

New Braunfels Transit Study

Technical Memorandum No. 5: *Unmet Needs and Potential Transit Demand*



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Prepared for:
Alamo Area Metropolitan Planning Organization



Prepared by:
KFH Group, Inc.
Austin, Texas

In association with:
Toole Design



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INTRODUCTION

This technical memorandum 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.¹ 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.

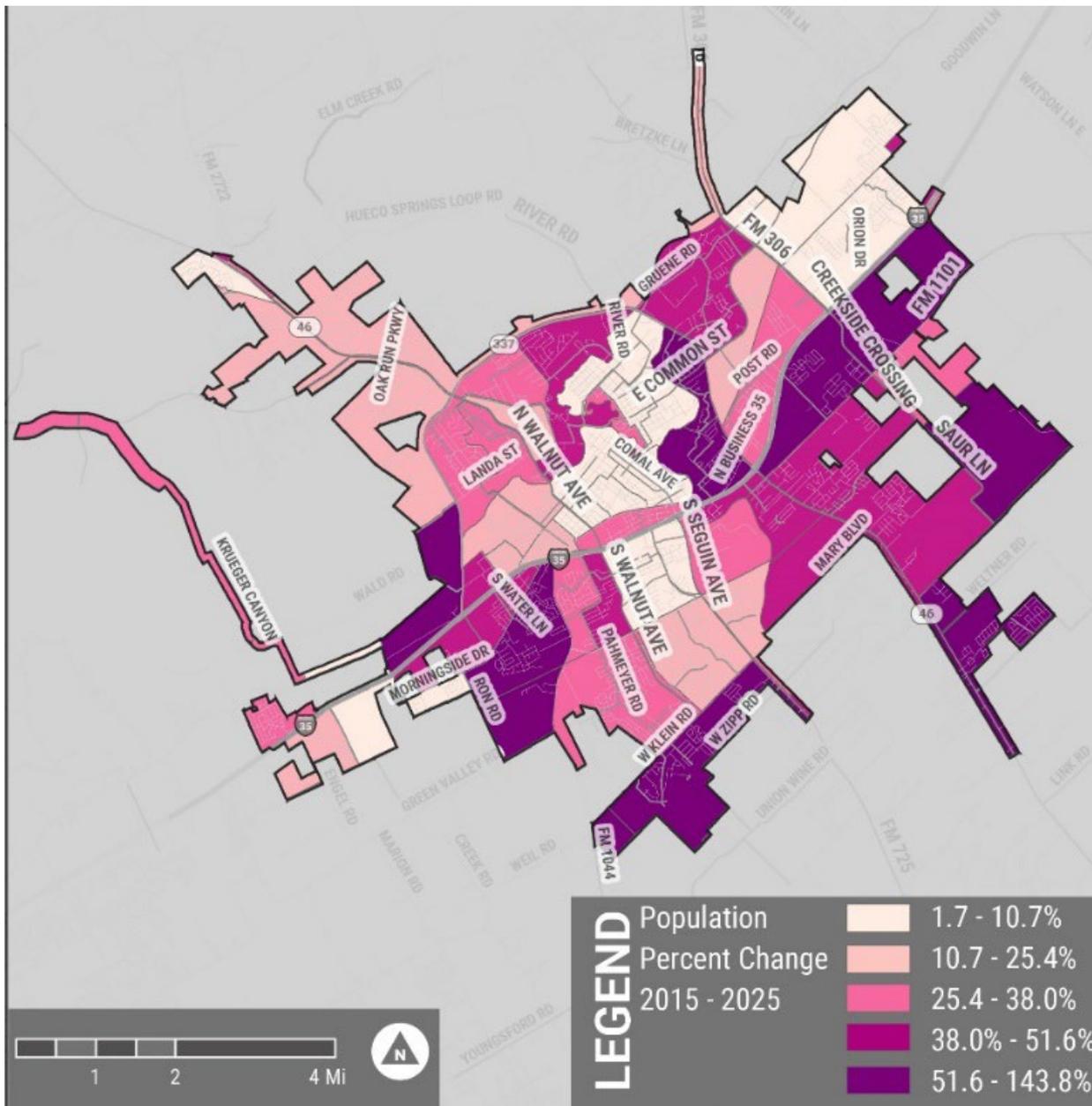
A review of AAMPO's forecasts for employment and population in 2025, conducted as part of its Travel Demand Modeling process, reveals that employment is projected to grow by 38 percent and population by 36 percent by 2025 (compared to 2015 data). This suggests that by the time the service is implemented, service needs may shift and/or increase. Figure 5-1 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.

¹ American FactFinder

Figure 5-1: Population Change 2015 - 2025



A few key findings and patterns from our demographic analysis in Technical Memorandum 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.² 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 VIA³. In each case, one end of the trip must be based in that system's service area. Technical Memorandum No. 3: *Review of Existing Services* indicated that there were about 31 commuters using vanpools to go to Austin and 16 going to San Antonio.

² ACS 2017 5-Year Estimates

³ This does not include USAA's fleet of over 100 vehicles

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 5-1 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 5-2 (one percent) and 5-3 (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.

Tables 5-2 and 5-3 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 5-3, 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 5-1: Daily Home-Based Work Trips – 2025

From	To			
	New Braunfels	Bexar, Downtown	San Antonio 410	Seguin, Guadalupe Co.
New Braunfels		10799	4470	5128
Bexar/Downtown	2765			
San Antonio 410	327			
Seguin	1080			

Table 5-2: Daily Potential Transit Usage at 1 Percent Transit Use 2025

From	To			
	New Braunfels	Bexar, Downtown,	San Antonio 410	Seguin, Guadalupe Co.
New Braunfels		108	44	51
Bexar/Downtown	28			
San Antonio 410	3			
Seguin	11			

Table 5-3: Daily Potential Transit Usage at 2 Percent Transit Use – 2025

From	To			
	New Braunfels	Bexar, Downtown,	San Antonio 410	Seguin, Guadalupe Co.
New Braunfels		216	88	102
Bexar/Downtown	55			
San Antonio 410	6			
Seguin	22			

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 Technical Memorandum No. 2: *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 5-4).

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 5-4.

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 comparable. 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 5-4: Review of Comparable Cities⁴

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

* US Census 2018

** Prior 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 5-2) 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 5-3) and highest number of residents per vehicle (Figure 5-4). In each case Texarkana is the leader.

Figure 5-2: Ridership per Capita in Comparable Cities

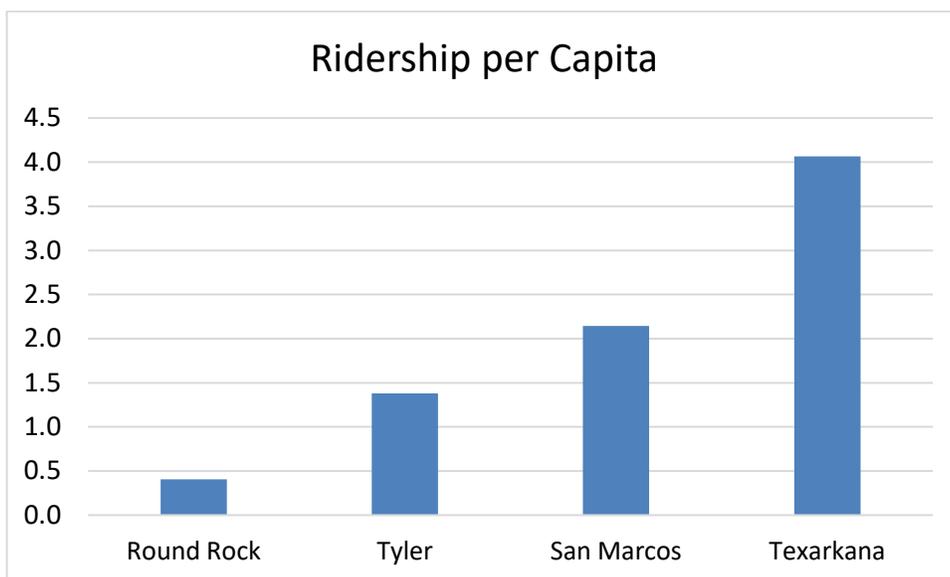


Figure 5-3: One-way Trips per Hour in Comparable Cities

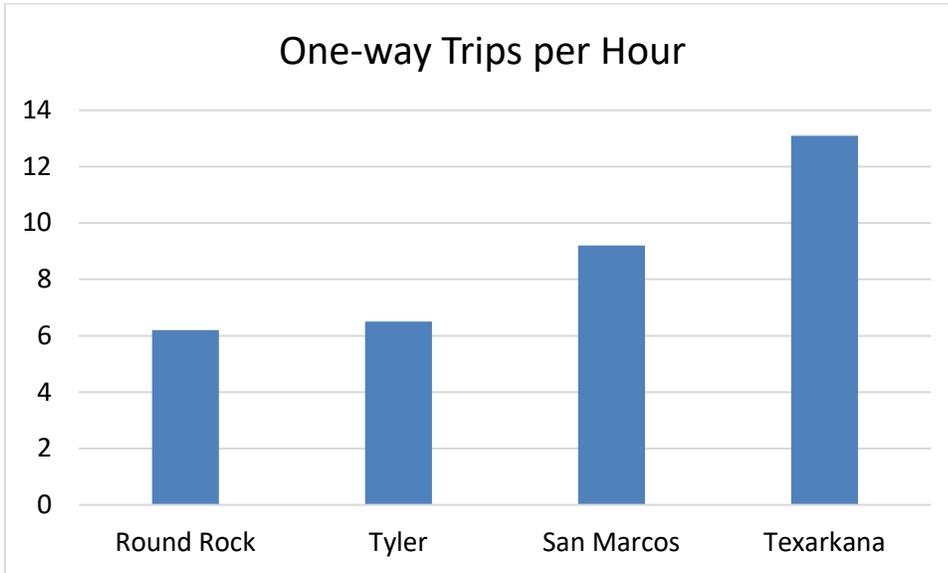
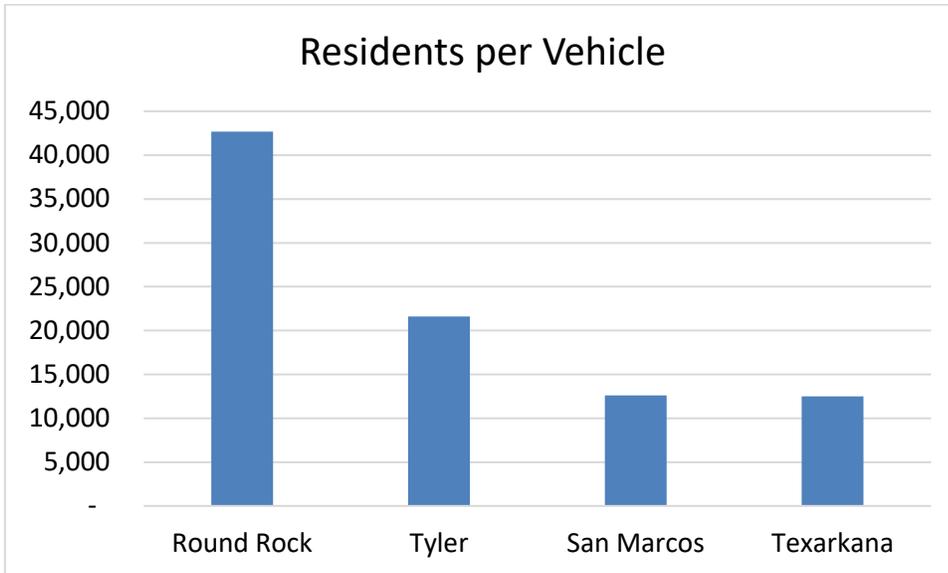


Figure 5-4: Residents per Vehicle in Comparable Cities



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.