antonio Street and then turns north on the Union Avenue heading toward Christus Santa Rosa Hospital. It then reverses at the hospital to go south on N. Union Avenue, turns east on E. Common Street and then heads north on Gruene Road toward Gruene historic district to continue up to FM 306. An alternative route is also proposed where the route continues to move northeast on the E. Common Street and continues up to FM 306 before it loops over to the Gruene historic district on Gruene Road.

**Pathways**

This route has some sidewalk accessibility problems. There are sporadic accessible pathways and there are many gaps as well. Leaving the Plaza, the sidewalks are accessible and the new bridge will be accessible as well. Union Avenue is for the most part, less than accessible with gaps in sidewalks, lack of curb cuts and steps. Common Street and Gruene Road have poor accessibility, also with long gaps in sidewalks, and in Gruene a lack of curb cuts and sidewalks makes for inaccessibility.

**Major Origins and Destinations**

This corridor takes 30 minutes to complete a round trip. Major origins and destinations served by this route include:

- Medical: Christus Santa Rosa Hospital, PAM Specialty Hospital
- Civic: Comal County Courthouse
- Shopping/Attraction: Gruene historic district, Market Plaza, Schlitterbahn Waterpark, Comal County Fairgrounds, New Braunfels Public Library, Common Market
- Major employer: Home Depot Supply office, Christus Hospital and Schlitterbahn

Additionally, the alternative route serves Gruene Senior Living, Rio Terra Senior Living and New Braunfels Regional Rehab Hospital; however, the alternative route also serves apartment complexes such as Northwood, Augusta at Gruene, Cotton Crossing and Villas at Sundance.
Figure 7-5: Route 3 – Gruene Corridor
Route 4 – Northeast

This is a destination-based route that runs adjacent to I-35 (Figure 7-6). It serves northeastern part of the city and connects downtown with medical facilities, schools, shopping centers, and major employment centers. A major portion served by this corridor consists of commercial land use. From the Main Plaza, this route heads southeast along the S. Seguin Avenue and turns east on N. Elliot Knox Boulevard, also known as I-35 Business. It then spurrs northwest on TX-46 via Loop 337 and continues up to Church Hill Drive before returning south to the I-35 Business. Subsequently, it merges with the I-35 Frontage, continues up to HEB Plus and then turns southeast on Creekside Crossing to head toward Resolute Hospital after which it goes back to the Main Plaza along the same route.

Pathways

The Northeast route has limited accessibility with many areas where the pathways are non-existent or inaccessible. Leaving the Plaza on Seguin, there is very good accessibility until I-35 Business, which for the most part is inaccessible. I-35 Frontage Road, north is also inaccessible except for those going south to the high school where the pathway is accessible. Town Center at Creekside is accessible as is the grounds surrounding Resolute Hospital. On the return, I-35 frontage on the southbound side is accessible.

Major Origins and Destinations

This route takes an hour to complete a round trip. The major destinations served by this route include:

- Park and Ride at Loop 337
- Civic: New Braunfels Convention Center, Comal County Health Department
- Shopping: Market Place, New Braunfels Square, Town Center at Creekside, HEB Plus, CVS
- School: Church Hill Middle School, Goodwin Frazier Elementary School, Memorial Early College High School, Canyon High School
- Medical: Resolute Hospital, Fresenius Kidney Care, Rivercity Rehab
- Major Employer: Buc-ee’s, McCoy’s Building Supply Millworks, Resolute Hospital, Retail stores at Town Center at Creekside

Some apartment complexes are also located adjacent to this route that include River Park, Hawthorne Riverside, Westshore Colony, Langtry Village, Creekside Apartments and low income housing apartments such as Village Circle and Residences of Solms Village.
Figure 7-6: Route 4 – Northeast Corridor
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

Route 5 – Gruene/Northeast

This corridor is an alternative to the Northeast route and a combination of both Gruene and Northeast corridors (Figure 7-7). This route is a southeastern extension of Gruene corridor to Resolute Hospital along FM 306. It is a destination-based corridor and connects downtown with major medical facilities, shopping and employment centers. It is a one hour round trip.

Pathways

Pathway access is sporadic with good pathways north on Rio Grande from the Plaza to Union, Town Center at Creekside, Resolute Hospital and Christus Hospital complexes. FM 306 also has good accessibility from Resolute Hospital to Common Street.

Major Origins and Destinations

Major origins and destinations along this route include:

- Medical: Christus Santa Rosa Hospital, Resolute Hospital, PAM Specialty Hospital
- Shopping/Attraction: Gruene Historic District, Market Plaza, Common Market, Schlitterbahn Waterpark, Comal County Fairgrounds, New Braunfels Public Library,
- Town Center at Creekside, HEB Plus, CVS
- Multifamily Housing Apartments: Residences of Solms Village (low income housing), Augusta At Gruene, Northwood, La Sierra and Creekside Apartments
- Major employer: Home Depot Supply Office, Buc-ee’s, McCoy’s Building Supply Millworks, Resolute Hospital, Retail stores at Town Center at Creekside
- Civic: Comal County Courthouse

Route 6 – Southwest

This corridor (Figure 7-8) heads southwest from the Main Plaza along W. San Antonio Street, through residential areas and goes past Loop 337 to the west on FM 482 toward Greentree apartments. The round trip takes half hour. Being an origin-based corridor, it primarily serves residential areas that includes low income housing apartments such as Greentree, Comal and Dardee. Sage apartments are also located adjacent to this route. Comal County Jail is an important destination along this route.
Figure 7-7: Route 5 – Gruene/Northeast Corridor
Figure 7-8: Route 6 – Southwest Corridor
Pathways

Pedestrian access on this route is sporadic. San Antonio Street is accessible downtown and continuing improvements are being made toward Walnut Avenue. Beyond Walnut Avenue, except for a short stretch of Loop 337 that is accessible, the rest of the route is mostly without any kind of sidewalk or pathway.

Major Origins and Destinations

Origins and destinations on this route include:

- Comal Apartments
- Greentree Apartments
- County Jail

Route 7 – Southeast

It is an origin-based corridor (Figures 7-9) that connects downtown with the southeastern part of New Braunfels which is primarily residential. From the Main Plaza, the route heads southwest on the W. San Antonio Street and then southeast on S. Santa Clara Avenue. The route turns northeast on Butcher Street and then southwest on S. Guenther Avenue to serve the elementary and the high schools and then follows W. Nacogdoches Street toward east to meet S. Seguin Avenue. The route continues south on S. Seguin Avenue before it turns west on the W. County Line Road by Fischer Park. It then turns south on Dove Crossing Drive and meanders through the residential neighborhoods up to W. Klein Road.

Pathways

This route has some accessibility on Seguin north of the Interstate. County Line Road and Dove Crossing Drive have some accessibility. The rest of the route is typically without contiguous stretches of sidewalks.

Major Origins and Destinations

This route takes half hour to complete a round trip. Some of the apartment complexes served by this corridor are Butcher Street and Villa Serena apartments. Important destinations along this corridor include:

- Human service: New Braunfels Food Bank
- School: New Braunfels High School Ninth Grade Center, Carl Schurz Elementary School
- Shopping: Gateway Plaza, CVS
Figure 7-9: Route 7 – Southeast Corridor
Microtransit and ADA Paratransit

There are two types of paratransit proposed here. The first is the required Americans with Disabilities Act (ADA) Complementary Paratransit for persons that because of a disability can’t use or access the fixed route service. These persons must apply and be certified as eligible. ADA requires complementary paratransit service within three-quarters of a mile from fixed route service.

The second type of paratransit is microtransit, an app based paratransit service that serves small service zones of typically residential areas – used by riders to circulate in their community or as feeder service to fixed route for longer trips. These services are most successful when offering a 15 minute response time, however that comes with a cost. The response time will be reflected in the level of service selected in the next section. It is also possible to mix the microtransit with ADA paratransit to meet the ADA needs (required response time of one day).

Service Strategies

The service strategies are presented at four levels of service. The first three are multimodal approaches while the last one relies solely on microtransit for all service.

- **Low Level (Status Quo Funding)**
  - This is a low level of service that matches the cost of the existing service. Two fixed route buses and three microtransit vehicles (one hour response time) operating Monday through Friday.

- **Mid-Level Service**
  - This includes three fixed route vehicles and three microtransit vehicles (45 minutes to one hour response time).

- **Full Service Level**
  - This includes four fixed route buses and three microtransit and ADA paratransit buses (15 - 30 minute response for microtransit).

- **Microtransit Option**
  - This option calls for microtransit exclusively, requiring an estimated 12 – 15 vehicles (15 - 30 minute response time).
Table 7-1 details the potential ridership of each strategy at different numbers of days and hours of service. Table 7-2 details the costs of the various strategies also at different numbers of days and hours of service.

For each level, it is assumed that the fixed routes will operate on one hour headways (the lowest level possible for this type of service). Microtransit options will start with one hour response time for the low level of service and 15 minutes for the full service option. To estimate costs and level of service changes to operate on 30 minute fixed route headways, one should increase the costs by about 90 percent as in essence the service level is doubled. Ridership is estimated by what is typically found in comparable environments and is based on expected productivity. The productivity level for each mode and each service level is used to calculate the potential ridership.
Table 7-1: Potential Ridership by Strategies

<table>
<thead>
<tr>
<th>Service Duration</th>
<th>Service Level</th>
<th>Vehicles</th>
<th>Productivity (One-Way Trips per Vehicle per)</th>
<th>Ridership-Fixed Route</th>
<th>Ridership-Micro/Para</th>
<th>Total Ridership</th>
<th>Total Cost per One-way trip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fixed Route</td>
<td>Para/ Micro-transit</td>
<td>Fixed Route</td>
<td>Para/ Micro-transit</td>
<td>Daily</td>
<td>Annual</td>
</tr>
<tr>
<td>Fixed Route and Paratransit/Microtransit</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>120</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>Midlevel</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>252</td>
<td>63,000</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>480</td>
<td>120,000</td>
</tr>
<tr>
<td>Full Microtransit</td>
<td>Low</td>
<td>10</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Midlevel</td>
<td>12</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>15</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday through Saturday - 300 days*12 hours</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>120</td>
<td>36,000</td>
</tr>
<tr>
<td></td>
<td>Midlevel</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>252</td>
<td>75,600</td>
</tr>
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<td>10</td>
<td>5</td>
<td>480</td>
<td>144,000</td>
</tr>
<tr>
<td>Full Microtransit</td>
<td>Low</td>
<td>10</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>15</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seven days all year- 360 days*12 hours</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>120</td>
<td>43,200</td>
</tr>
<tr>
<td></td>
<td>Midlevel</td>
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<td>3</td>
<td>7</td>
<td>5</td>
<td>252</td>
<td>90,720</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>480</td>
<td>172,800</td>
</tr>
<tr>
<td>Full Microtransit</td>
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<td>10</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>15</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 7-2: Costs by Strategies

<table>
<thead>
<tr>
<th>Service Duration</th>
<th>Service Level</th>
<th>Vehicles</th>
<th>Fixed Route Cost</th>
<th>Paratransit Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fixed</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>*<em>Monday through Friday - 250 days <em>12 hours</em></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Route and Paratransit/Microtransit</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>$360,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>Midlevel</td>
<td>3</td>
<td>3</td>
<td>$540,000</td>
<td>$675,000</td>
<td>$540,000</td>
</tr>
<tr>
<td>Full</td>
<td>4</td>
<td>4</td>
<td>$720,000</td>
<td>$900,000</td>
<td>$600,000</td>
</tr>
<tr>
<td><strong>Full Microtransit</strong></td>
<td>Low</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midlevel</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monday through Saturday - 300 days*12 hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Route and Paratransit/Microtransit</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>$432,000</td>
<td>$540,000</td>
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<tr>
<td>Midlevel</td>
<td>3</td>
<td>3</td>
<td>$648,000</td>
<td>$810,000</td>
<td>$540,000</td>
</tr>
<tr>
<td>Full</td>
<td>4</td>
<td>4</td>
<td>$864,000</td>
<td>$1,080,000</td>
<td>$720,000</td>
</tr>
<tr>
<td><strong>Full Microtransit</strong></td>
<td>Low</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midlevel</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Seven days all year - 360 days*12 hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Route and Paratransit/Microtransit</td>
<td>Low</td>
<td>2</td>
<td>3</td>
<td>$518,400</td>
<td>$648,000</td>
</tr>
<tr>
<td>Midlevel</td>
<td>3</td>
<td>3</td>
<td>$777,600</td>
<td>$972,000</td>
<td>$648,000</td>
</tr>
<tr>
<td>Full</td>
<td>4</td>
<td>4</td>
<td>$1,036,800</td>
<td>$1,296,000</td>
<td>$864,000</td>
</tr>
<tr>
<td><strong>Full Microtransit</strong></td>
<td>Low</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midlevel</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>15</td>
<td></td>
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</tr>
</tbody>
</table>

*Operating and administrative costs for fixed route range from $60 - $75 per hour*

*Operating and administrative costs for paratransit/Micro transit range from $50 - $60 per hour*
Key Considerations

Key assumptions and considerations used in developing these strategies include the following:

- It is anticipated that the **microtransit and ADA paratransit will be combined** where feasible. This service could also be expanded to reach into adjoining communities for additional costs.

- At the same time, there should be stringent rules and eligibility for ADA paratransit. That is, it should only be used by persons that can’t use fixed route due to a disability that limits that activity. **Age and distance beyond three-quarters of a mile are not by themselves qualifying considerations.**

- All routes will meet at the transfer center at either the top or bottom of the hour. **It is very important that the buses meet at the same time in a seamless manner.**

- All buses will be **accessible** for persons with disabilities and will have **bicycle racks.**

- Permitting all seniors to ride paratransit including those that would otherwise not qualify for ADA service will **increase the price of that service by about 20 percent.** Other funding sources for this service (if desired) could be sought.

- **Pathway access is excellent in some locations and poor to non-existent in other areas.** The downtown area is reasonably accessible and that accessibility is accelerating, making much of the downtown area accessible. The pathways for each route are summarized in the descriptions of the route corridor in the previous section.

- **Productivity** acts differently with different modes. Microtransit and ADA paratransit in general are limited in their productivity.

  - For example, the new microtransit services can generate 4 – 6 one way trips per hour and over time that will not change as it is not physically and safely possible to increase productivity. Vehicle operators and customers can only move so fast.

  - Fixed route on the other hand will only improve over time perhaps up to 10 or 12 one way trips per hour. More is possible.

  - As a general rule if fixed route ridership is anticipated to be under five trips per vehicle hour then microtransit may be advantageous.

- We can look at other combinations of services as needed.
Status Quo Funding: Low Level of Service

This low level of service represents a status quo funding option and can be viewed in Figure 7-10. This strategy describes the best option for this low level of service. Two buses serving the essential corridors, supported by three in service microtransit/ADA paratransit vehicles. The general public microtransit component of this service will be on a one hour response time to minimize costs. 15 minutes is optimal, but that would double that portion of the costs. As discussed in Chapter 5, this strategy will produce a relatively low level of ridership with a cost per trip considerably higher than the other alternatives.

Description

This service level requires two fixed route buses on one hour headways and three microtransit/ADA paratransit vehicles. Designated communities (many to the south of I-35 and southwest of downtown) could be served by an app (or telephone) that can respond in as little as 15 minutes. In this case to keep costs low, a one hour response time is used. Microtransit will be available as a local neighborhood circulator typically tied to a major destination(s) as well as to a fixed route bus for access throughout the system.

Routes

These routes cover many major origins and destinations, however as can be seen in Figure 7-10 there are a considerable number of neighborhoods beyond one-half mile that are not served by fixed route. These areas to be served by microtransit are along the I-35 corridor northeast and southwest (down to the Greentree and Comal Apartments). There are also a number of newer neighborhoods south of I-35. It should be noted that many of these neighborhoods are very difficult for fixed route to serve and in many cases, microtransit can do it better.

The routes proposed allows for key access across the city and include the following. Other combinations of corridors can also be considered.

1. Walnut Southeast (30 minute route)
2. Walnut Northwest (30 minute route)
3. Gruene/Northwest (60 minute route)

Ridership

This strategy will provide about 66,000 one-way trips annually for Monday through Friday service (Table 7-1). More than three times the current ridership at the same total cost. This comes to about 264 one-way trips per day. Operating 360 days, will generate 95,000 trips.
Figure 7-10: Low Level Service Corridor
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

Operating Costs

This is the status quo strategy (Table 7-2), and operating costs range from between $800,000 to $1,000,000 for the low cost weekday option to $1,166,400 for the 360 days of service. The $810,000 figure is similar to the existing annual costs of about $850,000. The cost per trip for this strategy is about $12.27, almost one-quarter of the current cost per trip of $42.74. The cost of doing nothing different is very high.

Advantages and Disadvantages

Advantages

• A significant improvement over the existing service and far more service for the same money
• Combines fixed route with microtransit
• Allows the general public to use the service
• Can meet a regional bus

Disadvantages

• The service is predominantly for seniors at the senior center at this time, many of whom may not be eligible for ADA paratransit – some may not appreciate change
• Response time for microtransit will be well higher than the normal 15 minutes due to costs, this will have a negative impact on ridership potential
• Microtransit productivity will always be limited

Mid-Level of Service

This level of service adds one fixed route bus to the mix over the status quo strategy, expanding fixed route’s reach and allowing the three ADA/microtransit vehicles to provide a quicker response time – perhaps 30 – 45 minutes. There are a number of route corridor options at this level. This set of corridors generates the most coverage without sacrificing ridership (Figure 7-11).

Description

This service level requires three fixed route buses on one hour headways and three microtransit/ADA paratransit vehicles. Compared to the Low Level, this strategy serves the I-35 corridor, a very heavily travelled corridor for local residents. Microtransit will be available as a local neighborhood circulator - typically tied to a major destination(s) as well as to a fixed route bus for access throughout the system.
Figure 7-11: Mid-Level Service Corridor
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

Routes

These routes cover most major origins and destinations, however as can be seen in Figure 7-11 there are a considerable number of neighborhoods beyond the one-half mile fixed route corridors. These areas to be served by microtransit are mainly a number of newer neighborhoods south of I-35. It should be noted that many of these neighborhoods are very difficult for fixed route to serve and in most cases, microtransit can do it better.

The routes proposed allows for key access across the city and include the following. Other combinations of corridors can also be considered.

1. Walnut Southeast (30 minute route)
2. Walnut Northwest (30 minute route)
3. Gruene (30 minute route)
4. Northwest (60 minute route)
5. Southwest (30 minute route)

Ridership

This strategy will provide about 108,000 one-way trips annually for Monday through Friday service, considerably more than the previous strategy (Table 7-1). This comes to about 432 one-way trips per day. Operating 360 days, this strategy will generate 156,000 trips a 63 percent increase in ridership over the Low Level Strategy.

Operating Costs

This is the second level of service and operating costs range from $990,000 for the weekday option to $1,425,000 for the 360 days of service or about 22 percent greater cost than the first strategy (Table 7-2). The cost per trip for this strategy is about $9.17 per one way trip or 25 percent less per trip.

Advantages and Disadvantages

Advantages

- Expands fixed route along the I-35 corridor
- Improves productivity and lowers per trip costs compared to the Low Level strategy
- Combines fixed route with microtransit
- Allows the general public to use the service
- Can meet a regional route
Disadvantages

- The service is predominantly for seniors at this time – some may not appreciate change
- Costs more in a time of uncertainty
- Response time for microtransit will be higher than the normal 15 minutes due to costs, this will have a negative impact on ridership potential
- Microtransit productivity will always be limited unlike fixed route
- The Gruene and Southwest routes have limited accessible pathways

Full Service Level

The full level of service provides extensive coverage of fixed routes with feeder service supplied by microtransit with the shortest response time of the three options.

Description

This is the full level of service that New Braunfels can support. It combines four fixed route buses with four ADA/microtransit vehicles. As can be seen in Figure 7-12 there are few areas of the city outside of the one-half mile zone, perhaps allowing for a shorter response time for microtransit. This service level will generate the highest level of ridership. While the cost of this service may be daunting at this time, this level of service can be deployed successfully after 3 – 5 years, as the service matures.

Routes

These routes cover virtually all significant origins and destinations, with few areas farther than one half mile from a route (Figure 7-12). For those areas beyond fixed route. It should be noted that many of these neighborhoods are very difficult for fixed route to serve and in those cases, microtransit can do it better.

The routes proposed allows for exceptional access across the city and include the following:

1. Walnut Southeast (30 minute route)
2. Walnut Northwest (30 minute route)
3. Gruene (30 minute route or expanded to 60 minutes)
4. Northwest (60 minute route)
5. Southwest (30 minute route or expanded to 60)
6. Southeast (30 Minutes)
Figure 7-12: Full Service Corridor
Ridership

This level of service will maximize ridership in the system. This strategy will provide about 180,000 one-way trips annually for Monday through Friday service, two thirds more than the previous strategy (Table 7-1). This comes to about 720 one-way trips per day. Operating 360 days, this strategy will generate 259,000 trips a 56 percent increase in ridership over the Mid-Level Strategy.

Operating Costs

Clearly this level of service is the most expensive when considering the system as a whole, yet on a per trip basis, this is the lowest cost by far - $7.33 (Table 7-2).

Operating costs range from $1,320,000 for the weekday option to $1,900,000 for the 360 days of service or about 33 percent greater cost than the Mid-level strategy. This is depicted in the review of costs in Table 7-2.

Advantages and Disadvantages

Advantages

• Fixed route coverage is extensive
• Improves productivity and lowers per trip costs compared to the other strategies
• Due to smaller coverage area, allows a shorter response time for microtransit which should result in an increase in ridership
• Allows the general public to use the service
• Can meet a regional route

Disadvantages

• The service is predominantly for seniors at this time – some may not appreciate change
• Cost considerably more in a time of uncertainty
• Response time for microtransit will be higher than the normal 15 minutes due to costs, this will have a negative impact on ridership potential
• Microtransit productivity will always be limited
Full Microtransit Service Level

As a fourth option, the study team offers a full microtransit option. That is, all trips would be served by microtransit, for access anywhere within the designated service area. This is by far, the most expensive service requiring the most vehicles to cover the entire service area.

Description

Microtransit is a recent development as an app based version of dial a ride service. The service may pick up a passenger at the curb or at a close by intersection. 15 minute response time is typical for many areas and in this operating scenario it is expensive. The Low Level of service would be at a one hour response time, Mid-Level would be 30 – 45 minutes, with the Full Service Level at 15 minute response time.

Ridership

Typically, 4 – 6 one-way trips per hour, are seen in microtransit in areas similar to New Braunfels. With greater than 15 minute response time and long one way trips (unencumbered by zone limits), productivity is limited to 3 – 5 one way trips per hour. At the lowest level of service (Table 7-1), 90,000 to 129,000 trips (one hour response time) could be produced annually. At service every day, between 225,000 to 324,000 trips could be generated. This ranges from 360 to 900 daily one way trips, produces the highest numbers of riders.

Costs

It is natural that the mode that operates the most vehicles will be the most expensive. Operating between 10 – 15 small buses will be required to provide a response time of 1 hour or 15 minutes, respectively. Per trip costs are the highest due to the low productivity between $10 at the highest service level to $16.67 for the lowest level of service (Table 7-1). Total costs are about 66 percent higher than the full service level at between $2 Million and $3 Million (Table 7-2).

Advantages and Disadvantages

Advantages

- Provides curb-to-curb service for all
- There is no separate ADA paratransit service
- There are numerous apps to support this service that have proven successful
- As ridership increases and patterns develop, fixed route service could be planned
Disadvantages

- Productivity limits inhibit growth in areas that could support more than 5 – 6 one-way trips per hour
- Would be a service upgrade for seniors
- Far and away the most expensive option, requires almost double the vehicles of the multimodal options

Summary – Four Operating Strategies

Clearly, due to the pandemic, there are many unknowns, so it is very difficult to predict any type of outcome for transit. For the purposes of this study it will be assumed that life and transit will get somewhere back to normal in the next 1 – 2 years. It would take at least that amount of time to implement the service.

Coming out of the pandemic and getting people back to work, will require transit to support these people in need. Based on all of the unknowns, the low level of service may be the most practical at this point in time.

Transfer Location- Decision Point

The first step in the process of designing service is to determine where the main transfer point will be, as any service developed will be a timed transfer system where the buses meet every hour and on the half hour.

The location of a transfer center is an important consideration for any transit system. The proper placement of a TC will minimize bus mileage and time for the buses and customers, reduce transfers and provide better service area coverage. Wherever the transfer point is located it should meet most of the critical locational elements described as follows:

1. **At or adjacent to a major destination(s)** – When the transfer center is at a major destination, it reduces the number of transfers required for passengers. This reduces the time on the bus and in turn can improve ridership. Locations such as downtown, a large mall or big box stores are typical, with most transfer centers being in the downtown area.

2. **Excellent access for buses** – Minimal time loss related to entry to the facility is important to customers and the reach of the service. This is particularly important for intercity and regional routes that should stay close to major roads traveled.

3. **Safe and inviting location** – The transfer facility should be located in a well-lit location where people have no concerns about their safety.
4. **Accessible/safe pathways for pedestrians and bicyclists** – Clearly access is critical, avoiding inaccessible pathways and parking lots. Pedestrian access should include accessibility for all and appropriate protected crosswalks to ensure safety. Bike access should also be protected with bike racks at major stops and the transfer station.

5. **Adequate space for future expansion** – The space must accommodate all buses that may be on-site at one time, now and for the next 10-20 years. This will include internal service as well as other providers public and private. Space should also be included for passenger auto access to drop off customers, commonly called “Kiss and Ride” access.

6. **Centrally located to each route** – Where geographically feasible, the buses should be able to access the facility from a variety of roads and not have multiple routes travel on the same roads.

7. **Public/Private Partnership Potential** – There are other less tangible factors at play from time to time. In this case there may be opportunities for public/private partnerships and private funding at some locations, such as a big box store, mall or medical center. Further, some locations lend themselves to leasing retail or office space.

For now, the transfer center could be:

- Space along a curb or curbs on the Plaza or a side street with a series of bus shelters. The number of buses arriving for a meet will be dependent on the service level chosen; between 3 and 7 vehicles.

- In a large parking lot with curbs, pedestrian pathways and controlled vehicular access (such as in the Walmart or HEB).

- An attractive facility where a variety of modes meet such as is operated by CARTS in San Marcos. This facility can have additional space to lease out as appropriate. For example, a new facility in Alice, Texas calls for lease space for a police and emergency response substation. Transfer facilities can also contain fast food restaurants or convenience stores as in McAllen.

*Pictures of the T-Line Transit Center, Texarkana, TX.*
For the short term, the transfer point should be in a location that can easily be converted. It is most likely that the service will start with one of the first two options and grow into a facility. While few sites will meet all of the criteria and compromises have to be made, some sites will stand out.

Based on the transfer criteria spelled out above, there are two areas that could credibly serve as a transfer point. These include:

- **On or adjacent to the plaza/downtown** – This area meets most, if not all, of the major criteria. It is centrally located and at a major destination (Figure 7-13). It can have excellent bus and pedestrian access and could be available for a public/private partnership eventually. This could be an off the street facility or a curb side facility with shelters. If space was made available for up to 6-7 vehicles with appropriate shelters (that fit the downtown motif) this could be the least cost option.

- **At the vicinity of I-35 and Walnut Avenue** – There are three major parking lots with varying degrees of space available (Figure 7-14). While it is not centrally located, the area includes two of the most popular destinations (HEB and Walmart). This option would require a public/private partnership and considerable construction to ensure safe pedestrian and controlled vehicular access along with curbs and accessible sidewalks. This would also be an excellent stop for any regional service developed.
Figure 7-13: Transfer Site - Downtown Main Plaza
Chapter 7: Strategies for Implementing Public Transit in New Braunfels

Main Plaza New Braunfels.

Arial View of the Main Plaza. Source: Google Earth
Figure 7-14: Transfer Site - Walmart

New Braunfels Potential Transfer Area
I-35 & Walnut
Regional and Commuter Service – Decision Point

At this time, regional commuter transit service is limited to vanpools. Prior to March 2020 and the emergence of the COVID-19 pandemic, a recommendation to implement a vanpool program specifically for New Braunfels seemed logical. Until the need for social distancing subsides, vanpools may be a less appealing option given the confined space and proximity of fellow riders that are needed to make vanpool commuting an affordable option. One option would be bigger vehicles operating half full.

The review of needs and estimates of ridership indicate that linking New Braunfels with service to San Antonio, San Marcos and Seguin will produce a low level of ridership that would be difficult to justify as a stand-alone transit service. However, if a regional commuter service starting in San Antonio, was linked to the CARTS service from Austin to San Marcos, overall ridership could justify the service assuming the costs could be spread among the various communities served. Therefore, the study team believes that the options are limited and the following are offered.

Vanpool Service

Currently vanpool service is potentially available for New Braunfels residents commuting into VIA’s or Capital Metro’s service area. The numbers as reported in Chapter 4 are very low – 16 riders to the VIA service area and 31 to Austin. However there is no entity responsible for vanpools to other destinations such as San Marcos or Seguin as well as origins along Canyon Lake into New Braunfels.

Service to and from Seguin would be best suited to vanpools due to the low transit ridership potential (Figure 7-15). Vanpools programs are inexpensive as the vanpools can pay for themselves or at least get close. Often the local employers subsidize the rider’s monthly costs. The greatest expense is the recruitment and management of the program. It is recommended that the entity that administers the transit system also manage the vanpool program.

Pilot Commuter Service

In the event that a decision is made to fund a pilot commuter route between New Braunfels and Seguin, the service should operate at least six months and operate two AM and PM peak round trips and one mid-day round trip. This service would cost about $110,000 annually or about $55,000 for a six month pilot. In addition it would need a vehicle in excellent condition, large enough to social distance as needed.
Figure 7-15: New Braunfels-Seguin Commuter Route
Regional Service

The only way that a regional service, beyond vanpools may be successful would require a regional I-35 network from the Austin area through San Antonio. The Austin- San Marcos leg currently exists and prior to the pandemic was getting good ridership.

An I-35 network (Figure 7-16) would combine resources or service with CARTS in San Marcos with service to Austin and direct connections to Capital Metro. South, the service would connect with VIA in the northeast and then downtown. New Braunfels stops would be at the North Park and Ride lot, Walnut/I 35 where the regional service would connect with the New Braunfels service and the future south park and ride.

Frequency should be three am commuter options in each direction and one mid-day round trip, from San Antonio to a meeting with CARTS in San Marcos for direct connection to Austin. In fact, a one seat ride would be preferable, operated by one entity. The operating cost for this level of service, assuming $75 per hour, would be about $375,000 annually for the entire Austin to San Antonio run, of which New Braunfels share would be about 25 percent or a little under $100,000 annually.

Capital Requirements and Costs – Decision Points

Transit Vehicles

Different transit conditions require different transit vehicles. Service area characteristics may require smaller more nimble vehicles or larger vehicles with more capacity. During this pandemic, with social distancing being important, transit systems are using their biggest buses. When it is time to procure vehicles, this should be a consideration. Generally, transit systems prefer vehicles that are a little larger rather than smaller and that was before the social distancing was necessitated. Now, bigger is better. All vehicles should be accessible to persons with disabilities. There should also be a 20 percent spare vehicle requirement.

Fuel typologies have benefits and come with costs. Compressed natural gas and electric vehicles require significant facility investment if facilities are not available, and can require additional spare vehicles.
Figure 7-16: San Antonio - New Braunfels - San Marcos - Austin Regional Commuter Route
Bus Typologies

There are a number of fixed route bus types to consider. These three are the general categories. A cost range is introduced here and it should be understood that with an 80 percent federal match, the cost to New Braunfels for a medium duty bus is only about $20,000 to $30,000 more per bus than a light duty cutaway. For the additional cost, New Braunfels would get vehicles that:

- Could last twice as long,
- Provide a more comfortable ride,
- Have greater capacity or more room for social distancing

Cutaway – Small Bus

Cut-away chassis are smaller than buses and usually have a high floor (Figure 7-17). These vehicles customarily have a seating capacity of between 8 and 30 seats and their size can vary significantly from 15 to 30 feet long. These vehicles have a 5-7 year life as a front line vehicle, less if used in heavy duty service. They are used in a wide variety of applications. They are most often used as feeder buses, dial-a-ride and ADA paratransit service as well as lightly traveled fixed routes. All must have lifts or low floor with ramp. These vehicles range from $125,000 to $175,000 in cost depending on size and configuration.

Medium Duty Transit Coach

Medium duty low floor buses (Figure 7-18), typically 30 feet in length are practical in systems similar to New Braunfels. These buses are designed to last up to 10 years and allow for a standard bus configuration without the cost of a heavy duty bus. These buses seat 20 – 25 passengers and can typically transport 2 to 6 persons using wheelchairs. San Marcos uses buses of this type in their fixed route service. These vehicles typically cost between $300 – 350,000 each.
Low Floor Heavy Duty Bus

Most larger transit systems use heavy duty low floor buses for its regular fixed route service (Figure 7-19). These buses are generally 30 – 40 feet in length and are designed to last 12 years in heavy duty service. The low floor and wide door allow for rapid boarding and alighting. These vehicles seat 30 to 40 with additional room for standing. This vehicle typology is useful for systems needing large capacity vehicles to meet demand. They can range from $600,000 to $750,000 per vehicle. ¹

Summary – Transit Vehicles

The choice of vehicles will to a large degree be determined by funding availability. For example, a mid-duty bus would be appropriate for the service area, but if funding is available at 100 percent match for a heavy duty alternative fueled vehicle (for example), then the heavy duty bus may be the better option.

Paratransit Vehicles

ADA paratransit previously used small cutaway buses as described above. Now many systems are opting for accessible vans. Microtransit services have embraced these models. Fully accessible vans with ramps that can provide wheelchair access and space for four more passengers is between $85,000 and $100,000.

¹ 2013 Tri-county District of Oregon Contract with Gillig LLC. For the Purchase of 40’ Diesel Buses
Alternative Fuel Types

There are now a variety of fuel and battery choices for transit vehicles. Decisions on the type of fuel chosen are based on a number of factors that decision makers should consider:

- **Environmental policy** – Alternative fuels and batteries can make a difference in the local environment. Decisions are often made on this basis alone.

- **Various benefits** –
  - Electric vehicles are coming of age and have lower operating costs
  - Hybrid buses are best in stop and go traffic

- **Operational** – There are a number of operational issues and costs associated with alternative fuels, including but not limited to:
  - Infrastructure – Fueling/charging facilities, maintenance equipment
  - Expertise – Maintenance staff with specialties in electric and hybrid technologies would need to be hired.
  - Availability of specialty repair vendors

- **Financial** – Vehicle and ongoing costs vary and are a major consideration to the type of vehicle used.
  - Often the FTA will offer alternative fueled vehicles at a 90 percent or even 100 percent federal match.

**Biodiesel**

Transit fleets have been able to use biodiesel successfully. Biodiesel is a renewable, clean-burning diesel replacement made from a diverse mix of feedstocks including recycled cooking oil, soybean oil, and animal fats. Just like petroleum diesel, biodiesel operates in diesel engines. Essentially no engine modifications are required, and biodiesel maintains the payload capacity and range of diesel. Generally, transit fuel is a mixture of diesel and biodiesel. This is necessary for areas with colder climates as biodiesel can be difficult to use in colder climates. Manufacturer costs for biodiesel buses are the same as regular diesel buses.2

**Compressed Natural Gas (CNG)**

CNG can be used in place of other fossil fuels. CNG combustion produces fewer undesirable gases. It is safer than other fuels in the event of a spill, because natural gas is lighter than air and disperses quickly when released. The cost and placement of fuel facilities is the major barrier to adoption of CNG as a fuel. It is also why municipal government, public transportation vehicles were the most visible early adopters of it, as they can more quickly amortize money invested in new (and usually cheaper) fuel. If a fueling facility is available to transit this is a viable alternative. Santa Fe is an example of an all CNG fleet.

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2 2013 Tri-county District of Oregon Contract with Gillig LLC. For the Purchase of 40' Diesel Buses
A typical 40 foot low-floor CNG vehicle should cost between $500,000 and $750,000.\(^3\)

**Electric-Hybrid**

A heavy duty hybrid electric bus combines a conventional diesel internal combustion engine propulsion system with an electric propulsion system. Bus batteries store energy and recharge when the bus decelerates. When demand for power exceeds battery capacity, the diesel engine provides extra energy. Hybrid buses have lower emissions than other propulsion types. Hybrid buses are best suited to stop-and-go routes where average speed is 8 miles per hour. A typical hybrid 40 foot low-floor vehicle should cost between $600,000 and $900,000.\(^4\) This technology would require a major investment in infrastructure.

**Electric Battery**

Electric battery technology has been improving over the last few years to the point where heavy duty fully electric buses are viable transit vehicles under certain conditions. As charging times decrease and battery ranges increase these vehicles are becoming more attractive. The fuel and preventative maintenance cost are much lower on these vehicles but the initial costs are often greater depending on vehicle size and battery configuration. Denver is an excellent example of the use of this technology. Electric battery bus prices vary greatly depending on the size and battery configuration. Buses can range from $400,000 to $2 million.\(^5\)

**Vehicle Costs**

Potential vehicle costs are depicted in Table 7-3. This table uses the medium duty vehicles for fixed route and small transit type vehicles for microtransit, all with appropriate spare vehicles (one of each type).

**Table 7-3: Potential Vehicle Costs**

<table>
<thead>
<tr>
<th>Service Level</th>
<th>Vehicles</th>
<th>Vehicle Costs</th>
<th>Total Cost</th>
<th>20% Local Match</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed Route</td>
<td>Microtransit</td>
<td>Fixed Route</td>
<td>Microtransit</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>4</td>
<td>$900,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Midlevel</td>
<td>4</td>
<td>4</td>
<td>$1,200,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Full</td>
<td>5</td>
<td>5</td>
<td>$1,500,000</td>
<td>$500,000</td>
</tr>
</tbody>
</table>

\(^3\) 2013 Tri-county District of Oregon Contract with Gillig LLC. For the Purchase of Compressed Natural Gas Buses
\(^4\) 2013 Tri-county District of Oregon Contract with Gillig LLC. For the Purchase of Hybrid Buses
The need for Federal funding at an 80% federal match (at least) is imperative. This makes the cost difference between heavy duty and medium duty vehicles low. This scenario therefore assumes that vehicles should be medium duty transit coaches similar to those used in San Marcos (and recommended by the consultant). These vehicles cost between $300,000 and $350,000 depending on size (30 to 35 foot) and fuel, with alternative fuels and hybrids costing more than diesel.

In the past, on a regular basis, FTA announces alternative fueled vehicle grants including between a 90 and 100 percent match. This could be an advantage if purchasing an electric vehicle at 100 percent match, as operating/maintenance costs are considerably lower.

Facilities and Other Capital Expenses – Decision Points

Infrastructure needs include a variety of facilities that can be supplied by New Braunfels and other participating entities or through a public private partnership. The facilities include the following in addition to the transfer center discussed earlier in this document. Funding for these capital projects would be at an 80 percent Federal match and typically are competitive.

1. **Bus Stops** – Stops should be examined for pedestrian access, safety and security with considerations for stop improvements/enhancements. Some stops will have only a pole in the ground, where others may have a bench or a shelter. Review and prioritize safety, accessibility, pathways, shelters, benches, lighting and other improvements. Shelters can cost between $8,000 and $15,000 installed, less if the city does the installation with existing staff.

2. **Park and Ride Lots** (Primarily for regional service)– There is currently a park and ride lot on State Highway 337 and a second one being built alongside I–35. If commuter service is established a third park and ride lot, perhaps alongside I-35 at Walnut Avenue should be considered. Arrangements with sponsors should include parking access for customers. Larger facilities such as Walmart could be recruited as well.
3. Operations and Maintenance Facility – This facility can be owned by the city, the transit district, a local government, shared with a school district or leased or owned by a contractor. The best and least expensive option will be for the city or whoever is the responsible entity to own the facility and not have to pay for the facility lease with operating funds (at a lower match). This would be most advantageous if the city already has a facility where it can store 10 – 15 vehicles and have space for management, operations and maintenance.

4. Transit Technology – There are a number of software packages available for fixed route and paratransit. In fact the new microtransit approaches have a variety of vendors with their own software. Electronic farebox or card readers may be desired as well.

Other Capital Costs

There are a variety of capital costs that may need to be addressed.

Operating Facility

The operations facility would include space for offices, drivers, parking and maintenance. There are a number of options including:

- Existing city or county facility – can be included as local match and is the least expensive option.
- Using federal funds to buy and existing facility or build a new facility the latter is a 3 – 4 year process if funding is available.
- Have the contractor find a suitable facility and charge it to the contract – This is the most expensive option.

Existing Park and Ride lot on State Highway 337- Aerial View   Source: Google Earth
These costs will be determined after selection of an option for a facility.

**Onboard Technology**

Buses require fareboxes and a variety of technology, including card readers, on-off counters, automatic vehicle locators (AVL) and onboard cameras. While electronic fareboxes start at over $5,000 per vehicle and up to $15,000, they are overkill for the levels of ridership New Braunfels will experience. For the above equipment, without a sophisticated farebox, the estimated cost per vehicle is $10,000 (shown in Table 7-4).

**Bus Stops**

Most bus stops will include a pole in the ground and little else. There are some that will require a pad to connect the street to the pathway (across the verge). Some stops will require a shelter and those will be determined when the routes are selected. There should also about five benches per route. For these (modified status quo scenario) purposes six shelters and ten benches are programmed into the costs in Table 7-4.

**Paratransit Technology**

Utilizing the latest microtransit technology will require initial startup costs and first year of monthly fees at about $100,000, with about $25-35,000 annual fees for subsequent years. This technology will be critical to the success of microtransit.

Additional equipment, computers and software should include transit specific software. It is recommended in most cases that the new transit system procure and retain ownership of transit software such as maintenance software and other transit specific software.

**Table 7-4: Capital Costs – Low Level of Service**

<table>
<thead>
<tr>
<th>Capital Need</th>
<th>Number</th>
<th>Estimated Cost</th>
<th>Local Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Board Technology</td>
<td>7</td>
<td>$70,000</td>
<td>$14,000</td>
</tr>
<tr>
<td>Buses – Low Scenario</td>
<td>7</td>
<td>$1,300,000</td>
<td>$260,000</td>
</tr>
<tr>
<td>Shelters</td>
<td>6</td>
<td>$60,000</td>
<td>$12,000</td>
</tr>
<tr>
<td>Benches and Pads</td>
<td>10</td>
<td>$20,000</td>
<td>$4000</td>
</tr>
<tr>
<td>Office equipment/software</td>
<td></td>
<td>$150,000</td>
<td>$30,000</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td><strong>$1,600,000</strong></td>
<td><strong>$320,000</strong></td>
</tr>
</tbody>
</table>

The Low Level Scenario calls for $316,000 of local share (20%) support for capital equipment, shelters and equipment, assuming the 80 percent is an FTA capital grant. This could be lower if alternative fuel vehicles are used.
Organizational Strategies

Organizational strategies address how the service will be administered, planned, operated and other transit related tasks. The steps in determining the most appropriate organization include:

<table>
<thead>
<tr>
<th>Entities involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational structure - City, transit district, county, new entity</td>
</tr>
<tr>
<td>Operational structure – In house or contracted service</td>
</tr>
<tr>
<td>Start-Up Strategy</td>
</tr>
</tbody>
</table>

There are multiple ways to configure the administration, operations and oversight of service. The first step is to outline potential overall organizational structures. Each can be effective and all should have similar costs.

**A note on the census:** The census will be completed next year and at this point no one knows how that will affect transit. The assumption here is that New Braunfels will be in a similar situation as now.

### Determining Entities Involved

Transit can take advantage of economies of scale. While one consideration is having New Braunfels funding the service itself and operating exclusively within the city limits, there are other opportunities:

- Comal and Guadalupe Counties can contribute as some service could overlap into one of the counties (Greentree and Comal Apartments are excellent examples as is Canyon Lake to New Braunfels service).

- Schertz and Cibolo could join as well allowing all to take advantage of economies of scale and reduce the overall operating costs for each entity.
Organizational Structures

The two issues that revolve around what entity will administer/be responsible for the service and what entity will operate the service. In most cases, the responsible organization will want to contract out the service to an experienced transit entity. That would be the recommendation for New Braunfels. There are some options, however, regarding how the responsible organization can be configured:

1. An existing governmental entity such as New Braunfels - agreements with other governmental entities as appropriate.

2. A new entity such as a transit district formed for this purpose. This entity would have board representation reflective of the participating jurisdictions. This could be housed at the City of New Braunfels or at a separate location and could include other cities as well as Comal and/or Guadalupe County.

Requirements and functions would include the minimum as listed below. Other functions can, but do not have to include all of those listed under Other Critical Functions listed below.

Minimum Requirements

The responsible entity must conduct some tasks directly under any scenario. These functions should not be contracted out:

- Ensuring compliance with FTA and TxDOT rules and regulations.
- Budgeting and financial management – The responsible entity/subrecipient will be responsible for all aspects of financial management.
- Service monitoring and oversight – The responsible entity should continually monitor service. Complaints and commendations should be in-house as well.
- Seeking sources of funding – This is a constant effort.
- Short and long range planning – Short and long range guidance should come from the responsible entity.

Other Critical Requirements

These functions can be contracted out or can be conducted in house. In each case the process and procedures must follow state and federal regulations and rules:

- Day-to-day operation of the service
- Grant administration
- Procurement
- Marketing
- Recruitment, hiring and training
- Operations planning
- Facility management
Costs should be similar under any operating scenario. The decision points revolve around:

- **Representation and political issues** – Ensuring all governmental entities that contribute to the service are properly represented.

- **Capabilities** – Administrative and operational capabilities require different approaches. Some entities while capable of administrative functions are not suited to operating service. There are some entities that would be suited to operate the service, but not conduct administrative functions.

### Start-Up Efforts

Under any scenario, there will be need for a start-up effort by hiring a manager and contracting for or securing legal and financial management services. There could be a long lead time for the securing of funds and procurement of vehicles and other capital equipment (one to two years if everything goes well). Vehicles should be procured and operational plans should be finalized. The demands of the service should require having a team in place 6 - 8 months prior to implementation. Initial planning and applications should be the responsibility of the support entity.

### Funding and Sustainability

Funding transit in a city within a larger urbanized area (UZA) requires cooperation from a variety of sources. For the San Antonio UZA, VIA is the recipient of FTA urban funds. This requires a close working relationship with VIA in order to possibly gain access to the funds. Currently VIA matches New Braunfels’s funding of over $400,000 and has authorized funding for FY 2021, through the CARES Act.

Everything has changed in the past few months as the pandemic resulted in economic upheaval and many unknowns regarding local transit and city revenue projections for the next five years. Unknowns include the key elements. Will VIA be able to continue to supply a share of Federal funds as they have been for a number of years? If so, how far into the future? Will New Braunfels be able to fund its share of the service even with VIA’s contribution?

Further complicating the ability to predict funding, is the changes that will be seen based on the census and how this may affect transit funding. This will not be known for at least a year.

### Funding Options

Funds can come from a variety of sources. These can include Federal Transit Administration funding, local government funding and possibly sponsorship/partnership funding.
FTA Funding

Several FTA grant programs administered by VIA or the FTA could potentially provide funding for the service. The most appropriate candidates include:

- **Section 5307** - Urbanized Area Formula Grants – through VIA
- **Section 5339** - Grants for Buses and Bus Facilities - FTA
- **Section 5310** - Enhanced Mobility of Seniors and Individuals with Disabilities – MPO/VIA/AACOG potentially to support aspects of the service designed to better serve seniors and people with disabilities

Over the past few years, using FTA Section 5307 funds, VIA has provided fifty percent FTA matching funds for New Braunfels service. This funding is provided by VIA. At this point no one knows what the end result of the pandemic will bring to transit. For the purposes of this study, we will use the assumption that VIA will continue the status quo level of funding.

FTA regularly announces grant opportunities, typically for capital through the FTA Section 5339 program. The grant awards included facilities and low emission vehicles.

There are regular grant opportunities for a variety of needs, such as serving job access needs (Ladders of Opportunity grants for example) or targeted funds for alternative fueled vehicles. These regular opportunities can help launch the system by securing 80 – 90 percent of funding for vehicles.

Other Federal Funds

FTA periodically announces new, one time or annual grant opportunities for targeted purposes, most of which could be applied to this corridor service due to the wide variety of needs it can serve. Most notable are BUILD grants, formerly known as TIGER grants. Since 2009, Congress has dedicated nearly $4.6 billion for seven rounds of TIGER to fund projects that have a significant impact on the Nation, a region or a metropolitan area. - See more at: https://www.transportation.gov/tiger/about#sthash.KEixnxhN.dpuf.

About 28% of this funding has gone to transit projects, including rural areas. This on-going grant process provides an excellent opportunity to procure vehicles, facilities and other capital needs.

Fare Revenue

Fare revenue, including cash fares and sales of bus tickets or passes, is considered operating revenue that cannot be used as local match for FTA grants. Grantees must first deduct fares collected from their operating expenses in order to calculate net operating deficit, and the 50% local match is calculated from the net deficit.
Setting Fares

In determining fares for the proposed route, it will be important to balance revenue goals with ensuring service is affordable to transportation dependent individuals. That is, maximize revenue while ensuring all can ride. The recommended approach has three levels of fares:

1. **Single Ride Fare** – This fare would be the “full price fare” typically about $1.

2. **Monthly and Multi-Ride Tickets** – This would be a deeply discounted fare, for example: $0.75 per ride for a 10-ride ticket or $30 for a monthly pass.

3. **Children, Seniors and Persons with Disabilities** – Children and senior fares should be ½-fare and persons with disabilities that are eligible for ADA paratransit services can ride fixed route for free, where capable.

Fare revenue can be significant in a constrained environment. Assuming an average fare of $0.75, at the low level of service – five days per week about $50,000 can be generated annually – for seven days a week service, $72,000 can be generated.

Local Funding

There is no substitute for local match. It is essential to start-up and sustainability and will be about one-half of the operating costs. For a status quo – low level option that would be $400–500,000 annually. The bulk of this funding will fall on local governments, however there is the possibility of bringing in sponsors that would support the service.

Sponsorships

Sponsorships imply an agreement that benefits all parties. In a sponsorship program, one side receives revenue and support, while the other side receives advertising and promotional benefits commensurate with the cost.

Sponsorships have had success in many locations across the country and many systems in Texas generate revenue from the private sector and in return receive direct advertising, promotional benefits and contributing to the community. Many transit systems have had success bringing in revenue from arrangements with the private sector. Bus wraps are particularly popular in many communities across the country.
In Summary – What the Future Brings

New Braunfels continues to grow outward with growth in both residential housing as well as higher density mixed use development to the north and northeast, in particular. Figure 7-20 depicts these areas of future growth combined with the full service level routes. As can be seen, even at this full service level, outlying areas will not be reached with fixed routes within the next five to ten years. These areas should be monitored for growth and at the appropriate time, if funding is available microtransit can be used to meet those transportation needs.

Re-inventing Public Transit in New Braunfels

While this is not the best time to implement a new transit system, doing nothing should not be an option as even implementing a status quo funding alternative will re-invent transit in New Braunfels and dramatically increase ridership 300 percent over the approximately 20,000 annual riders now. Tables 7-1 and 7-2 summarize the potential ridership and costs.

Since New Braunfels and VIA are already spending in excess of $800,000 annually on service in New Braunfels, the choice is between doing nothing or improving the existing service with much higher ridership at little to no additional costs. The time will come when the pandemic recedes to the point where people feel safe and are willing to ride. By planning now and having a plan ready to go, New Braunfels will have an excellent chance to secure capital funding that is needed to properly start service.
Figure 7-20: Areas of Future Growth Combined with Full Service Level Routes
Appendix A: Survey Analysis by Age Cohort
Appendix A:
Survey Analysis by Age Cohort

Introduction

In response to New Braunfels’ questions on how age impacts the response to the general public survey, Toole Design looked at each question and organized the data according to the age brackets defined in the survey. Age groups answered the survey at different levels. Therefore, for each question, the percentage of the respondents in that age bracket can be compared.

Table A-1: Survey Responses by Age

<table>
<thead>
<tr>
<th>Age Bracket</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-25</td>
<td>21</td>
</tr>
<tr>
<td>26-35</td>
<td>52</td>
</tr>
<tr>
<td>36-45</td>
<td>84</td>
</tr>
<tr>
<td>46-55</td>
<td>52</td>
</tr>
<tr>
<td>56-60</td>
<td>45</td>
</tr>
<tr>
<td>61+</td>
<td>113</td>
</tr>
</tbody>
</table>

There were 367 respondents that included their age in the survey. Of these, 113 were over 61 years old; this is the most represented age bracket. The second most represented was the 36-45 years old bracket. Only 6% of the 367 respondents were between 18 and 25 years old.

This appendix shows the responses to each question based on age and, where insights could be gleaned, a note on the results. In cases where the number of responses to the question differs substantially from 367, the sample is noted as n.
Appendix A: Survey Analysis by Age Cohort

Responses

How important is it for New Braunfels to have fixed-route bus service?

Those between the ages of 18 and 25 and over 61 years old responded that fixed route bus service was important or very important more often, however, most respondents thought it was important/very important.

If fixed route bus service were available in New Braunfels, how likely would you be to use it?

A pattern between likelihood of using bus service and age was not apparent. Respondents ages 18-25 answered that they would likely use fixed route service more than any other age group.
Appendix A: Survey Analysis by Age Cohort

How often would you use the bus service?

For all age brackets, at least half of the respondents said they would use bus service one or more days a week. Respondents between 26 and 55 years old said they would use bus service 6-7 days a week most. Respondents 18-25 years old said they would use the service 3-5 days a week most. \( n=253 \)

How frequent should the bus service be?

There were no clear patterns based on age.
What would your preferred method of fare payment be?

None of the respondents between 18 and 25 years old preferred cash payments.

What is the maximum per-ride fare you would be willing to pay for a bus service?

There is no clear pattern based on age but through the responses on this question, the price elasticity based on age can be estimated. For example, respondents over age 61 seem to be less willing to pay more than $1 than other age groups and respondents between 26 and 35 years old seem to be less willing to pay more than $1.50 than other groups. Respondents between the ages of 46 and 55 are more willing to pay over $2.50 than other groups.
Would you need training or assistance on how to use public transit?

There were no clear patterns based on age. Most respondents (84%-90%) did not need training or assistance to use public transit.

How difficult is it for you to find transportation?

It is most difficult for respondents ages 18-25 and over 61 years old to find transportation. It is least difficult for respondents between 46 and 55 years old.
How satisfied are you with the current transit options in New Braunfels?

Patterns on satisfaction with current options and age are not distinct, however, respondents between 18 and 25 years old were less satisfied than all other groups.

Are you aware that Alamo Regional Transit (ART) offers scheduled ride services in New Braunfels?

As respondents increase in age, they are more aware of scheduled ride service.
**Do you use Alamo Regional Transit (ART)'s scheduled ride service?**

There is no clear pattern based on age. Most respondents never use scheduled ride service.

**Do you use taxis, Uber, Lyft, or other ride-hailing services?**

Use of ride hailing services is comparable across most age brackets, however, respondents between 26 and 45 years old reported using them more.
Ranked Answers

Rank the top three reasons you would use fixed route bus service in New Braunfels.¹

Running errands was the most highly rated reason to potentially use fixed route bus service and all age groups ranked this reason at comparable levels. Medical and dental appointments were ranked very low for ages 18-25 and going to and from school was ranked very low for respondents over 46 years old.

¹ This shows a weighted score. It weights the ranked (1-3) answers from the survey and calculates the summation.
If reliable bus service was available, what are the top three places you would use it to travel to?

Most trips would be taken within New Braunfels and this was comparable across all age brackets. Respondents between 26 and 35 years old valued access to water recreation more than other groups and respondents between 18 and 25 years old valued access to San Marcos more than other groups.
Rank the top three characteristics for a new bus service in New Braunfels in order of your preference/need.

Patterns based on age were not clear. The top ranked characteristic for each age group is in the table below.

**Table A-2: Survey Responses by Age**

<table>
<thead>
<tr>
<th>Age Bracket</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-25</td>
<td>Affordable fares</td>
</tr>
<tr>
<td>26-35</td>
<td>Express connections</td>
</tr>
<tr>
<td>36-45</td>
<td>Express connections</td>
</tr>
<tr>
<td>46-55</td>
<td>Schedule information</td>
</tr>
<tr>
<td>56-60</td>
<td>Affordable fares; Express connections</td>
</tr>
<tr>
<td>61+</td>
<td>Affordable fares</td>
</tr>
</tbody>
</table>
What form of transportation do you use most commonly?

There were no clear patterns based on age. Respondents between 18 and 25 replied that they used privately operated bus systems slightly more than other groups and respondents between 56 and 60 replied that they used dial-a-ride service slightly more than other groups.
Appendix B: Streetlight Data Results
Appendix B: Streetlight Data Results

Local Analysis

The local analysis was conducted using 31 zones within New Braunfels, which were largely based on Traffic Analysis Zones, with some modifications based on land uses and destinations. These zones are included in the map below. All analysis was conducted using Streetlight Data’s Location-Based Services, which comes from smartphone apps that use opt-in location-based services. All analysis used in this Appendix were conducted using data from March, April, September, and October 2018. These analyses can be refined to include any number or range of months from January 2016 through July 2019. This provides an opportunity for future analyses to ascertain seasonal travel trends.
Origin - Destination Matrix

An Origin/Destination Matrix was developed to demonstrate the traffic volumes originating and ending between each zone. As an example of how interpret this matrix, using Zone 1 as the origin zone and Zone 2 as the destination zone: 149 trips that originated in Zone 1 ended in Zone 2.
Appendix B: Streetlight Data Results

Local Origin - Destination Matrix


Origin Zone Maps

The following maps detail the overall volume of trips that originate in each zone. The first map details the relative volume of all origin zones. Subsequent maps focus on commuting times (weekdays, peak AM and PM), as well as weekends (Saturday and Sunday, all hours).

*Origin Zones: Daily, all hours*
Appendix B: Streetlight Data Results

Origin Zones: Weekday (M-Th) Peak AM (6AM – 10AM)

| 5.71k - 7.58k | 3.85k - 5.71k | 1.98k - 3.85k | 116 - 1.98k |

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Appendix B: Streetlight Data Results

Origin Zones: Weekday (M-Th) Peak PM (3PM – 7PM)

- 7.96k - 10.58k
- 5.34k - 7.96k
- 2.72k - 5.34k
- 96 - 2.72k
Appendix B: Streetlight Data Results

Origin Zones: Saturday and Sunday (all hours)
**Individual Origin Zones**

The following series of 31 maps focuses on each of the 31 local zones defined in New Braunfels as origin zones. The origin maps show where trips that begin in the identified zone (those outlined in black) end. For example, the map for Zone 1 highlights in red the zone where the most trips that began in Zone 1 ended. In this case, most trips that originate in Zone 1 end in Zone 5, followed by Zone 23.
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone

Legend:
- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips
- Origin Zone
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone

Zone 4

Zone 5

Zone 6

Legend:
- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips
- Origin Zone
Appendix B: Streetlight Data Results

- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips

Origin Zone:
- Zone 7
- Zone 8
- Zone 9

Legend:
- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips
- Origin Zone
Appendix B: Streetlight Data Results

- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips

Origin Zone:
- Zone 10
- Zone 11
- Zone 12

Legend:
- Red: Hi Volume of Trips
- Orange: Hi-Med Volume of Trips
- Yellow: Med Volume of Trips
- Green: Low-Med Volume of Trips
- Light Green: Low Volume of Trips
- Black: Origin Zone
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone

Zone 13
Zone 14
Zone 15

Legend:
- **Hi Volume of Trips**
- **Hi-Med Volume of Trips**
- **Med Volume of Trips**
- **Low-Med Volume of Trips**
- **Low Volume of Trips**
- **Origin Zone**
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone:
- Zone 16
- Zone 17
- Zone 18

Legend:
- Red: Hi Volume of Trips
- Orange: Hi-Med Volume of Trips
- Yellow: Med Volume of Trips
- Green: Low-Med Volume of Trips
- Light Green: Low Volume of Trips
- Black: Origin Zone
Appendix B: Streetlight Data Results

- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips

Origin Zone:
- Zone 19
- Zone 20
- Zone 21

Legend:
- Red: Hi Volume of Trips
- Orange: Hi-Med Volume of Trips
- Yellow: Med Volume of Trips
- Green: Low-Med Volume of Trips
- Light Green: Low Volume of Trips
- Black: Origin Zone
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone:
Zone 22
Zone 23
Zone 24
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone

Zone 25
Zone 26
Zone 27

Legend:
- Red: Hi Volume of Trips
- Orange: Hi-Med Volume of Trips
- Yellow: Med Volume of Trips
- Green: Low-Med Volume of Trips
- Light Green: Low Volume of Trips
- Black: Origin Zone
Appendix B: Streetlight Data Results

Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Origin Zone
Appendix B: Streetlight Data Results

Zone 31

- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips
- Origin Zone
Destination Maps
The following maps detail the overall volume of trips that end in each zone. The first map details the relative volume of all destination zones. Subsequent maps focus on commuting times (weekdays, peak AM and PM), as well as weekends (Saturday and Sunday, all hours).

Destination Zones: Daily, all hours
Appendix B: Streetlight Data Results

Destination Zones: Weekdays (M-Th) Peak AM (6AM – 10AM)

<table>
<thead>
<tr>
<th>1.49k - 1.99k</th>
<th>994.5 - 1.49k</th>
<th>498.75 - 994.5</th>
<th>3 - 498.75</th>
</tr>
</thead>
</table>

Map showing destination zones with different color codes indicating the traffic volume during the peak morning hours.
Destination Zones: Weekdays (M-Th) Peak PM (3PM – 7PM)
Appendix B: Streetlight Data Results

Destination Zones: Saturday and Sunday, all hours

![Destination Zones Map]

- Red: 24.97k - 33.26k
- Orange: 16.68k - 24.97k
- Yellow: 8.39k - 16.68k
- Green: 106 - 8.39k
Individual Destination Zones

The following series of 31 maps focuses on each of the 31 zones defined in New Braunfels as destination zones. The maps show patterns seven days a week during all hours. The destination maps show where the trips that end in the identified zone (outlined in black) begin. For example, the map for Zone 1 highlights in red the zone where the most trips that ended in Zone 1 began. In this case, most trips that originate in Zone 1 end in Zone 5, followed by Zone 23.
Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Destination Zone
Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Destination Zone

Zone 4

Zone 5

Zone 6

Red: Hi Volume of Trips
Orange: Hi-Med Volume of Trips
Yellow: Med Volume of Trips
Green: Low-Med Volume of Trips
Light Gray: Low Volume of Trips
White: Destination Zone
Hi Volume of Trips
Hi-Med Volume of Trips
Med Volume of Trips
Low-Med Volume of Trips
Low Volume of Trips

Destination Zone

Zone 28

Zone 29

Zone 30

Legend:
- Hi Volume of Trips
- Hi-Med Volume of Trips
- Med Volume of Trips
- Low-Med Volume of Trips
- Low Volume of Trips
- Destination Zone
Regional Analysis

Origin - Destination Matrix

An Origin - Destination Matrix was developed to demonstrate the traffic volumes originating and ending between each zone. As an example of how interpret this matrix, 10,814 trips of those that originated in New Braunfels ended in the Cibolo/Schertz area.

<table>
<thead>
<tr>
<th>Origin Zone</th>
<th>Destination Zone</th>
<th>New Braunfels</th>
<th>San Antonio</th>
<th>Cibolo/Schertz</th>
<th>San Marcos</th>
<th>Seguin</th>
<th>Canyon Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Braunfels</td>
<td></td>
<td>274888</td>
<td>6668</td>
<td>10814</td>
<td>7671</td>
<td>3968</td>
<td>5956</td>
</tr>
<tr>
<td>San Antonio</td>
<td></td>
<td>6928</td>
<td>2082128</td>
<td>22315</td>
<td>1689</td>
<td>1174</td>
<td>1054</td>
</tr>
<tr>
<td>Cibolo/Schertz</td>
<td></td>
<td>11270</td>
<td>21793</td>
<td>231016</td>
<td>1317</td>
<td>961</td>
<td>818</td>
</tr>
<tr>
<td>San Marcos</td>
<td></td>
<td>7725</td>
<td>1593</td>
<td>1220</td>
<td>163658</td>
<td>726</td>
<td>812</td>
</tr>
<tr>
<td>Seguin</td>
<td></td>
<td>3772</td>
<td>982</td>
<td>868</td>
<td>763</td>
<td>62861</td>
<td>89</td>
</tr>
<tr>
<td>Canyon Lake</td>
<td></td>
<td>6584</td>
<td>1353</td>
<td>889</td>
<td>983</td>
<td>164</td>
<td>45840</td>
</tr>
</tbody>
</table>

Origin Maps

The following maps detail the trips that originate in New Braunfels and travel throughout the region. The first map details the relative volume of trips originating in New Braunfels and travelling to regional zones daily, including all hours. Subsequent maps focus on commuting times (weekdays, peak AM and PM), as well as weekends (Saturday and Sunday, all hours).
Regional Trips that originate in New Braunfels: Daily, all hours

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1k - 10.81k</td>
<td>Red</td>
</tr>
<tr>
<td>7.39k - 9.1k</td>
<td>Orange</td>
</tr>
<tr>
<td>5.68k - 7.39k</td>
<td>Yellow</td>
</tr>
<tr>
<td>3.97k - 5.68k</td>
<td>Green</td>
</tr>
</tbody>
</table>

Appendix B: Streetlight Data Results

Regional Trips that originate in New Braunfels: Weekdays (M-Th) Peak AM (6AM – 10AM)
Appendix B: Streetlight Data Results

Regional Trips that originate in New Braunfels: Weekdays (M-Th) Peak PM (3PM – 7PM)

<table>
<thead>
<tr>
<th>2.55k - 3k</th>
<th>2.1k - 2.55k</th>
<th>1.65k - 2.1k</th>
<th>1.2k - 1.65k</th>
</tr>
</thead>
</table>

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Appendix B: Streetlight Data Results

Regional Trips that originate in New Braunfels: Saturdays and Sundays, All hours

<table>
<thead>
<tr>
<th>Origin Zone Rates</th>
<th>Within New Braunfels</th>
<th>To San Antonio</th>
<th>To Cibolo/Schertz</th>
<th>To Seguin</th>
<th>To Canyon Lake</th>
<th>To San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td>From New Braunfels, daily avg.</td>
<td>88.70%</td>
<td>2.20%</td>
<td>3.50%</td>
<td>1.70%</td>
<td>1.90%</td>
<td>2.50%</td>
</tr>
<tr>
<td>From New Braunfels, 6-10am, M-Th</td>
<td>85.50%</td>
<td>3.60%</td>
<td>4.50%</td>
<td>2.30%</td>
<td>1.10%</td>
<td>3.60%</td>
</tr>
<tr>
<td>From New Braunfels, 3-7pm, M-Th</td>
<td>89.90%</td>
<td>1.50%</td>
<td>3.10%</td>
<td>1.20%</td>
<td>2.30%</td>
<td>1.90%</td>
</tr>
<tr>
<td>From New Braunfels, Saturday and Sunday, all hours</td>
<td>88.40%</td>
<td>2.10%</td>
<td>3.50%</td>
<td>1.20%</td>
<td>2.10%</td>
<td>2.80%</td>
</tr>
</tbody>
</table>

New Braunfels Transit Study
Destination Maps

The following maps detail the trips that end in New Braunfels, including information about where in the region they began. The first map details the relative volume of trips that end in New Braunfels from each starting zone averaged daily, during all hours of the day. Subsequent maps focus on commuting times (weekdays, peak AM and PM), as well as weekends (Saturday and Sunday, all hours).

Regional Trips that end in New Braunfels: Daily, all hours

| 9.4k - 11.27k | 7.52k - 9.4k | 5.65k - 7.52k | 3.77k - 5.65k |

© Qlik, OpenStreetMap
Regional Trips that end in New Braunfels: Weekdays (M-Th) Peak AM (6AM – 10AM)

| 2.16k - 2.58k | 1.74k - 2.16k | 1.32k - 1.74k | 901 - 1.32k |
Regional Trips that end in New Braunfels: Weekdays (M-Th) Peak PM (3PM – 7PM)

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.25k - 3.89k</td>
<td>Red</td>
</tr>
<tr>
<td>2.61k - 3.25k</td>
<td>Orange</td>
</tr>
<tr>
<td>1.96k - 2.61k</td>
<td>Yellow</td>
</tr>
<tr>
<td>1.32k - 1.96k</td>
<td>Green</td>
</tr>
</tbody>
</table>

© Qlik, OpenStreetMap
Regional Trips that end in New Braunfels: Saturday and Sunday, all hours

- 8.61k - 10.42k
- 6.8k - 8.61k
- 4.98k - 6.8k
- 3.17k - 4.98k
## Destination Zone Rates

### Table 2 Regional Destination Rates

<table>
<thead>
<tr>
<th>To New Braunfels, daily avg.</th>
<th>Within New Braunfels</th>
<th>From San Antonio</th>
<th>From Cibolo/Schertz</th>
<th>From Seguin</th>
<th>From Canyon Lake</th>
<th>From San Marcos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.60%</td>
<td>1.20%</td>
<td>2.10%</td>
<td>2.50%</td>
</tr>
<tr>
<td>To New Braunfels, 6 – 10am, M-Th</td>
<td>86.30%</td>
<td>2.50%</td>
<td>4.30%</td>
<td>1.50%</td>
<td>3.70%</td>
<td>1.70%</td>
</tr>
<tr>
<td>To New Braunfels, 3-7pm, M-Th</td>
<td>88.30%</td>
<td>2.20%</td>
<td>3.90%</td>
<td>1.30%</td>
<td>1.40%</td>
<td>2.80%</td>
</tr>
<tr>
<td>To New Braunfels, Saturday and Sunday, all hours</td>
<td>87.90%</td>
<td>2.30%</td>
<td>3.60%</td>
<td>1.10%</td>
<td>2.40%</td>
<td>2.80%</td>
</tr>
</tbody>
</table>