

Culver City Bike Share Feasibility Study

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I. Executive Summary

Bike share has the potential to greatly expand transportation options for residents, employees, and visitors to travel to and around Culver City and adjacent communities. As part of the Los Angeles region, Culver City is considering bike share within a landscape shaped by existing bike share systems, presenting a choice of joining one of the existing systems or building its own. The purpose of this report is to evaluate the feasibility of operating a bike share system in Culver City, evaluate which system would best serve Culver City's goals and interests, and provide a recommendation for implementation.

The first step in this process was to establish a set of goals and objectives by which the City could evaluate the systems under consideration. In partnership with the Bicycle and Pedestrian Advisory Committee (BPAC), the following four primary goals were established:

1. Increase access by integrating seamlessly with adjacent communities and by connecting to transit and points of interest.
2. Serve all residents of Culver City, despite geography, financial situation, physical ability, or ethnicity.
3. Be cost-effective and minimize reliance on sustained financial support from the City.
4. Be adaptable to meet new challenges and priorities, and able to expand in the future.

With these in mind, a draft service area, system size, and ridership projections were developed for Culver City and the surrounding areas. The recommended system consists of 62 stations / 620 bikes serving a 12-square-mile area covering all of Culver City, Palms, Playa Vista, Del Rey, and portions of Mar Vista. This recommended system is projected to attract between 15,000 and 20,000 trips per month.

Three primary systems were evaluated for their ability to meet the system goals and objectives, their financial implications, and for other non-quantifiable risks and barriers: Metro Bike Share (Metro), the Westside Cities system (CycleHop), and an independent Zagster system as a neutral third option. Within the CycleHop and Metro options, two different systems for each was evaluated that had varying contractual, equipment, and cost implications. In total, five options were evaluated:

1. Metro Smart Dock: an expansion of the current Metro Bike Share system, with the same equipment type as in Downtown Los Angeles.
2. Metro Smart Bike: an expansion of the Metro system using smart bike equipment that integrates with the Metro smart docks.
3. CycleHop – Santa Monica (SM): an expansion of the Westside smart bike system with a “Santa Monica” type contract in which the City covers capital and operating costs and keeps all revenue.
4. CycleHop – Long Beach (LB): an expansion of the Westside smart bike system with a “Long Beach” type contract in which the City pays capital costs and CycleHop carries the operating risk and keeps all revenue.
5. Zagster – a new independent smart bike system in which Culver City pays a flat per bike annual operating fee to Zagster and keeps all revenue, except for a credit card processing fee.

The costs, revenue, and net cash flow for Culver City for each of the five options was evaluated for a 5-year operations period. The Metro smart bike option was shown to be the most financially advantageous for the City, with a 5-year net cost of \$1.18 million. Of this, \$700,000 is for first year capital costs with a projected ongoing operational subsidy of approximately \$90,000 per year.

In consideration of the City's goals, operational standards, and the results of the financial analysis, it is recommended that Culver City pursue a smart bike system with Metro. Of the systems considered, Metro Bike Share achieves the stated goals and operational standards with the greatest certainty and with the most favorable financial implications.

II. Introduction

Biking in Culver City

Culver City is an independent city located nine miles west of Downtown Los Angeles, five miles east of Santa Monica, and four miles south of Beverly Hills and West Hollywood. The City is approximately five square miles with a residential population of approximately 40,000. Culver City is surrounded by the City of Los Angeles and the unincorporated Baldwin Hills. The City is served by the Metro Expo Line, Metro Bus, Culver CityBus, Santa Monica Big Blue Bus, and LADOT Commuter Express.

Culver City is a compact community with relatively high rates of walking and biking. The City has three major off-street multi-use paths that form the backbone of its bicycle network: Ballona Creek, Culver Boulevard, and Expo. Since the adoption of the Bicycle & Pedestrian Master Plan in 2010, the City has worked to connect these paths with on-street facilities to form a more cohesive network. In that time, biking to work has doubled from 1.0% to 2.0% (ACS 5-Year Estimates) and biking to school has also doubled from 3% to 6% (Parent Survey). Approximately one-third of Culver City students walk or bike to school.

The City is home to several major employers, including Sony Pictures Entertainment, Symantec, and Westfield Culver City. There are several clusters of creative office space growing in the Hayden Tract, the Arts District, and Fox Hills in addition to numerous retail centers. West L.A. College, located immediately outside Culver City's boundary, serves students from all over the region. The Baldwin Hills Scenic Overlook and the Ballona Creek Bike Path are regional recreational attractions. All of these places are potential trip generators for bike share.

What is Bike Share?

Culver City is considering implementing a bike share system, which is a form of public transportation that helps connect people to local destinations and access regional transit. Bike share is ideal for trips that are between a half mile and three miles—those that are too long to walk but too short to drive. These short trips to the store, to school, to the park, and other local destinations are about half of the trips most people take on a normal day. Bike share is a point-to-point, on-demand transit system that lets customers check out a bike in one location and check it back in at their destination, without having to return to the point of origin.

Bike share is a relatively new type of transportation in the United States, but has grown exponentially in the last five years. The Los Angeles region is one of the last major metropolitan areas to get bike share, with Santa Monica Breeze, Metro Bike Share, and Long Beach Bike Share all launching within the last 18 months. In such a rapidly developing industry, technology, business models, and payment systems are constantly evolving. To help understand the systems evaluated, some common terms and definitions that are used in this report are explained below.

Smart Dock vs. Smart Bike

The most common technology used in bike share systems is called a *Smart Dock*. In these systems, all of the technology that allows customers to check out a bike is located at the station. There is a kiosk that facilitates credit card payments and allows walk-up customers to check out a bike without a smart phone. There is no customer-facing technology on the bike itself, and the bike may or may not have GPS to track its location. In a Smart Dock system, bikes cannot be locked outside of a dock, so trips must begin and

end at a station. Most of the biggest bike share systems in the United States, like Capital Bike Share in Washington, D.C. and CitiBike in New York City, are Smart Dock systems.

Some newer bike share systems are deploying *Smart Bike* technology, which is somewhat more flexible, but can also increase complexity for system operators. In a Smart Bike System, the customer interface is on the bike itself instead of at the station. Instead of a dock, Smart Bikes can be parked at any bike rack. Smart Bike systems still usually have stations, but these stations consist of specially branded bike racks and information panels, instead of a kiosk with a computer. Customers interact with the bike share system via a mobile app and use a pin or RFID card to unlock the bike. To help facilitate walk-up customers, some Smart Bike systems locate kiosks in high-demand locations that can sell passes. Smart Bike systems can offer customers the ability to park a bike outside a station, usually for a nominal fee. This helps customers use bike share more conveniently if their destination isn't near a station.

Because Smart Bike systems allow more flexible operation, it is important to distinguish between the *Service Area* and the *System Boundary* of a Smart Bike system. In a Smart Dock system, they are the same thing. In any system, the bike share operator is responsible for ensuring that there are always a minimum number of bikes available at every station, even if that requires redistributing bikes among the stations, also known as rebalancing. In a Smart Bike system, the operator is also responsible for picking up bikes that are parked outside a station and delivering them back to a station. Because bikes are only reliably available at stations, only those customers that are within walking distance of a station are considered to be in the *Service Area*. However, customers are able to ride anywhere within the *System Boundary* without incurring a penalty charge. The *Service Area* is a part of the larger *System Boundary*, also referred to as a “geofence.” In a Smart Bike system, expanding the *System Boundary* is effectively free, but expanding the *Service Area* requires investing in additional bikes and stations.

Service Area: The portion of the community within convenient walking distance of a bike share station.

System Boundary: The geographic area within which bike share customers may ride without incurring a penalty fee.

Fares, Membership, and Payment

Most bike share systems use a mobile app as the primary customer interface, allowing customers to find stations/bikes and buy passes/memberships. Different systems have different ways to enable customers without a smart phone to still use the system, such as kiosks at stations for walk-up customers and RFID cards for members. Most bike share systems require customers to use a credit card, which provides an easy payment mechanism and also provides a financial guarantee to the system in the event of a lost or stolen bike. A limited number of systems have experimented with cash memberships, usually targeted for low-income customers without credit cards.

The traditional bike share fare structure offers an annual pass for regular customers and a day pass or multi-day pass for tourists or infrequent customers. A pass allows the customer to take an unlimited number of trips shorter than 30 minutes. Any trips longer than 30 minutes are charged an overtime fee to encourage customers to return the bike to a station so that it will be available for other customers.

A variation on this model provides members with a certain amount of ride time per day—such as 90 minutes—that can be used over multiple rides. Walk-up customers and members over their daily ride time are charged a per-minute rate. This fare structure means that customers are charged only for the time they use, and it prevents members from checking bikes in and back out in the middle of their trip in order to circumvent ride time limits.

Yet another fare structure provides more flexibility to customers by offering a “flex pass” to infrequent customers that is discounted from the walk-up rate intended for tourists, but more cost-effective than a

monthly or annual membership. This structure is considered to be more accessible to low-income customers that may not be able to pay a larger annual membership fee at once.

Since user fees are a critical revenue source for financial sustainability, bike share systems weigh tradeoffs between affordability, user-friendliness, and profitability when adopting a fare structure. Some systems have targeted programs to increase accessibility for low-income customers.

Opportunities for Innovation

No bike share system in the United States is currently integrated with transit fares, though Los Angeles County is the closest. All major transit systems in Los Angeles County accept TAP cards, which can hold either transit passes or stored value. All bike share systems in Los Angeles County currently accept the RFID chip in TAP cards as a unique customer identifier, which allows customers to check out a bike if they have a membership, but none of the bike share systems are connected to the TAP system on the backend, which is necessary for the bike share system to recognize passes or stored value (money) on the card. In the future, it might be possible to transfer from Metro or a municipal bus to bike share and vice versa.

Another area for innovation is accessibility for people with disabilities. All bike share systems in the United States use regular adult bicycles that have been made sturdier to withstand the rigors of bike share operations. Other types of bicycles, such as handcycles or tricycles, would make bike share accessible to people that may not be able to ride a regular bicycle, but introducing additional devices into the fleet poses significant challenges for rebalancing—which is necessary for the special bicycles to be available where needed. Some systems have made these special bicycles available on-demand if a customer calls to request one, just like paratransit, though offering this extra service is a significant expense if widely utilized.

Major Decisions for Culver City

Culver City must decide whether it wants to proceed with a bike share system and, if so, what form that system should take. The major decision points discussed in this report include:

- Goals and objectives
- Service area and system size
- Whether to deploy Smart Dock or Smart Bike technology
- How much money to spend on one-time capital expenses and ongoing operations subsidy
- Whether to join one of the two existing systems or go a third way
- Implementation timeline

III. Objectives and Outcomes

Bike share systems can offer a variety of mobility, economic, health, and social benefits to their communities. Developing a set of objectives and outcomes helps to focus how these benefits should be prioritized to best suit the needs of a community, and provides a means to guide the design and implementation strategy of a bike share system. In addition, developing a set of objectives and outcomes provides a way in which to facilitate discussion about the system with the public and stakeholders, and to keep decisions focused on the desired purpose and intent of the system.

Culver City developed a focused set of goals, objectives, and desired outcomes for the implementation of a bike share system primarily through a public discussion with the City's Bicycle and Pedestrian Advisory Committee (BPAC). To guide Culver City in establishing its goals for a bike share system, the goals and objectives of four other systems were reviewed as guiding precedents: New York City, NY; Hudson County, NJ; Memphis, TN; and Los Angeles County, CA. The following publications were reviewed and the goals, objectives, and desired outcomes compiled:

1. **New York City, NY:** New York City Planning Transportation Division (2009). *Bike-Share Opportunities in New York City*.
2. **Hudson County, NJ:** Together North Jersey, Hudson County, and North Jersey Transportation Planning Authority (2015). *Exploration of a Public Bike Share Program in Hudson County*.
3. **Memphis, TN:** City of Memphis (2013). *Memphis Bike Share Feasibility Study*.
4. **Los Angeles County, CA:** Metro (2015). *Regional Bike Share Implementation Plan for Los Angeles County*.

The collected objectives were presented to the BPAC at their September 8, 2016 meeting. The committee members and the public provided input on the sample goals, objectives, and priorities and created a long list in response. That list was then refined and organized into three categories to highlight the key issues for bike share:

1. **Goals and Objectives:** Goals and objectives are how the City will evaluate different options for bike share systems.
2. **Operational Standards:** Operational standards are expectations for any bike share system deployed in Culver City.
3. **Benefits of Bike Share:** Benefits are positive outcomes that will result from a bike share system in Culver City.

These categories frame the system's vision, standards, and objectives. The final list was presented and approved at the November 17, 2016 BPAC meeting, and is provided here:

Goals and Objectives, Operational Standards, and Benefits

Goals and Objectives

Goals and objectives are how the City will evaluate different options for bike share systems.

1. Culver City's bike share system should facilitate connections within the boundaries of Culver City and to nearby communities and points of interest, in order to provide increased transportation options for residents, promote health, reduce greenhouse gas (GHG) emissions, and promote tourism and economic development.
 - a. The system should connect to transit, including the Expo line and bus transit centers.
 - b. The system should connect to local destinations and employment centers in the greater Culver City area.
 - c. The system should integrate with adjacent and nearby bike share systems where possible.
 - d. The system should accept simple and easy fare payment, including integration with transit fare systems.
2. Culver City's bike share system should serve all residents of Culver City.
 - a. The system should serve all Culver City neighborhoods.
 - b. The system should serve low-income people that live and/or work in Culver City.
 - c. The system should serve people with disabilities to the extent feasible.
 - d. The system should serve communities of color within Culver City.
 - e. Program outreach should appeal to all of these populations.
3. The bike share system should be cost-effective and minimize its reliance on sustained financial support from the City.
4. The system should be adaptable to meet new challenges and priorities, and able to expand in the future.

Operational Standards

Operational standards are expectations for any bike share system deployed in Culver City.

- The system should have a high standard for operations to ensure the availability of bikes and docks during peak hours and at stations on the periphery of the service area.
- The user experience should be easy, including an intuitive user interface for walk-up and casual users.
- Stations and bikes should be durable, resistant to vandalism, and have low maintenance costs.
- Operation of the system should include funding for outreach, promotion, and education.
- The system should offer affordable fares and/or targeted fare programs for low-income users, including options for users without a credit card.
- The system should offer employer accounts/membership.

Benefits of Bike Share

Benefits are positive outcomes that will result from any bike share system in Culver City.

Bike share will:

- Reduce the need to use or own a car;
- Increase physical activity and provide health benefits;
- Lead to more investment in bicycle infrastructure and increased safety for all;
- Reduce GHG emissions related to transportation, particularly from local trips; and
- Promote tourism and economic development by increasing local mobility.

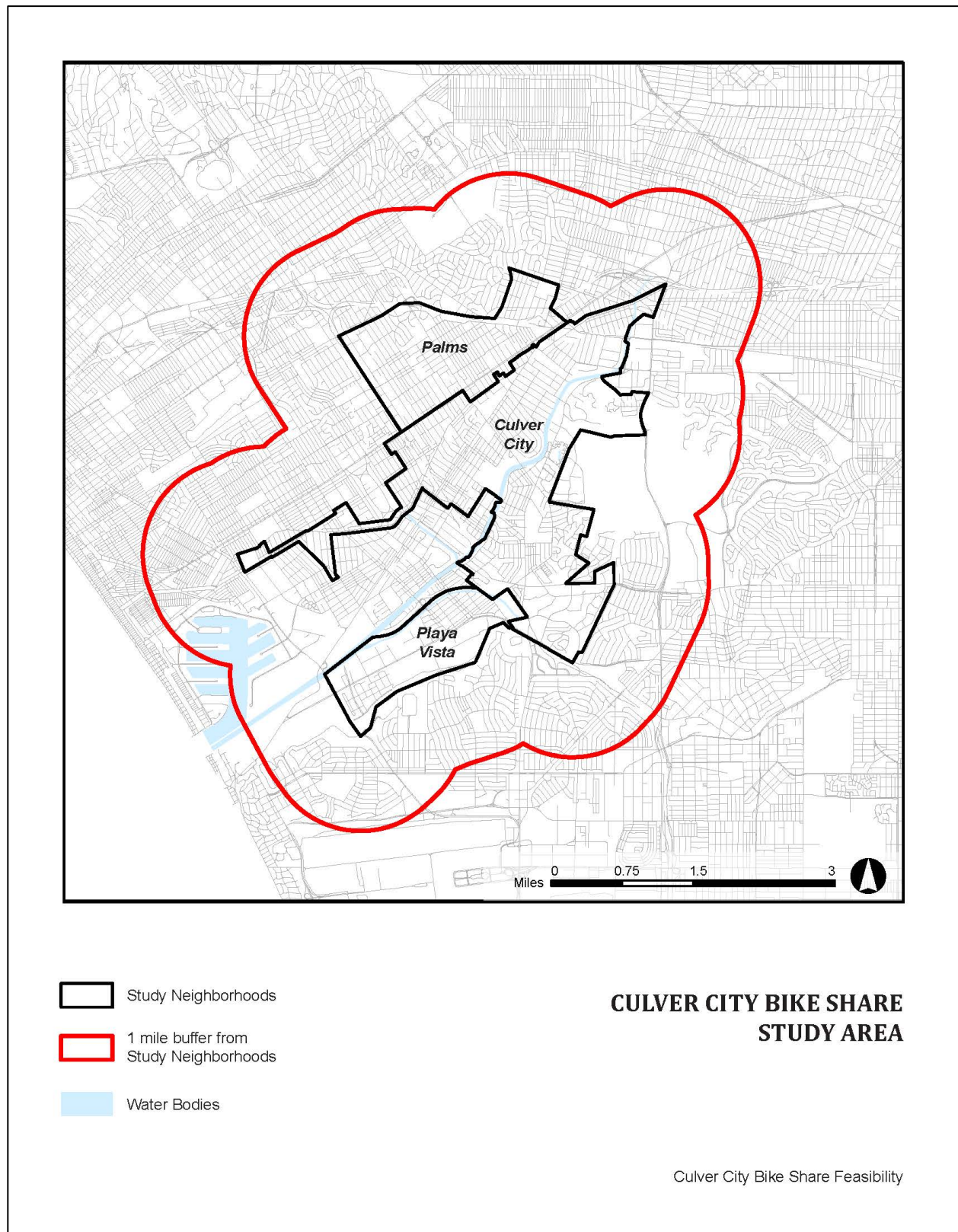
IV. Demand Analysis and Ridership Estimates

Serving a strong ridership base is important to ensure the system's financial sustainability, so system planning must take into account likely ridership generators. In other cities, bike share ridership generally skews toward higher-income and whiter populations instead of reflecting citywide demographics. While the reasons for this are complex, station location is one factor. Therefore, meeting the BPAC's goals to serve community members of all demographics and income levels requires including social equity factors in determining the system's service area.

Demand and Equity Analyses: Heat Mapping

A demand and equity goals heat mapping analysis was prepared for Culver City and the surrounding areas to aid in determining the preferred bike share service area and identify areas of need with respect to social equity. Due to the irregular shape of Culver City, the BPAC's desire to provide meaningful service to all parts of the City, and the City's contiguity with adjacent Los Angeles neighborhoods, the heat mapping study area was defined as all census tracts with their centroid within one mile of Culver City, Palms, and Playa Vista, as shown in Figure 1.

Figure 1: Culver City bike share study area



The demand heat mapping analysis compiled both demographic and non-demographic attributes that were identified as potential ridership factors in order to distinguish “hot spots,” or areas where a high concentration of potential ridership factors are prevalent. The ‘Potential Ridership’ map was used to determine the extent of the potential service area and the composition of neighborhood areas within the service area that are projected to share similar ridership demand. Demographic data represents characteristics of the population including population, age, and employment. Non-demographic data generally represents geographic features, such as the location of businesses and public transit.

To bring additional context to the heat map analyses, an equity/goals heat mapping analysis was also created. The ‘Equity’ map looked at two attributes that were identified as key equity concerns – racial/ethnic diversity and poverty levels. By mapping these two attributes, areas with equity concerns could be recognized and prioritized in developing the final bike share service area.

Finally, the Potential Ridership and Equity maps were multiplicatively combined. The final output map provides guidance on where bike share could achieve ridership/popularity as well as fulfill larger social equity goals for the City. Conducting a ridership and equity analysis helps to ensure that potential for ridership is not the only consideration in planning Culver City’s bike share system.

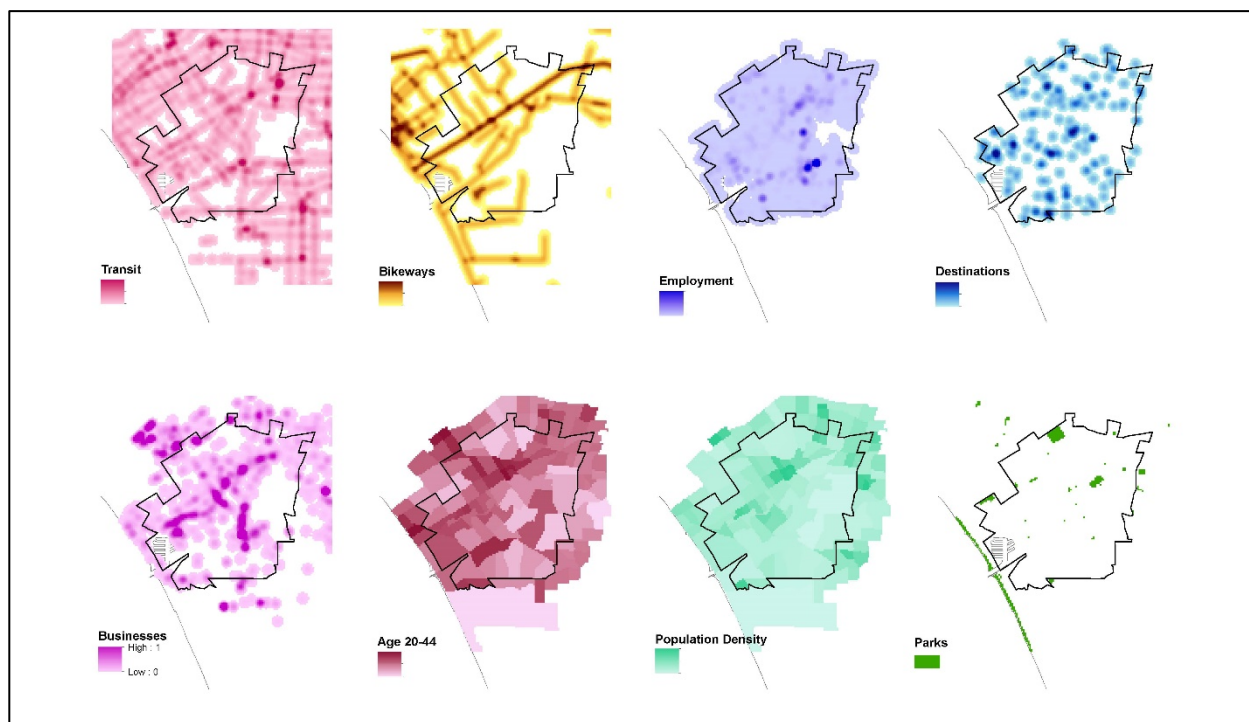
Ridership and Equity Potential Factors

Ridership Potential Metrics

The metrics listed below and shown in Figure 2 were selected for analysis because they are commonly used predictors of bike share demand. These metrics have been used in similar analyses in other U.S. cities, including Chicago, Denver, New York, Philadelphia, San Francisco, and Seattle.

- *Residential Population Density:* This data reflects the density of the residential population in the study area. The greatest population density occurs in Palms and Culver City West. *Source: U.S. Census, American Community Survey, 5-year estimates, 2014.*
- *Population Age 20-44 Density:* This data reflects the density of the residential population in the study area that are between the ages of 20-44, the likely age group for bike share riders. *Source: U.S. Census, American Community Survey, 5-year estimates, 2014.*
- *Employment Density:* Employment density reflects the number of jobs per square mile of land in the study area. *Source: On the Map, U.S. Census, American Community Survey, 5-year estimates, 2014.*
- *Destination Density:* This metric reflects the locations of major destinations in the study area, including: educational institutions (both public and private), cultural and performing arts centers, health and medical centers, libraries, museums and aquariums, recreational facilities, and sports complexes and venues. *Source: Los Angeles County Open Data*
- *Transit:* This metric is a combination of bus and light rail stations, including Culver City, Big Blue Bus (Santa Monica), LADOT Commuter Express, and LA Metro bus stops, and the Expo Line Stations. *Source: Culver City, LA Metro, and Santa Monica*
- *Bikeways:* The location of bikeways reflects areas where infrastructure already exists for biking. *Source: LA Metro*
- *Businesses density:* This metric includes storefront-type businesses, such as restaurants, bars, hotel/motels, salons/barber shops, and retail stores, and was used as a proxy for commercial/customer origins and destinations. *Source: Los Angeles Open Data, Active Businesses and Culver City Businesses.*
- *Parks and Open Space:* Parks are a common origin and destination for recreational trips. *Source: California State Parks, Culver City Parks, and LA City Department Parks and Recreation parks.*

Figure 2: Bike share ridership potential factors



Equity Metrics

Based on the project's goals and objectives, two demographic metrics were used to identify areas of social equity.

- *Total Households below poverty line:* The analysis was structured to areas with concentrations of lower-income households. *Source: U.S. Census, American Community Survey, 5-year estimates, 2014.*
- *Non-white, non-Hispanic/Latino population:* The analysis was structured to identify areas with larger percentages of residents of color. *Source: U.S. Census, American Community Survey, 5-year estimates, 2014.*

Weighting of Metrics

Certain metrics are better predictors of bike share potential than others, and the importance of individual metrics should align with project goals and objectives. Based on the goals and objectives described in Section II, each metric was assigned a weight. The higher the weight value for a given metric, the greater the relative importance of the metric. Various iterations of the combination of weights were tested to determine the most appropriate weights for each metric that best represented the priority of each metric for ridership. Population and employment density, which have been shown to be two of the three most important factors that determine ridership (system size being the third), were weighted twice as much as the other metrics for determining Ridership Potential. The two metrics for the Equity heat map were weighted equally. The final weights for the Ridership Potential and Equity maps are shown in Tables 1 and 2.

Table 1: Ridership potential metrics and weights

Metric	Weight
Population Density	1
Employment Density	1
Population Age 20-44 Density	0.5
Destination Density	0.5
Transit Density	0.5
Bikeways Density	0.5
Business Density	0.5
Parks Density	0.5

Table 2: Equity metrics and weights

Metric	Weight
Total Households Below Poverty Line	1
Non-White Population	1

Heat Maps

Heat maps were created to visualize and quantify the potential demand for bike share and equity. The metrics were normalized to a scale of 0 to 1 and combined using the weighting described above.

For Ridership Potential, the areas shown in darker orange in Figure 3 are those that have the highest concentration of potential ridership factors. For Equity, the areas shown in the darkest purple in Figure 4 are those that have the greatest equity concerns.

Figure 3: Ridership potential heat map

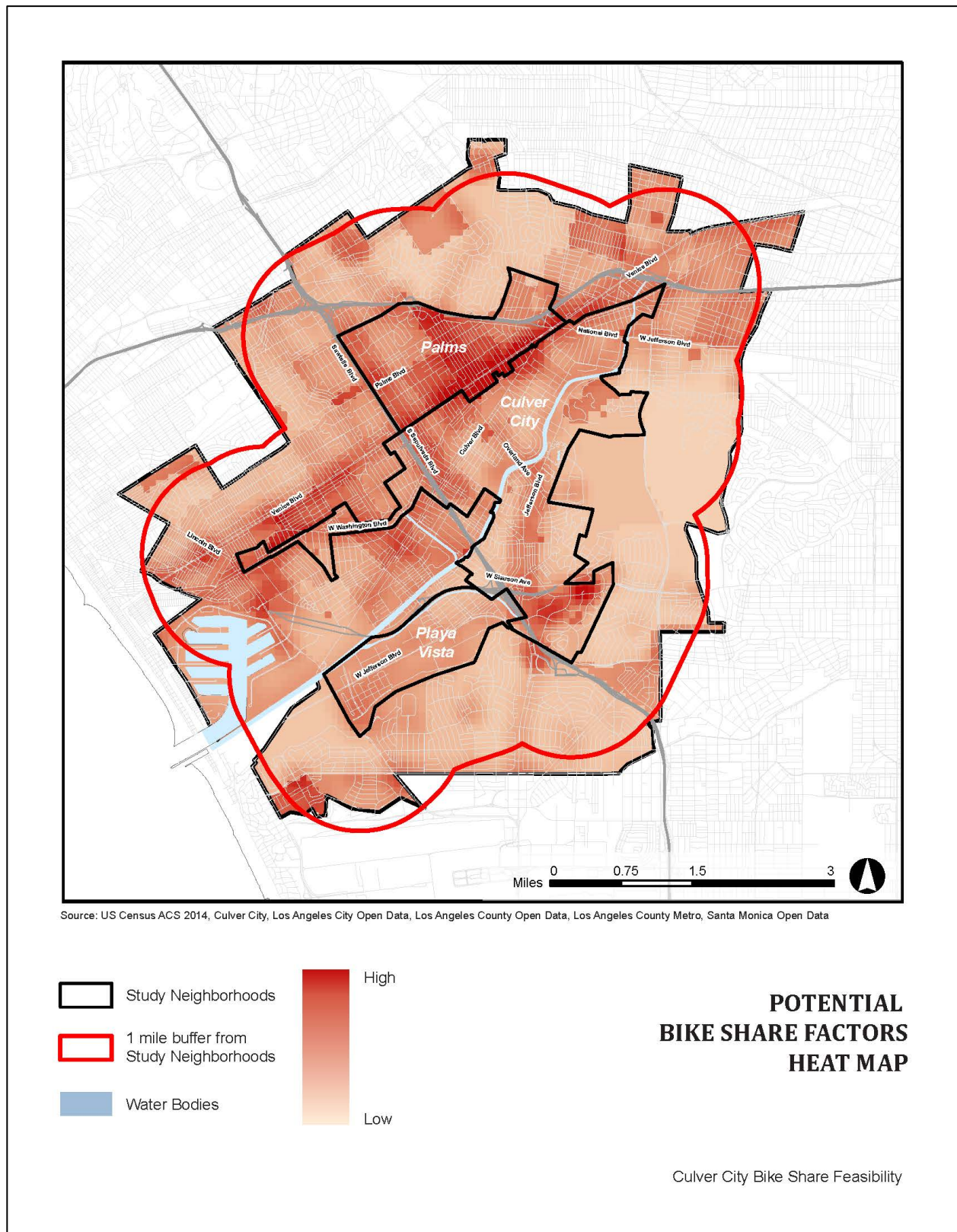
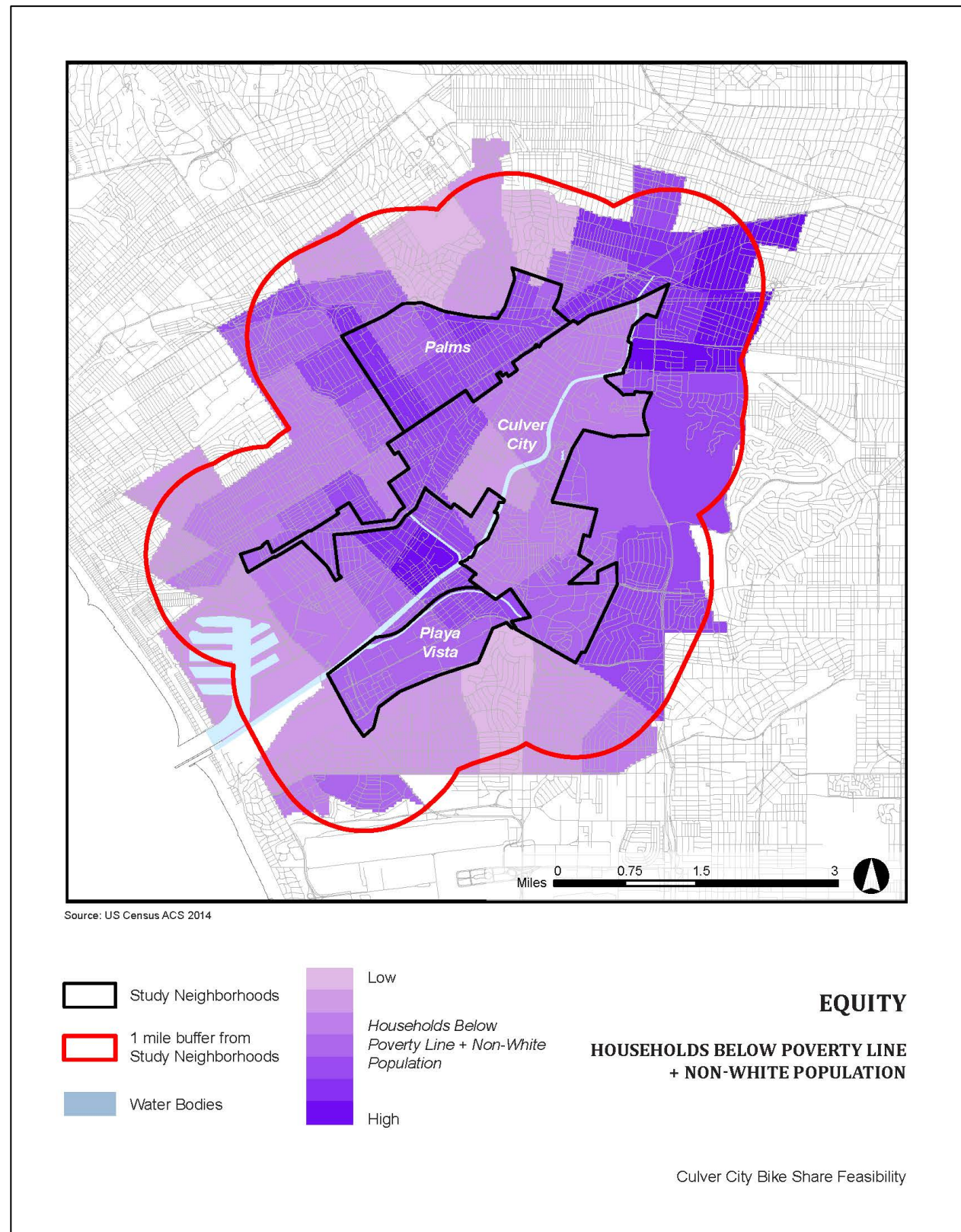


Figure 4: Equity heat map

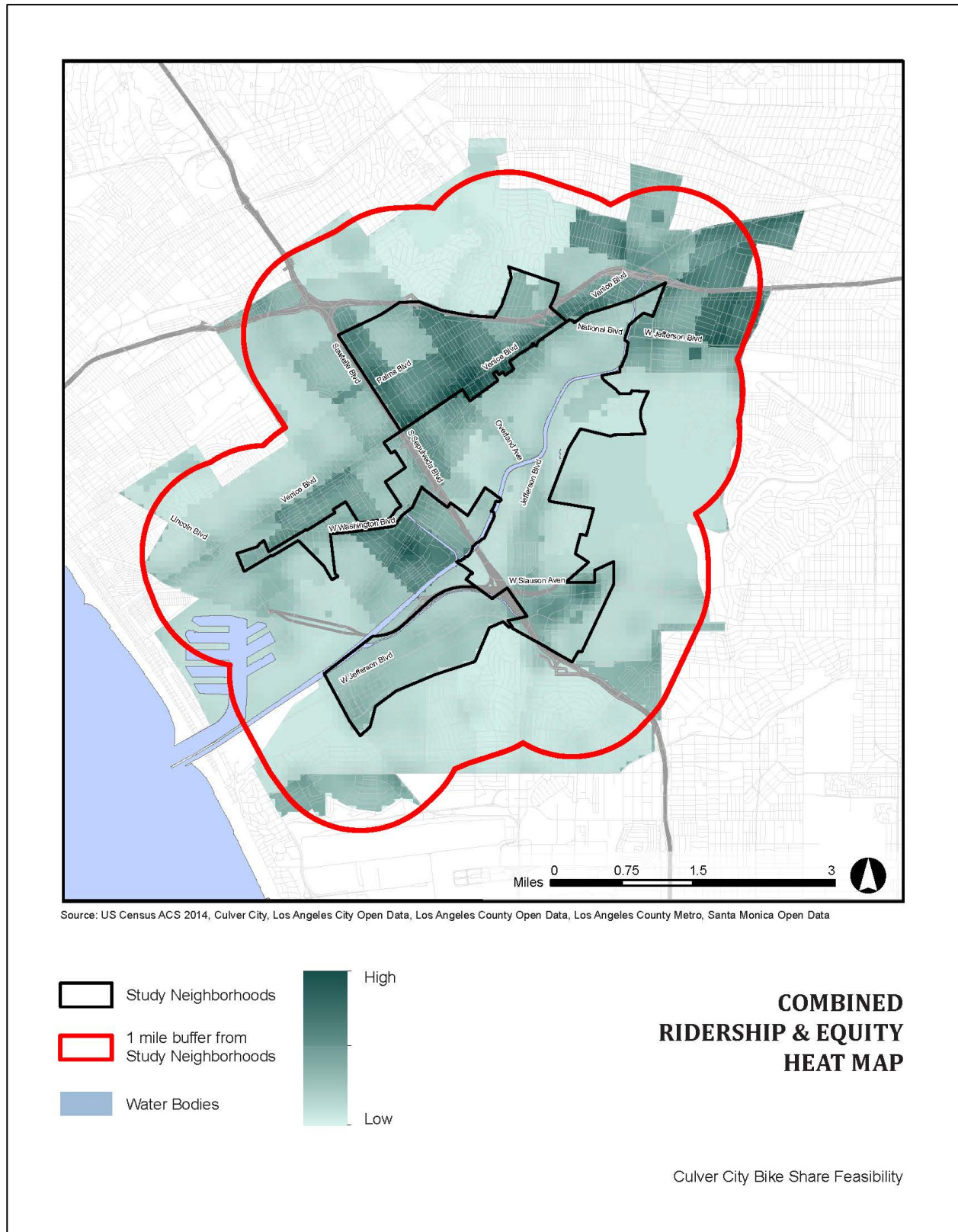


Final Heat Map

The Ridership Potential and Equity heat map analyses were combined to show the areas that have a high ridership potential and the greatest equity concerns. The final output is shown in Figure 5. The highest concentrations of ridership potential and equity concerns appear in Palms and downtown Culver City; Mar Vista south of Venice Boulevard, Fox Hills, and Del Rey (where Mar Vista Gardens is located). Palms has some of the highest population density and equity concerns in the study area, with Mar Vista having similar population densities. Employment and number of storefront businesses are prevalent in downtown Culver City and in Fox Hills.

Note: Playa Vista is a rapidly developing mixed-use neighborhood with thousands of new residents and employees that are not fully reflected in the data sources used for this analysis.

Figure 5: Combined ridership potential and equity heat map



Service Area

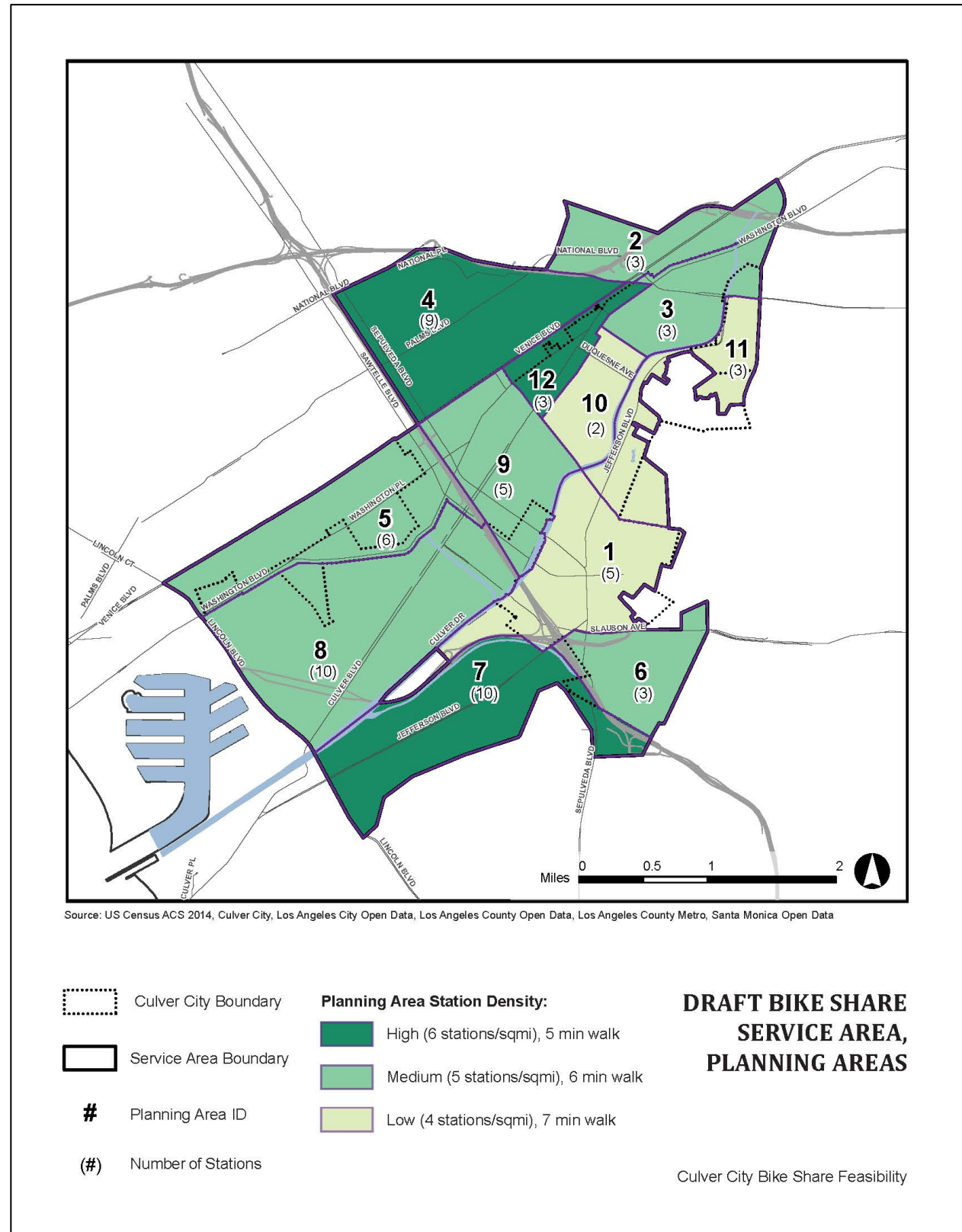
Using the heat mapping analysis as a guide, a recommended service area was developed to show the extent of the bike share system and potential station/bike densities in sub-areas throughout the service area. In order to provide meaningful service to all parts of Culver City and to serve trips that cross city borders—both goals identified by the BPAC—the recommended service area extends beyond the jurisdictional boundaries of Culver City and includes Palms, Playa Vista, Del Rey and portions of Mar Vista. The 12 sub-areas were delineated using guidance from the heat mapping, natural barriers like Ballona Creek and the Baldwin Hills, and major thoroughfares.

The final recommended service area is shown in Figure 6. The recommended service area is 12.2 square miles, has a residential population of approximately 140,000, an average population density of about 11,500 people/square mile, and an employment population of nearly 100,000.

Each sub-area was assigned either a high (6 stations/sq mi), medium (5 stations/sq mi) or low (4 stations/sq mi) average station density based on anticipated ridership, which was then manually adjusted to account for geography and feedback from stakeholders. The recommended system size to adequately cover the recommended service area is 62 stations with an average density of 5.1 stations per square mile. Each station is assumed to have an average of 10 bikes, for a total system size of 620 bikes.

Palms, downtown Culver City, and Playa Vista were the three sub-areas determined to warrant a high station density. Palms and downtown Culver City, as revealed through the heat mapping analysis, have both high potential ridership factors and high equity concerns. While Playa Vista was not identified as a prominent area based on ridership potential and equity, the neighborhood was assigned a greater station density in anticipation of continued development there. The cost of additional station density in Playa Vista would likely be offset by contributions and/or sponsorships by private partners.

Figure 6: Culver City bike share service area and planning sub-areas



Ridership Projection

To project ridership for the recommended service area, data from other peer cities across North America that have active bike share programs were compiled and used to model potential Culver City ridership.

The peer cities¹ used to build the ridership model were:

- Hubway – Boston, MA
- Divvy – Chicago, IL
- CoGo – Columbus, OH
- B-cycle – Denver, CO
- Nice Ride – Minneapolis, MN
- Breeze – Santa Monica, CA
- Pronto – Seattle, WA
- Bike Share Toronto – Toronto, Ontario (Canada)
- Capital Bikeshare – Washington D.C.

Data points were analyzed from each system to build a multivariate model for predicting monthly ridership. The independent factors considered were:

- Number of bikes
- Number of stations
- Number of docks
- Size of service area (square miles)
- Station density
- Population of service area
- Population density of service area
- Employment of service area
- Employment density of service area
- Number of annual members

Several iterations of an exploratory regression were run to understand which factors best predicted which kinds of ridership (annual trips, monthly trips, daily trips per bike, and daily trips). It was determined that monthly ridership was best predicted by three factors: (1) number of stations, (2) population of service area, and (3) jobs in service area. These three variables were selected because they have a strong relationship to projecting monthly trips. All three variables had an R-squared value that was relatively close to 1, which means the projected ridership of the regression based on that value was a close fit to the actual ridership of the peer cities. A multivariate regression was then built using these three independent factors to predict monthly trips.

In reviewing the peer city data, it became apparent that Culver City's recommended service area was in many ways different than the selected peers in terms of urban form and connectivity. Most city-scale bike share systems in North America serve an urban core (downtown) and the surrounding neighborhoods, which generally become more residential as you go further from the core. However, Culver City is not the "downtown" of the Los Angeles metropolitan region, and unlike most other bike share core service areas, has a higher residential population than employment.

¹ The Downtown Los Angeles system was not included because the ridership data was not available at the time this analysis was conducted.

As a result, several iterations of the regression model were developed using different combinations of peer cities to estimate the high and low monthly trips for a Culver City bike share system.

Low Estimate

The low estimate for Culver City's projected monthly ridership was determined by looking at the three peer cities that were the most similar to Culver City in terms of their population and employment in the service area: Washington D.C., Santa Monica, and Minneapolis. The multivariate analysis estimated approximately 15,000 trips/month for the recommended Culver City service area. This is similar to the number of monthly trips that the Downtown Los Angeles system has.

High Estimate

The high estimate for Culver City's projected monthly trips was determined by looking at all nine of the peer cities. This is the high estimate because it includes cities much larger than Culver City with more traditional urban forms (regional core surrounded by lower density residential neighborhoods). The multivariate analysis estimated approximately 20,000 trips/month for the recommended Culver City service area. This is similar to the number of monthly trips that the Santa Monica system has.

Interpretation

As estimate through the regression ridership model, Culver City's recommended service area is projected to have approximately between 15,000 and 20,000 trips/month. This is a system-level ridership projection, not a station-level ridership projection, and is based on characteristics of the service area, including number of stations, employment, and population.

V. Review of Bike Share Options

Currently, there are two public bike share system operators in Los Angeles County: Bicycle Transit Systems (BTS), which is the vendor for Metro Bike Share, and CycleHop, which is the selected vendor for a handful of Westside cities and Long Beach. The two vendors currently operate independently without interoperability between their systems, although both vendors have stated intentions to work towards a more regional system for Los Angeles County in the future. The presence of two separate operators poses challenges for the creation of a regional bike share system from an equipment, governance, and operations perspective. Culver City's central location makes it an important territory for the expansion plans of both existing systems, so both operators are eager to serve the City. Both systems may not serve the City's objectives equally, however, so each system's attributes, plans for growth, opportunities, and constraints are reviewed below. A third proposal from Zagster was also included in this evaluation as a "neutral option," since they currently do not operate a large scale, public bike share system in the county.

Overview of Bike Share Operators

Bicycle Transit Systems (BTS), founded in 2013 and headquartered in Philadelphia, PA, is the current operator for Metro Bike Share. In addition to the Los Angeles Metro system, BTS manages and operates Philadelphia's Indego bike share, Oklahoma City Spokies, and the RTC Bike Share in Las Vegas. BTS' manufacturer, B-Cycle, has implemented and operated over 25 systems throughout the U.S., including Denver, Madison, San Antonio, and Charlotte. B-Cycle offers a kiosk-based bike share technology that has three main components, the bicycle, the stations, and the software. Similar to other "smart dock" system, the stations are solar-powered, meaning that the docks do not need to be hardwired.

CycleHop, founded in 2011, currently operates in four cities in Los Angeles County: Santa Monica, Beverly Hills, West Hollywood, and Long Beach. CycleHop operates numerous bike share systems in North America, including Tampa Coast, Phoenix Grid, and Vancouver Mobi. The CycleHop system utilizes equipment and technology from Social Bicycles (SoBi). SoBi was founded in 2010 in Brooklyn, New York, and manufactures wireless enabled "smart bikes," which replaces the "smart dock" equipment by placing all the technology for renting, releasing, and locking the bicycles on the bike rather than on the racks. Smart bikes have onboard GPS, and station and system areas are defined by GPS geofences, so that the bikes can be located at any time and to ensure proper payment.

Zagster was founded in 2007 and is headquartered in Cambridge, MA. Zagster builds and operate bike sharing systems nationwide in partnership with colleges, hotels, multi-family residential buildings, and corporate campuses. Zagster provides bikes, sharing technology, maintenance, and rider support for every network they operate. Some of their locations include: General Motors, Duke University, and Cleveland, OH. California State University (CSU) East Bay and CSU Irvine also have bike share programs operated by Zagster. Zagster has a presence at a couple corporate campuses in Playa Vista, in the western end of the proposed service area.

Metro Bike Share (BTS)

Background

In June 2015, the Metro Board of Directors (the "Board") adopted the Regional Bike Share Implementation Plan for Los Angeles County and awarded a two-year contract in the amount of \$11 million to BTS for the equipment, installation, and operations of the Metro Countywide Bike Share Phase I

Pilot in Downtown Los Angeles. A memorandum of understanding (MOU) was negotiated and executed between the City of Los Angeles and Metro to implement the pilot system. On July 7, 2016, the Downtown Los Angeles pilot was launched with 65 stations on the ground (62 of which are active today). Through September 2016, there had been over 55,000 rides, averaging one ride per bike per day. By the end of the year, the total number of trips had almost doubled. The Downtown Los Angeles pilot was approved for a five-year extension in October of 2016.

Metro is working with other cities to join the system. The current contract with BTS allows for a regional bike share system with up to five phases including approximately nine different bike share ready communities in Los Angeles County, as identified in the Regional Bike Share Implementation Plan (adopted in June 2015). The plan outlines a five-phase plan for regional bike share, as shown in Table 1.

Table 1: Regional Bike Share Implementation Plan, project phasing (2015)

Phase	Status	Area	Number of Stations
Phase I	<i>pilot</i>	Downtown Los Angeles	65
Phase II	<i>recommended</i>	Pasadena	34
Phase III	<i>preliminary</i>	Central/University Park	65
Phase IV	<i>preliminary</i>	Hollywood and West Hollywood	53
Phase V	<i>preliminary</i>	Venice, Marina Del Rey, Huntington Park, North Hollywood, and East Los Angeles	37

Since the adoption of the Regional Bike Share Implementation Plan, three communities have confirmed that they are ready to have bike share launched within their jurisdiction: Pasadena, the Port of Los Angeles, and Venice. In October of 2016, the Board authorized the three communities for bike share implementation and funding. Venice and Pasadena are slated to be online Summer 2017, with Port of Los Angeles system following soon after. The next step is to identify future expansion areas through feasibility studies for over 20 cities or neighborhoods identified in the plan. The feasibility studies will include rough costs, recommendations for station density and quantity, and, for cities further along in the process, preliminary station siting. The cities for expansion are still being determined, however, Culver City neighbor Marina Del Rey is a likely candidate.

Decision Process

The process for a city to join the Metro Bike Share system is as follows. After a city notifies Metro of its intent to join, Metro drafts an MOU for adoption by both the city council and the Metro board. At the same time, Metro will exercise an option in its operations contract with BTS to increase the size of the system and add the new service area. Once the Board has authorized expansion into a new community, a purchase order for bike share capital can be placed. Metro estimates it takes approximately 6-7 months from when the purchase order is placed to launch the system.

All aspects of the process considered, the estimated timeline for Culver City to launch a bike share within the Metro system would be approximately one year from action by City Council. While the current BTS contract is limited to a number of bikes, it would be able to accommodate Culver City within this contract.

System Size and Service Area

In July 2015, a Metro board report included an initial estimate for a potential Culver City system with Metro. The system contemplated at the time would have had a total of 144 bikes distributed over 10 stations within Culver City. The estimate was generated by applying a system-wide station density to a set of mapping factors. However, Metro has expressed that the estimate is just a starting point for discussion and that they would work with Culver City to develop a system that was appropriate, provided that Culver City provides justification for its bike share system plans. According to the report, if Culver City

were to expand a bike share system outside its jurisdictional boundaries, Metro could help facilitate station siting and procedures to make an expanded system possible. The service area would not have to be limited to Culver City only, and the neighboring areas of Palms and Playa Vista could be incorporated into the Culver City phase.

Business Model and Funding Structure

Metro Bike Share is publicly owned and privately operated. Under this model, Metro owns the equipment (including the bikes, kiosks, and technology) and contracts out the O&M (including repair and maintenance of bikes, rebalancing bikes, technology and website, customer service, outreach, and marketing) to BTS. Metro intends to retain ownership of the regionally integrated system in all cities for the long-term and periodically rebid its operations contract to maintain competitive pricing. Metro shares the cost of the system with participating cities by funding up to 50% of total capital costs per city and up to 35% of net operations and maintenance (O&M) costs per city on an ongoing basis. Participating cities are responsible for paying the balance for the initial capital investment and continued operations. User fees from annual and monthly memberships and daily use fees would pay for a portion of the O&M costs.

Revenue Sources

Revenue – User Fees

Currently, the fare structure includes three fare options for Metro Bike Share. Users can purchase either a monthly pass or annual flex pass, or pay a walk-up rate. The monthly pass costs \$20 and is valid for 30 days and has unlimited half-hour trips. Any trips longer than 30 minutes are charged at the rate of \$1.75 per extra half hour. The flex pass is a pay-per-trip pass with an annual fee of \$40. Trips up to 30 minutes each are \$1.75 each, with an additional charge of \$1.75 per extra hour. The walk-up fare option does not require a pass and charges a flat \$3.50 per trip up to 30 minutes each, with \$3.50 charged per extra half hour. The monthly pass and the flex pass can only be purchased online (on a computer or mobile device). Walk-up trips can be purchased with a credit/debit card at the payment kiosk available at each bike share station.

Metro retains control over the fare structure, including the ability to adjust it in the future. Any change to fare structure would be automatically applied to the system in Culver City. This would provide integration with the rest of the Metro system, emphasizing a singular regional bike share system. The current Metro fare structure has a limited and simple menu of pass options. The three options are also flexible and streamlined to meet the diverse needs of communities that may need to serve user bases composed of local residents, workers, and visitors. However at \$240 per year for unlimited use and \$3.50 per walk-up trip, Metro fares are relatively high for bike share and may be limiting potential ridership.

Revenue – Sponsorship and Advertising

Metro is currently looking for a system-wide title sponsor. Metro's contract with BTS includes a provision for sponsorship, and the black Metro bicycle provides flexibility to add sponsor placement with decals on the body, skirt guard, and basket at a later time. BTS staff is currently working with their partner Spectra to find compatible sponsors. Spectra has experience securing bike share sponsorships. Revenue that would be generated from a title sponsor would first be applied to Metro's portion of financial commitment, though this is subject to renegotiation. In their current forecasts, Metro estimates that the sponsorship will be valued at more than the 35% operations share, so cities could potentially share in the proceeds of a sponsorship deal.

In the Metro system, Culver City may seek station sponsorships. Revenue from station sponsorship would be applied to Culver City's portion of financial commitment, and does not need to be shared with Metro. Metro estimates that up to \$10,000 to \$20,000 could be generated per station sponsor. It is likely that Culver City's billboard ordinance, which prohibits ad panels on station kiosks, would limit the value of potential station sponsorships. While advertising options in Culver City may be limited, there are other

forms of value that Metro would offer potential sponsors, including free social media, digital and marketing material, and digital sponsorship on Metro's bike share website.

Technology

The Metro Bike Share system uses B-Cycle bikes and bike share technology. The Downtown Los Angeles pilot installed a traditional smart dock system. In early 2018, B-Cycle plans to introduce a smart bike, called "B-Cycle Dash," and then incorporate electric assist (e-assist) in 2018. The Dash smart bikes will be able to dock at standard smart dock stations, enabling interoperability between a Metro smart bike system and the current equipment installed in Downtown Los Angeles. More information is needed to see if the e-assist will be compatible with previous systems as well. Hardwired stations are likely needed in order to charge e-assist bicycles.

Equity and Accessibility

With board direction, Metro considered equity early in the development of its business plan. Metro prepared a Title VI equity analysis to evaluate the bike share program's accessibility to low-income people and people of color. A grant-funded partnership with the Los Angeles County Bicycle Coalition (LACBC) and Multicultural Communities for Mobility (MCM) is currently gathering additional input into the system from low-income and Spanish-speaking users. In addition, BTS collects demographic data online when users sign up, allowing Metro to analyze user characteristics.

Metro designed its fare structure system to be flexible and streamlined to meet the diverse needs of communities that may need to serve user bases composed of local residents, tourists, or both. For instance, the overage charge rate does not escalate and thus supports users who may be traveling from greater distances to access a transit station or a final destination. The walk-up rate is priced to accommodate all users, including low-income riders. The flex pass option is the most affordable option for occasional users. This pass provides transit dependent users who are the most price-sensitive a low annual entry fee at \$40. The \$40 flex pass fee could be further subsidized or waived for low-income riders to provide access to the system at the lower \$1.75 per ride fare, the same price as Metro bus fare. Further integration with transit fares, potentially including free transfers, could make the system even more accessible to low-income customers.

Metro Bike Share has a limited number of handcycles available to customers who call the operations center. Upon receiving a request, BTS will deliver the special cycle to a customer within the service area. This service is not currently well publicized and therefore not frequently utilized.

Future Development and Expansion

Metro has extensive plans to expand the bike share system into other areas of Los Angeles County in order to create a truly regional system. Metro is also moving towards greater integration with transit services to encourage bike share as a first/last-mile solution for transit riders.

Downtown Los Angeles

In October 2016, Metro approved extending the Downtown Los Angeles Pilot for a period of 5 years at a cost of \$19.7 million.

Pasadena

The City of Pasadena was identified through the 2015 Board adopted Implementation Plan as Phase II of the Metro Bike Share program. Expansion to Pasadena will include approximately 34 stations with a scheduled launch for summer 2017. This launch date reflects a one-year acceleration over what was included in BTS's contract. The cost of expansion to Pasadena was \$12.9 million (inclusive of an initial two-year pilot for \$4.7 million plus options for four additional years). The cost of the Pasadena expansion will be shared between Metro and the City of Pasadena.

Venice

Expansion to Venice was identified through the 2015 Regional Implementation Plan as Phase V of the Metro Bike Share program. Indicators for success such as density, existing bikeway network, and support contributed to advancing the Venice expansion. In line with board direction and in an effort to address system interoperability, the Venice expansion will also explore siting stations within the City of Santa Monica. The City of Los Angeles and the City of Santa Monica have an MOU allowing for up to five bike share station locations to be located in the other's right-of-way in order to facilitate inter-jurisdictional trips. Five Santa Monica Breeze stations are already located in the City of Los Angeles jurisdiction in Venice. The two cities and Metro have agreed to collaborate in working toward interoperability and user-friendliness. An accelerated launch in Venice is being accomplished by exercising a portion of Phase III in the BTS contract.

Metro's expansion to Venice and Santa Monica will include up to 15 stations with a summer 2017 launch date. Due to economies of scale, 82 stations were purchased as part of the DTLA Pilot, with 65 implemented and 17 stations available for expansion in other areas of the City of Los Angeles. The City of Los Angeles has indicated they would like to allocate 15 of these stations to Venice and Santa Monica. The summer 2017 launch date reflects a two-year acceleration of a portion of Phase III in BTS's contract with a cost for expansion of \$5.1 million.

Port of Los Angeles

The Port of Los Angeles has also expressed interest in joining Metro Bike Share to provide visitors and residents with improved connectivity between key waterfront attractions. Expansion to the Port of Los Angeles will include approximately 11 stations, with a scheduled launch for summer 2017. The \$4.9 million cost of the Port of Los Angeles expansion will be shared between Metro and the Port.

In addition to expansion to these three areas, Metro has also conducted outreach to plan and prepare for expansion phases in other communities considered to be ready for bike share. Metro previously conducted working groups with the City of Los Angeles, Huntington Park, County of Los Angeles, Culver City, and Pasadena. Metro prepared a draft financial analysis and timeline for planning and implementation of bike share for these communities. Metro has also presented to cities in the San Fernando Valley, the San Gabriel Valley Council of Governments Transportation Committee and Planners TAC, and South Bay Councils of Governments on Metro Countywide Bike Share Program. Burbank, Downey, Glendale, and San Fernando have all indicated interest in joining Metro's Bike Share program.

Regional Interoperability

Metro's stated goal is to have all bike share systems in the region participate in the operation of a single system and is aiming towards creating a "seamless user experience." With the development of the Westside CycleHop bike share systems, Metro plans to continue to coordinate with these cities and leave open the possibility that the CycleHop systems could be integrated into the Metro Bike Share system in the future.

The Transit Access Program (TAP) card, which allows users to ride seamlessly across Los Angeles County, is one of the main instruments Metro has pursued to create an integrated experience between Metro Bike Share, transit, and other bike share systems. The TAP card allows users to load stored value (money) as well as a variety of passes and transfers for travel across transit agencies in Los Angeles County, although these features are not yet available for bike share. At this time, bike share customers can associate their bike share account with their TAP card, but they must first register with Metro Bike Share online and provide a credit card to cover bike share charges. Stored cash value on a TAP card may not be used for Metro Bike Share at this time, but Metro is working to allow this to happen soon. Metro is currently undergoing approval for an Interoperability Strategy, which was developed in the Regional Implementation Plan and fleshed out late 2015.

Currently there is no integration between Metro Bike Share and other municipal bike share systems, though there is discussion to use TAP to better integrate bike share systems across Los Angeles County. Santa Monica Breeze also allows customers to associate their TAP card with their membership account, but bike share customers still cannot use TAP stored value and memberships are not yet reciprocated between the systems. Reciprocal memberships would require greater backend integration between CycleHop, BTS, and TAP to facilitate payments. Allocation of membership revenues would also need to be negotiated between Metro and the other systems.

Transit Integration

As a transit agency and the agency behind the TAP card, Metro is in a unique position to facilitate an integrated mobility system for Los Angeles County. In the 2015 Regional Bike Share Implementation Plan, Metro considered several types of fare structures that would allow “seamless integration” between Metro bike share and Metro bus and rail fares.

A seamless user integration, which is still under development, would link account registration and/or payment for multiple Metro services and bike share. In order to create this type of integration, Metro anticipates that the development of a regional back-office and clearinghouse and/or the procurement of a third-party intermediary service provider would be required. Metro estimates that the implementation of such a system would occur with the Metro Phase II Expansion.

CycleHop

Background

In late fall of 2015, the City of Santa Monica launched the Santa Monica Breeze public bike share program, operated by CycleHop with equipment from Social Bicycles (SoBi). After the adoption of the 2011 Bike Action Plan, the City of Santa Monica aspired to prioritize the development of a bike share system that would offer the community a convenient way to connect with transit and with the districts that are the heart of the Santa Monica community. Santa Monica was successful in receiving grant funds through Metro’s Call for Projects and from South Coast Air Quality Management District (AQMD). In February 2014, the City advanced with an open, competitive procurement process to select a bidder for the installation and operation of a bike share system. Around this time, Metro was developing its own business model for a regional bike share system, with plans to issue its own Request for Proposals in the following year. However, the City of Santa Monica decided to move forward with selecting a bike share operator prior to Metro advancing, as postponement would have caused the City to lose its federal grant funds and would have delayed the implementation of a Santa Monica bike share system for at least a year. In November 2014, the City of Santa Monica selected CycleHop to implement and operate their bike share system. The Santa Monica Breeze bike share system is comprised of 500 bikes and has over 80 hubs throughout the City of Santa Monica, along with five additional hubs in neighboring Venice in the City of Los Angeles.

During the development of its bike share system, the City of Santa Monica worked closely with the Westside Cities Council of Governments (WSCCOG) to ensure that the system would support the development of a coordinated bike share system for the Westside that would be affordable, support transit, and work well throughout the region. Since Breeze launched in 2015, Beverly Hills, West Hollywood, and Long Beach have all followed, launching their own bike share systems with CycleHop as the operator. CycleHop is the largest smart bike system operator in North America. Smart bikes have the technology located directly on the bikes, which means that the bikes do not require a smart dock and can also be locked to any public bike rack, increasing user flexibility and convenience. The flexibility of the system means that CycleHop programs in Los Angeles County allow riders to lock bikes outside of stations for a nominal fee, or outside the system boundary for a more substantial penalty fee.

The Beverly Hills Bike Share program was launched in May 2016, with 50 smart bikes and 11 stations in Beverly Hills. The adjacent City of West Hollywood launched its bike share program, WeHo Pedals, in August 2016, with 150 bikes at 20 stations throughout West Hollywood. While each city manages and funds its program separately, both the Beverly Hills and WeHo Pedals bike share programs share a system boundary, which is the area in which users can lock their bikes from either system without incurring a penalty fee. Long Beach Bike Share was launched in March 2016, with 500 bikes at 50 stations. Its service area covers roughly the southern half of the city of Long Beach, from the Los Angeles River to the San Gabriel River, between the Pacific Ocean and Pacific Coast Highway/Stearns Street.

Decision Process

Cities participating in the Westside system negotiate a contract directly with CycleHop. The Santa Monica contract with CycleHop includes a “me too” clause that specifies that CycleHop must offer the same pricing to other cities on the Westside. CycleHop can provide templates for the contract to expedite the process. CycleHop has said that from the time a contract is signed, a bike share system for Culver City could be on the ground within six months. The six-month timeline is flexible, as CycleHop can also do a test fleet prior to a full system launch. Culver City staff has participated in semi-regular Westside bike share coordination meetings with other cities and would coordinate system expansion with this group.

System Size and Service Area

The size and system area for a Culver City bike share system with CycleHop would be defined based on the Culver City’s needs and requirements, and does not have to be limited to areas within Culver City’s jurisdiction. CycleHop systems set a system boundary within which users can ride and park their bikes without incurring any penalty fees. If a user parks a bike outside of the system boundary, they incur a fee, the rate of which has been set by the operator. ‘Stations’ are more broadly defined in CycleHop systems and can either be bike share-specific hubs for both bike pick-up and drop-off or existing physical infrastructure with designated areas for bike drop-off. The CycleHop bike share system model also allows for rapid expansion and growth due to the flexible technology and cost of deployment.

With smart bike technology, station and system boundaries are defined by “geo-fences” or, virtual boundaries for real-world geographic areas. Culver City, like other Westside bike share system operators, would be able to define stations by drawing GPS coordinates on the CycleHop software platform to “geo-fence” an area as a defined station. Geo-fenced stations can be drawn around official bike share system stations as well as existing bike racks or bike corrals, including outside Culver City’s jurisdiction. The system would be able to recognize when a bike is inside a station through the on-board GPS on each bicycle. The flexibility of defining stations with CycleHop allows Culver City to leverage currently installed infrastructure where appropriate. Signage near existing infrastructure utilized for the bike share system would help inform the public the existence of a bike share drop-off and would display safety, customer service, and nearby station information.

With a CycleHop system, Culver City may not need the same degree of station density as a traditional bike share system. CycleHop may be able to utilize existing infrastructure in the City of Los Angeles or work with private property owners to place new stations to include areas outside of Culver City in the service area. CycleHop could provide a team of staff that would target businesses outside Culver City to site stations on private property. In order to site new station infrastructure on City of Los Angeles right-of-way, CycleHop would need to work with the City of Los Angeles to obtain necessary permits. There would be a cost to secure these permits.

Business Model and Funding Structure

CycleHop is flexible with the business model for a Culver City bike share system, and has utilized different structures for various cities in Los Angeles County. Because the CycleHop system is not eligible for Metro

funding, any business model would rely more heavily on local funding, in addition to user fees, sponsorships, and/or advertising revenue.

The current framework for Santa Monica, Beverly Hills, and West Hollywood is that all equipment is city-owned and paid for by the city. CycleHop operates the system for a fixed annual fee and generates revenue for the city. Under this framework, Culver City would own all capital including bikes, and CycleHop would operate and manage the system, rebalancing stations and move bikes to where they are needed most. CycleHop would also provide logistical handling, bicycle/station assembly and installation, technology setup, testing and training, and warehouses and rebalancing vehicles. Any revenue generated from user fees are tied to the operator that owns the bike, so Culver City bikes would generate revenue for Culver City, even if they are used in Los Angeles or other nearby jurisdictions. Sponsorship deals would be separate from the City-CycleHop contract, and Culver City would retain all revenue from any potential sponsor deal.

Another option for Culver City would be to follow a Long Beach-type business model. In this structure, Culver City would pay for all equipment, but CycleHop assumes responsibility for the ongoing operation costs in exchange for keeping all revenue from users, sponsorship, and advertising. CycleHop would take all revenue generated by the bike share system but they would also be assuming all risk. Culver City could negotiate for revenue to be shared after a certain period of time, but only once a profitability threshold is met. In Long Beach, funding for the bike share system came from a \$2.3 million Metro Call for Projects grant. Aside from the City investment of \$565,000 in matching funds for the initial purchase of the 500 bicycles, Long Beach Bike Share will operate without cost to the City. As discussed later, the Metro Call for Projects is no longer a funding source for bike share.

Revenue Sources

Revenue – User Fees

CycleHop has the ability to customize a user fee structure to meet the unique needs of Culver City, given that each bike share system operates independently. However, a user fee system that drastically diverges from what currently exists in other Westside cities could potentially cause confusion for customers. Culver City would likely adopt a user fee structure similar to other Westside cities bike share systems, which provide a menu of fee options. Santa Monica, West Hollywood, and Beverly Hills all have Pay As You Go (PAUG), Monthly, Annual, and Student plans. Long Beach also has a PAUG plan, but the other options are prepaid, monthly basic, and a monthly plus plan. All four systems also have the following additional fees:

- Overtime fees, prorated by the minute or hour
- Fee for leaving bike outside a station/hub location within the service boundary
- Fee for leaving bike outside the system boundary (penalty fee)
- Credit for return “out-of-hub” bike to a bike share system hub location

The Pay As You Go (PAUG) payment plan is intended for customers seeking short-term access to their local bike share program. In some systems, this plan may include a small *one-time* or *yearly* fee for setting up a subscription with the bike share operator. Once registered, the customer simply pays for the time they ride the bikes. The hourly fee is prorated based on riding time. New customers are often charged in advance for their first hour of riding, or can add additional credit to their account when signing up. When a PAUG customer rides, their usage fees are deducted from this balance. If the customer's balance falls below a threshold (varies per program) then the member's card on file is charged.

The Monthly payment plan includes between 60 and 90 minutes of rental time each calendar day for 30 days, depending on the system. Additional minutes are charged at the PAUG rate. The Annual payment

plan also includes 60-90 minutes of rental time each calendar day. Additional minutes are charged at the PAUG rate.

Revenue – Sponsorship and Advertising

CycleHop aims to increase the financial sustainability of the Westside system by pursuing additional sponsorship revenue, in partnership with the cities that own each system. CycleHop is trying two approaches to securing title sponsorships – either finding one sponsor to cover all Westside cities or securing a sponsor for each entity. CycleHop recognizes that each city is a brand and has an identity, therefore they are sensitive to selecting the appropriate sponsor that would be a good fit for Culver City's brand. If they secure one sponsor for all the Westside city systems in the next year, they would reevaluate the selection if Culver City joins after, or will find a different sponsor for Culver City. CycleHop is currently in advanced discussions with three brands, and estimates that it takes about 1.5 years to sell sponsorships. CycleHop estimates revenue being up to \$1,500-\$1,750 per bike per year for a title sponsorship and \$500 per bike per year for sponsorship/advertising on station kiosks. CycleHop believes Culver City has high media value and does not foresee difficulties in securing a sponsor for a Culver City bike share system.

Sponsorship deals are typically a 5-year deal with a 3-year out, meaning the deal can last anywhere between 3 to 5 years. Sponsorship deals typically factor in a 3% escalation rate to account for inflation. Any deal can be terminated under unforeseen circumstance, including expansion of the bike share system, which would result in a larger sponsorship package. If the incumbent sponsor does not accept the larger sponsorship package, Culver City will be able to go out and find a new sponsor.

Individual station sponsorships are also a good option to help defray the City's capital and operations costs. The City can also contract with CycleHop to sell station sponsorships on behalf of the City. CycleHop stations typically have a smaller footprint than traditional bike share kiosks, so there is less space available for advertising. According to CycleHop, Culver City's billboard ordinance does not pose a significant financial challenge.

CycleHop seeks to maximize the value of potential digital media sponsorship opportunities, as all of the user base and user interactions funnel either through the mobile app or website. CycleHop can guarantee views to a potential digital sponsor. For example, the CycleHop system already utilizes geofences to delineate stations and system boundaries. This concept can be expanded to create geofences for push notifications for sponsor business that get triggered when a user locks a bike in a geofence near a local business.

Technology

CycleHop bike share systems utilize SoBi's smart bike technology, which eliminates expensive dock infrastructure by placing all the technology for renting, releasing and locking the bicycles on the bike rather than on the racks. Smart bikes have onboard GPS, which communicates via a GSM connection with stations and system boundaries defined by GPS geofences. The onboard technology allows the following:

1. **Parking:** With smart bikes, bicycles are available at stations and the onboard technology allows users to lock the bike to any available bicycle rack. All available bikes are shown on the smart phone app and online. Credits are offered to users who return bikes to station areas, reducing the burden of rebalancing bicycles, and lowering the cost to bike share users. Additionally, each bike can be reserved in advance through the mobile app or online, and accessible with the reserved user's PIN code or TAP card. Smart bikes can also be placed on "Hold" for quick stops, so that users do not have to end a ride for short stops.

2. **Apps:** Riders can use a mobile app to reserve bikes, pay for rental, find available bikes using real-time GPS, track rides online, and share their rides with their social networks.
3. **Data:** With GPS data embedded on all smart bikes, Culver City would be able to collect data on travel patterns and system usage. This information could potentially help Culver City in a number of ways, including:
 - a. Tracking reductions total miles traveled via bike share;
 - b. Informing the need and location of future station locations;
 - c. Identifying high-demand bike routes for future bike infrastructure.
4. **Payment:** With the smart bike model, each bike is capable of accepting payments and releasing the bike-locking mechanism independently via a mobile, web, and administrative software that interacts with the smart-bike hardware.
5. **Footprint:** Smart bike racks are more slender and lighter than smart stations. This is due to fact that the locking mechanism is on the bike itself, eliminating the need for electrical power at stations to operate kiosks and docking mechanisms. The onboard technology can diminish infrastructure costs and eliminate the potential for failure caused by conventional kiosks. Kiosks are optional with the CycleHop system, which can reduce costs and increase flexibility in deployment.

These advantages are similar for all smart bike systems.

Equity and Accessibility

At the discretion of each city, some CycleHop programs have implemented fare discounts for targeted groups. For example, Santa Monica Breeze offers a special \$7 monthly membership for students. Santa Monica Breeze has also developed a partnership with the Community Corporation of Santa Monica to promote bike share to affordable housing residents.

CycleHop, with SoBi, is capable of introducing more accessible bicycle types into the Culver City bike share system. Feasibility-wise, CycleHop could integrate accessible bicycles as a special service within the bike share system, rather than including specially equipped bicycles in the general fleet. However, there are no currently existing accessible bicycles in service or in the pipeline. Provision of helmets and expansion to bikes for children and families could also be integrated, but would have to be driven by Culver City.

Future Development and Expansion

CycleHop is currently working with the Westside cities to develop a long-term plan for integration of the various discrete systems and bring additional partners on board to fill gaps in the current service area between participating cities. The next phase in CycleHop's expansion is a bike share system at UCLA and the surrounding neighborhood of Westwood, in Los Angeles, which is set to launch spring 2017. The system is anticipated to have 130 bikes located in 16 hubs, with two hubs located in the Westwood Village. Some property owners in Century City are also in preliminary talks with CycleHop to locate stations there, though it is unclear how non-governmental partners would be accommodated within the Westside cities bike share working group.

Regional Interoperability

Currently, the only interoperability with Metro's system is that CycleHop's on-bike computers have the ability to read the type of card technology used by the Metro TAP card. Metro will soon complete

upgrades to the TAP system that will enable greater functionality, such as access to stored value, for both Metro Bike Share and the Westside system, if CycleHop develops compatible software.

Within the Westside, as previously mentioned, each city's bike share system has different system boundaries (with the exception of Beverly Hills and West Hollywood, which share a system boundary). Users are fined for locking a bike outside of the system boundary of the bike share system they are riding, and bikes outside of each system's boundaries have to be rebalanced by CycleHop.

The next step for regional interoperability is to provide reciprocal memberships for all of the Westside cities, and this is underway. This would allow members in the Culver City system to also use the systems in Santa Monica, Beverly Hills, and West Hollywood, though it would not yet allow customers to ride between the various service areas. Each city's bike share system would continue to be branded and operated as separate systems and the service areas may still not be contiguous.

CycleHop's vision is to develop a greater system service area that encompasses all Westside cities, although none of the current contracts or MOUs provide for operating a unified system. This would merge each bike share system's geofences into one large contiguous area with no fines for locking a bike anywhere within the entire Westside system boundary. If this integration were to occur, there is discussion to call the entire system "Westside Ride" and forgo all individual system names. Assigning revenue in this situation is still being determined, but the general concept is that revenue would be assigned from point of origin, not based on which city owns the actual bike. To allow this to occur, the backend technology would have to be modified and contracts and MOUs would need to be renegotiated.

Zagster

Background

Zagster specializes in providing relatively smaller bike share systems in campus environments. Zagster has only a limited presence in Southern California, including having bikes at a couple corporate campuses in Playa Vista. As a new entrant into the Los Angeles County bike share landscape, Zagster has not yet addressed any of the local barriers that both CycleHop and Metro have had to overcome in order to launch public bike share systems.

Decision Process

In order for Culver City to launch a Zagster bike share system, a Master Services Agreement (MSA) would be negotiated directly between Culver City and Zagster. Zagster would be able to provide a standard form MSA. Zagster's timeframe from when the program is approved to launch could be as short as 30-45 days, depending on the size of the launch.

System Size and Service Area

Zagster has system planning capabilities to recommend a bike share system size, system design, and feasibility analysis for Culver City. Zagster would work collaboratively with Culver City to identify bike share station locations and develop a station planning map for the system, which could include stations beyond Culver City boundaries. Culver City could modify the recommended system, either by adding additional stations to the recommendation or relocating recommended stations to other locations.

If Culver City were interested in having stations in the City of Los Angeles, Zagster would seek an MOU with the City of Los Angeles to permit stations in the public right-of-way. As part of the Albuquerque, NM, system, Zagster signed a separate agreement with the City of Santa Fe, NM, to expand the program so that residents that utilize the system as a first mile/last mile connection would be able to rent bikes in Santa Fe under Albuquerque's program.

Business Model and Funding Structure

Zagster's business model is based on an all-inclusive, flat per-bike fee. Zagster would own all of the equipment for Culver City's bike share system, which saves the City from having to purchase depreciating assets. Zagster would manage all aspects of the bike share program in partnership with the City. The flat fee would include the following:

- Dedicated launch team and success manager
- System planning consultation
- Marketing consultation and material production
- Bike delivery, setup, and installation
- Station sign production and station installation
- Ongoing bike maintenance and parts replacement
- Ongoing marketing and account support
- Staffed phone and email support for riders
- Access to analytic dashboards
- Theft and vandalism coverage
- Liability coverage for bikes and stations

All operations and maintenance related to the bike share program is included in the cost of the Zagster service. Zagster maintains all bikes on a routine basis to make sure that the program is operating effectively and safely. This includes performing all repairs and replacements on bikes to keep them in working order, rebalancing bikes, and providing 24/7 customer support via phone and email.

Revenue Sources

Revenue – User Fees

Pricing, membership plans, and eligibility varies across Zagster bike share systems. Typically, several types of membership are available, including a 24-hour membership, weekly membership, monthly membership, and/or annual membership. Zagster would recommend a fare structure that best fits Culver City, but ultimately the City would be able to dictate the fare structure for the bike share system. Zagster would collect revenue from customers and would return 93% of the revenue to the City, less a 7% credit card processing fee.

Revenue – Sponsorship and Advertising

Like under the Metro and CycleHop options, the City would be free to pursue sponsorship deals. Culver City would be solely responsible for securing a title sponsor with no restrictions from other partners. The City could also pursue station sponsorships, subject to the City's billboard ordinance, and other potential forms of sponsorship.

Technology

The standard Zagster smart bikes have a step-through frame design that's aimed for ease of ridership and stability. Each bike is equipped with 8 gears, front and rear LED lights, a bell, and a front basket. All bikes are equipped with fenders, a chain guard, and a U-lock that allows riders to lock the bike anywhere, including regular bike racks.

Equity and Accessibility

Zagster provides accessible bikes as part of its system offerings. Currently Zagster has incorporated accessible bikes into bike share systems at Ohio State University; and in Corvallis, OR; Rome, NY; Westminster, CO; Fort Collins, CO; Carmel, IN; and College Park, MD. Accessible bikes enable access

for riders who would otherwise be unable to use bike-share systems. In a system with accessible bikes, parking hubs for accessible bikes would be available at each location, subject to operational constraints, to allow for parking and interconnectivity between locations. Some types of accessible bikes are shown in Figure 7.

Figure 7: Zagster bicycle options



VI. High-Level Financial Feasibility Analysis

A financial analysis was used to estimate potential costs and revenues that would be incurred by Culver City and its partners for a five-year period. Three potential bike share vendors were considered: Metro Bike Share, CycleHop, and Zagster. Analyses were performed using data and inputs provided by the vendors and derived from publicly available data sets. Revenue projections were developed based on the ridership estimate described in Section IV and applied to each vendor's fare structure. The low ridership estimate was used to be conservative. For each vendor, total costs were calculated for each year, as well as totaled across a five-year timeline to allow for a comprehensive assessment and informed comparison between the vendors being considered. The five-year analysis extends from fiscal year 2017/18 to fiscal year 2022/23. The initial results were shared with each of the vendors to allow for their review and feedback.

Each vendor offers different equipment types and contract structures, resulting in varying capital, operating, and maintenance costs, as well as revenue and cost sharing assumptions. Five scenarios were analyzed:

1. *Metro Smart Dock*: an expansion of the current Metro Bike Share system, with the same equipment type as in Downtown Los Angeles, in which Metro, Culver City, and the City of Los Angeles share financial responsibility.
2. *Metro Smart Bike*: an expansion of the Metro system, using smart bike equipment that integrates with the Metro smart docks, in which Metro, Culver City, and the City of Los Angeles share financial responsibility.
3. *CycleHop – Santa Monica (SM)*: an expansion of the Westside cities smart bike system using a "Santa Monica" type fee-for-service contract in which Culver City pays for both capital and operations and assumes financial risk.
4. *CycleHop – Long Beach (LB)*: an expansion of the Westside cities smart bike system using a "Long Beach" type risk/revenue-sharing contract in which Culver City pays for capital costs and CycleHop carries the operating risk and keeps all revenue.
5. *Zagster*: a new independent smart bike system with a fee-for-service contract in which Culver City pays a flat per bike annual operating fee to Zagster and keeps all revenue, except for a credit card processing fee.

In the two Metro scenarios, the City of Los Angeles will participate as a full partner, so Culver City is only financially responsible for the portion of the system within Culver City limits. Under the other three scenarios, Culver City is financially responsible for the entire proposed system, irrespective of jurisdictional boundaries. In these three scenarios, the City of Los Angeles would conduct permitting and station siting within its jurisdiction, but Culver City would need to reimburse these costs. For consistency, a station siting and permit cost of **\$5,960 per station** was applied to all proposed stations in the system.

Metro Bike Share

Choosing the current Metro Bike Share vendor for expansion into Culver City would result in Culver City being only responsible for the cost of 28 Smart Docks or 280 Smart Bikes installed within its municipal borders. Similarly, Culver City would only be eligible for a share of the revenue generated by equipment within its borders. The City of Los Angeles would be financially responsible for the additional 34 Smart Docks or 340 Smart Bikes to be installed in Palms, Playa Vista, and other Los Angeles neighborhoods.

As an incentive, Metro shares a portion of the capital and operations costs for cities that participate in its system. Metro pays for 50% of the capital costs of installation, as well as 35% of the ongoing net operations and maintenance costs.

Metro provided two alternatives for equipment type: a traditional Smart Dock system like in Downtown Los Angeles and a new Smart Bike system similar to the technology used in Santa Monica and Long Beach. Under either option, Culver City would see a total of 28 docks/280 bikes deployed within their municipal borders.

Costs

For the Smart Dock option, capital costs were reported by LA Metro of **\$65,860 per docking station** (equivalent to \$6,586 per bike). For Smart Bikes, reported capital costs were **\$3,800 per bike**. The \$5,960 per station siting and permit cost was added to these capital costs. For the Smart Bike option, it was assumed that the \$5,960 cost would be applied for every 10 bikes. These costs were multiplied by the planned number of stations or bikes to obtain the total capital required for equipment. Metro will pay for 50% of the capital costs for equipment associated with either equipment option, with Culver City being responsible for the other 50% plus the station siting and permit costs. The full capital cost of all equipment and municipal fees was assumed to be realized in year one of the analysis.

Annual operating and maintenance costs were reported as either a per docking station or per bike cost, depending on the equipment alternative selected. Metro reports an annual operating and maintenance cost of **\$30,960 per docking station** (equivalent to \$3,096 per bike) for the Smart Dock option, or **\$2,220 per bike** for the Smart Bike option. As per Metro's standard agreement with other municipalities, these costs are invoiced to the city at the end of each year, reflecting actual net operating and maintenance costs incurred. Additionally, as per their standard agreement, Culver City would be invoiced for 65% of this annual cost, with Metro covering the remaining 35%. For both the Smart Dock and Smart Bike options, it was assumed that only 40% of the operating and maintenance cost would be incurred in the first year of operation. This assumption was based on the lower maintenance required in the first year of operation, as well as the anticipated mid-year roll out of the new system. In subsequent analysis years, the full operating and maintenance cost was assumed, and escalated by 3% each year to account for inflation and other factors.

For each year, including the first, 65% of the net operating and maintenance costs were assumed to be the responsibility of Culver City, with the remaining 35% assumed by Metro.

Revenue

Three main revenue streams were assumed for each of the operators considered:

1. Revenue from Rides: All revenue collected as a result of actual usage of the bike share system.
2. Revenue from Passes: Revenue generated from the sale of daily, monthly, or annual passes.
3. Potential Sponsorship: Potential revenue generated from title and/or station sponsor agreements.

To project revenue generated from rides, ridership data from the existing Metro Bike Share system from the fourth quarter of 2016 was analyzed to determine the proportion of rides resulting from walk-ups, monthly, or annual passes, and was then further categorized by trip duration to determine any overage charges.

The full expansion of the bike share system in this region would include the installation of 62 new Smart Dock stations or 620 Smart Bikes in Culver City, Playa Vista, and other areas immediately surrounding Culver City. A projected ridership of 15,000 trips per month was used. Applying the fare type and trip duration proportions calculated from the existing system, as well as the existing fare structure to calculate

the expected additional revenue generated from these 15,000 new riders per month, yielded a total annual revenue of **\$322,805**. This revenue was assumed to be consistent whether the Smart Dock or Smart Bike alternatives were selected.

Determining the revenue generated by equipment located within Culver City itself was calculated by simply assigning a portion of the total revenue proportional to the number of Smart Docks or Smart Bikes to be located in Culver City, equating to an annual revenue of **\$145,783**. For year one of the analysis, it was assumed that only 40% of the total revenue would be realized, due to an anticipated partial year of operation. For subsequent analysis years, the full annual revenue was assumed, and escalated 3% each year to account for inflation and other factors.

Metro reported that in they have sold 3,425 passes within the existing bike share network. To determine anticipated revenue generated from the sale of passes, the breakdown of pass type reported in the fourth quarter 2016 ridership numbers was assessed, and it was inferred that 90% of these sales were monthly passes and the remaining 10% were annual flex passes. Extrapolating to the ridership projected for the bike share expansion and applying the existing fare structure, the sale of passes would generate an additional **\$79,197 per year**. The portion of this total revenue that would be generated by Culver City equipment was calculated by assigning a share proportional to the Smart Docks or Smart Bikes within the city limits, yielding an annual revenue for Culver City of **\$35,766**. This revenue was assumed to be consistent whether the Smart Dock or Smart Bike alternatives is selected.

For year one of the analysis, it was assumed that only 40% of the total revenue would be realized, due to an anticipated partial year of operation. For subsequent analysis years, the full annual revenue was assumed, escalated 3% each year to account for inflation and other factors.

The anticipated revenue generated by the sale of title and/or station sponsorships was estimated using the conservatively low yield of **\$1,100 per bike** for all scenarios. Calculating revenue generated by this stream was done by assuming no revenue would occur in year one due to the lag time in securing sponsorship deals, with the full revenue stream being realized in each subsequent year, escalated by 3% each year to account for inflation and other factors.

Net Cash Flow

Finally, the City's net cash flow was calculated as the difference between the City's share of capital costs, operating costs, and revenue. It was assumed that operating revenue would be split the same way as operating expenses with Metro retaining 35% and sharing 65% with the City.

Totaling across all five years of the analysis resulted in a five-year cost to Culver City of **\$2,323,986** for the Smart Dock option, of which **\$1,088,920** is for capital expenses and approximately **\$580,000 per year** is for operations.

The projected five-year cost to Culver City of the Smart Bike alternative is **\$1,183,159**, of which **\$698,880** is for capital expenses and approximately **\$90,000 per year** is for operations.

The large difference in costs is primarily related to the significantly lower capital, operating, and maintenance costs reported for the Smart Bike alternative.

CycleHop Bike Share

The CycleHop option would install a bike share system entirely comprised of smart bikes. Under this scenario, Culver City would be responsible for the costs of installing and maintaining the 620 Smart Bikes to be located in Culver City, Palms, Playa Vista, and other Los Angeles neighborhoods within the 12-square-mile service area.

CycleHop has entered into a variety of revenue and cost sharing agreements with different cities in the United States. To provide a comparison of the potential costs to Culver City associated with opting for alternative agreements, two cost/revenue sharing agreement variations were analyzed.

The first, similar to the current agreement between CycleHop and the City of Santa Monica, assumes that Culver City would be responsible for the full capital costs and annual operating costs, but would also collect 100% of all revenue generated by the sale of passes, rides, and corporate sponsorships and advertising. In other words, the City bears the financial risk of operations.

The second contract structure variation analyzed is similar to the current agreement between CycleHop and the City of Long Beach. Under this structure, Culver City would be responsible for 100% of all capital costs and municipal fees to install the system in year one. Subsequently, CycleHop would assume responsibility for all operating and maintenance costs, and would also retain 100% of all revenue generated from the sale of passes, rides, and corporate sponsorships and advertising. Under this model, the City would only be responsible for a fixed one-time capital cost with zero ongoing operational subsidy. However, the City may also have less oversight over service levels and other policy goals if the system is managed to maximize profitability instead of other public benefits.

Costs

CycleHop reported that their Smart Bikes require a capital investment of **\$2,940 per bike** under the fee-for-service “Santa Monica” model. CycleHop reported a higher **\$3,540 per bike** in the risk-sharing “Long Beach” model in order to offset their operational risk. Additionally, a cost of **\$6,960 per station** (10 bikes) will be required to cover the costs of siting stations, necessary permitting, and other approvals (\$5,960 municipal staff time + \$1,000 for CycleHop staff time). These costs were multiplied by the planned 620 smart bikes to obtain the total capital cost of the system, which was assumed to be realized in year one of the analysis.

Under the “Santa Monica” model, annual operating costs would be invoiced to the city by CycleHop as an annual fee of **\$2,220 per bike**. It was assumed that only 40% of the total operating costs would be invoiced in year one due to a partial year of operations. The full operations fee was assumed for all subsequent analysis years, escalated by 3% each year to account for inflation and other factors.

Under the “Long Beach” model, CycleHop would not charge the City an annual operations fee and instead collect user and sponsorship revenue directly. CycleHop would assume the financial risk of any operational losses that accrue if the system is not profitable.

Revenue

As with Metro Bike Share, revenue from the CycleHop system would be generated by three main streams: revenue from rides, revenue from the sale of passes, and revenue generated by the sale of title and/or station sponsorships.

To determine the revenue generated by rides, it was assumed that the same breakdown of pass type and trip duration could be used as realized in the Metro ridership data from the fourth quarter of 2016. This was done because it was assumed that Culver City’s ridership patterns (i.e. relative quantity of each type of pass sold) would be more similar to Downtown Los Angeles than Santa Monica, the latter of which is a compact beachfront city that is more bikeable and a popular tourist destination. Applying this same breakdown to CycleHop’s fare structure yields a total annual revenue of **\$298,448** generated from the 620 smart bikes. It was assumed that only 40% of this potential revenue would be realized in year one of the analysis due to a partial year of operation. The full revenue was assumed for all subsequent analysis years, escalated by 3% per year to account for inflation and other factors.

Calculating the revenue generated by the sale of passes with the CycleHop alternative was done by assuming the same number of monthly and annual passes sold as the LA Metro Bike Share alternative and applying the CycleHop fare structure. This yielded a total annual revenue of **\$116,685** from the sale of passes. It was assumed that only 40% of this potential revenue would be realized in year one of the analysis due to a partial year of operation. The full revenue was assumed for all subsequent analysis years, escalated by 3% per year to account for inflation and other factors.

The anticipated revenue generated by the sale of title and/or station sponsorships was estimated using the conservatively low yield of **\$1,100 per bike**. CycleHop reported a potentially higher yield from this revenue source, however it was unclear how realistic these higher revenue targets would be given Culver City's advertising policies that limit billboard-type displays. Calculating revenue generated by this stream was done by assuming no revenue would occur in year one due to the lag time in securing sponsorship deals, with the full revenue stream being realized in each subsequent year, escalated by 3% each year to account for inflation and other factors.

Net Cash Flow

Under the CycleHop "Santa Monica" contract structure, the total five-year cost to Culver City was calculated at **\$3,783,834**. Of this, **\$2,254,320** would be for capital costs and net annual operations costs would be approximately **\$275,000 per year**.

Under the CycleHop "Long Beach" contract structure, the total five-year cost to Culver City was calculated at **\$2,626,320**. This cost would entirely be for capital costs with no ongoing operations subsidy from the City.

Zagster Bike Share

The Zagster option would install a bike share system entirely comprised of smart bikes. As with the CycleHop options, Culver City would be responsible for the costs of installing and maintaining the 620 Smart Bikes to be located in Culver City, Playa Vista, and the surrounding Los Angeles area.

Costs

Zagster reported that their Smart Bikes would require no capital investment from Culver City. Instead, Culver City would be charged a flat **\$1,800 per bike** annual fee to cover the equipment, operating and maintenance of the system. This fee would be set for five years, with no escalation year-to-year. The full \$1,800 per bike fee is assumed to be applied in year one, regardless of a partial year of operations.

Like the other systems, a cost of **\$5,960 per dock** (10 bikes) was assumed to cover the costs of siting stations, necessary permitting, and other approvals. The full cost of municipal fees was assumed to be realized in year one of the analysis.

Revenue

As with previous operators, revenue from the Zagster system would be generated by three main streams: revenue from rides, revenue from the sale of passes, and revenue generated by the sale of title and/or station sponsorships. As per Zagster standard agreement with municipalities, Zagster returns 93% of all revenue collected from rides and the sale of passes to the City and retains 7% to cover credit card processing.

To determine the revenue generated by rides, the same methodology as previously described was applied to the Zagster fare structure. Using this methodology, the total annual revenue to the City (93% of total) generated by rides was calculated to be **\$220,583**. It was assumed that only 40% of this potential revenue would be realized in year one of the analysis due to a partial year of operation. The full revenue

was assumed for all subsequent analysis years, escalated by 3% per year to account for inflation and other factors.

Calculating the revenue generated by the sale of passes with the Zagster alternative was done by assuming the same number of monthly and annual passes sold as in the Metro Bike Share and CycleHop alternatives, and applying the Zagster fare structure. 93% of the revenue from the sale of passes calculated using this methodology yields a total annual revenue of **\$100,471**. It was assumed that only 40% of this potential revenue would be realized in year one of the analysis due to a partial year of operation. The full revenue was assumed for all subsequent analysis years, escalated by 3% per year to account for inflation and other factors.

As with other vendors, it was assumed that annual revenue generated from the sale of corporate sponsorships and advertising would be **\$1,100 per bike** under the Zagster alternative. Calculating revenue generated by this stream was done by assuming no revenue would occur in year one due to the lag time in securing sponsorship deals, with the full revenue stream being realized in each subsequent year, escalated by 3% each year to account for inflation and other factors.

Net Cash Flow

Under the Zagster option, the total five-year cost to Culver City was calculated to be **\$1,498,800**. Of this, **\$1,357,098** reflects start-up costs in year one and an operational subsidy of **\$80,000 per year** gradually decreases over time. The decreasing operational subsidy is based on an assumption of revenue escalating at 3% per year while the operations fee stays flat.

Summary of Alternatives

The five-year net cash flow for Culver City under the five scenarios analyzed is summarized in Table 2.

Table 2: Summary of financial analysis

Option	First Year Capital Costs*	Launch Year Net Operations	Full Year Net Operations	5-year Culver City Total Cost
1 Metro – Smart Dock	\$1,088,920	\$178,186	\$252,623	\$2,323,986
2 Metro – Smart Bike	\$698,880	\$114,413	\$88,408	\$1,183,159
3 CycleHop (SM)	\$2,254,320	\$379,547	\$274,873	\$3,783,834
4 CycleHop (LB)	\$2,626,320	\$0	\$0	\$2,626,320
5 Zagster	Included in Ops	\$1,357,098	\$82,854	\$1,498,800

* This includes staff time for station planning and permit fees.

While all five options are financially feasible, the Metro Smart Bike option has the lowest cost to Culver City at only \$1,183,159 over the five-year study period. The lower cost to Culver City of the Metro option reflects cost-sharing with the City of Los Angeles and Metro to serve the entire proposed 12-square-mile service area. The Smart Bike option has significantly lower capital and O&M expenses than the Smart Dock option.

Potential Funding Sources

Some cities pursue grants in order to fund their bike share systems, particularly for startup capital costs. Most of the systems in Los Angeles County were initially funded by the Metro Call for Projects, a regional grant program for multimodal projects available every two years. Since adopting a standard bike share

funding formula, Metro effectively no longer funds bike share through the Call for Projects. Since 2015, all cities receiving Metro funding for bike share have been required to join the Metro Bike Share system.

If Culver City decides not to join the Metro Bike Share system, the California Active Transportation Program (ATP) is one of the only other grant funding sources. If Culver City opts for a Metro Bike Share system, Culver City could apply for ATP funding as a partner with Metro. Depending on the award amount, Culver City would have to negotiate with Metro to determine the split for applying the grant to system costs. While bike share is eligible for ATP funding, it is unlikely that an application would be competitive, judging by projects funded in previous ATP cycles.

The City has a variety of transportation funding sources available at the local level, in addition to the City's general fund. Bike share is eligible for local return from Proposition A, Proposition C, Measure R, and Measure M sales taxes. Recently passed by voters in November 2016, Measure M local return will provide an additional \$565,000 per year that has not yet been allocated by City Council. Bike share is also eligible for Transportation Development Act (TDA) Article 3 funding. The City may also seek contributions from developers as mitigation for traffic impacts from upcoming projects.

VII. Risks and Barriers

There are several risks and barriers to implementing bike share in Culver City that are not easily quantified in the financial analysis. The impact of these potential risks and barriers on achieving the goals and objectives set out for the bike share system is discussed qualitatively below.

Financial Considerations

- The financial analysis makes a series of assumptions about potential revenue sources including ridership, pass sales, and sponsorships. These assumptions were conservative, but as with any predictions about future events contain an inherent level of risk. If ridership is below expectations, or if the mix of walk-up customers and members is different than projected, then the system may require a greater operating subsidy from the City. If it takes longer than anticipated to secure sponsorships, then the system may require more public funding in the first couple years. Conversely, the system could exceed ridership projections and potentially even prove profitable for the City.
- Culver City's billboard ordinance limits the ability to earn advertising revenue from ad panels on bike share stations. However, branding on the bicycles or other sponsor recognition is still possible. Greater exploration of what is and is not permissible under City ordinance is needed before making more precise revenue assumptions.

Metro Bike Share

- The financial analysis assumes that the City of Los Angeles will pay for all expenses associated with bikes and stations located outside of Culver City boundaries. This relies on the City of Los Angeles deciding to implement bike share in their portion of the proposed service area at the same time or shortly after Culver City. If Los Angeles decides not to install bike share in these communities, or makes it a low priority, that could affect the utility of Culver City's system, with impacts on both ridership and revenue. Culver City will need to work in partnership with LADOT and L.A. Council Districts 5 and 11 to secure Los Angeles' participation in a shared system.
- The Metro Bike Share system currently uses Smart Dock technology for their Downtown Los Angeles service area. If Culver City decides to pursue Smart Bikes instead, the City would need to work with both Metro and the City of Los Angeles to implement the new technology in the proposed service area. LADOT has indicated a preliminary willingness to install smart bikes in the Westside service area if Culver City does. The City of Los Angeles could decide not to install smart bikes, in which case there could be interoperability issues with Culver City's system. If the City of Los Angeles decides not to install smart bikes, Culver City could choose to install the more expensive Metro Smart Dock system or to go with a different operator.
- There have been recent discussions that Metro could change their bike share fare structure to encourage more ridership, which could have financial implications for participating cities if the result is lower revenue from riders. Culver City would be only one voice in a decision-making process about fare policy, but future decisions could affect the City's annual costs. Culver City would need to work with other cities in the Metro system to advocate for fare policies that are financially sustainable, or to advocate for a greater operating subsidy from Metro.

- Metro is pursuing full integration between bike share and the TAP transit fare card, potentially allowing for seamless transfers and a single fare between modes. This could increase the transportation utility of the bike share system, essentially recognizing that it is a natural extension of public transportation, which would help to achieve the City's goals of regional integration and easy fare payment. However, it could also reduce revenue from rides and/or pass sales, potentially increasing the City's annual costs. Again, Culver City would need to work with other cities in the Metro system to advocate for fare policies that are financially sustainable, or to advocate for a greater operating subsidy from Metro.
- A Culver City Metro bike share system would be owned and operated by Metro, reducing Culver City's direct ability to enforce operational standards or control other aspects of the system.

CycleHop

- Although the CycleHop system would be interoperable with the other systems on the Westside in Santa Monica, Beverly Hills, and West Hollywood, it is not clear how or whether these systems will be fully integrated. Currently, each city owns their own bikes and operates their system independently, with membership reciprocity across all CycleHop systems. At present, customers are not allowed to ride from one service area to another (e.g. from Beverly Hills to Santa Monica) without incurring a penalty fee, though this may change in the near future. However, there is not a clear path forward for a fully integrated "Westside Ride" system with truly unified operations. Without full integration, there are extra operational costs such as returning bikes back to their home service area every night. There may also be conflicts between operational constraints and sponsorship agreements if bikes are not circulating in the sponsor's target media market.
- Even if Culver City joins the Westside system, there is no clear plan to serve the portions of the City of Los Angeles between Culver City and the other Westside cities, leaving gaps in the service area. For example, Santa Monica Breeze has an expansive system boundary that extends all the way to the 405 on the east and Venice Blvd to the south, nominally covering Mar Vista, Brentwood, and West L.A. However, these communities do not have stations, meaning that residents and employees do not have reliable access to bike share. Thus, the Breeze service area is actually a smaller geographic area that would not be contiguous with the proposed Culver City service area. This could impact the system's ability to achieve the first goal of serving all Culver City residents and adjacent areas. It also potentially limits the Culver City system from being seamless with the other Westside CycleHop systems, since there could be large gaps between station areas between the independent cities.

Service Area: The portion of the community within convenient walking distance of a bike share station.

System Boundary: The geographic area within which the bike share customers may ride without incurring a penalty fee.
- Under the "Long Beach" contract model, the system is assumed to be operationally self-sufficient. It could be difficult to enforce operational standards, especially if ridership and advertising revenue are lower than expected and CycleHop is not profitable. This could impact the system's ability to achieve the City's goal of providing a minimum level of service to all neighborhoods within the service area if some neighborhoods aren't profitable.
- Metro is the region's primary transportation funding agency. Culver City is likely only able to access funding from Metro if implementing Metro's bike share system. If Culver City were to pursue a non-Metro system, the City would be the first jurisdiction to request an exemption from

Metro's funding policy. This could limit Culver City's ability to apply for and receive public funding from Metro. As previously discussed, this makes a Metro system financially advantageous.

- Siting stations for a non-Metro system in the City of Los Angeles could be more difficult and costly without the full support of Metro and LADOT. This could limit the ability to site stations where they would have the greatest benefit instead of where it is easiest. This could impact the system's ability to connect Culver City seamlessly with the neighboring areas and could undermine ridership and revenue predictions.

Zagster

- A Zagster system would introduce a third bike share operator to the region that would not be integrated with either of the two existing systems. Some of the higher cost of the Metro and CycleHop systems includes a level of TAP integration that may not be feasible for Zagster, or may come at additional cost. Introducing a third operator could reduce the utility of the system and suppress potential ridership and revenue. It could also impact Culver City resident's ability to purchase a membership that would be reciprocated by the other systems in Los Angeles County.
- Like under the CycleHop options, Culver City is likely only able to access funding from Metro if implementing Metro's bike share system. If Culver City were to pursue a non-Metro system, the City would be the first jurisdiction to request an exemption from Metro's funding policy. This could limit Culver City's ability to apply for and receive public funding from Metro. As previously discussed, this makes a Metro system financially advantageous.
- Like under the CycleHop options, siting stations for a non-Metro system in the City of Los Angeles could be more difficult and costly without the full support of Metro and LADOT. This could limit the ability to site stations where they would have the greatest benefit instead of where it is easiest. This could impact the system's ability to connect Culver City seamlessly with the neighboring areas and could undermine ridership and revenue predictions.

VIII. Recommendations and Next Steps

Recommended System

The four primary goals of a bike share system for Culver City are:

1. Increase access by integrating seamlessly with adjacent communities and by connecting to transit and points of interest.
2. Serve all residents of Culver City, despite geography, financial situation, physical ability, or ethnicity.
3. Be cost-effective and minimize reliance on sustained financial support from the City.
4. Be adaptable to meet new challenges and priorities, and able to expand in the future.

In addition to these goals, there are several operational standards (see Section III). In consideration of these goals, operational standards, and the results of the financial analysis, it is recommended that Culver City pursue a Metro Smart Bike system in partnership with the City of Los Angeles. Metro Bike Share achieves the stated goals and operational standards with the greatest certainty (see Section VII) of the systems considered with the most favorable financial implications for the City (see Section VI).

A system of 620 smart bikes and approximately 62 stations will provide adequate service for the proposed 12-square-mile service area at a projected cost to Culver City of \$1.18 million over five years, with Metro and the City of Los Angeles paying for the remainder of the system. Of the proposed 620 bikes, 280 would be physically located within Culver City boundaries. The City would incur a one-time \$700,000 capital cost for equipment and station siting and would need to budget for a projected ongoing operational subsidy of approximately \$90,000 per year.

Potential Implementation Timeline

If the City decides to implement the recommended Metro Bike Share system, there are key steps the City must take. The timeline below provides for system launch as early as May 2018. The City of Los Angeles would need to undertake a similar approval process in parallel. Ideally, Los Angeles and Culver City's systems could launch at the same time with a completely integrated planning and outreach process. Depending on how quickly the City of Los Angeles is able to proceed, Culver City may decide to launch at a later date or to pursue a phased approach with only a portion of the system following this timeline.

Approval

1. Draft MOU with Metro (April – June 2017)
2. Refine final system size and cost estimate (April 2017)
3. City Council approves MOU with Metro and includes bike share in City budget (May/June 2017)
4. Metro Board approves MOU and BTS contract amendment (June/July 2017)

Outreach

5. Begin public outreach with an informational booth, sample station and bikes, and a tactile (in-person) crowdsourcing map. If timing allows, this outreach could begin at CicLAVia on March 26.
6. Launch an online countywide crowdsourcing map so that the public can suggest locations for bike share stations. (April – ongoing)

7. Launch a digital Culver City crowdsourcing map with service area (September – November 2017)
8. Conduct additional outreach with key business and community stakeholders. Have public presentations at farmers markets and other public events. (October 2017 to launch)

Station Mobilization

9. Order smart bike equipment from B-Cycle (August/September 2017)
10. Metro Board approves Programmatic CEQA Finding and Title VI Analysis (Fall/Winter 2017)
11. Final site planning, station design, and permitting (November 2017 – February 2018)
12. Equipment mobilization (March 2018)
13. Installation (April 2018)
14. System launch (May 2018, National Bike Month)

IX. Appendix: Financial Analysis

The following spreadsheets show the projected costs, revenues, and net cash flow of each bike share system alternative for the City of Culver City. For the two Metro Bike Share alternatives, costs to the City of Los Angeles are also shown.

Metro - Smart Dock

Culver City			Year 1 FY 17/18	Year 2 FY 18/19	Year 3 FY 19/20	Year 4 FY 20/21	Year 5 FY 21/22	TOTALS
Total Number of Stations		28	28					
Total Number of Bikes (10 bikes/sta)		280	280					
Capital Costs								
Cost per station*		\$ 65,860	\$ 1,844,080					\$ 1,844,080
Municipal staff costs/station		\$ 5,960	\$ 166,880					\$ 166,880
Total Capital		\$ 2,010,960						\$ 2,010,960
Culver City/Metro Contributions	Metro Contributions		\$ 922,040					\$ 922,040
	Culver City Contributions (up to 50% capital + muni costs)		\$ 1,088,920					\$ 1,088,920
Operating & Maintenance Costs (O&M)								
Cost per Station*		\$ 30,960						
Escalation per Year		3%						
Total Costs±			\$ 346,752	\$ 892,886	\$ 919,673	\$ 947,263	\$ 975,681	\$ 4,082,256
Culver City/Metro Contributions	Metro Contributions (35%)		\$ 121,363	\$ 312,510	\$ 321,886	\$ 331,542	\$ 341,488	\$ 1,428,789
	Culver City Contributions (65%)		\$ 225,389	\$ 580,376	\$ 597,787	\$ 615,721	\$ 634,193	\$ 2,653,466
Revenues ±±±								
Revenue from Rides±		\$ 145,783	\$ 58,313	\$ 150,156	\$ 154,661	\$ 159,301	\$ 164,080	\$ 686,512
Revenue from Passes±		\$ 35,766	\$ 14,306	\$ 36,839	\$ 37,944	\$ 39,083	\$ 40,255	\$ 168,428
Potential Sponsorship±±		\$ 1,100	\$ -	\$ 317,240	\$ 326,757	\$ 336,560	\$ 346,657	\$ 1,327,214
Net Cash Flow								
Metro Contributions (35%)			\$ 1,017,986	\$ 136,028	\$ 140,109	\$ 144,312	\$ 148,641	\$ 1,587,076
Culver City Contributions (65%)			\$ 1,267,106	\$ 252,623	\$ 260,202	\$ 268,008	\$ 276,048	\$ 2,323,986
TOTAL CULVER CITY 5 YEAR COST								\$ 2,323,986
TOTAL CULVER CITY 5 YEAR COST - Maximum Exposure (no ridership)								\$ 2,879,697

Los Angeles (Including Playa Vista)			Year 1 FY 17/18	Year 2 FY 18/19	Year 3 FY 19/20	Year 4 FY 20/21	Year 5 FY 21/22	TOTALS
Total Number of Stations		34	34					
Total Number of Bikes (10 bikes/sta)		340	340					
Capital Costs								
Cost per station		\$ 65,860	\$ 2,239,240					\$ 2,239,240
Municipal staff costs/station		\$ 5,960	\$ 202,640					\$ 202,640
Total Capital		\$ 2,441,880						\$ 2,441,880
LA/Metro Contributions	Metro Contributions (up to 50% capital + muni costs)		\$ 1,322,260					\$ 1,322,260
	Los Angeles Contributions		\$ 1,119,620					\$ 1,119,620
Operating & Maintenance Costs (O&M)								
Cost per Station		\$ 30,960						
Escalation per Year		3%						
Total Costs			\$ 421,056	\$ 1,084,219	\$ 1,116,746	\$ 1,150,248	\$ 1,184,756	\$ 4,957,025
LA/Metro Contributions	Metro Contributions (35%)		\$ 147,370	\$ 379,477	\$ 390,861	\$ 402,587	\$ 414,664	\$ 1,734,959
	Los Angeles Contributions (65%)		\$ 273,686	\$ 704,742	\$ 725,885	\$ 747,661	\$ 770,091	\$ 3,222,066
Revenues								
Revenue from Rides		\$ 177,022	\$ 70,809	\$ 182,333	\$ 187,803	\$ 193,437	\$ 199,240	\$ 833,621
Revenue from Passes		\$ 43,430	\$ 17,372	\$ 44,733	\$ 46,075	\$ 47,458	\$ 48,881	\$ 204,520
Potential Sponsorship	Annual per bike	\$ 1,100	\$ -	\$ 385,220	\$ 396,777	\$ 408,680	\$ 420,940	\$ 1,611,617
Net Cash Flow								
Metro Contributions			\$ 1,438,766	\$ 165,177	\$ 170,132	\$ 175,236	\$ 180,493	\$ 2,129,803
Los Angeles Contributions			\$ 1,335,989	\$ 306,756	\$ 315,959	\$ 325,438	\$ 335,201	\$ 2,619,343
TOTAL LOS ANGELES 5 YEAR COST (includes Playa Vista) \$ 2,619,343								

Assumptions and Data Sources

* Capital costs for equipment provided by Metro via comments on financial analysis, 2/16/2017

** Conservatively low assumption based on 2/17/2017 phone call with Metro

± Assumed 40% of full-year operating & maitenance costs and ridership revenue in Year 1, 100% in subsequent years

±± Assumed 0% of potential sponsorship in Year 1, 100% of potential revenue thereafter

±±± Assumed that revenues are split 35/65 between Metro and Culver City

2) Metro - Smart Bike

Los Angeles (Including Playa Vista)			Year 1 FY 17/18	Year 2 FY 18/19	Year 3 FY 19/20	Year 4 FY 20/21	Year 5 FY 21/22	TOTALS
Total Number of Stations		34	34					
Total Number of Bikes (10 bikes/sta)		340	340					
Capital Costs								
Cost per Bike		\$ 3,800	\$ 1,292,000					
Municipal staff costs/station		\$ 5,960	\$ 202,640					
Total Capital			\$ 1,494,640					\$ 1,494,640
Plams/Metro Contributions	Metro Contributions (up to 50% capital + muni costs)		\$ 848,640					\$ 848,640
	Los Angeles Contributions		\$ 646,000					\$ 646,000
Operating & Maintenance Costs (O&M)								
Cost per Bike		\$ 2,220						
Escalation per Year		3%						
Total Costs			\$ 301,920	\$ 777,444	\$ 800,767	\$ 824,790	\$ 849,534	\$ 3,554,456
Playa Vista/Metro Contributions	Metro Contributions (35%)		\$ 105,672	\$ 272,105	\$ 280,269	\$ 288,677	\$ 297,337	\$ 1,244,059
	Los Angeles Contributions (65%)		\$ 196,248	\$ 505,339	\$ 520,499	\$ 536,114	\$ 552,197	\$ 2,310,396
Revenues								
Revenue from Rides		\$ 177,022	\$ 70,809	\$ 182,333	\$ 187,803	\$ 193,437	\$ 199,240	\$ 833,621
Revenue from Passes		\$ 43,430	\$ 17,372	\$ 44,733	\$ 46,075	\$ 47,458	\$ 48,881	\$ 204,520
Potential Sponsorship		\$ 1,100	\$ -	\$ 385,220	\$ 396,777	\$ 408,680	\$ 420,940	\$ 1,611,617
Net Cash Flow								
Metro Contributions			\$ 923,449	\$ 57,805	\$ 59,539	\$ 61,326	\$ 63,165	\$ 1,165,284
Los Angeles Contributions			\$ 784,930	\$ 107,353	\$ 110,573	\$ 113,890	\$ 117,307	\$ 1,234,054
TOTAL LOS ANGELES 5 YEAR COST (includes Playa Vista) \$ 1,234,054								

Assumptions and Data Sources

* Capital costs for equipment provided by Metro via comments on financial analysis, 2/16/2017

** Conservatively low assumption based on 2/17/2017 phone call with Metro

± Assumed 40% of full-year operating & maitenance costs and ridership revenue in Year 1, 100% in subsequent years

±± Assumed 0% of potential sponsorship in Year 1, 100% of potential revenue thereafter

±±± Assumed that revenues are split 35/65 between Metro and Culver City

Assumptions and Data Sources

* Capital costs provided by CycleHop via comments on financial analysis, 2/21/2017.
Includes capital cost per bike plus start-up cost per bike. LB costs are higher than SM costs.

** Station siting and permitting costs provided by CycleHop via comments on financial analysis, 2/21/2017. Includes municipal staff hours plus CycleHop staff hours.

*** O&M costs provided by CycleHop via comments on financial analysis, 2/21/2017.

± Assumed 40% of full-year operating & maitenance costs and ridership revenue in Year 1, 100% in subsequent years

±± Assumed 0% of potential sponsorship in Year 1, 100% of potential revenue thereafter.
Assumed 100% of sponshorship revenue goes to the City.

±±± Assumed conservatively low estimate of \$1,100/bike of annual sponsorship revenue.

Assumptions and Data Sources

* Capital costs provided by CycleHop via comments on financial analysis, 2/21/2017.
Includes capital cost per bike plus start-up cost per bike. LB costs are higher than SM costs.

** Station siting and permitting costs provided by CycleHop via comments on financial
analysis, 2/21/2017. Includes municipal staff hours plus CycleHop staff hours.

*** O&M costs provided by CycleHop via comments on financial analysis, 2/21/2017.

± Assumed 40% of full-year operating & maintenance costs and ridership revenue in Year 1,
100% in subsequent years

±± Assumed 0% of potential sponsorship in Year 1, 100% of potential revenue thereafter.
Assumed 100% of sponshorship revenue goes to the City.

±±± Assumed conservatively low estimate of \$1,100/bike of annual sponsorship revenue.

Assumptions and Data Sources

* Zagster answer to questions - November 7, 2016 - No equipment costs to the city.
Equipments costs are included in the flat \$1,800/bike/year cost invoiced.

** Zagster answer to questions - November 7, 2016 - Flat O&M fee of \$1,800/bike/yr for five years.

± Assumes 40% of potential revenue is realized in Year 1, with 100% of the fee charged thereafter. Zagster collects the revenue and returns 93% of the revenue to Culver City, with a 7% credit card processing fee.

±± Assumed 0% of potential sponsorship in Year 1, 100% of potential revenue thereafter. Assumed 100% of sponshorship revenue goes to the City.

±±± Assumed conservatively low estimate of \$1,100/bike of annual sponsorship revenue.