



Bike Share Master Plan

City of Boerne

Bike Share Feasibility Report

November 2018





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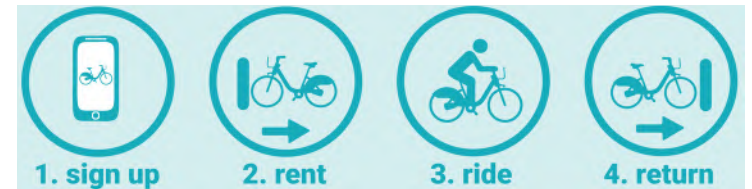
1 – Introduction

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 Boerne. This report focuses on the feasibility of bike share in the City of Boerne and provides a template for considering bike share in other parts of Kendall 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 Boerne. 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 Boerne 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

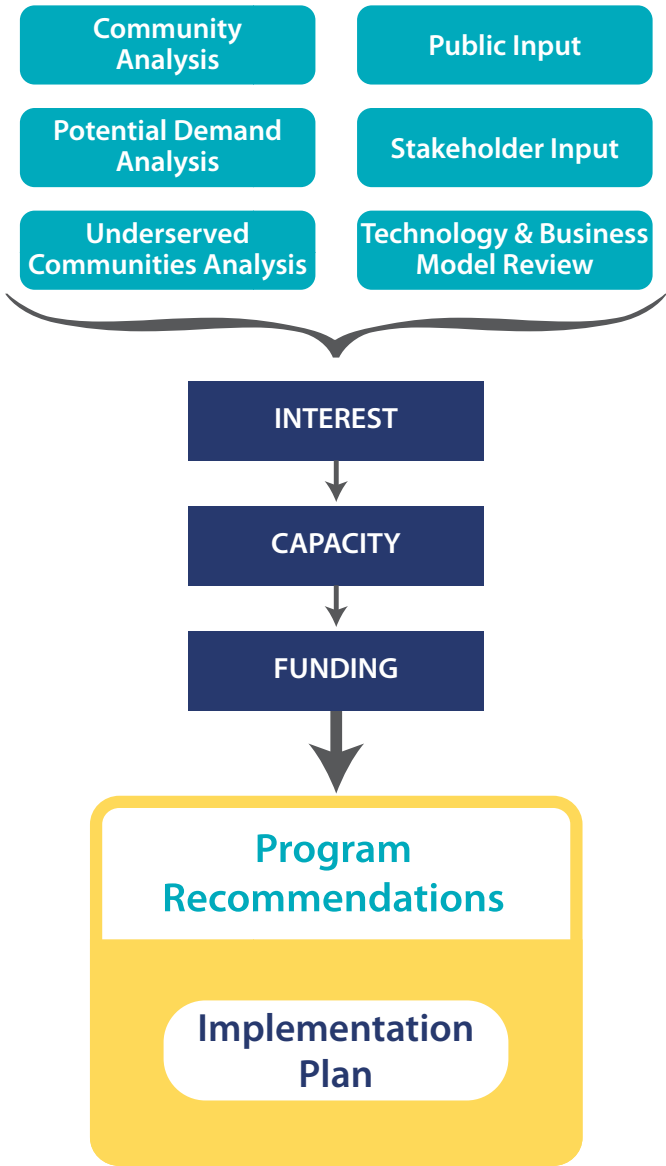


Figure 1. Feasibility assessment process.

an online survey and a crowdsourcing map that were promoted through traditional and online media and at a public outreach event. The assessment also included a map-based demand analysis to identify areas with the highest potential demand for bike share and areas with traditionally underserved populations. The project team combined all of this information to identify the locations, types, and forms of bike share that could meet the needs of the community in Boerne.

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 Boerne. A cost assessment and implementation plan were developed to show the path forward for bike share in Boerne.



2 – Community Analysis

Boerne has a population of just over 16,000 people and is one of the fastest growing cities in the Alamo region.¹ It is located approximately 31 miles northwest of San Antonio in the Texas Hill Country. The city encompasses approximately 11 square miles and is a local and regional visitor destination with attractions including the Hill Country Mile and Cibolo Creek.

Opportunities

Policy Context

City and regional plans and policies support bicycling as part of a multimodal transportation system that is needed to accommodate future growth in the City. Active transportation is also recognized as a way to achieve better community health outcomes and improve overall quality of life. The City of Boerne's Master Plan (updated in 2018) includes a specific mobility goal to "proactively plan for a multimodal transportation system to reduce congestion, accommodate anticipated travel demand, and provide quality of life amenities."² Specific recommendations include adopting a complete streets policy, planning for build-out of the high priority on-street bikeway network proposed in AAMPO's Bicycle and Pedestrian Study (2016), budgeting for the build-out of the off-street bicycling network, and expanding efforts for bicycling education and enforcement activities.³

¹ American Community Survey, 2016, one-year estimate

² Boerne Master Plan Update, October 2018

³ Alamo Area Metropolitan Planning Organization. Bicycle and Pedestrian Planning Study. 2016.

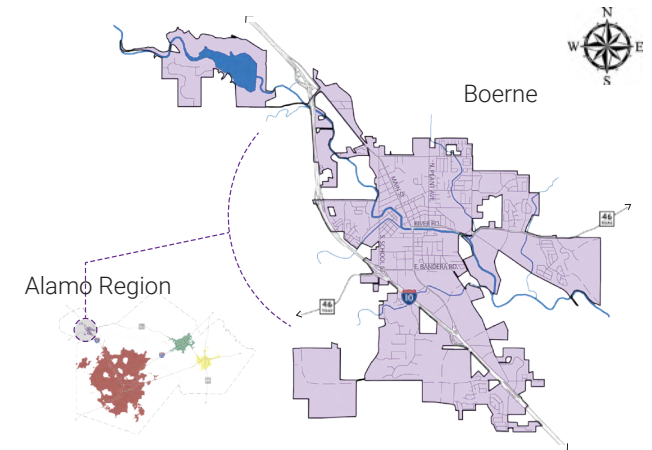


Figure 2. Context map.

Credit: Alamo Area Regional Bicycle & Pedestrian Planning Study

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.³

Transit Service

Alamo Regional Transit provides a "demand-responsive, curb-to-curb" bus service to all residents in Kendall County.⁴ 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

⁴ Alamo Regional Transit. Accessed on October 31, 2018: <https://www.aacog.com/67/Alamo-Regional-Transit>



“ *Bicycling 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

daily travel use

According to a regional survey, driving is the dominant form of travel. Nearly all survey respondents reported using a car on a daily basis, yet 11.6% and 5.5% reported they walk or ride their bike on a daily basis.

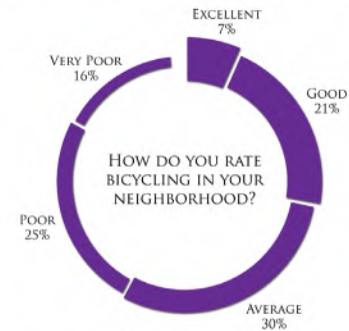


interest in biking and walking



challenges to bicycling

In the regional survey, residents of Boerne rated bicycling in their neighborhood as **BELOW AVERAGE**. When asked what prevents them from bicycling more, the top answer was the **LACK OF BIKE LANES, TRAILS, OR PATHS**.



top five

BARRIERS TO BICYCLING



top improvements

Survey respondents identified how important or unimportant they felt several possible improvements would be to improving walking and bicycling in their city. Here are the top five most improvements that are considered most Boerne*.



*In order by the sum of both very important and important responses.

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 Boerne.

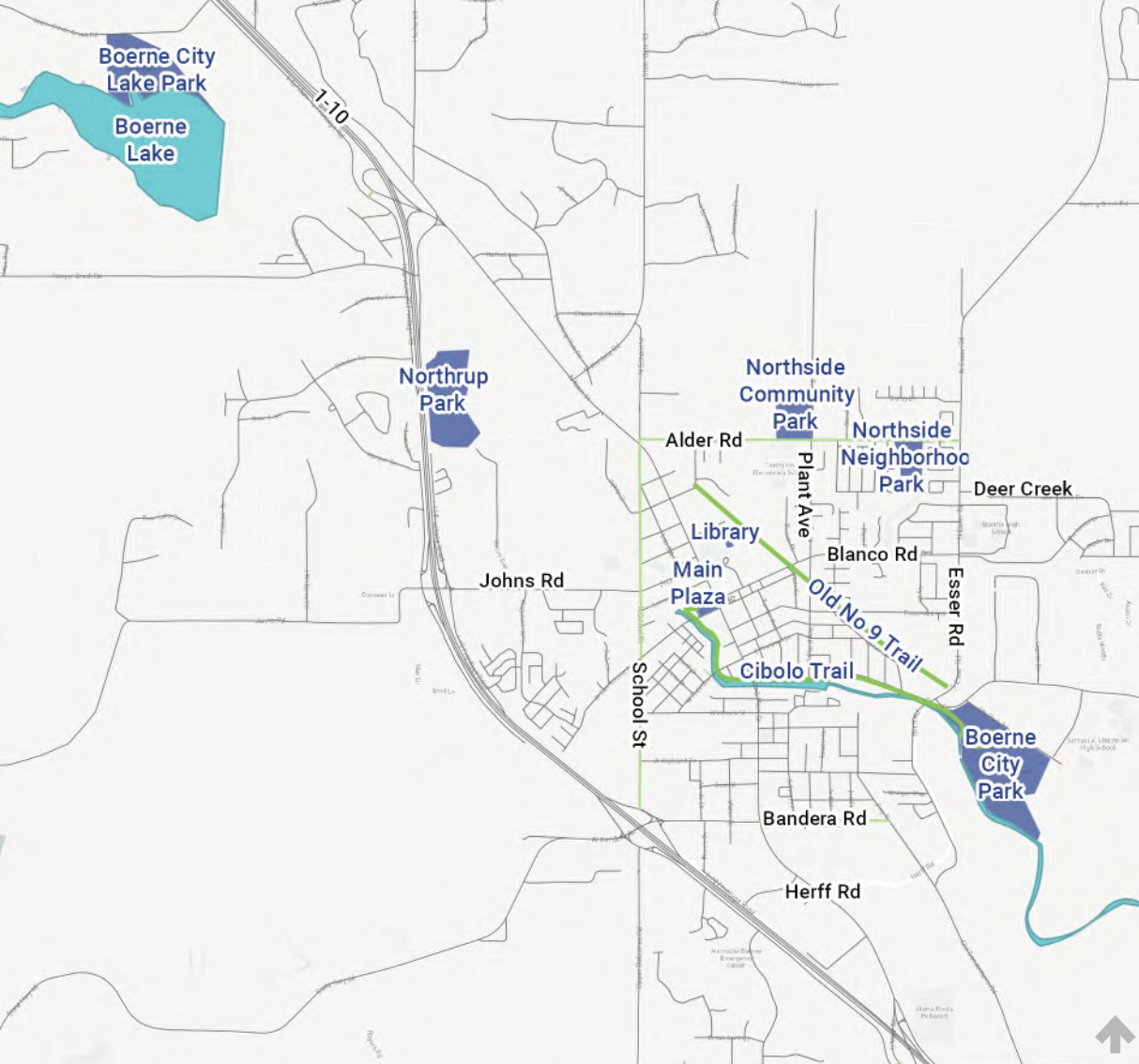


Figure 4. Existing Transportation Network and Destinations.

- Parks and Destinations
- Multi-use Trails
- Streets rated comfortable for biking*

*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.



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 Boerne. AAMPO's Bicycle and Pedestrian Plan outlines a system, that when complete would provide a connected network of approximately 29-miles of on-street bicycle facilities and 66-miles of shared-use trails in Boerne. Key facilities in this network include connecting the Old Number 9 Greenway to downtown, the Hill Country Mile, and the Cibolo Creek Trail with bike lanes on E Blanco Road and S Plant Ave; and extending the Cibolo Creek Trail to Northrup Park to the northwest.

Destinations and Attractions

Bike share ridership is typically highest in areas with higher density, mixed land uses, and where people live, work, play, and take transit. Downtown Boerne is a relatively dense area with numerous commercial and visitor destinations. It also hosts a number of events throughout the year. As a small town, there are residential areas in the one to two miles around downtown (less than a 20-minute bike ride), which is an ideal distance for a bike share trip.

During the summer months, the Hill Country Mile 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 move around by bicycle and reduce traffic and parking demand.

Universities and Colleges

Boerne is home to one of Wayland Baptist University's (WBU) 10 teaching sites in the San Antonio area. The teaching site is located approximately one mile east of



“ The availability of on and off-street bicycle infrastructure and improving safety for bicycling are related, and can be improved with further enhancement of the network of bicycle facilities, as well as increased education and awareness of bicyclists. ”

- Alamo Area Regional Bicycle & Pedestrian Planning Study



Figure 5. Destinations along the Hill Country Mile.



Figure 6. The Dickens on Main event draws large crowds to Boerne every Thanksgiving weekend.
Photo © 2016 DoM Talboys Photography

downtown with classes held at Champion High School. The site provides a location for working adults and military personnel to take classes closer to their home or office but is only small and student traffic averages around 35 students per evening at the Boerne teaching site.

Challenges

Auto-Focused Transportation System

The majority of trips in Boerne are made by automobile. Of residents who work, 92% drive or carpool, 5% work from home, 2% walk, and 1% take some other form of transportation (including bicycling).⁵ 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

Boerne's existing bicycle infrastructure, shown in Figure 4, somewhat limited and disconnected. Although utilitarian bicycling rates are low, recreational bicycling occurs at higher levels and the city has developed a number of trails in the last few years including the Old Number 9 Greenway that runs diagonally through the City and connects the Civic Center in the northwest of the City to Cibolo Creek in the southeast.

Residents express a high level of concern about riding on the streets in Boerne as there very few separated bike lanes. Boerne lacks dedicated bicycle facilities, but does include two miles of side paths (trails that run alongside streets) and 9.5 miles of shared-use bike and pedestrian trails. 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

⁵ US Census Bureau. 2012-2016 American Community Survey 5-Year Estimates. File DP03 Selected Economic Characteristics



Figure 7. Despite wide cross-sections, there are few bike lanes in Boerne.

bicycle commuting compared to cities with no change in facilities.^{6, 7, 8, 9}

Land Use and Density

Development in Boerne 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.

6 Buehler, R. & Pucher J. (2012). *Cycling to Work in 90 Large American Cities; New Evidence on the Role of Bike Paths and Lanes*.

7 Dill, J. & Carr, T. (2003). *Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them*.

8 Hunt, J. & Abraham, J. (2007). *Influences on Bicycle Use*. *Transportation*, 34, 453–470.

9 Parkin, J., Wardman, M. & Page, M. (2008). *Estimation of the Determinants of Bicycle Mode Share for the Journey to Work Using Census*.

Weather

Boerne's 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 Boerne as they require less physical effort to ride than standard bikes and can help encourage year-round ridership.



Ridership Potential

Boerne is most likely to attract bike share riders that are residents taking a recreational ride or accessing shopping or entertainment or tourists and visitors that are looking for a visitor experience that connects them to the attractions of the area. Table 1 identifies potential market segments for bike share ridership based on community and stakeholder feedback.

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

User Type	Potential	Notes
Residents	Medium	Local recreational bike rides or shopping and entertainment trips to the Hill Country Mile, Downtown Boerne, and local area businesses
Commuters	Low	There may be some staff working Downtown that choose to bike share. However, many residents work outside the city
Employees	Low	There may be some daytime trips from jobs in Downtown
Visitors and Tourists	High	There is large potential for visitors to park once and then move about using bike share to access the trail network, the Hill Country Mile, Cibolo Creek, and other destinations
Students	Low	WBU has a teaching site approximately one mile east of downtown but the enrollment is small
Someone Else Pays	Low	There are not many large employers and so opportunities for group memberships may be limited
Supporter*	Low	There is limited bicycling advocacy in Boerne
Other	Low	Other trips could come from hotels and major retail stores located along I-10, however bicycle access to these areas is difficult

* 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.



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 Boerne. Stakeholder outreach included regular meetings with the Study Oversight Committee (SOC), which was comprised of representatives from the City of Boerne 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 Boerne and where it should be located.

The project team also conducted a focus group meeting with staff from the City of Boerne's Parks and Planning Departments. 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 busy times,
- A bike share program could support the City's recent investment in its off-street trail network and its latest policy direction to encourage multi-modal transportation, and



Figure 8. The AAMPO Bike Share Board Game.



- There could be an opportunity to use bike share as a means to bolster the bicycling culture and add legitimacy to bicycling.

Challenges

- The City has limited financial and staff resources to support a bike share program directly,
- The City does not have a comprehensive or connected network of bikeways,

- The major roads are TxDOT controlled and there is limited immediate opportunities to create safer access for bicyclists,
- Downtown and the Hill Country Mile generally has narrow sidewalks that may make station placement difficult or disorganized bike parking problematic. There would also be concerns if stations were to replace on-street vehicle parking, and
- Electric-assist (e-assist) bikes should be considered to counter the effects of extreme summer heat and could be an easier entry-point for people to try bicycling.

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

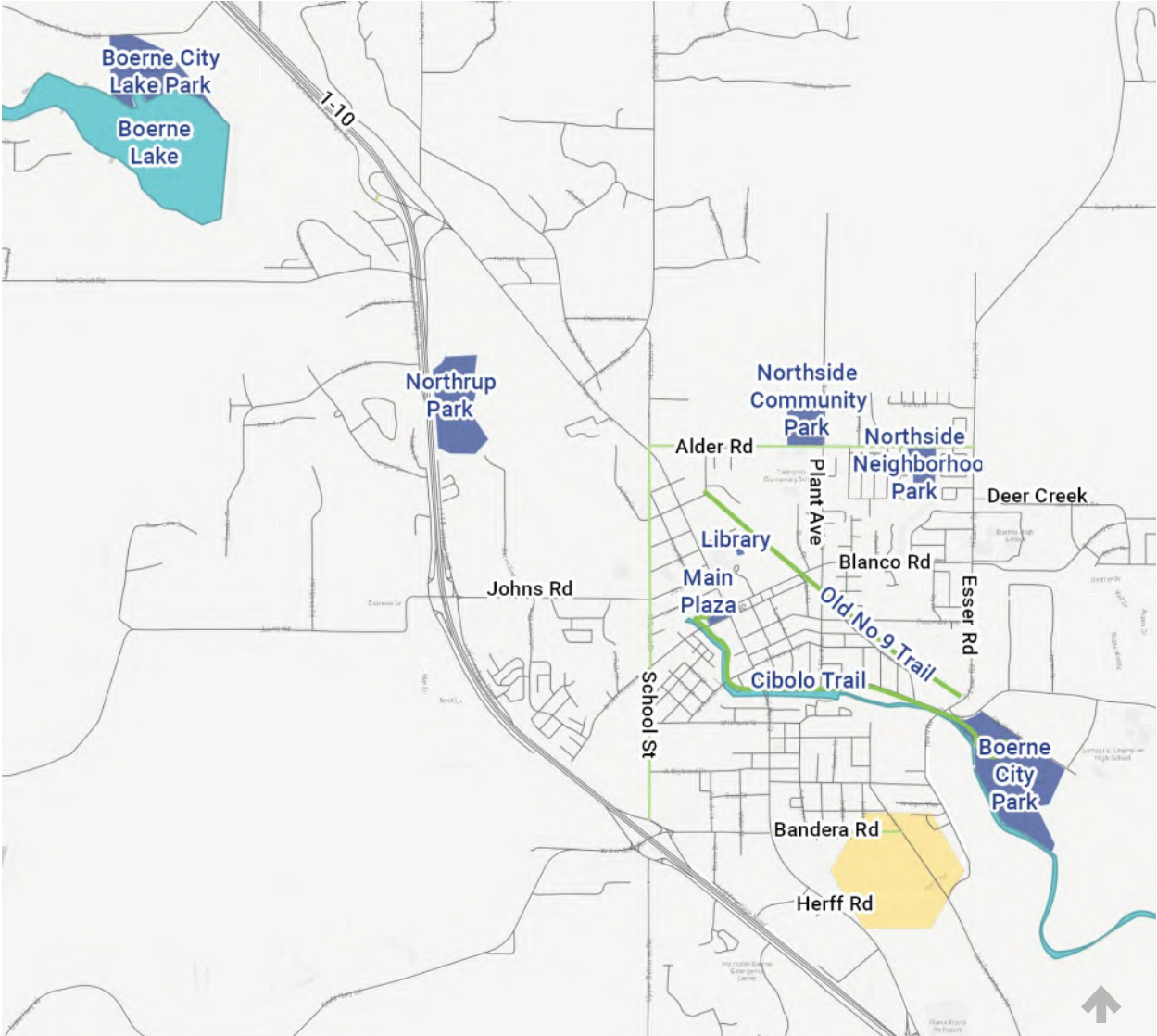
The City of Portland's adaptive bike program is a model program for other communities. Before starting the program, the City conducted interviews with physically disabled community members to learn how to best meet their needs. The information gathered during this outreach process led the City to develop 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.



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 Boerne Farmer's Market.

Regionwide, the map had a total of 157 unique users that suggested 263 potential bike share station locations, but included only 1 location in Boerne. The number of votes per half-mile hexagon are shown in Figure 11 and also show a general lower interest in bike share than in the rest of the region.

Figure 11. Crowdsourced bike share station suggestions.



The Wikimap was available from October to December 2017.





1 – 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 Boerne.¹⁰ The model considers: total population, retail jobs, the number of nondriving (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.¹¹ Results show low expected demand across most of Kendall County compared to other parts of the region, but there are some concentrations of demand in Boerne. The model results for Boerne are shown in Figure 129 and the areas expected to have the highest ridership include the neighborhood along Old No 9 Trail.

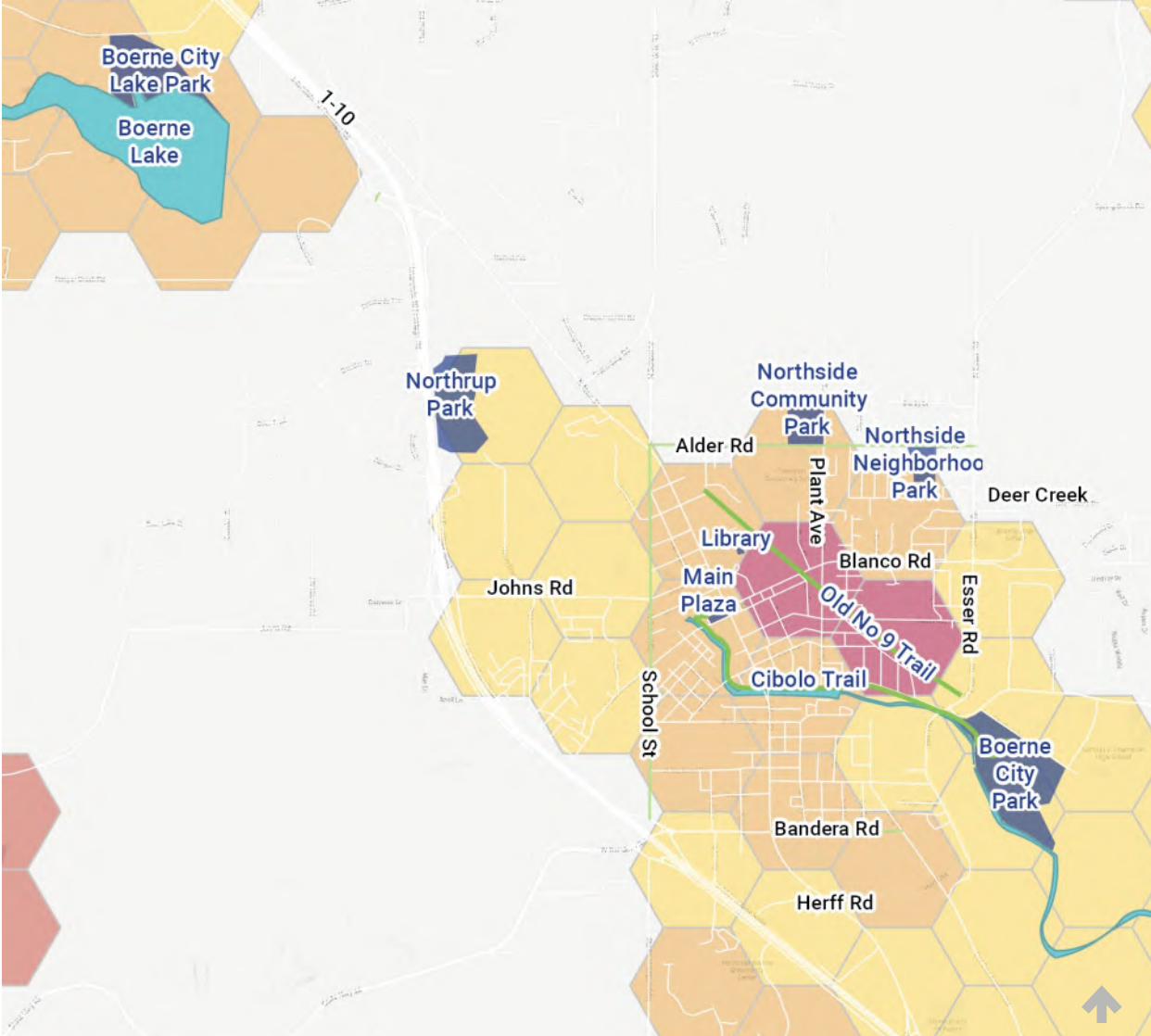
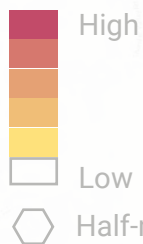


Figure 12. Potential bike share demand in Boerne.

Relative level of expected demand



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.



10 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.

11 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.



2 – Underserved Communities

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 Boerne is approximately \$61,000 and the countywide median is over \$75,000. This is higher than in many of the other areas in the region. However, there are opportunities for bike share to provide a relatively low-cost transportation option that could be made accessible to transportation underserved populations within the community. Given there is no transit service in Boerne, 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 Boerne with the highest concentrations of low-income people and people of color. The results are shown on Figure 13.¹² In general, Boerne had lower concentrations of communities traditionally underserved by transportation than did the rest of the region with scores ranging from 6 to 8 (out of 10), where many parts of the region fall into the 9 and 10 range. The central area of Boerne include the highest proportions of people typically underserved by transportation.

12 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).

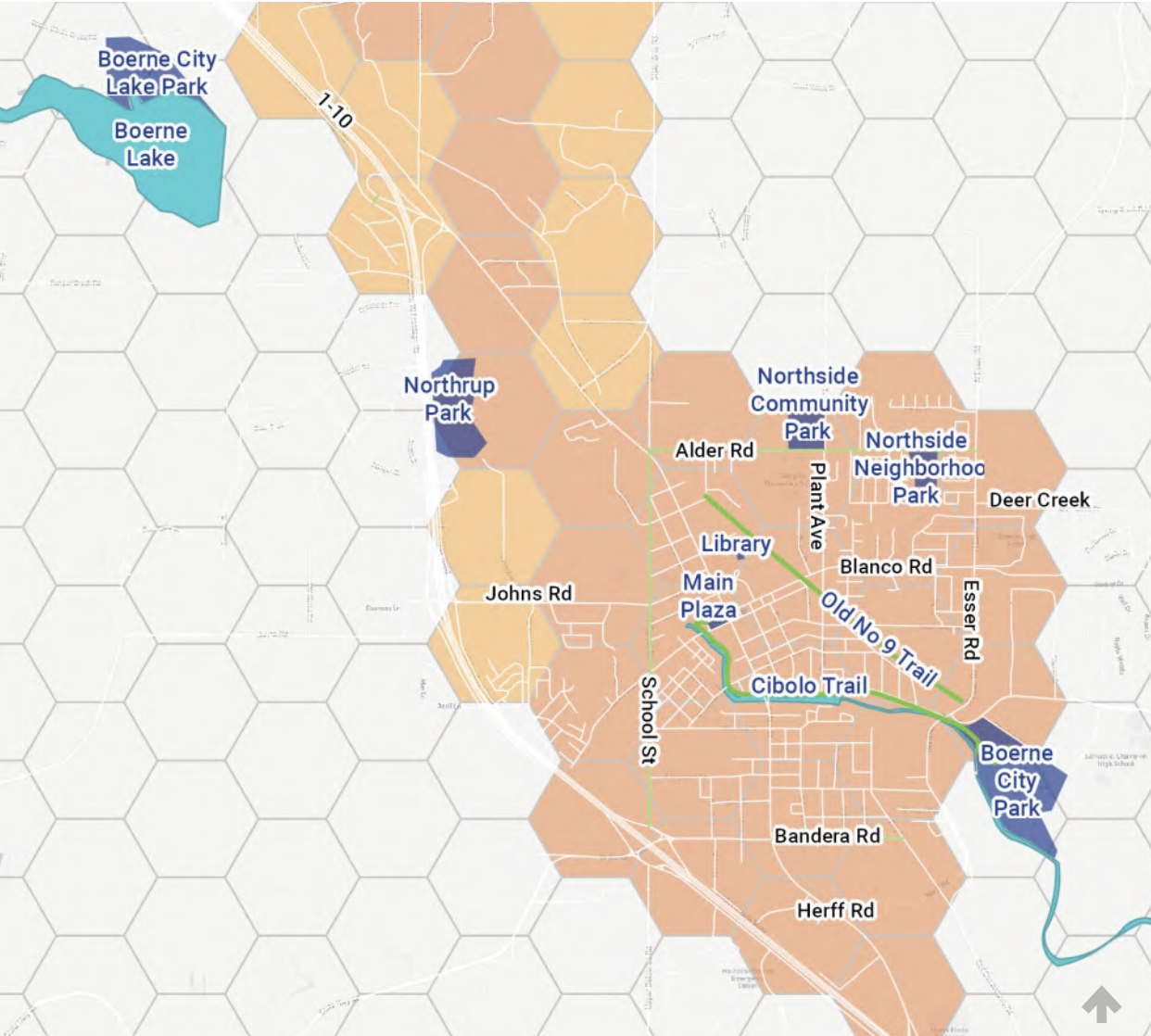
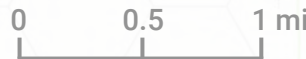


Figure 13. Communities traditionally underserved by transportation.

Equity index

- ≤ 6
- 7
- 8
- 9
- 10
- Half-mile Diameter

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)





“ **Factors inhibiting bicycling in Boerne ...such as the availability of bicycle lanes and improving safety for bicycling ... can be improved with a strong network of bicycle facilities and increased education and awareness of bicyclists.** ”

- Alamo Area Regional Bicycle & Pedestrian Planning Study

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,¹³ 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.

13 PayNearMe. 2018. <https://home.paynearme.com/en/help/>.

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.^{14, 15}

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 2018.¹⁶ The Champions range in age from 15 to 70 and come from a diversity of backgrounds.

14 Ford GoBike. 2018. "Bike Share for All." <https://www.fordgobike.com/pricing/bikeshareforall>.

15 Jump Bikes. 2018. "Boost Plan." <https://jumpbikes.com/cities/san-francisco/boost-plan/>.

16 Better Bike Share. 2017. <http://betterbikeshare.org/grants/>



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.



Figure 14. E-assist bicycles, like JUMP Bikes' dockless e-bike, can be integrated into any bike share system



Figure 15. E-assist bicycles, like JUMP Bikes' dockless e-bike, can be integrated into any bike share system



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

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.



Figure 16. WE-Cycle smart dock station in Aspen, CO.

Capital Cost
\$4,000 to \$6,000 per bike* (purchase)
\$5,200 to \$6,100 per bike (purchase – e-assist)
Operating Cost
\$1,200 to \$2,700 per bike per year
Vendors
8D
BCycle
Bewegen
Motivate
PBSC

* Includes the cost of the stations.

Pros
<ul style="list-style-type: none"> • Stations are visible and iconic • Secure locking technology • Organized • Proven and tested technology • Reliable for users to find a bike
Cons
<ul style="list-style-type: none"> • Siting requires long contiguous space • More expensive technology • Relies on more components • More time to implement • Station capacity limitations



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

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.



Figure 17. Biketown smart bike share hub in Portland, OR.

Capital Cost
\$2,500 to \$4,500 per bike (purchase) \$1,800 per bike per year (lease option)
Operating Cost
\$1,200 to \$2,700 per bike per year
Vendors
BCycle GotchaBikes Jump Motivate NextBike Zagster

Pros
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Moderately expensive technology • Less predictable for operator than smart dock



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

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.



Figure 18. Lime and Spin bikes in Seattle, WA.

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
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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



Case Study

City: Austin, TX

Technology: E-assist Scooters

Launch Date: 2018

Scooters: 2,000

Stations: N/A

Trips/day: 20

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

Source: money.cnn.com

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.¹⁷

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*	
Bird	GOAT
Lime	Jump
Skip	Razor
Spin	

¹⁷ The Micro-Mobility Revolution: The Introduction and Adoption of Electric Scooters in The United States, in *Populous Research* <https://www.populus.ai/micro-mobility-2018-july>



Figure 19. Bird Scooters in Los Angeles, CA.
Credit: Bird Scooters

Pros
<ul style="list-style-type: none"> • Pros of dockless bike share plus: • May attract a broader set of users than bikes
Cons
<ul style="list-style-type: none"> • 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



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

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.



Figure 20. Bike Library in Golden, CO.

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
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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



Case Study

Name: Bike and Roll

Cities: Chicago, IL

Technology: Standard Bikes

Launch Date: 2016

Bikes: Up to 20

Stations: 2 rental storefronts, 2 automated locations

Cost to Use: \$7/hour or \$28/day and up, depending on bike type

Source: *Bike and Roll*

Automated Bike Rental

Similar to a smart dock system, an automated bike rental system includes one or more stations where bikes can be checked out. The main differences are that bikes are generally available to rent for longer periods, it may be required to return the bike to the same location, in-field operations such as rebalancing are minimal, and the system may be operated and maintained by a local bike shop.

These systems, such as the system in Chicago may be owned and operated by a bike rental company or a bike shop. In Chicago, Bike and Roll has two physical bike rental storefronts and two locations with automated rental stations.



Figure 21. Automated bike rental station at the North Branch Trail in Chicago, IL

Capital Cost
Zero cost to cities – costs borne by a private company
Operating Cost
Limited cost to oversee the program – the operating costs are borne by a private company
Vendors
Various

Pros
<ul style="list-style-type: none"> • Stations are visible and iconic • Secure locking technology • Organized parking arrangement • Reliable for users to find a bike
Cons
<ul style="list-style-type: none"> • Siting requires long contiguous space • Limited locations may reduce convenience • Station capacity is limited; bikes may not be available



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.



Figure 22. San Antonio Bike Share is a bikeshare system owned by a non-profit organization.
Credit: San Antonio Bike Share

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 23. 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 less support for bike share in Boerne than some other communities in the region. Based on this, any future bike share program should attempt to meet the following goals:

- Use limited or no public funds,
- Require minimal or no agency staff time,
- Serve recreational users and visitors,
- Utilize as much as possible the established trail network, and
- Provide different types of bikes including kids and adaptive bicycles.

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 models are an automated bike rental program provided by a private third-party or a bike library run as an extension of the City Library.

An automated bike rental program would be provided by a private third-party, most likely a bike rental business, and would require very few City resources except some staff time to develop a contracting mechanism and a permitting structure to allow the business to operate the rental stations in the public right-of-way or on publicly-owned property. This type of system would be targeted towards visitors and residents for recreational rides and

Table 2. Assessment of Bike Share Options in Seguin

	Smart Dock	Dockless	Automated Bike Rental	Bike Library	Agency Owned	Third-Party Owned
Limited or no public funding	○	●	●	◐	○	●
Minimize staff time	◐	●	●	○	○	●
Serve recreational users	●	●	●	◐	●	●
Focus system on trail network	●	○	◐	●	●	◐
Variety of bike fleet	○	○	○	●	●	○

○ Worst performance ◐ Average performance ● Best performance



could be focused on the trail network with rental stations at either end of the Old Number 9 Greenway. Because the bikes are normally a standard type, it is unlikely that other types of bikes such as kids and adaptive bicycles could be provided. However, these bikes could be provided at the physical location of the bike rental business.

A bike library would fill many of the stated objectives also. For example, it could offer an inexpensive and very accessible service for local residents, could be focused on the trail system with checkouts integrated into the City's Library system, and variety could be provided in the types of bicycles that are available. However, operations would

be limited to the opening hours of the library and therefore may not be convenient to all users and particularly out-of-town visitors. It would also require more City resources including some upfront capital to purchase or refurbish the bikes, ongoing operating support such as staff time to checkout bikes, and operating funds to pay for third-party maintenance. For these reasons, this option is not recommended at this time. However, if City resources become available in the future, it is an option worth exploring.



Comparison to Seguin

- ↑↑ Much higher than Boerne
- ↑ Higher than Boerne
- ~ Similar to Boerne
- ↓ Lower than Boerne

Case Studies

Automated Bike Rental - Bemidji, MN

Population: 15,000 ~
Median household income: \$34,000 ↓
Non-white population: 21% ↓
Education: Bemidji State University, 4,500 students ↑
Bike Share: 45 bikes at 3 hubs
Vendor: Sierra Vista Library



Figure 24. Nice Ride bikes at Lake Bemidji State Park in Bemidji, MN. Credit: Bemidji Pioneer

Nice Ride MN conducted a pilot program between 2014 and 2017 with 45 bikes in Bemidji, MN. Users signed up for an account on line that was tied to a debit or credit card. They could then checkout a bike from one of three locations for multiple hours or a day. The stations were co-located with staffed facilities such as the Lake Bemidji State Park office and bikes, helmets, and other accessories could be checked out through these locations during office hours.

Automated Bike Rental – Chicago, IL

Population: 2.7 million ↑↑↑
Median household income: \$50,000 ↓
Non-white population: 68% ↑↑
Education: Multiple universities, 670,000 students ↑↑
Bike share: 2 physical store fronts, 6 automated locations
Vendor: Bike and Roll / Smoove



Figure 25. Automated bike rental station at the North Branch Trail in Chicago, IL

Bike and Roll is a bike rental company operating two physical storefronts in Downtown Chicago that also offers automated bike rental services at the Dan Ryan Woods and the North Branch Trail. In 2015, the company was contracted by the Forest Preserve District to open a concession at the Dan Ryan Woods along with 5 automated checkout locations. Each automated station holds up to 10 bikes that can be checked out using credit, debit, or prepaid cards. Bikes can be checked out for a few hours or an entire day. To avoid rebalancing and limit operating costs, the bikes must be returned to the original station. The concession supplements the service offering staffed bike rental as well as quadcycles, baby seats, trailers, and other accessories for an additional charge.¹

¹ Accessed on November 9, 2018: <https://chi.streetsblog.org/2015/05/21/automated-bike-rental-is-coming-to-the-forest-preserves-this-summer/>



Comparison to Seguin

- ↑↑ Much higher than Boerne
- ↑ Higher than Boerne
- ~ Similar to Boerne
- ↓ Lower than Boerne

Bike Library – Sierra Vista, AZ

Population: 44,000 ↑

Median household income: \$56,280 ~

Non-white population: 43% ↑

Education: Several satellite locations, <2,000 students total ↑

Bike library: 1 location, short term check out

Managed by: Sierra Vista Library



Figure 26. Sierra Vista Bike Library bikes.
Credit: Sierra Vista Bike Library

Sierra Vista is a bike-friendly town in southern Arizona. It has a system of bike trails, road biking routes, nearby mountain bike trails, and a strong bicycling-advocacy community. It has earned bronze status as a Bicycle Friendly Community.

Sierra Vista Public Library hosts a bike library with several types of bikes available for checkout. These include all-purpose cruisers, adult tricycles, and kids bikes. Helmets, locks, and local bike maps are included with the check out. All library card holders are eligible to check out bikes for up to three days, with one renewal allowed.



10 – Implementation: Automated Rental

An automated bike rental system could include one or more automated stations that are maintained by a local bike shop. The bike shop would service and repair the bikes and may also provide a staffed rental location to rent different types of bikes, helmets, and other equipment. This type of system requires users to find one of the checkout stations, but provides flexibility to the user allowing them to check out a bike for a longer period than other bike share types and the flexibility to take the bikes anywhere in the city.

This model minimizes the resources needed from the City and would only require some staff time to determine the most appropriate contracting mechanism and permit system for the third-party to set up stations in the public right-of-way or on publicly-owned property.

System Needs

- Interest from a third-party vendor to establish the program. It is our understanding that a prominent local bike shop is planning to open a store in Boerne and they may be interested in providing this additional service in Boerne, and
- A contract, memorandum of understanding, or permitting mechanism to allow the program to operate in the city and place rental stations in the public right-of-way or on publicly-owned property.



Figure 27. SCAD smart bike station at the Savannah College of Art and Design.

Credit: The Gotcha Group

System Plan

Automated bike rental hubs should utilize the most visible locations along the Old Number 9 Greenway to encourage use from the targeted demographic of recreational use by local residents and visitors. Checkout locations could be established at the north-end of the trail at the Boerne Public Library and at the south end at the trailhead at Esser Road. The size of the hubs depends on the operator's available resources and anticipation of demand.

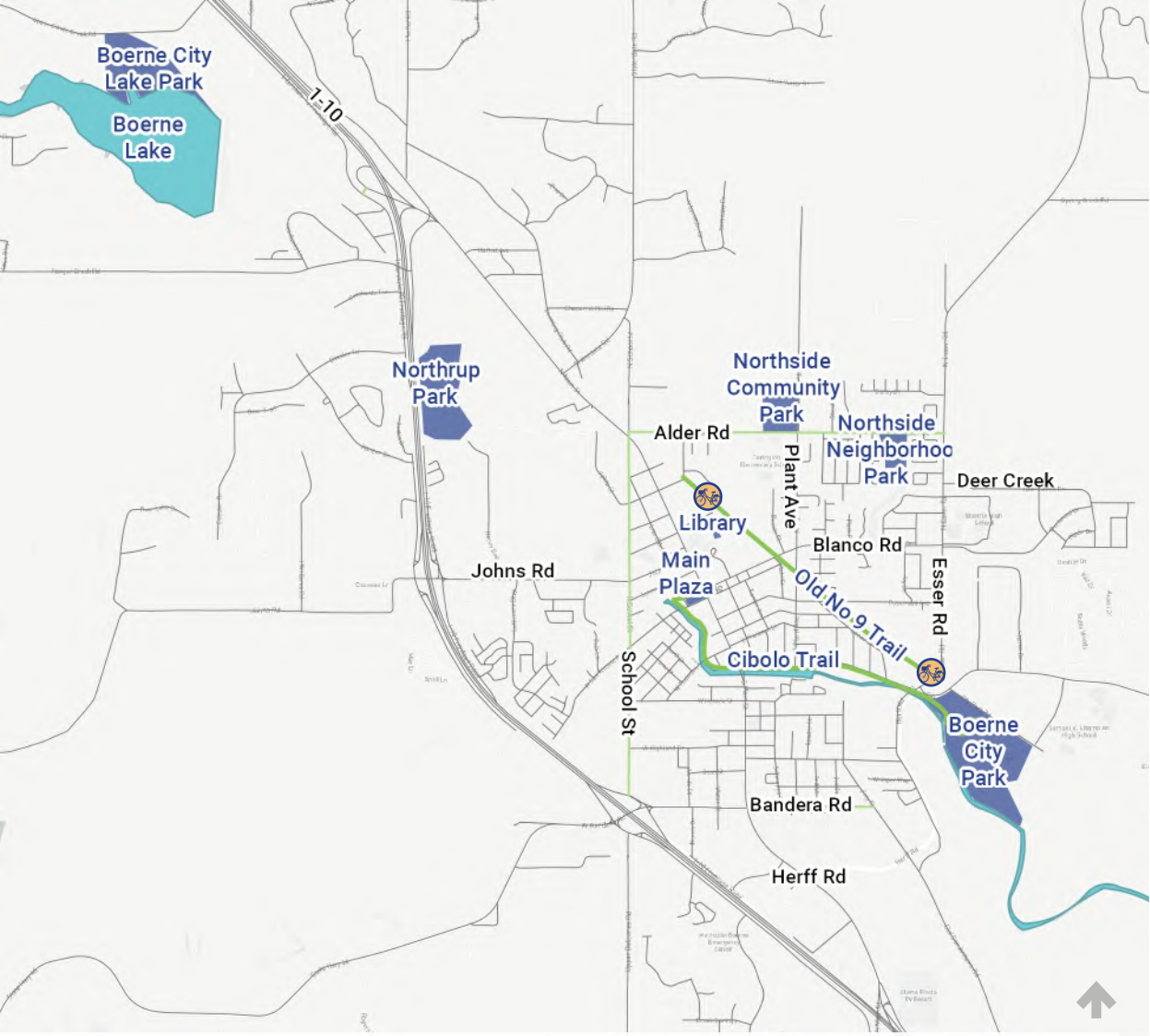


Figure 28. Proposed Boerne automated bike rental system.

- Potential Automated Rental Station
- Parks and Destinations
- Multi-use Trail
- Streets rated comfortable for biking*

*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.



Key Questions

The following questions need to be answered to move forward an automated bike rental program:

- Is there interest from a local bike shop to establish this sort of system in Boerne? How will this interest be determined?
- What sort of contracting (or procurement) mechanism will be used to allow the vendors to operate the program?
- How big will the checkout stations be, where will they be located, and what permitting mechanism will be used to allow these in the public right-of-way or on public property?



Appendix A: Bike Library Implementation

A bike library would consist of a fleet of bicycles that could be checked out from one or more attended locations for no or minimal cost. Similar to library books, the bikes could be checked out for a few hours or a few months before being returned. Bike libraries can be an extension of the public library system or independently operated by city-contracted staff, volunteers, or bicycling advocacy groups.

This type of program is not set up for short, spontaneous, point-to-point trips; but would provide anyone in the community a way to get a bicycle that they could use for transportation or recreation. For example, a visitor could check out a bike for a few hours or a resident or student could check out a bike and keep it for a month or a semester as a means to get around.

System Needs

- Capital to purchase or refurbish bikes and buy equipment,
- Ongoing funding to cover the cost of operations and maintenance,
- A champion to implement and oversee the program,
- Space to operate and funds to pay for rent, utilities, etc.
- A check-out process to keep track of the bikes, and
- Staff or contractors to administer the program, perform check outs, and maintain the bikes.



Figure 29. Fort Collins Bike Library, Fort Collins, CO
Credit: Spark Logix Studio

System Plan

Bike libraries come in many forms. For Boerne, the best option would be for interested regional partners to create a system with a central hub at somewhere such as the Public Library. Satellite locations could be added if community interest grows and other stakeholders become involved.

The size of each hub depends on available space and funding. The central hub should start with at least 10 – 20 bikes and a variety of bike types including kids bikes and adaptive bicycles. The smaller hubs could be 5 – 10 bikes. As demand grows, additional bikes may need to supplement the fleet.

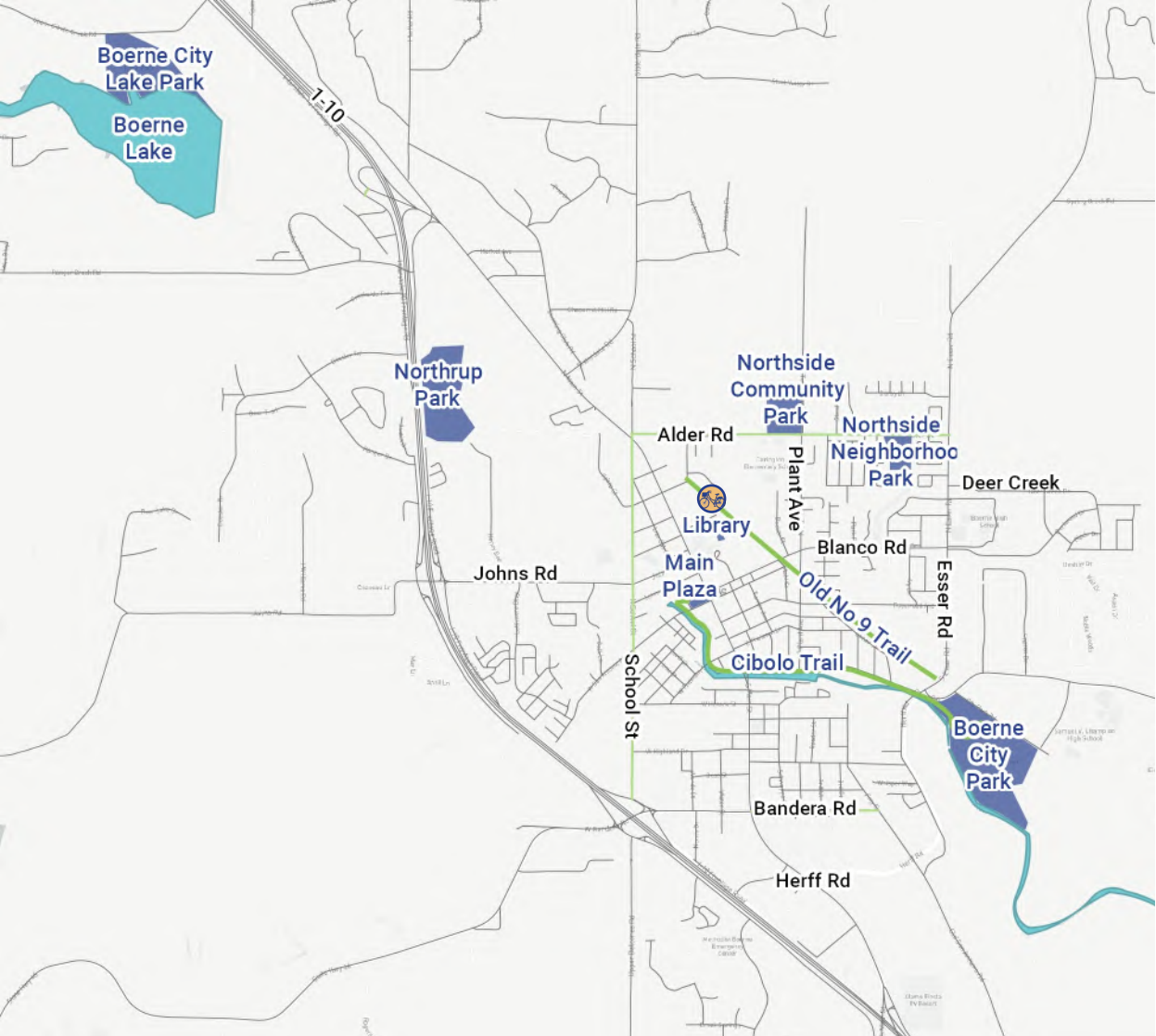


Figure 30. Proposed Boerne automated bike rental system.

- Potential Bike Library Location
- Parks and Destinations
- Multi-use Trail
- Streets rated comfortable for biking*

*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.



Key Questions

The following questions need to be answered to move forward with the bike library:

- Would the City's public library be interested and have the capacity to oversee the program and check bikes in and out?
- Do current staff have the capacity to add the program to their responsibility of duties?
- What other partners are interested in participating in the program and what is the extent of their involvement?
- Where would the bikes be sourced? Would these bikes be purchased new or would they be recycled and refurbished?
- Is there sufficient space available at each location to store bikes before they are checked out?
- What is the checkout process? Can the same check-out technology used for books and other library resources be used for the bikes?
- Who determines when a returned bicycle needs maintenance? Who conducts maintenance?
- What capital funds are available to purchase or refurbish bikes and buy equipment?
- What funding sources are available to cover ongoing operating costs?



Boerne

