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Cover photos courtesy of Toole Design: Cyclist on Comal Avenue (top) and Guadalupe River (bottom).
1 – Introduction

The Alamo Area Metropolitan Planning Organization (AAMPO) is evaluating the role of bike share in the Greater San Antonio region, including expansion of the existing bike share program in San Antonio (Bexar County), additional mobility options that might complement that program, and the feasibility of bike share in some of the communities within Guadalupe, Comal, and Kendall Counties, including New Braunfels. This report focuses on the feasibility of bike share in the City of New Braunfels and provides a template for considering bike share in other parts of Comal County.

The report summarizes the bike share assessment process, outlines possible system options, and identifies implementation needs if bike share is to move forward in New Braunfels. It can be used to inform the public or generate interest among decisionmakers, potential vendors, potential funders, and other stakeholders.

Bike Share Overview

Bike share is a mobility option that allows users to access a network of bicycles that can be checked out, ridden, and returned. Depending on the system, bikes are either returned to specified hubs or can be parked within a designated service area. Bikes are typically accessed through a mobile phone app, by credit card, or by signing up for the program online. There are hundreds of bike share programs operating in the United States and many more in various stages of planning. Bike share has proved to be an effective, low-cost mode of transportation for short trips. Most trips are between one and three miles long and last from 15 to 35 minutes. Common reasons for riding bike share include connecting to transit, commuting, social or entertainment trips, and recreation.

Assessment Process

This feasibility study was overseen by a Study Oversight Committee (SOC) made up of representatives from AAMPO; the Cities of Boerne, New Braunfels, San Antonio, and Seguin; Bexar, Comal, Guadalupe, and Kendall Counties; San Antonio Bike Share (SABS); the Texas Department of Transportation (TXDOT); and VIA Metropolitan Transit.

The feasibility assessment process is shown in Figure 1 and began with a review of current conditions in New Braunfels to identify opportunities and challenges for bike share. It included a review of geographic conditions, land use patterns, demographics, population trends, transportation infrastructure, city infrastructure, and local and regional policies.

Outreach was conducted to gather feedback from stakeholders and the public. Stakeholder outreach included interviews and meetings with City, County, and other agency staff and public outreach included
At the end of 2017...

- Bike share was operating in more than 90 U.S. cities,
- Bike share users took 35 million trips, and
- There were more than 100,000 bike share bikes in operation.

-NACTO’s Bike Share In the U.S.: 2017

A variety of different bike share technologies and business models were considered and informed by case studies of comparable cities that have implemented these types of programs. Based on this analysis, the project team made recommendations about which type of bike share program would be most successful given the interest, capacity, and funding environment in New Braunfels. An implementation plan was developed to show the path forward for bike share in New Braunfels.

Figure 1. Feasibility assessment process.
2 – Community Analysis

New Braunfels has a population of nearly 71,000 people and is one of the fastest growing cities in the Alamo region.\textsuperscript{1,2} 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 encompasses 45 square miles and is a local and regional visitor destination with attractions including Downtown and Main Plaza, Landa Park, Historic Gruene, the Faust Street Bridge and water activities focused on the Schlitterbahn water parks and floating on the Comal and Guadalupe Rivers.

Opportunities

Policy Context

The City of New Braunfels’ plans and policies support bicycling as part of a multimodal transportation system that can connect popular destinations within a reasonable bicycling distance and reduce traffic and parking demands.\textsuperscript{2,3} Active transportation is also recognized as a way to achieve better community health outcomes and improve overall quality of life.\textsuperscript{3} The Comprehensive Master Plan (updated in 2006), the Future Land Use Plan (2016), the Strategic Parks and Recreation Master Plan (2010), the Regional Transportation Plan (2012), the AAMPO Bicycle and Pedestrian Study (2016), and the Master Thoroughfare Plan (2017) promote bicycling and propose the build-out of a more complete on- and off-street bicycling network.

Most of these plans and policies also recognize that there is considerable community support for bicycling improvements such as new trails and on-street bike lanes. For example, a regional survey conducted as part of AAMPO’s Bicycle and Pedestrian Study showed that 90 percent of respondents would like to bike more often (see Figure 3).\textsuperscript{4} These trends are also being reflected in city regulations such as the City of New Braunfels’ recent “safe passing” law designed to protect bicyclists riding in traffic.\textsuperscript{5}

1 American Community Survey, 2016, one-year estimate
2 AAMPO Bicycle and Pedestrian Study
3 Envision New Braunfels, 2018. Accessed on October 31, 2018: https://files.acrobat.com/a/preview/28b951ad-542d-4f1f-a0e6-8e2516c01b78
5 Alamo Area Metropolitan Planning Organization, Metropolitan Transportation Plan “Mobility 2040”
**Bicyling as an activity was often perceived as “dangerous” or “unsafe.”**

Frequently cited barriers to bicycling include too few facilities (i.e. bike lanes or paths), safety, weather, distance between destinations and lack of bicycle ownership.

-Alamo Area Regional Bicycle & Pedestrian Planning Study

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**Figure 3.** Findings from public outreach conducted as part of the Alamo Area Regional Bicycle & Pedestrian Planning Study showing support for bicycling and bike-related improvements in New Braunfels.
Transit Service
Alamo Regional Transit provides a “demand-responsive, curb-to-curb” bus service to all residents in New Braunfels and Comal County. The service operates Monday to Friday between 7 AM and 6 PM and has to be booked at least 24 hours in advance. Fares cost between $2 and $12 depending on the distance of travel. A bike share program could provide an on-demand public transportation service that better serves spontaneous trip making in town and reduces the need for a private automobile.

Future Bicycling Infrastructure
Long-range planning documents support the expansion of bicycling infrastructure in New Braunfels. The City’s Regional Transportation Plan recommends the integration of bicycle infrastructure into street cross-sections as part of future designs and the City’s Comprehensive Plan discusses the role of streets and streetscapes for all modes including bicyclists and pedestrians. AAMPO’s Bicycle and Pedestrian outlines a plan, that when complete would provide a connected network of approximately 72 miles of on-street bicycle facilities and 57 miles of shared-use trails in New Braunfels.

Destinations and Attractions
New Braunfels has a number of visitor attractions and local amenities that draw people to the City. These include Downtown New Braunfels, historic Gruene, Landa Park, Wurstfest (Octoberfest celebration), the Schlitterbahn water parks, and floating on the Comal and Guadalupe Rivers. Many of these destinations are less than 2 miles apart (approximately a 20-minute bike ride), which is an ideal distance for a bike share trip.

Figure 4. Existing Transportation Network and Destinations.
*Streets comfortable for bicycling include arterial streets rated as comfortable by AAMPO’s Bicycle Level of Traffic Stress analysis. Note that not all bicyclists will feel comfortable on these streets because speeds may be as high as 30 - 35 mph.

7 City of New Braunfels 2012 Regional Transportation Plan, March 2012. Access on October 31, 2018: https://www.nbtexas.org/1248/Regional-Transportation
During the summer months, the City can get very busy putting pressure on the street system and parking capacity. Bike share, in conjunction with increased bicycling facilities, could encourage residents and visitors to get around the city by bicycle and reduce traffic and parking demand.

**Challenges**

**Auto-Focused Transportation System**
The majority of trips in New Braunfels are made by automobile. Of New Braunfels residents who work, 92% drive to work, 3% work from home, and less than 2% bicycle, walk, or take public transportation, and 3% use other means. The high rates of driving are related to several factors including low-density, automobile-oriented development patterns through most of the city; an incomplete bicycling network; widespread availability of free or low-cost parking; limited public transit options; and hot temperatures in the summer. Bike share would provide an opportunity to replace some of these vehicle trips.

**Existing Bicycling Infrastructure**
New Braunfels’ bicycle infrastructure, shown in Figure 4, is generally limited and disconnected. There are almost seven miles of on-street bike facilities. A more complete network of comfortable bike facilities would encourage more bicycling and help support a bike share program. Research clearly shows that more and better bicycle facilities lead to more bicycling, with one study finding that a 10% increase in bike facilities saw a two-to-three percent increase in bicycle commuting compared to cities with no change in facilities.²³⁴

**Land Use and Density**
Development in New Braunfels is relatively low density and spread out, presenting a more challenging environment for implementing bike share. Consideration should be given to technologies that have the flexibility to serve destinations outside of the key activity nodes where traditional bike share stations would ordinarily be placed.

**Weather**
New Braunfels’ climate typically yields mild winters and hot, dry summers. Temperatures between June and September often reach above 90°F, which can be unpleasant for many potential bicyclists. Electric-assist (e-assist) bikes should be considered in New Braunfels as they require less physical effort to ride than standard bikes and can help encourage year-round ridership.

---


Table 1. Potential Bike Share Users in New Braunfels
(informed by stakeholder and public input)

<table>
<thead>
<tr>
<th>User Type</th>
<th>Potential</th>
<th>Notes</th>
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<tr>
<td>Residents</td>
<td>Medium</td>
<td>Local recreational, shopping, and entertainment trips particularly to Downtown New Braunfels and Gruene</td>
</tr>
<tr>
<td>Commuters</td>
<td>Low</td>
<td>There may be some staff working at destinations at the Schlitterbahn and the river outfitters that choose to bike share. However, many residents work outside the city</td>
</tr>
<tr>
<td>Employees</td>
<td>Low</td>
<td>There may be some daytime trips from jobs in Downtown</td>
</tr>
<tr>
<td>Visitors and Tourists</td>
<td>High</td>
<td>There is large potential for visitors to park once and then move about using bike share to access the numerous tourist destinations in the city as well as dining, shopping, and entertainment destinations</td>
</tr>
<tr>
<td>Students</td>
<td>Low</td>
<td>HPU in New Braunfels has a small enrollment and the campus is not easily accessible by bike</td>
</tr>
<tr>
<td>Someone Else Pays</td>
<td>Medium</td>
<td>Opportunity for employers such as the Schlitterbahn and the river outfitters to support discounted use of the program</td>
</tr>
<tr>
<td>Supporter*</td>
<td>Low</td>
<td>There is limited bicycling advocacy in New Braunfels</td>
</tr>
<tr>
<td>Other</td>
<td>Low</td>
<td>Other trips could come from hotels and major retail stores located along I-35, however bicycle access to these areas is difficult</td>
</tr>
</tbody>
</table>

*A “supporter” is someone that pays for membership in the program to support it, but that does not use the program. This is essentially a donation to the program.

Ridership Potential

New Braunfels is a diverse city with many types of residents, some of whom are more likely to ride bike share than others. More likely to use the system, there are a significant number of visitors each year, particularly during summer, who may be inclined to ride bicycles as part of their visitor experience or to conveniently get around. Table 1 identifies potential market segments for bike share ridership based on community and stakeholder feedback.
3 – Stakeholder Outreach

Stakeholder outreach was an essential part of the bike share assessment, informing the project team of the major opportunities and challenges and assisting with the potential design of a bike share system in New Braunfels. Stakeholder outreach included regular meetings with the Study Oversight Committee (SOC), which was comprised of representatives from the City of New Braunfels and other local, regional, and partner agencies. Activities conducted with the SOC included an opportunities and challenges assessment, identification of potential users of the program, and the AAMPO Bike Share Board Game, that helped identify what type of bike share system should be implemented in New Braunfels and where it should be located.

The project team also conducted a focus group meeting with staff from the City of New Braunfels’ Parks and Planning Departments, the Visitors Association, and Downtown New Braunfels. This meeting was used to identify opportunities and challenges and determine these agencies’ interest and capacity to take on a bike share program.

Opportunities

• A bike share program could connect visitor destinations and relieve traffic and parking stress during peak times,
• The City is starting to build bicycling infrastructure and promote bicycling. Bike share could further support and encourage more of this investment,

Figure 5. The AAMPO Bike Share Board Game.
• There may be local grants available for the bike share program from the New Braunfels Economic Development Corporation, the TIRZ district, or the Christus Hospital Foundation, and
• The city has walking and driving tours of Downtown and Gruene. Bike share would provide a bike tour option.
• The river outfitters may be a resource to help operate the program. They are located in most of the places where visitors want to access and have an investment in getting more people to their locations.

Challenges
• The City does not have a comprehensive network of bikeways. The existing network is disconnected with a number of critical streets and river crossings lacking bike lanes,
• The City has limited financial and staff resources to support a bike share program directly,
• The river is a precious resource to the City and its economic prosperity. As well, urban form is important and any system should be well organized and minimize clutter and the opportunity for bikes to end up in the river, and
• Electric-assist (e-assist) bikes should be considered to counter the effects of extreme summer heat and areas of the City with steep topography.

Best Practice - Adaptive Bike Program
Adaptive BIKETOWN in Portland, OR

The City of Portland’s adaptive bike program is a model program for other communities. Before starting the program, the City conducted interviews with physically disabled community members to learn how to best meet their needs. The information gathered during this outreach process led the City to develop a selection of different types of adaptive bikes so that people with different types of limitations are not all limited to one type of bike. The program offers a mix of tandems, hand-cycles, and three-wheeled bikes.

The program is managed separately from BIKETOWN and is operated through a partnership with Albertina Kerr, a non-profit that works with developmentally disabled children and adults. Unlike BIKETOWN, users can only rent bikes from a limited number of locations and the bikes must be returned to their pickup location. Bikes cost $5 per hour or three hours for $12.

Best Practice - Equity Program
Better Bike Share in Philadelphia, PA

Philadelphia’s Better Bike Share Program is a comprehensive program which has increased bike share ridership among local low-income communities. The program uses ambassadors from local community organizations to conduct outreach to low-income populations so that people learn about bike share from people who they are familiar with, or may have an easier time relating to.

The program also provides bike safety education and a discount fare option. Like many discount fare programs, Philadelphia’s program provides a reduced pass ($5/month vs $17/month) to recipients of SNAP benefits. The program also allows users to pay with cash through PayNearMe, a system that lets users add cash to their bike share accounts at 7-Elevens and Family Dollar stores.
4 – Public Outreach

Several opportunities were provided for the public to provide input to the study.

Overview of Public Comment

The project team attended the New Braunfels’ Farmers’ Market on Saturday, October 21st, 2017 from 9 AM to 1 PM and spoke with approximately 100 people ranging in age from children to seniors, the majority of whom were New Braunfels residents. Attendees could provide feedback using the online tools loaded onto iPads provided at the event or respond to the questions displayed on the project boards.

Public feedback was generally supportive of bike share in New Braunfels although there were a few verbal comments concerned about the public cost of the system and some that expressed a desire for more bike facilities to support bike share and private bicycling. Respondents felt that the program would be most used by tourists and visitors, by residents for fun or recreation, and possibly by employees to move around town and run errands.

Survey

The survey was available from October 10th to December 19th, 2017 and had 30 respondents from New Braunfels, representing 5% of all respondents regionally. It was promoted through traditional and online media and available for people to fill out at the New Braunfels Farmers’ Market event. New Braunfels respondents included two current members of San Antonio Bike Share.
(SABS) and 28 non-members. Following is a summary of their responses:

Demographics of Survey Respondents: Compared to the City-wide population, the following demographic groups were overrepresented in survey respondents: people aged 40 to 64, women, people with higher levels of education, and white people; people with higher incomes were also slightly overrepresented. Note that a significant number of respondents did not provide demographic or socio-economic information. See Figure 8 for details.

Current Travel Behavior: Approximately 75% regularly travel by car. Forty-six percent have access to a working bicycle, however only 11% regularly bicycle. Twenty-nine percent of respondents walk regularly.

Smartphone and Financial Access: Respondents are well connected to technology. All respondents indicated that they have access to a smart phone; all but one had access to a credit card; all but three had access to a debit card; and all but one respondent had reliable internet access.

Awareness of SABS: Approximately 57% of non-members had heard of SABS, most by seeing a station or someone riding a bike. Some knew about it from news articles and community events.

Potential Ridership: Approximately 57% of non-bike share members would consider using bike share for fun or to get exercise; approximately 7% said they would use it for commuting. Other reasons were to save money or time spent on transportation.

Concerns: The most frequently cited barrier to using a bike share program in New Braunfels was 62% of respondents stating a concern about safety or the lack of bike lanes.
Figure 8. Demographics of survey respondents compared to city-wide trends.
Crowdsourcing Map

An online map was developed for users to identify locations where they would like to see bike share. Users could also like or dislike other peoples’ suggestions. The map was available from October 10th to December 19th, 2017 and was promoted through both traditional and online media and at the New Braunfels Farmer’s Market.

Regionwide, the map had a total of 157 unique users that suggested 263 potential bike share station locations, including 36 locations in New Braunfels. Those 36 locations received over 52 votes of support.

The number of votes per half-mile hexagon are shown in Figure 9 and show high support for bike share in downtown and the Market Place retail center. The highest supported area was Gruene, Landa Park, and the Farmers Market votes.

Figure 9. Crowdsourced bike share station suggestions.

Net “like”/“dislike” votes per station

- 0
- 1
- 2 - 3
- 4 - 6

Half-mile Diameter

The Wikimap was available from October to December 2017.
5 – Bike Share Demand

Demand for bike share is driven by factors such as population and employment density and having sufficient destinations and attractions to support bike trips throughout the day. Demand models built using data from existing systems are used to predict where ridership is expected to be highest. The accuracy of these models is uncertain, especially in smaller cities, but they are a good indicator of relative demand.

This study uses the Rixey regression model to map potential bike share demand in New Braunfels. The model considers: total population, retail jobs, the number of non-driving (walk/bike/transit) commuters, median income, non-white population, number of residents with a bachelor’s degree, and number of bike share stations within 4,800 meters (about 3 miles).

The model was run for the entire AAMPO region. Results show low expected demand for bike share across most of Guadalupe County, but with concentrations of demand in New Braunfels. The model results for New Braunfels are shown in Figure 10 and the areas expected to have the highest ridership include the neighborhoods in central and south New Braunfels and the retail centers in those neighborhoods.

The model was applied to hexagonal bins by calculating summary statistics around the bin centroid. Station density assumptions are based on median values in the San Antonio system: For areas with low population density (< 500 people/quarter mile) and low retail employment density (<100 jobs/quarter mile): 10 stations per 4,800 meters; for all other areas:: 54 stations per 4,800 meters.

Figure 10. Potential bike share demand in New Braunfels.

The values on this map are based on a demand model developed using bikeshare ridership from Denver, Minneapolis, and Washington, DC (Rixey, 2013). It helps to identify locations with the most potential for future ridership.

13 This model was chosen due to its focus on resident rather than tourist trips. Rixey, R. “Station-level forecasting of bikesharing ridership: Station Network Effects in Three US Systems.” Transportation Research Record: Journal of the Transportation Research Board 2387 (2013): 46-55.

14 The model was applied to hexagonal bins by calculating summary statistics around the bin centroid. Station density assumptions are based on median values in the San Antonio system: For areas with low population density (< 500 people/quarter mile) and low retail employment density (<100 jobs/quarter mile): 10 stations per 4,800 meters; for all other areas:: 54 stations per 4,800 meters.
The Equity Index combines the quintile scores of each area considering median household income (1: highest income to 5: lowest income) and percentage of people of color (1: lowest percentage to 5: highest percentage).

One of the increased focuses of community transportation is to ensure that any new transportation system is accessible to low income populations and people of color, who are typically among the most transportation underserved populations.

The median household income in New Braunfels is $61,618, which is somewhat lower than the countywide median of $69,666. Bike share provides a relatively low-cost transportation option that could be made accessible to areas with high concentrations of these population groups. Given there is no transit service in New Braunfels, bike share could be a way to connect people to jobs, amenities, and services, and provide access to physical activity.

The project team prepared a composite equity map to identify areas of New Braunfels with the highest concentrations of low-income people and people of color. The results are shown on Figure 11. In general, the central and southern areas of New Braunfels include the highest proportions of people typically underserved by transportation.

Figure 11. Communities traditionally underserved by transportation.

The map uses Census Tract data from the American Community Survey 2011 – 2016 5-year estimates, including median household income and percentage people of color. The data were matched to a hexagonal grid using a weighted area sum. The data were separated into quintiles for income and percent people of color, and each hexagon was assigned a score of 1 through 5 for each of the two categories with 5 indicating the lowest quintile for income and the highest quintile for percentage people of color. The two scores were summed to give a composite equity score with equal weight for each variable. The highest possible composite score was 10 and the lowest was one (some hexagons did not contain data for both categories).
Any bike share system should include programs that engage all members of the community in the program. The following are some examples of programs implemented in other cities:

**Redistribution Requirements**
Ithaca, NY is in the process of installing bike corrals in several low-income neighborhoods and is requiring their dockless bike share companies to redistribute bikes into those neighborhoods daily.

**Flexible Payment Options**
LimeBike has partnered with PayNearMe, a financial services app, which allows users to pay bills and online purchases with cash at one participating 7-Eleven store. Many cities are requiring bikeshare vendors to provide a cash payment option.

**Subsidized and Reduced Payment Options**
In San Francisco, JUMP offers a low-income discount to use the system. Bikeshare for All is a subsidized membership program that allows qualifying low-income residents to sign up for a $5 annual membership their first year, then pay $5 per month ($60/year) in subsequent years.

**Intentional Hiring**
Ithaca, NY received a Better Bike Share grant to collaborate with community partners and hire and train five Ithaca Bike Champions who conducted outreach in several before, during, and after the launch of their dockless bike share system in April 2018. The Champions range in age from 15 to 70 and come from a diversity of backgrounds.

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“**In New Braunfels, most of the destinations are west of I-10, but the residential development is happening is east of I-10. I-10 could be a barrier for bike share.**”

- Study Oversight Committee Member

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7 – Technology

There are several bike share technology options. The main distinction is between smart dock systems, smart bike systems, and dockless bike share and e-scooter systems. Low-tech bike share options are also possible, including bike lending or bike library programs.

E-assist bicycles can be incorporated into most bike share programs, though operating and charging the bikes will work differently depending on the type of technology. There are also e-assist scooter share systems that are a recent addition to the shared mobility industry and work similarly to dockless bike share.

There are advantages and disadvantages to each of these technologies and sometimes the decision on technology will be dictated by funding and interest from the public and private sectors. The following pages include case studies of where these technologies have been applied in similar sized cities.
Smart Dock

Smart dock systems are organized into stations that have a computerized terminal to process transactions and a series of inter-connected docks to park the bikes.

The technology for tracking and locking/unlocking the bikes is contained in the dock, not on the bike. Although some systems include an additional lock on the bike to allow for mid-trip stops, the user must always return the bike to a station in order to end a trip.

E-assist bikes are available in many of these systems and can reduce some barriers to access including steep terrain or hot weather conditions.

Case Study

Cities: Aspen and Basalt, CO

Technology: Smart dock

Launch Date: 2013

Bikes: 210

Stations: 48

Trips/Year: 40,030

Cost to Use: First 30 minutes free, $0.50 for each additional minute

Source: we-cycle.org

### Capital Cost

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<tr>
<th>Description</th>
<th>Cost Range</th>
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<td>$4,000 to $6,000 per bike* (purchase)</td>
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<td>$5,200 to $6,100 per bike (purchase – e-assist)</td>
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### Operating Cost

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<td>$1,200 to $2,700 per bike per year</td>
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### Vendors

8D  
BCycle  
Bewegen  
Motivate  
PBSC

* Includes the cost of the stations.
Smart Bike

Smart bike systems put the technology on the bike itself, making docking stations unnecessary and introducing flexibility to the system. Each bike includes a transaction terminal, a GPS unit, and a lock that allows the bike to be locked to itself or to bike racks or other street furniture.

Most smart bike systems utilize branded or regular bike racks and geofencing to create “hubs” that replicate the organization of the stations found in smart dock systems. However, many systems allow the user the flexibility to park out-of-hub for a fee.

Users locate bikes and sign up for smart bike systems using mobile and web-based applications.

Case Study

City: Portland, OR
Technology: Smart bikes
Launch Date: 2016
Bikes: 1,000
Stations: 123
Trips/Year: 387,990
Cost to Use: $0.08 / min + $5 sign-up fee
$19/month for 90 minutes of ride time
$99/year for 90 minutes of ride time
Source: biketownpdx.com

<table>
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Pros
- Stations can be made visible and iconic
- Secure locking technology
- Organized
- Proven and tested technology
- Reliable for users to find a bike
- Flexible for users to park a bike

Cons
- Moderately expensive technology
- Less predictable for operator than smart dock

Figure 15. Biketown smart bike share hub in Portland, OR.
Dockless

Dockless systems are a recent bike share technology in the U.S and require no dedicated infrastructure. They are a variation of the smart bike model—with the technology and locking mechanism being on the bike—with the principal difference being that these bikes only lock to themselves with a wheel lock and cannot be locked to external objects such as bike racks.

These systems do not use branded hubs or stations though it is possible to create designated areas where the bikes are meant to be dropped off or picked up.

Users typically must have a smartphone app to locate a bike and scan a Quick Response (QR) code to rent a bike, though some systems have experimented with cash options. Dockless systems are typically owned and operated by third party for-profit companies.

Case Study

City: South Bend, IN
Technology: Dockless
Launch Date: 2017
Bikes: 200
Stations: N/A
Trips/Year: 293,000
Cost to Use: $1.00 for 30 min

Source: southbendtribune.com

| Capital Cost |
| Zero cost to cities - costs borne by private companies |

| Operating Cost |
| Limited cost to cities to oversee the program - Operating costs borne by private companies |

| Vendors* |
| Jump |
| Lime |
| Spin |
| Zagster |

Pros

- Easy to access and use
- Flexible for users to park
- Easy and fast to implement
- Scalable and good for small or large systems
- Inexpensive technology and no cost to cities

Cons

- Less organized
- Less agency control
- Less proven and tested technology
- Less reliable for users to find a bike

*Dockless bike share is a quickly changing industry with new companies frequently entering the market
E-Assist Scooters

E-assist scooter systems are similar to dockless bike share systems, except that they use electric-assist scooters instead of bikes. They are the newest of the shared-mobility technologies.

The e-scooters are equipped with GPS units and are self-locking. They are located and checked out using a smartphone app and can be picked up and dropped off anywhere in the service area. E-assist scooters are generally owned and operated by third party for-profit companies; many of these companies also provide dockless bike share.

Local jurisdictions may need to consider policy changes to define where and how scooters should be operated. Early indications suggest that e-assist scooters may attract a wider range of users than bike share.\(^20\)

<table>
<thead>
<tr>
<th>City: Austin, TX</th>
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</thead>
<tbody>
<tr>
<td>Technology: E-assist Scooters</td>
</tr>
<tr>
<td>Launch Date: 2018</td>
</tr>
<tr>
<td>Scooters: 2,000</td>
</tr>
<tr>
<td>Stations: N/A</td>
</tr>
<tr>
<td>Trips/day: 20</td>
</tr>
</tbody>
</table>

**Cost to Use:** Varies, typically $1 per trip, then $0.15 per minute

*Source: money.cnn.com*

<table>
<thead>
<tr>
<th><strong>Capital Cost</strong></th>
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<tr>
<td>Zero cost to cities - costs borne by private companies</td>
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<table>
<thead>
<tr>
<th><strong>Operating Cost</strong></th>
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<tr>
<td>Limited cost to cities to oversee the program - operating costs borne by private companies</td>
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<table>
<thead>
<tr>
<th><strong>Vendors</strong>*</th>
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<tbody>
<tr>
<td>Bird</td>
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<tr>
<td>Lime</td>
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<tr>
<td>Skip</td>
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</table>

**Pros**

- Pros of dockless bike share plus:
- May attract a broader set of users than bikes

**Cons**

- Cons of dockless bike share plus:
- May introduce issues such as riding on the sidewalk
- No basket for carrying items

*E-scooters are a quickly changing industry with new companies frequently entering the market*
**Bike Library**

Bike lending libraries are staffed locations where regular bicycles are available to check out for free or for a small fee. As most systems operate independently, there is a larger variety of types and business models. Some function more like a short-term bike share system and others are more like a personal bike rental option available for a few days, months, or more.

Check-outs and returns are conducted in person. This requires staff which may limit the number of locations and the hours of operation. Most bike libraries have one or two locations for bike checkout and it is rare for bike libraries to have more than four or five locations. Bike libraries generally have a greater variety of bike types available in the fleet.

### Case Study

**Name:** Golden Bike Library  
**Cities:** Golden, CO  
**Technology:** Standard Bikes  
**Launch Date:** 2015  
**Bikes:** 60+  
**Stations:** 1  
**Checkouts/Year:** 1,697  
**Cost to Use:** First 2 hours free, then $10/day  

*Source: City of Golden*

#### Capital Cost

Varies depending on source and model of bikes

#### Operating Cost

Varies depending on fleet size and system; reduced through volunteer staff and in-kind support

#### Vendors*

Local libraries, schools, universities, community centers, tourist centers

### Pros

- Flexibility to create a system that is responsive to local needs
- Low-tech nature means lower upfront costs and inexpensive operating technology
- Generally affordable for the user
- Long-term rental options
- Mixed fleet options

### Cons

- Limited operating hours due to staffing or volunteer needs
- Less convenient rental process
- Limited visibility and awareness of program; mostly marketed through word of mouth
- Limited to one or a few locations, rather than disbursed through the service area

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*Figure 18. Bike Library in Golden, CO.*
8 – Business Models

Bike share systems operate under several different business models. Traditionally, bike share programs were funded through capital grants and operated using a combination of user fees, sponsorship, and local public funds. These older systems are most often owned by a public agency or a nonprofit organization created specifically for this purpose and operated by either the owner or a private third party. The newer smart bike and dockless programs are generally operated by third-party companies supported by venture capital funding or large urban mobility companies that take on the financial risk for the program. There are advantages and disadvantages to both of these business models and the appropriate model depends on the local funding environment, staff capacity, and interest from the public, non-profit, and private sectors.

**Agency or Nonprofit Owned**

Most docked and some smart bike programs in the United States are overseen by government agencies or non-profit organizations. These organizations are responsible for identifying funding and procuring the system. Similar to many transit systems, these organizations may operate the program themselves or they may contract operations to a third party. This model requires more effort and time to secure funding, procure the system vendor, and launch the program; it also requires staffing capacity and often some level of upfront or ongoing public funding. However, it gives the agency full control over the program and decisions surrounding its implementation and operation.

**Requirements**

- A capital funding source to purchase equipment – this is often obtained through federal and/or state grants or local public funding. The size of the system is often dictated by the amount of funding available,
- An ongoing funding source to sustain operations. Usage fees are likely to make up only a portion of operating cost (20% to 40% in small communities) and sponsorship, grants, or public funding are required to make up the shortfall (similar to other transit systems), and
- Staff time to identify funding, procure the vendor, administer the contract, oversee and monitor the program, respond to public comment, publicize the system, and implement complimentary programs.

**Examples**

- Boise GreenBike, Topeka Metro Bikes (agency owned and operated),
- Corpus Christi Bike Share (agency owned and third-party operated),
- San Antonio Bike Share, Aspen WE-Cycle (non-profit owned and operated),
- Golden Bike Library, City of Golden, CO (city owned and operated),
- Joint Base Lewis-McChord Bike Library, WA (partnership between JBLM military base, Pierce County, and Pierce Transit) (agency owned and operated), and
• University of Wyoming Bike Library (university owned and operated).

Third-Party Owned and Operated
Some traditional, docked bike share programs and most of the new dockless programs are owned and operated by third-party vendors. Previously, vendors bid for the right to operate bike share in a city, often obtaining exclusive rights to the use of the public right-of-way. Dockless bike share implementation has changed this dynamic and now many cities offer competitive opportunities for multiple vendors to establish systems through a multiple-selection procurement process, a memorandum of understanding, or a permit system.

Requirements
• Interest from a third-party vendor,
• A mechanism to allow and regulate the use of the public right-of-way, and
• Staff time to monitor the program, respond to public comment, publicize the system, and implement complimentary programs.

Examples:
• Dallas, TX, Austin, TX, Davidson, NC, Flagstaff, AZ (all dockless third-party owned and operated) and
• JUMP Chicago Bicycle Library and Ofo Chicago Bicycle Library, Equicity (nonprofit), We Keep You Rollin’ (nonprofit), JUMP, Ofo (nonprofit partnership with private companies).

Figure 19. San Antonio Bike Share is a bikeshare system owned by a non-profit organization. Credit: San Antonio Bike Share

Figure 20. DIVY in Chicago is owned by a public agency, the Chicago Department of Transportation. Credit: People for bikes
9 – Option Evaluation & Case Studies

Based on the findings of the community analysis, public and stakeholder input, and the demand and equity analyses, there appears to be support for bike share in New Braunfels. Based on these inputs, any future bike share program should attempt to meet the following goals:

- Use limited public funds, although there may be some local grant funding opportunities,
- Require minimal agency staff time,
- Connect the major tourist attractions to reduce traffic and parking demands,
- Provide reliable bike availability
- Consider e-assist technology to reduce the impact of topography, and
- Minimize clutter and the opportunity for discarded bikes.

Table 2 shows the project team’s assessment of how the different bike share technologies and business models meet these goals. No single program type meets all of the desired goals, but the best performed system is a smart-bike program provided by a private third-party. This business model requires minimal staff effort and public funding and the technology provides the best balance of bicycle availability and user flexibility. The “lock-to” requirement would help organize the bikes in the public right-of-way and discourage clutter and vandalism. This type of program would require some public funding, which would be used to install bike racks and provide staff oversight. Some or all of this cost could be recouped through permit fees charged to the vendor(s).

<table>
<thead>
<tr>
<th>Table 2. Assessment of Bike Share Options in Seguin</th>
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<tbody>
<tr>
<td>Smart Dock</td>
</tr>
<tr>
<td>Limited public funding</td>
</tr>
<tr>
<td>Minimize staff time</td>
</tr>
<tr>
<td>Connect tourist destinations</td>
</tr>
<tr>
<td>Reliability and user convenience</td>
</tr>
<tr>
<td>E-assist technology</td>
</tr>
<tr>
<td>Reduce clutter</td>
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</tbody>
</table>

○ Worst performance  ● Average performance  ● Best performance
The START Bike Share program was launched as a pilot program in July 2017 with 18 BCycle Dash smart bikes. During the pilot conducted between July 21 and September 22, 2017, 250 members signed up to use the 18 bikes and took more than 4,000 rides. 75% of memberships were people from a non-local zip code. 60% of trips are taken by locals. In 2018, the system was relaunched with 55 bikes and 16 hubs.

The program costs a user $50 for an annual pass, $20 for a three-day pass, and $8 for a daily pass. These memberships provide unlimited 30-minute rides for no extra charge, $1.50 per 15 minutes for additional time, and a $2 convenience charge to lock outside a hub. A $90 annual membership option provides unlimited 60-minute rides and no convenience charge to lock outside of a hub. Bikes can be checked out using the BCycle app, swiping a membership card, or using a PIN. Employers can get a 25% reduction if they pay for their employee’s membership and the Jackson / Teton County Affordable Housing Department offers bike share memberships to all residents of its properties.

The program was intended to provide a “healthy and environmentally-sensitive way for residents, commuters, and visitors to move around” Jackson and to help reduce traffic and parking congestion during the busy summer months.

Capital costs for the program were funded by Energy Conservation Works and the Teton Conservation District with operating costs covered by user revenues and funding from Friends of Pathways and the Jackson Town Council.
Rogue Bike Share operates with seven stations in the City of Ashland and once in the City of Medford. The Rogue Valley is located in Southern Oregon and Ashland is home to Southern Oregon University (SOU), the Oregon Shakespeare Festival, and numerous outdoor events and activities. The two cities are connected by the Bear Creek Greenway.

The system is an overhaul of the previously underperforming regional bike share system. It was relaunched as a Zagster system in September 2017 using pooled funding from the Oregon Department of Transportation, the Rogue Valley Transit District, the City of Ashland, and SOU that will fund the program for 2-3 years. The system is meant to target residents, college students, visitors, and transit users, and has a robust equity program; it is free for low-income people enrolled in public assistance programs.
A smart bike system would include a fleet of bikes that can be checked out using an app or membership card. These bikes do not use stations, although “hubs” can be created to provide formalized parking areas. However, users have the flexibility to park the bike outside of a hub location for an additional charge. Different to dockless systems, smart bikes have a built-in U-lock or cable lock that allows them to be locked at a bike rack or other street furniture, which can better organize the system compared to dockless bikes that can only be locked to themselves and are often parked outside of designated bike parking areas.

It would be operated by a third party and provide the best balance of user flexibility with reliability of being able to find a bike and the organization of being able to lock the bike at a bike rack. It would be a way to provide New Braunfels with some form of public transportation service and is likely to be most used during the summer months when traffic and parking are at their peaks. This could help reduce these demands. E-bikes should be considered to counteract the hot weather in summer and to assist riders in areas with steep topography.

**System Needs**

- Interest from third-party vendors to establish a program in New Braunfels. Technology providers may be able to partner with the river outfitters or other entities in New Braunfels that could provide contacted operating services to the vendor,

- A contract, memorandum of understanding, or permitting mechanism to allow these programs to operate in the public right-of-way. Alternatively, if these systems are to operate on private property, the vendor will need to enter into an agreement with the property owner to install and operate the location,

- Staff time to oversee and monitor the program,

- Permit fees to help fund staff time or bicycle improvements, and

- Policy changes to define the use of e-bikes.
System Plan
A smart-bike program is intended to be flexible, but “hubs” can be set up to encourage users to return the bikes to these locations. The system needs to be sized to provide an adequate number of bikes and hubs should be established close to major destinations including Downtown, Landa Park, the Schlitterbahn water parks, put-in and take-out points for the river float, Gruene, and others. A pilot program in New Braunfels should start with at least 60 bikes and 12 hub locations. More can be added as the program is built-out over time.

Business Model
The recommended smart-bike program is dependent on interest from third-party vendors providing this service. Trends in the industry show that although smaller cities were included in early rollouts of dockless bike share, a number of mobility companies are now focusing their efforts on larger markets. Some vendors have pulled out of smaller and suburban communities. However, there are vendors that have shown interest in smaller markets and especially in providing e-assist bikes and e-scooters. New Braunfels may be particularly attractive because of the number of regional visitors that the City gets during the summer. Visitors are generally less price sensitive and the system may be able to generate more revenue that a city of similar size that does not have that scale of tourist market.

Vendor interest could be tested through RFI process or the City could approach the river outfitters to determine their interest in a bike share program. The river outfitters are set up in many of the desired locations and could have an interest in increasing access to their businesses and delivering a new visitor experience. They are also the best positioned to provide operating services with staff, space,
and similar skillsets to repair, maintain, and operate tubing equipment.

Although the vendor will be responsible for the cost and operation of the program, some staff time will be needed to update necessary policies, create a contractual framework, and oversee and monitor the program. Staff should consider:

• Where updates are needed in existing policy and regulation,

• Assessing and recommending any changes to how pedal-assist e-bikes are considered in City codes and policies, and

• Opportunities for rapid-implementation bike infrastructure projects to support the bike share program.

Key Questions

The following questions need to be answered to move forward a smart-bike program:

• Is there interest from the private sector to establish a system in New Braunfels? How will this interest be determined?

• Do current policies and regulations define or restrict the use of pedal-assist e-bikes? Are policy changes required to allow these bikes?

• What sort of contracting (or procurement) mechanism will be used to allow vendors to operate the program?

• What are the preferred program boundaries and hub locations?