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# Transportation Equity Through Cycling

Identifying Best Policies and Practices in  
Bicycle Incentive Programs

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Project Lead: Elliott Soong Shaw  
Faculty Advisor: Adam Millard-Ball  
Client: LADOT, Joshua Fogelson

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<b>16. Abstract</b> <p>Cities are continually turning towards more sustainable modes of transportation as many adopt initiatives and policies to reduce greenhouse gas emissions and increase quality of life. Active transportation is positioned at the center of this shift as many cities continually untether themselves from car travel and turn to walking/cycling as an alternative.</p> <p>One of the most effective alternatives to vehicular travel are bicycles, specifically electric bicycles (E-bikes). Cycling offers several mental and physical health benefits, and E-bikes dramatically reduce physical barriers to cycling through the addition of an electric motor that aids the user in propelling their bicycle.</p> <p>Bike Share programs have been active in North America for decades and have historically been the most accessible option for bicycle access to those who do not want the costs and responsibilities associated with ownership. As the need for public funding in Bike Share increases, some cities are turning to alternative Bicycle Incentive programs (any program that incentivises the increased adoption of bicycle use) to promote cycling modal share. Government bodies are capitalizing on the rising popularity of E-bikes and cycling in North America by designing and implementing more of these programs in the form of Purchase Subsidies, Leasing &amp; Ride-to-Own programs, and Low-Interest Loans.</p>			
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A decorative border of white bicycle icons surrounds the central white text area. The icons are arranged in a rectangular frame, with five icons along each of the top and bottom edges, and five icons along each of the left and right edges.

# Transportation Equity Through Cycling

Identifying Best Policies and Practices  
in Bicycle Incentive Programs

**Project Lead:** Elliott Soong Shaw  
**Faculty Supervisor:** Adam Millard-Ball  
**Client:** LADOT

*A comprehensive project submitted in partial satisfaction of the requirements  
for the degree Master of Urban and Regional Planning.*

**June 2023**

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# Executive Summary

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Metro Bike Share has been in operation since 2016 and is now seeking a new contractor to operate the program. My client LADOT has asked that I survey the available research on Bike Share and provide a report on current trends and best practices to inform the transition between the current operator and the new one. Bike Share presents several equity barriers that have come up in my research, so this process outlines those issues with some recommendations to create a more accessible bike share system.

Building on the equity lens, LADOT have also requested research on how to best utilize available funding to address incentivize cycling and increase its modal share. Through online research and semi-structured interviews, I gathered information on current and future purchase incentive programs. 11 programs were selected for this project and an email communication sent to each program team requesting an interview. In total 7 interviews were conducted with a variety of incentive programs.

My report focused on programs in the United States and Canada, as funding streams are similar in the two countries. Programs outside of these countries have funding streams and policies regarding e-bikes that are not entirely comparable, and they do offer examples that USA/CAN program models should aspire towards.

# Disclaimer

This report was prepared in partial fulfillment of the requirements for the Master in Urban and Regional Planning degree in the Department of Urban Planning at the University of California, Los Angeles. It was prepared at the direction of the Department and of LADOT as a planning client. The views expressed herein are those of the authors and not necessarily those of the Department the UCLA Luskin School of Public Affairs, UCLA as a whole, or the client.





# Literature Review

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## What is Bike Share

Bicycle Sharing as a concept originated during a 1965 protest action in Amsterdam.<sup>1</sup> As highlighted by Fishman in various articles, the concept of Bike Share originated through a political stunt in which white-painted bicycles were placed on the street for public use.<sup>2</sup> Eventually the bicycles were vandalized or stolen, but the underlying notion of bicycle access without ownership was carried forward through iterations like that of Copenhagen in the mid-90's<sup>3</sup> and Lyon in the early 2000's.<sup>4</sup> Modern-day bike share includes payment and security systems that were introduced for program liability and longevity.<sup>5</sup> As we look to the dominant user base, a pattern emerges: users generally skew young, White, and male-identifying with higher incomes and educational attainment.<sup>6</sup> As cities turn to bicycles and active transportation as a tool for mobility justice and public transportation, user demographics brings into question how equitable bike share is in practice.

Contemporary bike share is based on a rental service model, where the public can access use of a bicycle without the costs or responsibilities associated with ownership.<sup>7,8</sup> Bicycles are rented and used for the duration of a trip, then returned back to the system.<sup>9</sup> Trips are billed through structured fee and billing systems, and many programs offer income-qualified pricing to address cost-access barriers.<sup>10</sup>

Bike Share falls under the umbrella term micromobility, defined as “small and lightweight modes of transport with speeds less than 25km/h”<sup>11</sup> which includes bicycles, scooters, skateboards, and other rolling devices. These modes of transportation are becoming increasingly electrified, widening access to a new array of vehicles that reduce the physical capacity required for operation. Micromobility and e-micromobility, especially, has emerged as a popular transportation method for younger generations who are less reliant on cars and other automobiles.<sup>12</sup> Bike Share, and cycling in general, can improve physical or mental health and wellbeing,<sup>13</sup> address climate change actions,<sup>14</sup> reduce traffic congestion and VMT,<sup>15</sup> and promote transportation equity and mobility justice.<sup>16</sup>

# Benefits of Cycling and Bike Share

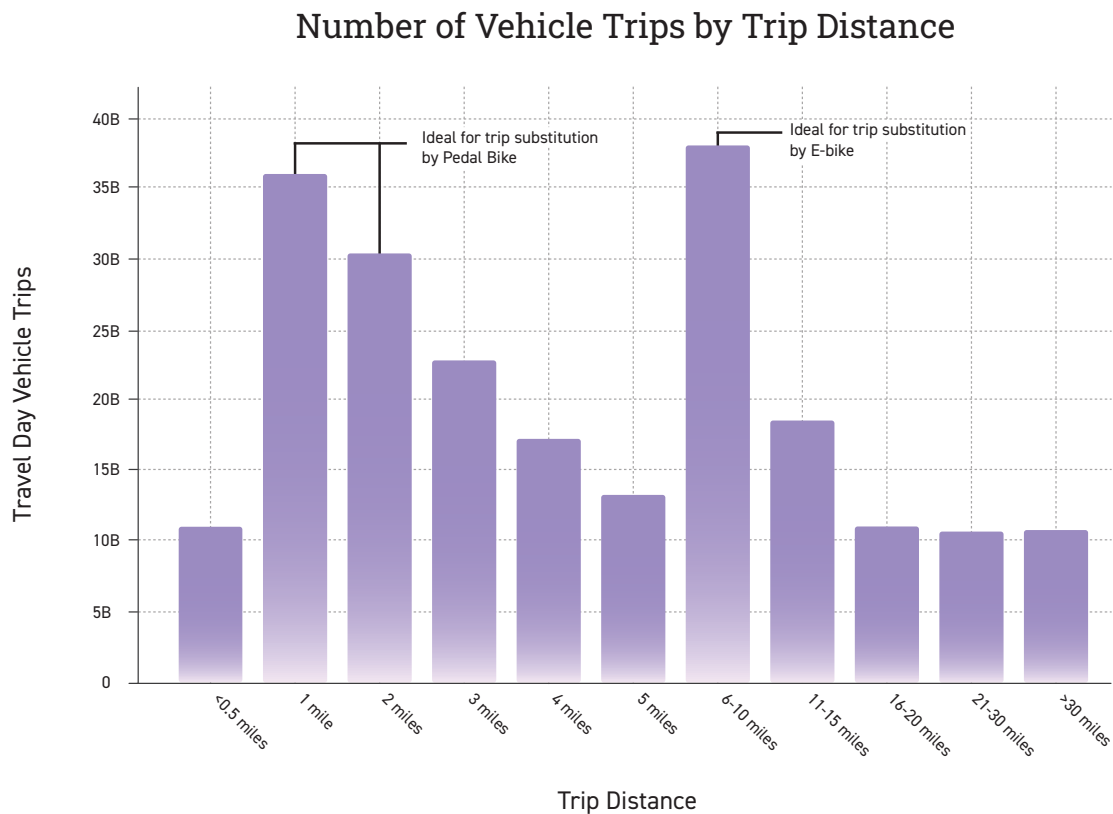


Figure 1. Vehicle Trips by Trip Distance, National Household Travel Survey<sup>20</sup>

Of the many benefits offered by cycling and Bike Share Systems (BSS), emissions reductions and improvements to physical and mental health are the most cited. In a study by Zheng & Li, the potential of bicycles to replace short trips by automobile is presented as a key incentive to adopt BSS and promote cycling more generally.<sup>17</sup> According to the Federal Highway Administration, most automobile trips fall under both the 1 and 2 mile categories, and the 6-10 mile category.<sup>18</sup> Most automobile trips below 2 miles are an ideal candidate for trip replacement by bicycle or electric bicycle (e-bike), and trips between 6 and 10 miles can be replaced, either partially or fully, by e-bike.<sup>19</sup>

Aside from trip replacement, physical activity through cycling has proven to reduce health risks, even when accounting for external side effects like pollution exposure.<sup>21</sup> One study examined positive effects of increased physical activity through cycling in Los Angeles, determining that a shift from automobiles to bicycles could reduce risk of mortality and prevent hundreds of health-related deaths.<sup>22</sup> Zheng & Li theorized that individual health care costs would be reduced (and therefore lesser the burden on the system at large) if individuals adopted cycling and increased physical activity, exhibiting how a communal shift towards cycling extends benefits beyond the individual.<sup>23</sup> Dill et al note that marginalized groups, such as low-income individuals and people of color, have lower rates of physical activity and lower access to opportunities for physical activity.<sup>24</sup>

## Equity in Cycling and Bike Share

Transportation equity and mobility justice describes reducing barriers to access until no person or group is disadvantaged by them.<sup>25</sup> When considering barriers among bike share programs most systems include an equity component in their plans, yet the same user demographics are repeated throughout their metrics.<sup>26</sup> This represents a clear disconnect between planning and implementation, and shaping programs that enable individuals of all backgrounds to participate should be the priority of every system.

Barriers to access include high use-costs, credit/debit card requirements, access to smartphones or the internet, negative perception and stigmas surrounding bicycle use, and a lack of knowledge about what BSS offer and how to use them.<sup>27</sup>

Steps toward a more equitable distribution of services include offering more stations within close proximity to each other, adoption of e-bikes and other adaptive bicycles, supporting alternative payment and use systems such as community passes and cash-payment options, and supporting the expansion of cycling-specific infrastructure and facilities.<sup>28</sup>

## Bicycle Incentive Programs

To further address equity barriers, subsidized incentive programs exist that can better suit the needs of low-income and other marginalized individuals. Bicycle incentive programs offer alternatives to bike share that address many of the downfalls and equity barriers. They describe any program that encourages the uptake of bicycle use, usually as a tool for replacing/reducing vehicular travel.<sup>29</sup> Incentive programs take many forms, including car swaps, lending/leasing libraries, bike-to-work events, bicycle mileage reimbursement programs, bicycle sharing & loan programs, and bicycle purchase subsidy programs.<sup>30</sup>

Currently, there are many programs being developed, piloted, and launched that incentivize the purchase of e-bikes through publicly funded subsidies. These subsidies come in the form of low-interest loans, point-of-sale (POS) discounts, or post-purchase reimbursement vouchers. The focus of these programs is primarily to increase the rate of bicycle ownership and ridership, subsequently reducing VMT, carbon emissions, and decreasing barriers to active transportation.<sup>31</sup>

# The Rise of Electric Bicycles

E-bikes have become the key driver behind incentive programs in recent years, as they dramatically reduce physical barriers to cycling while increasing range of travel.<sup>34</sup> Electrically assisted bicycles utilize an electric motor to either add power to the user's pedal strokes (pedal-assisted) or propel the bike via throttle system (throttle controlled).<sup>35</sup> Assistance from the motor enable riders to cycle longer distances across varied terrain and steep hills, and provide aided propulsion for carrying heavy cargo.<sup>36</sup>

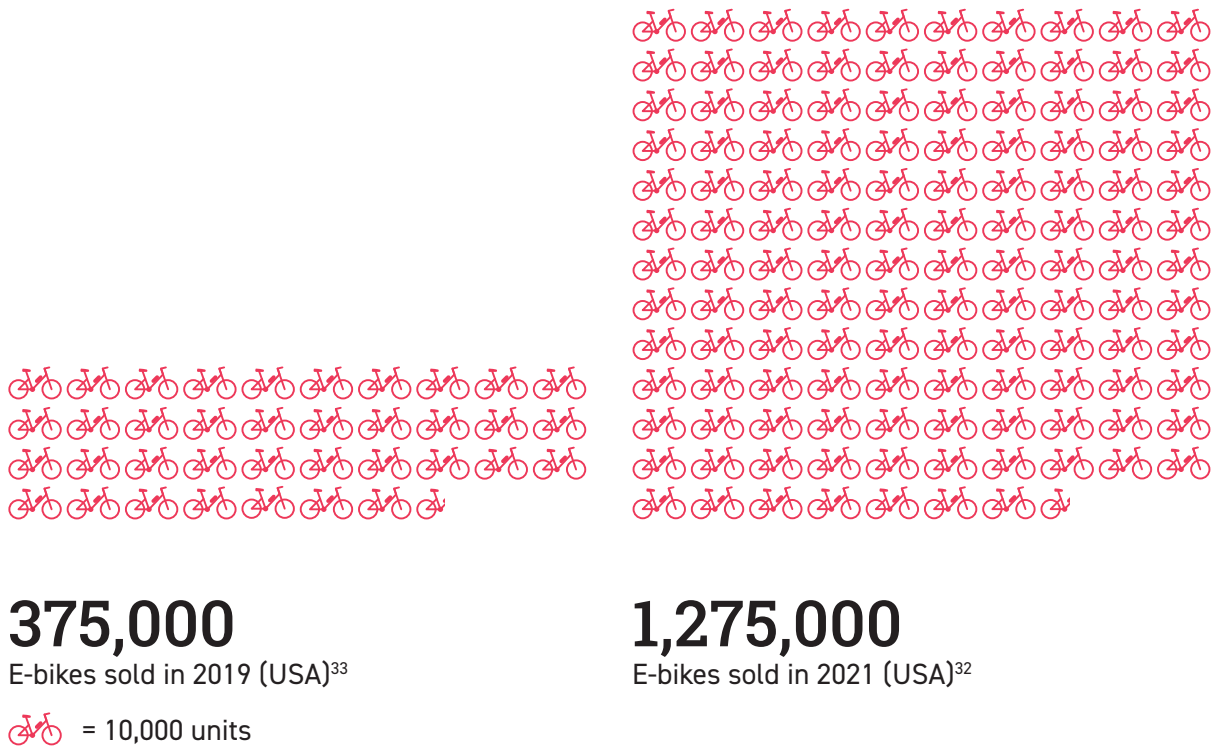


Figure 2. E-bike sales in the US 2019, 2021\*

\*Exact market details on e-bike sales are difficult to obtain. The numbers for Figure 2 were taken from a study by Portland State University's Transportation Research & Education Center and the National Institute for Transportation and Communities. Another study by the UC Davis Institute for Transportation Studies and the National Center for Sustainable Transportation offers slightly different numbers from the same market researcher, but the trend and overall takeaways are paralleled in showing an exponential increase in e-bike sales between 2018-2022.

The advantages offered by e-bikes are significant, and the general public is eager to utilize them for daily travel. One Canadian study found that bikeshare riders used e-bikes 3-5x more often and travelled an average of 1.7x further compared to trips on standard pedal bikes.<sup>37</sup>

Other studies have also shown that e-bikes are preferred for longer recreational trips, and that users are more willing to choose them when faced with high traffic congestion or poor public transit options.<sup>38</sup> In addition, e-bike sales and uptake have skyrocketed since the COVID-19 pandemic began, revealing an obvious desire in the market that public agencies can utilize to their advantage. The first two years of the pandemic created an environment where many people were walking and cycling, increasing exposure to bicycles and e-bikes and creating positive associations with active transportation.<sup>39</sup>

Growth in the e-bike industry has more than tripled between 2018 and 2022, as sales grew 122% between 2019 and 2020 alone (not accounting for the market share of direct-to-consumer sales) and increased additional 53% between 2020 and 2021.<sup>40</sup>



A critical barrier to e-bike adoption is up-front purchase costs, as the average price for most models fall between \$1,000 and \$3,000 with some specialized models, such as cargo or adaptive e-bikes, costing upwards of \$5,000.<sup>41</sup> For this reason many early adopters of e-bikes have been wealthier individuals who reside in communities with expansive cycling infrastructure, not unlike the typical user demographics associated with bike share use.<sup>42</sup> To address this cost barrier and support broad adoption of e-bikes and active transportation, public entities have turned to purchase subsidies and other incentive programs that reduce cost of ownership to a level at which the majority of residents can afford, or offer e-bikes at extremely low-cost or free of charge.<sup>43</sup>

Purchase incentive programs have emerged as a response that harnesses the popularity of e-bikes to promote broad adoption and increase equity in cycling. These programs are often a product that support sustainability goals to improve air quality, reduce GHG emissions, encourage movement away from car travel, increase physical and mental health, and support local economies.<sup>44</sup>

	<b>Class I</b>	<b>Class II</b>	<b>Class III</b>
<i>type</i>	<i>Pedal-Assist</i>	<i>Throttle Controlled</i>	<i>Pedal-Assist</i>
<i>max. speed</i>	<i>20 mph</i>	<i>20 mph</i>	<i>30 mph</i>

Table 1. E-bike classifications<sup>50</sup>

E-bikes are not yet standardized across the United States, which can cause confusion among consumers and program participants. Purchase incentive programs are forced to mold policies that direct participants toward high-quality e-bikes that meet certification standards, and away from low-quality products that may fail within a year or two or require proprietary components not readily available.

Generally, programs will refer to their state policy of e-bike classification, but there is a widely accepted three-tiered system: Class I, Class II, Class III.

The specific designations for each class vary depending on the State or Federal language, and may differ slightly in the speeds and wattage limits.<sup>45</sup>

Class I refers to pedal-assisted and Class II refers to throttle-controlled motors, both limited to speeds of 20 mph.<sup>46</sup> Class III refers to pedal-assisted motors that can reach speeds higher speeds, but are not allowed to exceed 30 mph.<sup>47</sup> Pedal-assisted systems engage the electric motor when user input increases, when riding uphill, for example.<sup>48</sup> Throttle controlled systems use a throttle mounted to the handlebars to control motor output, similar to a motorcycle.<sup>49</sup>



# Survey of Bike Share Research

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## System Models

There are two types of BSS operating globally: docked and dockless. They both operate on the same principle of shared bicycle use with one major difference - docked BSS requires users to begin and end trips at stations located throughout the system's boundaries, while dockless BSS allows users to begin trips wherever they find the bicycle and end the trip anywhere else within the boundaries of the system.

I view bike share as two eras: pre and post pandemic. Dockless BSS were popular pre-pandemic and accounted for the majority of systems due to their ease of deployment and low cost-barriers at the time.<sup>51</sup> The effect of the COVID-19 pandemic on bike share and active transportation should be noted as a turning point for BSS and e-bikes globally, as ridership experienced a enormous spike after the COVID-19 pandemic began and e-bike sales have grown exponentially in the years since.



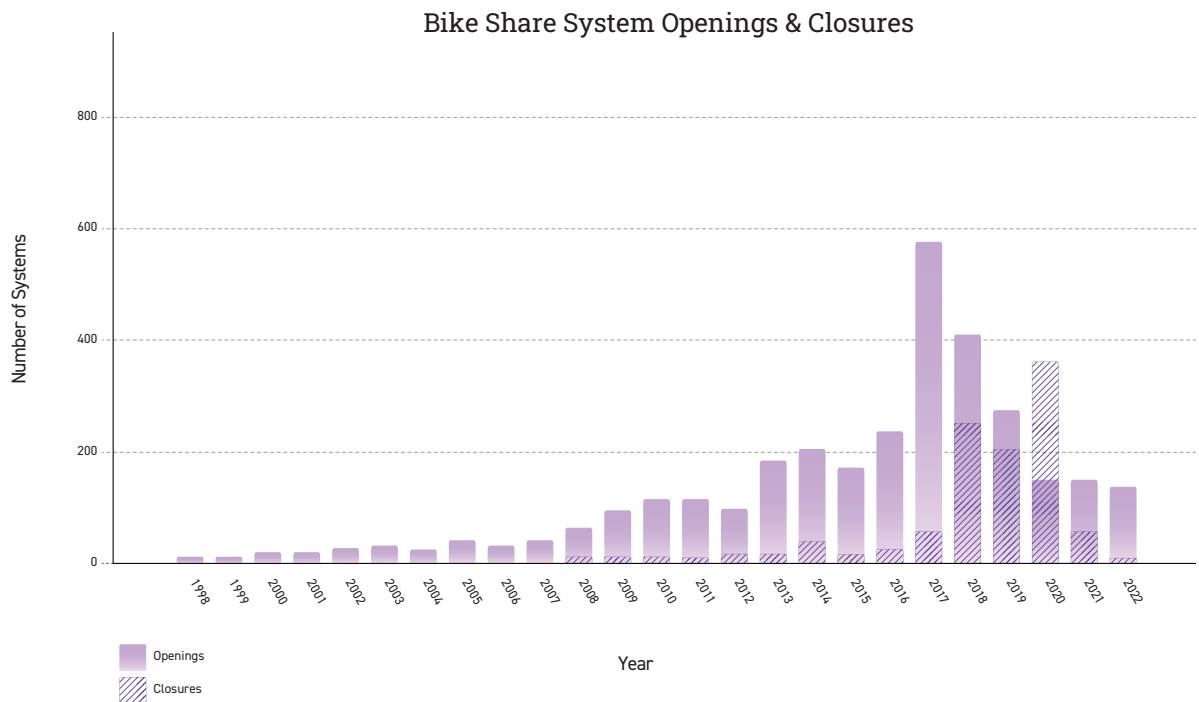


Figure 3. Bike Share System Openings & Closures 1998-2022<sup>57</sup>

## Funding Models

Funding for BSS are complicated and have evolved over the last decade alongside the boom-and-bust of venture capital (VC). Most bike share systems in North America currently operate with some input from venture capital as either the primary operator or investor alongside public dollars.<sup>52</sup> Private equity is often front-and-center of BSS in the form of title sponsors, playing a significant role in their operation. For example, Minnesota's BSS was forced to close when the title sponsor declined to renew their \$3 million contract and both the private operator, Lyft, and the state of Minnesota could not source new funding to continue the program.<sup>53</sup> Many cities rely on title sponsors as a primary source of funding; Citibank in New York City, Blue Cross Blue Shield in Boston and (formerly) Minnesota, and Shaw Communications in Vancouver, therefore binding public infrastructure to private equity.<sup>54</sup>

Pre-pandemic VC operations were able to front the deployment and operational costs while employing a user-generated profit model, but as private equity rises and falls their ability to cover those costs has evaporated.<sup>55</sup> As the question of how these public resources will continue to operate emerges, public entities are forced to either step-in with financial support or allow these public amenities to shut-down.<sup>56</sup>

## Management Structures

As commitment from private equity fluctuates, the responsibility of funding bike share will fall on public institutions to either source new funding or seek out additional sponsorships. Across North America there are several management and operation models, as many BSS involve public and private funding and contractors.<sup>58</sup> Lyft is now the largest private company in the United States involved in bike share since acquiring rival operator Motivate in 2018 and BSS equipment supplier Public Bicycle System Company (PBSC) in 2022.<sup>59</sup>

Docked systems are typically managed by partnerships between cities and private operators or managed and operated entirely by private companies such as Lyft or BCycle (Trek), while dockless systems are operated mostly by private corporations.<sup>60</sup> Historically the private dockless models have represented nominal costs for cities, representing a quick and economical way to implement bike share.<sup>61</sup> Docked systems impose higher costs and additional staff resources, although they offer more stability as private equity wavers and bike share enters the realm of publicly-supported transportation.<sup>62</sup>

In Mexico, Europe, South America, and China, operational models differ from those in the United States. A public-private partnership model between advertising corporations and municipalities exists in many European cities, most notably in Paris, France. JCDecaux, one of the world's largest global advertising corporations, entered in agreement with the City of Paris to fund and operate the city's bike share program in exchange for exclusive advertising rights within Paris.<sup>63</sup> JCDecaux, along with Clear Channel Outdoor (the world's first and second-largest outdoor advertising corporations, respectively) operate BSSs in Austria, France, Ireland, Italy, Norway, Spain, and Sweden.<sup>64</sup>

# Operation

Dockless BSS operate on the same concept as dockless scooters, where they can be found almost anywhere in the public (and often private) Right-of-Way (ROW). Operators are primarily private, venture-capital funded entities that operate on a profit-driven model.<sup>65</sup> Dockless systems require little to no infrastructure for deployment, as companies can simply place bikes around the city and users can begin riding them. This type of system was most common in the late 2000s and early 2010s, when a surge of BSS were deployed quickly and simultaneously to capture their share of the customer-base.<sup>66</sup> There are several concerns with dockless Bike Share: Theft and Vandalism, Rebalancing Challenges, Public Nuisance/ROW Obstruction, and Volatility in Operators and Funding Sources.

Docked BSS use stationary corrals where users must begin and end their trips at specified locations. Bicycles are unlocked at a station when users begin a trip, using the bike as they wish until they complete their trip at another station within the network. Trips are usually billed in increments of time such as 30 or 45 minute windows, often with the first 30 minutes offered free-of-charge.<sup>67</sup> This model of bike share is less affected by theft, vandalism, and ROW obstruction, yet still requires occasional rebalancing.

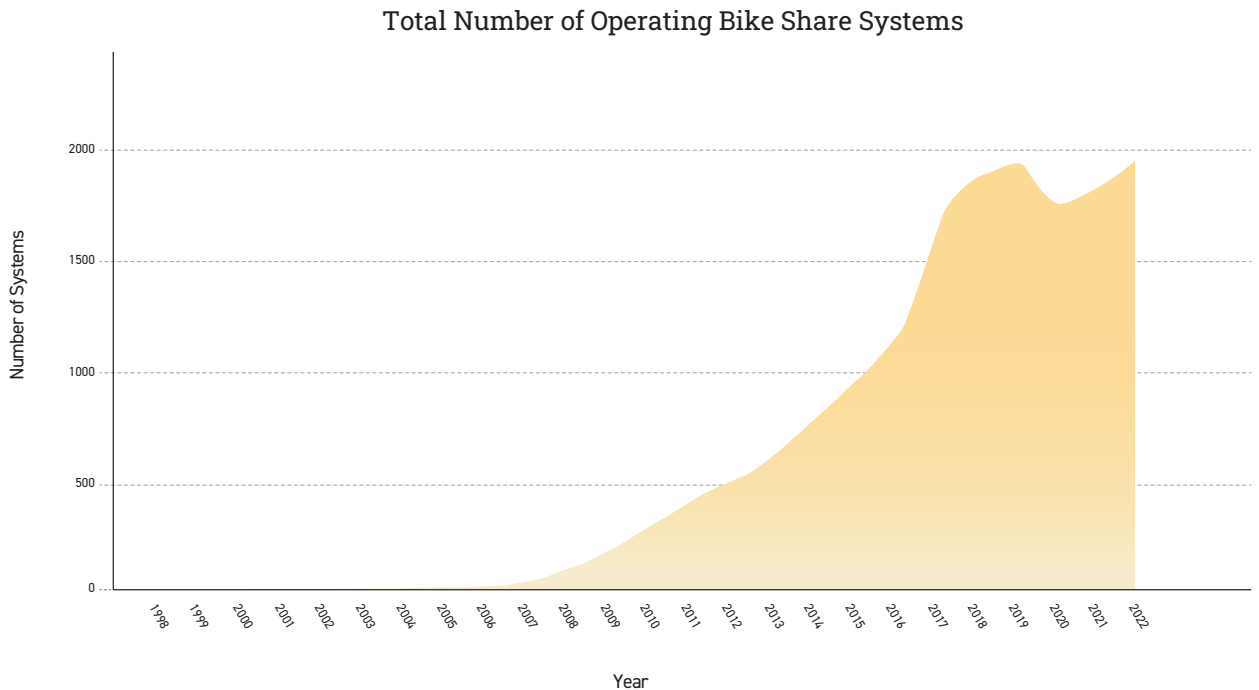


Figure 4. Total Operating Bike Share Systems, 1998-2022<sup>68</sup>

## Theft & Vandalism

Due to their free-floating nature, dockless bikes are susceptible to high rates of theft and are often knocked over, vandalized, thrown in bodies of water or forested areas, or left in places that are inaccessible to the public.<sup>69</sup> This creates major financial and logistical drawbacks for the operator and has contributed to a negative perception of dockless systems in the public eye.<sup>70</sup> In a study of Dallas' dockless bike share it was reported that bikes were frequently vandalized and damaged, with 600 of the 2,400 total bikes reported missing at the time of the study.<sup>71</sup>

These issues plagued pre-pandemic BSS, even causing some operators to shut down regional systems due to associated costs in recovery and repair.<sup>72</sup> Obike, a Chinese private operator, decidedly shut down overseas operations in Melbourne when the system experienced dramatic theft and damage to their bikes within the first month of operation.<sup>73</sup> The cost of retrieval outweighed the potential profit generated by the system, and the operator pulled out of the city with economic losses. One extreme example, WuKong bike, lost 90% of its fleet within the first five months of operation in 2017, although it is difficult to track the accuracy and scale of these reports as most operators are private and their information shared voluntarily.<sup>74</sup> Gu et al summarize that this issue persists in early phases of deployment and rates of theft/vandalism decrease only when the BSS are an established presence within the public eye.<sup>75</sup> This issue does not affect docked bike share at the same level as dockless systems given that docked bikes have higher levels of accountability in requiring registered users to 'activate' a bicycle before it can be removed from the docking station.



Bike Share bicycles piled on a young tree in Paris.

Credit: Author

## Public Nuisance & Obstruction

Of the drawbacks associated with dockless bikeshare, ROW obstruction and public nuisance is the most widespread and publicly facing issue. Bicycles are left blocking pedestrian pathways, sidewalks, ADA infrastructure, bike lanes, doorways, transit stops, and almost any other ROW found within the city.<sup>78</sup> Bicycles become obstructions to other public services such as bus and train transit, and feed negative perceptions of bike share within the public eye.<sup>79</sup>

## Rebalancing

Its often challenging to control distribution, as bike locations throughout the service area are determined by patterns of use. As stated above, bikeshare users are predominantly white males with higher incomes, so use patterns tend to distribute bicycles along those trip routes. This creates barriers to access for those who do not live in the areas of travel and a rebalancing challenge for the operators if they want to avoid clustering and service gaps.<sup>76</sup> A 2019 study found that 36% and 73% of the total emissions from docked and dockless systems, respectively, were due to rebalancing measures.<sup>77</sup> This process reduces the environmental sustainability factor and ability of BSS to reduce VMT and emissions due to a continued reliance on trucks and vans for redistribution.

# Addressing Barriers to Access in Bike Share

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## Who Uses Bike Share?

Bike share users in the United States and Canada are not representative of the larger diverse population. Users are overrepresented by White, male-identifying individuals who tend to skew younger with higher incomes and higher educational attainment.<sup>80</sup> Even among POC communities higher-earning and higher-educated individuals represent a greater share of BSS users, and in communities outside of North America the user groups still skew towards younger, higher-earning men.<sup>81</sup> When comparing user demographics in China, users are more evenly distributed among men and women (57% & 43%, respectively) yet are still overrepresented by younger generations.<sup>82</sup> This clear imbalance needs to be addressed if bike share systems are to become a viable part of the public transit system, as programs must accommodate users of all lifestyles.

Studies find that women use bike share for longer trips, negating the benefit that most systems offer by waiving fees for the first 30 minutes.<sup>83</sup> Women more often occupy domestic roles such as running errands, caring for children or other individuals, performing other domestic labour such as cooking, and providing support for the family at large.<sup>84</sup> Lower-income people of color are also more likely to require transportation for children in addition to themselves, further negating any use of traditional BSS which commonly uses basic bicycles or e-bikes that have capacity for only one individual.<sup>85</sup> Offering e-cargo bikes will accommodate the needs of users at every level and presents bike share as a viable alternative to driving. E-cargo bikes provide space to transport children and other cargo such as groceries, expanding the use of bike share past commuter and recreational trips.

## Payment, Registration, and User Requirements

Internet and payment access is a common barrier to bike share use, as many low-income residents are “unbanked” without reliable access to a debit or credit card.<sup>86</sup> Low-income residents are also less likely to have access to a smartphone and the internet, further distancing them from access.<sup>87</sup> Most bike share systems require payment cards and smartphones to rent and release bicycles, effectively barring anyone without these tools from using their local bike share system.

Subsidized memberships, community passes, and cash-payment options are all solutions to limited payment card and smartphone access. Memberships offered through community organizations can help with outreach and registration, and community lending passes remove the need for cards and phones.<sup>88</sup> When partnered with public services such as libraries, they offer community members greater access. One study found that respondents of color would be more likely to use bike share if a family pass was offered, as those communities tend to cycle as a group more often than individually.<sup>89</sup> Cash-payment options are another great solution, although not as straightforward since they would require someone to accept liability on behalf of the user. There may be circumstances in which cash payments could work, such as subsidized memberships through a CBO.

## Access to Bicycle Facilities & Infrastructure

Limited access to cycling infrastructure is another deterrent to cycling and bike share use.<sup>90</sup> Higher levels of protected cycling facilities leads to more public uptake, as various studies note that the public reacts positively to infrastructure that separates cyclists from car traffic and reduces vehicles on the roadway.<sup>91</sup>

NACTO guidelines state that bike share stations should be within 300-800m of each other, with ideal density being 300m between each station.<sup>92</sup> Paris, New York City, and Mexico City all fall within the ideal density for station spacing, all three cities operate successful systems, of which station density is a contributing factor.<sup>93</sup> Station capacity is also a crucial metric to adjust for demand, as individual station sizes can be increased to meet rider demands instead of increasing station density below 300m.<sup>94</sup> The average distance an individual is willing to walk to find a bike is about five minutes, a metric that does not often deviate, and should be standard practice to increase station capacity rather than placing more stations in a given area.<sup>95</sup>



## Riding Safety & Fear of Increased Attention from Law Enforcement

There is an overwhelmingly disproportionate amount of police attention aimed at low-income individuals and people of color, creating hostile environments for these communities when riding bicycles and using bike share.<sup>96</sup> This barrier is difficult to address from the perspective of BSS, but is a crucial aspect of why bike share adoption can be limited in communities of color and low-income neighborhoods. It is also a reason why increasing bike share station density without additional resources may not lead to greater use. Concerns about racial profiling and police violence while riding a bicycle, as well as racially motivated microaggressions from other road users, is a common issue among people of color.<sup>97</sup> One study found that Black and Brown participants were fearful of increased police attention and becoming targets of crime while riding a bicycle, further discouraging adoption of bicycles.<sup>98</sup>

An equally significant barrier is traffic safety while riding. Several studies have outlined that individuals are reluctant to adopt cycling due to the absence of safety while riding through urban environments.<sup>99</sup> Lacking infrastructure and lack of riding experience or confidence are key contributors and must be addressed by the city or region if they are to consider any mobility justice goals.

## Negative Perception, Lack of Awareness, and Bicycle Literacy

Public perceptions around cycling can be a crucial barrier regarding bike share use. General perception is often negative, as people view cycling as a recreational tool for wealthier individuals.<sup>100</sup> Cycling infrastructure is also viewed as a sign of gentrification,<sup>101</sup> so simply expanding facilities is not a solution to shifting perception. The more people of all backgrounds are committed to cycling, the more perceptions will improve. Bicycle incentive programs such as purchase subsidies and lending/leasing programs are an effective way to increase the number of cyclists on the street in a short period of time, adding to the perception that cycling can be adopted by anyone and is not reserved for the wealthy and privileged.

Studies have also shown a lack of public knowledge and awareness regarding bike share registration and operation.<sup>102</sup> The registration process can be confusing for some individuals, especially those who are not technologically literate, and some survey respondents noted they were not aware of income-qualified pricing options.<sup>103</sup> Using bike share requires knowledge to registration, how and where to find a bicycle, and rules surrounding time limits, all of which lead to misconceptions and low system use if the information is not clearly available.<sup>104</sup>

# Utilizing Alternative Incentives

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Although bike share systems have the potential to increase cycling modal share, especially among underinvested communities, the involvement of private capital and need for public investment is a significant barrier. Privatization of bike share will continue prioritizing profit-driven models, preventing these programs from becoming a true public benefit until they are publicly funded and operated.<sup>105</sup> As an alternative, subsidized incentive programs offer an alternative to bike share systems intertwined with private capital. Purchase subsidies, lending/loaning and long-term rental programs, as well as some adaptive programs that improve access to bike share have been established in recent years, and more are beginning to take shape. They offer individuals a path to bicycle use (predominantly e-bikes) that is often more accessible than bike share, and unravelled from private equity.

As of June 2023, there are over 75 Incentive Programs in the USA and Canada that in a mix of status', including pilot programs, actively open/closed programs, proposed or approved programs, and programs awaiting implementation.<sup>106</sup>

Several models exist, the most common of which is the Point-of-Sale/Point-of-Purchase (POS/POP) discount, Post-Purchase rebates, and Low-Interest loans. Lending or Leasing programs are less common but are becoming a popular solution to address the barriers that accompany rebate and bike share programs. Requiring participants to either purchase bicycles or pay a fee for short-term rentals is still a significant barrier to those who do not have the appropriate funds. In general purchase subsidy programs focus on the purchase of new e-bikes, not conversion kits, and limit purchases to commuter-focused e-bikes and e-cargo bikes instead of recreational models such as full-suspension e-mountain bikes.

## Management Structures

Incentive programs are managed and operated primarily by local and state governments, NGOs, or other advocacy groups.<sup>107</sup> Many public entities have sustainability goals related to reductions in VMT, GHG, and other fossil fuel emissions, leading to adoption of mitigation projects such as bicycle incentive programs.<sup>108</sup>

## Funding Structures

Programs are most often funded by grants, but funding can come from a variety of sources. Tampa, for example, funded their voucher program through several internal departments' excess project funds.<sup>109</sup> The ability for e-bike subsidy programs (and bicycle incentive programs, more broadly) to fulfill many sustainability-related projects goals qualifies programs to receive funding from a variety of sources.<sup>110</sup> Purchase subsidy programs are often forced to limited their distribution because of funding, as most programs experience popularity and large applicant pools that outweigh their funding limits.<sup>111</sup>

## Point-of-Sale/Point-of-Purchase Rebates

A POS rebate offers a discounted price at the time of purchase. Participants are required to apply, then present proof of an approved application, usually in the form of a voucher, to receive a discount during the transaction.<sup>112</sup> Applicant pools are often split into a standard tier and an income-qualified tier, the latter receiving a larger subsidy. The POS model requires retailers to submit reimbursement requests to the subsidy provider, creating a smoother transaction experience for participants. This also removes the up-front purchase costs, as many lower-income participants cannot afford to pay the full price of an e-bike and wait for reimbursement, as is the case with post-purchase rebates. This model works well with in-person sales in brick-and-mortar shops and is usually employed by municipal or regional entities where participants live within a smaller boundary. Point-of-sale rebates offer essential benefits and should be used as a model for most purchase subsidy programs. It simplifies the logistics of purchase subsidies for both the participants and partnering bike shops by removing cost barriers that post-purchase rebates create, and streamlines the process for participating shops.

## Post-Purchase Rebates

A post-purchase rebate relies on customers to make the initial purchase, submitting documentation and receiving the subsidy after the transaction. This requires less involvement from retailers, but as mentioned above, participants need to have funds for the full purchase-price readily available. This model is more accommodating when dealing with online transactions, as distributing POS rebates to online retailers is a complicated process.<sup>113</sup> This option is more often used by larger entities, at the State or Federal level, where subsidies must reach those in remote areas who cannot access brick-and-mortar shops.<sup>114</sup>

## Low-Interest Loans

Low-interest loans are another option for subsidizing e-bike purchases, although this model requires extensive oversight and management from the governing body. Loans can be distributed in several ways, including through utility providers.<sup>115</sup> This model is an effective way to boost e-bike ridership within a region, but is not an ideal solution as participants are paying more than the purchase price after loans have amortized.<sup>116</sup>

## Lending/Leasing & Long-term Rentals

Often titled Lending Libraries, as a catch-all term for both long-term leasing/rentals and lending programs, this model lends or loans bicycles (often e-bikes) to participants, for little to no cost, over longer periods of time. Periods can range anywhere from a single week to six months and require personal information or a small deposit from participants in exchange for the bike.<sup>117</sup>

This differs from bike share programs by increasing the length of time an individual can use the bike and significantly reduces cost barriers.

The term Lending Library is an important aspect of this model, since it projects a community-focused approach, yet can lead to confusion among participants when the program is not free like a traditional library. The word Library evokes a sense of place, sharing, and community, so it is therefore a strategic mechanism to market these programs and promote adoption both politically and publicly. However, the term can lead to criticism when participants are asked to provide deposits or small fees to lend bicycles.<sup>118</sup> It should be noted that these programs serve as an important service, enabling participants to fill transportation-related gaps in their lives with e-bikes and e-cargo bikes. They are also used by participants to, or even marketed as a, 'try before you buy,' meaning these programs often work in unison with bike share or purchase subsidies to increase exposure to e-bikes and cycling, and should be deployed simultaneously to have the greatest effect.

# Interviews and Program Analysis

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Interviews were conducted with 7 representatives of Incentive Programs. 5 of the programs were purchase subsidies, 1 was a lending library, 1 was a free community pass for the local bike share program.

Denver was chosen as the first purchase subsidy program to analyze and interview, as it is cited and recognized as one of the most successful purchase subsidy programs in the country.<sup>119</sup> Based on recommendations from that interview, the Yukon Territories and City of Tampa were contacted to see how their programs relate to Denver's.

The City of Nelson was selected because of their low-interest loan model and unique distribution through a municipally controlled utility provider. The program in Austin, TX is also distributed through an publicly controlled utility provider, but they did not respond to a request for an interview.

The Oakland interview was scheduled through LADOT, who were also interested in meeting with the OakDOT/GRID team to inform e-bike library program design in Los Angeles. I was able to join the meeting for my own research.

Berkeley was chosen based on their unique program design and partnership with their CBO. Their program sits in between other defined programs as it is not quite a leasing program or a lending library, but sits in the realm of e-bike give-away or ride-to-own programs.

Madison's community pass program was unique and was the only program in the country that I found to offer free access to bike share through a library-pass.

<b>Program Start</b>	<b>Incentive Type</b>	<b>Cost to User</b>	<b>Funding Source</b>
Fall 2023	Long-term lending	\$25/week, \$5/week (standard, income-qualified)	CARB Grants (Clean Mobility Options)

<b>Operator(s)</b>	<b>Partnering Organizations</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
OakDOT/GRID Alternatives	The Crucible & East Oakland Collective	100 bikes between two locations	\$1 million, with an additional \$500,000

## City of Oakland Electric Bike Library<sup>120</sup>

The Oakland Electric Bike library is in late stages of development and plans to open sometime in the Fall of 2023. Oakland Department of Transportation (OakDOT) is partnering with GRID Alternatives, a Bay Area organization that specializes in clean energy retrofits, to design and implement the e-bike library program. GRID and OakDOT partnered to apply for grant funding, and GRID is responsible for the management and operation of the e-bike library moving forward.

The program will be centred around a supply of e-bikes kept at partnering community-based organizations (CBOs) The Crucible and The East Oakland Collective (EOC). Neither of these CBOs have origins rooted in cycling but both have expressed interest in building cycling related programs to expand their offerings. OakDOT and GRID will use EOC and the Crucible as “reservation partners” to interface with participants and store/distribute the e-bikes. Partnerships with established bike shops were the initial goal of the program, but OakDOT/GRID found no shops willing to participate. They speculate this unwillingness could be due to additional staff and resources this program requires, as most bike shops are operating at capacity and do not have the physical or logistical space for additional programming. The solution was to partner with the two CBOs (EOC/Crucible) that had availability to support an e-bike library program. Instead, the program will sub-contract to local bike shops for maintenance and repair work, re-circulating funds from the program into the local cycling economy. Neither The Crucible or The East Oakland Collective have capacity or infrastructure for bicycle maintenance and repairs.



The e-bike library is being funded by two Clean Mobility Options (CMO) grants provided by the California Air Resources Board (CARB) for \$1 million and \$500,000. The initial \$1 million was based on cost estimates in early stages of planning, but due to extended planning timelines an additional \$500,000 is required to accommodate for inflation costs. The funding is expected to run the program for five years, including costs of maintenance and repair paid to local bike shops and the initial purchase of 100 e-bikes from two undetermined vendors. CMO/CARB is the official purchaser of the e-bikes, and the City of Oakland is the official owner until the end of five years, at which time EOC and the Crucible will gain ownership of the e-bikes to use as they see fit.

Before project implementation, OakDOT and GRID must establish a payment system that includes methods to accommodate individuals of all income levels. Estimated costs are \$5/week for income-qualified individuals and \$25/week for all other participants, but no fees have been finalized. The organizers are hoping to find a solution that includes theft deterrents while still considering cost barriers, such as rental deposits.

## **Program Structure & Operation**

Participants will interface with the partnering CBOs, being able to first look at the e-bikes at the two locations then completing any transactions in-person before taking the e-bikes home. The program is set to begin with 100 e-bikes. Individuals can lend e-bikes for a minimum of 1 week and up to 3 weeks, until they need to be returned to the same location they were rented from. OakDOT/GRID is expecting participants to charge and store the e-bikes at their homes.

The program is set up as a 'model' or proof-of-concept. OakDOT/GRID hope that the program's success will enable a continuation and eventual takeover by the Oakland Public Library, integrating the project into the public library system as a permanent model.

## **Key Takeaways**

Time between conception and implementation has take longer than expected. Establishing MOUs and partnerships was not as straightforward as anticipated, therefore prolonging the project timeline and requiring additional funding to compensate for inflation. This has also decreased the number of bicycles the grant is able to fund from 500 to 100, reducing overall impact of the program.

The program is also not requiring participants take any classes prior to using the library, as they are considered barriers to participation.

Cost barriers and liability are difficult to navigate. Responsibility for theft or damage should not fall on the reservation partners EOC/Crucible, so finding a balance between low-cost and cost-effective theft deterrents is a primary concern for the project management.

The term Library carries a lot of meaning (as discussed above), so settling on a program name has been another discussion among organizers. Libraries are often associated with free community-based supportive services, so requiring payment of any kind to participate may invite pushback from the public. One solution offered is to integrate the name of the program with partnering CBO titles instead of calling them "Libraries".

<b>Program Dates</b>	<b>Incentive Type</b>	<b>Cost to User</b>	<b>Funding Source</b>
May 2023 - May 2024	Long-Term Lending/Ride-To- Own	\$100 deposit	City of Berkeley Pilot Climate Equity Fund

<b>Operator(s)</b>	<b>Partnering Organizations</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
The City of Berkeley	Waterside Workshops	50 (600 applicants)	\$250,000

## City of Berkeley E-Bike Equity<sup>121</sup>

The E-Bike Access program in Berkeley is currently in operation as of May 2023, and available to income-qualified Berkeley residents over the age of 18. The income-qualification threshold is below 80% AMI for Alameda County, but participants can also use their SNAP, PG&E, Medicaid, or other qualified universal low-income benefits to register for the program. The stated goal of the program is to “cut greenhouse gas emissions and reduce the impact of climate change on low-income residents.”

The City of Berkeley has partnered with Waterside Workshops, a non-profit CBO to handle program operations and logistics, and submitted a joint grant application for funding. Waterside Workshops offers outdoor-related community-building services such as bicycle mechanics learning classes, wooden boatbuilding classes, and other outdoor recreation classes. They focus on youth-empowerment and skill building, modelling their services as a hands-on vocational job training for young Bay-Area residents. They were selected by the City of Berkeley to operate this program as they are an e-bike retailer and already have cycling infrastructure such as a mechanic shop and staff who are knowledgeable in bicycle repair and e-bike maintenance.

The City of Berkeley’s Climate Equity Fund Pilot Program provided \$250,000 to the project, with additional funding provided by the UC Berkeley’s Chancellor’s Community Partnership Fund (unkown amount).

## **Program Structure & Operation**

E-Bike Access allows participants to loan e-bikes through a local CBO, Waterside Workshop, for 1 year at no cost to the individual except a \$100 deposit. From approximately 600 applicants, the program selected 50 individuals to participate in the program via lottery. Participants are required to share monthly odometer readings, complete 4 surveys over the year, participate in an e-bike safety class, and bring the e-bike to Waterside Workshop every 3 months for maintenance and inspection. There is a mixture of e-bikes available, including e-cargo bikes, folding e-bikes, and commuter-focused e-bikes. If participants complete all the required actions after one year, they keep the bicycles permanently.

## **Key Takeaways**

As learned through the Oakland e-bike library process, finding a partner CBO that has existing cycling-related infrastructure and experience is difficult. Not every program can expect to partner with an organization like Waterside Workshops, and it seems the size of the Berkeley E-Bike Access program has been partially designed around what is manageable for the CBO – interfacing with participants only every 3 months, allowing the organization to predict and account for labour surges and providing maintenance to 100 e-bikes that are not in circulation.

<b>Program Dates</b>	<b>Incentive Type</b>	<b>Cost to User</b>	<b>Funding Source</b>
2022 - Present	Community Bike Share Pass	No Cost	Madison Library Foundation

<b>Operator(s)</b>	<b>Partnering Organization(s)</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
Madison Public Library	Madison BCycle	18 (2 per branch, 9 branches total)	Unknown

## City of Madison BCycle Community Pass<sup>122</sup>

The City of Madison offers a program through their Public Library system where individuals can reserve and take-out passes, for up to 1 week, that grant them unlimited access to the Madison BCycle bike share system.

Madison BCycle is a docked e-bike share system with station locations throughout the city of Madison. New station locations are sited based on 'sponsorships,' where the sponsor will fund the setup and installation costs of about \$4,000. Madison Public Library (MPL) has three branches that have sponsored BCycle stations located on, or next to, their property. The majority of BCycle stations are clustered along Madison's ismiss, a thin strip of land that lies between two lakes which is also the location of Madison's downtown core, limiting widespread access across the city.

The BCycle Community Pass program is entirely housed and operated within the Madison Public Library, who purchases each BCycle pass from the bike share operator for a one-time fee. Funding to purchase the passes is supplied by the Madison Library Foundation, an independent organization that supports the Public Library system in Madison through fundraising and support. Each library branch houses 2 passes and loans them out through an in-person reservation system.

## **Program Structure & Operation**

The BCycle Community passes are reserved for use and then picked up at a library branch. The individual can then use the pass to rent and return BCycle bikes as many times as they would like. The passes do not have a limit on individual trip length and can be reserved for any number of days, up to 1 week. MPL has 9 branches in total throughout the city and estimate there have been 1,500 'check-outs' of the passes since the program began in 2022. Participants must hold an MPL card, be over 18 years of age, and reserve the passes in-person at a library branch.

Participants are also anonymous; all information is kept intentionally private and not released to the BCycle operator or any other organization. MPL has stressed that this aspect of this program must remain in place to protect participants identities. This component is meant to open access to all residents, for example those who have past convictions and are not comfortable sharing the personal information required to register for the BCycle program.

If passes or helmets are not returned then the individual is responsible for the cost of replacement, but if the bicycles are not returned the library is responsible for cost of replacement. Participants must also sign a liability waiver that addresses any injury or harm incurred by use of BCycle's e-bikes.

## **Key Takeaways**

This program is an excellent solution to address the cost-barrier of bike share systems. It also offers a solution for those who do not have credit card or smartphone access but still want to use bike share programs. This is a seemingly straightforward program that cities can implement with little to no new infrastructure, and it's surprising that this model is not represented across more bike share programs.

There are only three MPL branches with bike share stations on or near their property, and the program would operate more effectively if each branch had a partnering station. Most feedback from participants has referred to this issue, as some branches are located a far distance from the nearest BCycle station, limiting the effects of this program and negating some of its benefits. Many participants also use this program to "try-out" the bike share program and its e-bikes, displaying a clear need for more public exposure to these amenities.

<b>Program Dates</b>	<b>Incentive Type</b>	<b>Incentive Amount</b>	<b>Funding Source</b>
2022 - Present	Purchase Subsidy Voucher (Point of Sale)	\$300 - \$1200 (determined by income) + \$200 for e-cargo bikes	Climate Protection Fund (\$0.25 sales tax)

<b>Operator(s)</b>	<b>Partnering Organization(s)</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
The City of Denver	Local Bike Shops	4,734	\$4.7 million

## City of Denver E-Bike Rebate<sup>123</sup>

The Denver E-Bike Rebate subsidy is a voucher-based rebate program that offers Denver residents a point-of-sale/point-of-purchase discount on e-bikes purchased through brick-and-mortar bike shops in Denver. Denver's bike share system ceased operations in 2020, so the e-bike rebate subsidy is, in part, a response to the loss of that system. The program has been active since 2022, distributing one round of vouchers each month, and is run by a logistics sub-contractor, APTIM, who was selected through a four-month RFP process. A 'release cadence' is used for voucher distribution to prevent overwhelming both local bike shops and the program's operating system. Distributed vouchers expire after 60 days, and the unused funds are recirculated back into the funding pool for future applicants.

The program partners with brick-and-mortar shops within the city of Denver, requiring that they are located within five miles of the city limits. This boundary expansion allows shops and residents located at the periphery to participate in the program. No online sales are eligible through the program as the city wants to control the type of e-bikes purchased, something that is easily done through vetted brick-and-mortar shops and more difficult to accomplish with e-commerce.

In 2020, the City of Denver voted in a ballot measure to introduce a \$0.25 sales tax that would pay into a Climate Protection Fund (CPF) overseen by the office of Climate Action, Sustainability, and Resiliency (CASR). The E-Bike Rebate program is funded through the CPF and was allocated \$3 million over 3 years. Initially only \$250,000 was allocated to run the program as a pilot for 1 year, but the number of applicants far exceeded this amount, forcing the City to cease operations and allocate additional funds from the CPF. Even with the reallocated budget of \$1 million per year, the program still used \$500,000 in the first month of operation due its popularity with Denver residents.

After 9 months of operation, the City of Denver distributed \$4.7 million in purchase subsidies to 4,734 residents.

According to a survey report on the program's operation throughout 2022, 67% of the funding was distributed to income-qualified residents and 3.4 car trips per week, on average, were replaced by bicycle.<sup>124</sup> 71% of respondents also reported using their cars less often after purchasing an e-bike, with 65% of respondents riding daily and 90% riding at least once a week.<sup>125</sup>



## Program Structure & Operation

There are two applicant pools separated into two funding streams: standard applicants and income-qualified applicants. Thresholds for income-qualified applicants are below 80% AMI, or are based on standardized programs such as SNAP, Medicaid, Old Age Pension, and other state-funded metrics to increase consistency across programming. Initially, disbursement amounts began at \$400 for standard applicants and increased to a maximum of \$1,200 for income-qualified individuals with an additional \$500 given to applicants who were purchasing e-cargo bikes (e-cargo bikes represent almost half the purchases over the 2022-2023 operating period). Rebate amounts were reduced at the beginning of 2023 to a base of \$300, and the additional for e-cargo bikes was reduced to \$200.

600 vouchers are available at the beginning of each month; 400 standard vouchers and 200 vouchers reserved for income-qualified applicants. Individuals apply through an online portal, receiving a voucher once their application is approved. Once the portal opens, the program operates on a first-come, first-serve basis, accepting applications until vouchers run out. Each type of voucher has a different 'portal line' so that income-qualified applicants are not in competition with standard applicants for webpage access.

Once vouchers are distributed, participants may use them to get a point-of-sale discount on e-bikes through a brick-and-mortar shop located within Denver. Vouchers take the form of a 10-digit code that is presented to the cashier during time of purchase. The shops then submit vouchers back to the program for reimbursement. Bike shops are reimbursed by APTIM within a one-month period, and reimbursements consistently happen within two weeks. APTIM is also liable for verifying each applicant's documentation, further streamlining the purchase process for bike shops, and removing their liability if someone attempts to defraud the program.

Bike shops are held liable, however, if an e-bike is sold that does not meet program qualifications. E-bikes must meet the criteria as defined by the State of Colorado, which uses the generally accepted Class I, II, III system to define e-bikes. Purchased e-bikes cannot have a motor that exceeds 750w and must have lights and reflective material installed on the front and rear. Full-suspension e-bikes are prohibited as the city wants to focus on commuting and avoid subsidizing the recreational mountain-biking culture that exists in Denver.

## Key Takeaways

Demand for participation is significantly higher than supply, as vouchers are usually gone within three to five minutes of opening the online portal. The first-come, first-serve model is an enormous drawback of this program as it creates a substantial barrier for anyone who doesn't have the time or resources to apply when the portal opens. The City of Denver was prevented from using a lottery system, as it would conflict with gambling regulations about gathering personal information under the pretense of a lottery.

The city has found it difficult to track voucher redemption, as rate of redemption is seemingly random and changes month-to-month. Denver has not yet been able to predict how many vouchers will be redeemed every distribution round. This issue forces some applicants to wait longer for a voucher, but it is difficult to address without requiring more intrusive data collection.

Limiting the program to brick-and-mortar shops is a mechanism to prevent purchases outside of industry standards of safety and mechanical certification. Unregulated e-bikes may be mechanically substandard and require serious maintenance within the first two years, some failing within that time period. Unregulated batteries and electronics on the bicycle can also fail and are a potential danger to the user. Utilizing the trust that local bike shops have already built between brands will remove the need for a vetting process by the city. This also reduces potential conflict with local bike shops, as proprietary components and unregulated bicycles can be difficult to maintain.

Creating strong relationships between the city and local bike shops is a primary goal of this program. Limiting purchases to brick-and-mortar shops only ensures that the tax revenue is diverted back into the Denver economy and that deeper connections are built between community members and their bike shops.

## **Key Takeaways (continued)**

The program has also attracted one large online retailer of note to open a brick-and-mortar shop in Denver to qualify their e-bikes for purchase through the program, causing pushback from smaller, independently owned bike shops. One e-cargo bike model from this large retailer is priced lower than most standard e-bikes and has created a slight disruption in the program's metrics as these models are being purchased in large quantities with the additional e-cargo bike rebate, skewing the balance of e-bikes and e-cargo bikes purchased through the program.

Program staff also work with non-profit organizations to refer people to the program but should create more opportunities for underprivileged individuals to gain access to the program in helping them navigate the application system, either through non-profits/CBOs or designating staff resources to aid certain residents with the application process.

Of surveyed participants the average trip length was 3.3 miles, 65% of which were under 3 miles and 84% of which were under 5 miles.<sup>126</sup> Looking again to the FHA National Household Travel Survey, most vehicle trips are under 5 miles, creating substantial opportunities for e-bike replacement.<sup>127</sup>

<b>Program Dates</b>	<b>Incentive Type</b>	<b>Incentive Amount</b>	<b>Funding Source</b>
Fall 2022 - Present	Purchase Subsidy Voucher (Point of Sale)	\$500 standard/ \$1000 low-income  (\$1000/\$2000 for e-cargo bikes)	Internal Funding Sources

<b>Operator(s)</b>	<b>Partnering Organization(s)</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
The City of Tampa	Local Bike Shops	180 (>1000 applicants)	\$170,000

## City of Tampa E-Bike Voucher<sup>128</sup>

The City of Tampa began the process of designing and implementing a purchase subsidy program in the Fall of 2022. The E-bike voucher program was created in response to the potential surge in VMT accompanying recent population growth, providing Tampa residents with sustainable modes of travel and a viable trip replacement for work, school, healthcare, and other essential travel. The city has a docked bike share program, but according to the city its use is primarily recreational and does not often replace car trips. The E-Bike Voucher program hopes to reduce VMT and increase cycling modal share in Tampa.

Tampa's program is modelled primarily after Denver's E-Bike Rebate program, using the voucher and POS discount system to distribute subsidies. The city is also focused on removing any cost barriers to e-bike purchases, such as the ones associated with post-purchase rebate programs. Because of Tampa's low median income, the city did not want participants to wait for post-purchase reimbursements, requiring a larger sum of cash up-front just to qualify for the program.

Participating bike shops were contacted by the city and are considered program partners. They must follow a set of conditions that includes providing helmets with each sale, providing consultations to participants before each sale, and providing maintenance to all e-bikes after purchase. Shops must be located within the city limits and only brick-and-mortar shops are eligible to partner with the program; the city wanted to retain subsidy funding within the Tampa economy, restricting purchases to local shops and making any online sales ineligible. 6 shops partnered with the program for the first round of vouchers and the city is hoping to partner with more as the program grows.

Funding for the E-Bike Voucher program was provided by various internal funding sources. The program designer and manager reached out to internal departments asking for excess funding that could be redirected to the voucher program. Due to the versatility of purchase subsidy programs in fulfilling project requirements for funding distribution, many internal teams were able to contribute. In total, the program was able to secure \$170,000 for the first round of vouchers (2022-2023). For the next round of funding, the city is hoping to source additional funding from Community Redevelopment Areas (CRAs), who each have large budgets with spending conditions. Each CRA requires their contributions to be spent within the respective CRA boundary, which will require some organizational work but will ultimately allow the program to offer additional vouchers.

## **Program Structure & Operation**

There are two types of vouchers: Standard and Income-qualified. Standard vouchers are \$500, and \$1000 for e-cargo bikes. Income-qualified vouchers are \$1000, and \$2000 for e-cargo bikes. Tampa uses a lottery selection process to reduce barriers to access that the Denver program struggles with. Applications were accepted for two weeks, during which time individuals can apply online or in-person at application-assistance sessions. “Pop-up” application sessions were also offered at public events during the two-week window. As a final component of the application process, applicants must pick a partnering shop and complete a consultation to determine which e-bike will suit the individual’s needs. This was also used as a mechanism to streamline process for bike shops, allowing them to forecast inventory requirements.

In total 180 vouchers were distributed to over 1000 applicants: 60 standard and 50 standard e-cargo, 50 income-qualified and 20 income-qualified e-cargo. Once applicants were all approved and documents were verified, a lottery draw for the first 10 participants was streamed live on social media as part of a media campaign to build excitement, and hopefully attract more funding, for future application rounds. Vouchers will be voided after July 9 2023, at which point the unused funds will be redistributed through the next round of vouchers or into a pool of applicants from the first round that did not receive vouchers.

## **Key Takeaways**

Offering both an application window and in-person paper applications is a significant improvement to the Denver model (acknowledging that Denver ran into legal barriers regarding a lottery system). Scheduling pop-up application sessions at public events was also a significant step to assist applicants who do not have regular access to the internet.

The consultation requirement helps shops to forecast inventory but does add a slight barrier that may deter some participants from using the voucher if they do not have excess time. The same can be said of safety classes required by other programs, and future programs should consider that low-income residents of have comparatively less time than higher-income residents.

Program Dates	Incentive Type	Incentive Amount	Funding Source
2020-Present	Post-Purchase Rebate	25% of purchase price, up to \$750, \$1500 for e-cargo bikes	Territorial Government

Operator(s)	Partnering Organization(s)	# of Incentives Distributed	Funding Amount
Yukon Territories Energy Branch	N/A	65 in last quarter of 2022	N/A

## Yukon Territories Clean Energy Rebate<sup>129</sup>

The Yukon Territories offers a post-purchase subsidy to its residents, applicable for any e-bike or e-cargo bike with motors under 500w and max speeds of 32 kmph (~20 mph). Conversion kits and e-motorcycles are not eligible. The subsidy provides a rebate for 25% of the total purchase price, up to \$750 for e-bikes and \$1,500 for e-cargo bikes.

The program has been running for about 4 years and is nested under a larger electrification subsidy program that includes subsidies for electric appliances, solar panels, electric vehicle charging stations, and other adaptive technology to reduce fossil fuel use. The territory has distributed 65 rebates in the last quarter of 2022 and has no requirements on where purchases are made, so long as the products are eligible vehicles under the program.

### Program Structure & Operation

Once an individual has purchased an e-bike, they submit the receipt along with other required documentation to the Territorial Finance Department for processing and approval. Applicants are required to submit "spec sheets" to determine the product's eligibility, and individuals receive a rebate cheque within 12 weeks of approval.

### Key Takeaways

Staff believe the program should expand to include 'grey area' vehicles, such as e-motorbikes and other vehicles that fall outside of the 500w/32 kmph range. Yukon Territories has a population of less than 50,000 people, a significant amount of whom are Indigenous and who have requested more powerful vehicles for use in hunting, fishing, and other outdoor/traditional activities that are common in the Territory.

<b>Program Dates</b>	<b>Incentive Type</b>	<b>Incentive Amount</b>	<b>Funding Source</b>
2020 - Present	Low-Interest Loan	Up to \$8000 (2 or 5 year amortizaion at 3.5% interest)	Nelson Hydro
<b>Operator(s)</b>	<b>Partnering Organization(s)</b>	<b># of Incentives Distributed</b>	<b>Funding Amount</b>
The City of Nelson	N/A	170	N/A

## City of Nelson E-Bike Loan<sup>130</sup>

The city of Nelson, BC offers a low-interest financing program to homeowners through their municipal electric utility company. Nelson's priority is to reduce VMT and promote commuter cycling among residents through granting these loans, and the city has seen the adoption of e-bikes and shifts in commuting as a result.

The program has distributed 170 loans since it began in 2020, and all logistics are handled at the municipal level by the Nelson Hydro accounting clerks. Nelson owns and generates its own hydroelectricity, allowing the city to simply include loan repayments homeowner's monthly electricity bills.

### Program Structure & Operation

Loans are be granted for up to \$8,000, and participants must choose between a 2 or 5 year amortization at an interest rate of 3.5%. Eligible e-bikes must be 'commuter-related,' and purchases are not limited to brick-and-mortar shops, although making purchases through local businesses is encouraged by the program.

### Key Takeaways

The most obvious drawback is that renters are not eligible for this program, although a provincial purchase subsidy has been released that all residents qualify for.<sup>131</sup>

Having utility infrastructure to house and distribute their loan program is a significant advantage that does not apply to every municipality or region hoping to operate a similar program. This represents a model for other cities and regions who can integrate loan or other incentive programs into existing municipal/regional public services.



# Incentive Program Summary & Policy Recommendations

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Of the purchase subsidy programs interviewed, Denver has operated the longest with the most success. It should be noted that White residents make up a disproportionate amount of Denver's racial demographic, the group that is most likely to ride a bicycle and perhaps adopt new paths to bicycle ownership such as a purchase subsidy program.<sup>132</sup> Tampa's program has also seen success in its first round, yet faces funding issues that will hopefully be resolved within the next round of vouchers in order to address the high volume of applicants.

When comparing program models, Denver and Tampa have distributed a significant number of vouchers in relation to their funding amounts, subsidizing over 5,000 e-bike purchases combined.<sup>133</sup> Comparatively, Oakland's library program has already forecast over \$1 million to purchase and loan only 100 e-bikes. If a low-income resident were to use an e-bike through the Oakland program for the full program length of five years, it would cost them \$2,600 (based on the estimated costs provided by OakDOT/GRID). Compared to the income-qualified \$1,000 and \$1,200 subsidy supplied by Denver and Tampa, respectively, for purchase and total ownership which would bring the cost of an average e-bike within the \$800-\$1,500 range.<sup>134</sup> E-bike batteries begin to lose their ability to hold a charge and need to be replaced every 5-10 years, with costs ranging around \$500-\$1,000.<sup>135</sup> In addition, yearly maintenance costs can fall anywhere between \$100-\$300 for regular components, adding a significant cost to ownership.<sup>136</sup>

Comparison between program models is complicated, as each offers their own qualitative benefits that are difficult to quantify. For instance, the Oakland Lending Library program requires a fee to use the e-bikes long-term, but the program allocates funding towards maintenance costs, subsidizing costs of ownership.<sup>137</sup>

Below are several recommendations on program implementation, based on interview takeaways and feedback from program representatives.

**1. Manage selection process and reduce access barriers –**

Use application windows and lottery system, offer in-person opportunities to submit applications

Application windows accommodate a wide range of schedules and time, especially important for individuals who have little time to fill out applications and limited internet access. Creating pop-up application opportunities at public events and other outreach can address the same barriers.

Due to funding constraints, applicants often outweigh the available subsidies. Therefore, lottery is an equitable model for selecting applicants, given the application process has distributed access to both standard and income-qualified individuals equitably.

**2. Set standardized income-qualification criteria –** Use pre-determined low-income programs or an AMI threshold used by the greater state or federal agency for applicant requirements

Remove as many document and other paper barriers as possible by using standards already set by larger programs for which many income-qualified residents are already registered.

**3. Structure the program to address need-cases first –**

Prioritize those who will be most impacted by the addition of an e-bike to their life

Funding limits on disbursement is the most common issue found among purchase subsidy programs. When limited funding is available, focus on residents for whom an e-bike will have the largest positive impact.

**4. Set clear guidelines for e-bike purchases** – Shape purchases through definitive e-bike classifications and certifications, and include a wide range of e-bike types

Setting quality guidelines for e-bike components, such as UL or ETL certification, that are universally recognized will ensure all e-bikes purchased have met a baseline for safety and quality. Setting clear guidelines will also streamline the process for participants, but setting too many restrictions may lead to confusion and frustration as e-bikes are continually evolving and come in many different forms.

Inclusion of e-cargo and adaptive e-bikes is important, as most residents will use these models in their daily life. E-cargo bikes also have a greater potential for replacing car trips, enabling a wider array of activities with their carrying capacity.

**5. Prioritize partnerships with local bike shops and CBOs** – Include bike shops in project design and utilize CBOs to engage community

Partnering with local bike shops will recirculate subsidies back into the local economy and solidify relationships between residents and local businesses. Project design can also benefit from industry knowledge that bike shops offer, and they can lend valuable knowledge of local contexts that will help shape programs. Establishing industry partnerships early-on in the design phase may prevent unexpected roadblocks further into the process.

CBOs can help a program reach members of the community that may not have access or resources to participate. Utilizing networks and infrastructure, as seen in Berkeley and Oakland, will help grow the program and take advantage of existing tools that a city or region may not have.

# Conclusions

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The overwhelming popularity of purchase subsidy programs shows the demand for e-bikes and cycling is at a critical point in the United States and Canada. Cities and regions are beginning to take advantage of the booming e-bike market and the many benefits that e-bikes offer in addressing climate-change related goals. As existing bike share systems offer easy access to a bicycle, most still have significant barriers to use, including the absence of e-bikes within their fleet. Financial barriers still exist within purchase subsidy programs and are being addressed with other incentive programming such as lending-libraries and community passes for local bike share. These offer benefits to those communities which programs should be prioritizing; low-income and other marginalized individuals who may benefit from the use of a bicycle but do not have the capacity to use bike share or purchase an e-bike, even through subsidized programs.

To have the greatest effect, programs should be implemented simultaneously. Ultimately, the goal is to offer alternatives to vehicular travel through bicycles and the most effective path is through publicly funded projects. Offering purchase subsidies alongside long-term rentals and lending libraries should result in the greatest number of bikes-on-the-street, which is the quickest and most effective way to address the issues of safety and perception.<sup>138</sup> More bicycles create collective desire for greater supportive infrastructure, therefore improving bike share systems and creating incentive programs is the first step in the cycle towards a safer, healthier, and more diverse future in transportation.



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# Interview Questions

## **E-Bike Rebate Inquiry Questions:**

Are there income qualifications or other qualifications?

- If not, do you have plans to introduce income-qualification?

How are the rebates distributed?

- How many rebates have been distributed so far?

How many bikes have been distributed (if different from number of rebates)?

How is the program being funded?

- How much funding has been allocated to the program until now?
- What is overall budget per month or per year?

Who manages and operates the program and the reimbursement?

- Subcontractors?
- What was the selection process for any contractors or subcontractors?
- Partnerships with bike shops for sales and maintenance?
- What are the partnerships like between the program operator/manager and the retailers?

Liability? Who is liable if fraud is attempted or incorrect bicycles are sold to participants?

What types of bikes are available through the program?

- What criteria was used to selected the types of e-bikes?
- Are cargo e-bikes included?

What is the goal of the program?

Are bikes meant to replace car trips and is this actually the case?

Any barriers or issues that have come up with the program?

- Complaints from residents?
- Issues dealing with retailers?

# Interview Questions

## **Lending/Leasing Library Inquiry Questions:**

Who is eligible for the program?

How many bikes are offered by the program?

- What types of bikes (ebikes, cargo ebikes)?

Where are the bikes stored and how are they distributed?

What is the geographical area - how large is the program's catchment area?

What is the funding source, what is the budget?

- How much has been spent on bicycles, maintenance, operations/management?

What relationships does the program have with bike shops or other organizations or contractors?

- Maintenance for bicycles?
- Contractors or Subcontractors for distribution or maintenance?

## Yukon Territories Clean Energy Rebate - Interview with Heather

Rebates are meant for e-bikes or e-cargo bikes

Eligibility for bikes:  
<500w

Pedal or throttle assist

Max speed of 32km/h

Cargo bikes must have extended frame

People or cargo capacity

Can be purchased online

E-mtb qualifies

Conversion kits, motorcycles not applicable

Crowd funding not eligible

Residents eligible for 2 rebates

Businesses eligible for 10 rebates

Rebate amount?

25% of cost - up to \$750

Up to \$1,500 for cargo bikes

Excludes shipping and assembly costs

Spec sheet of e-bike must be included in application to determine eligibility

Rebate cheque received within 12 weeks of application approval

Thinking of creating new rebate pot for grey-area vehicles between registered bicycles and vehicles - things that fall in between the 32km/h and 500w limitations  
Hunting aspect of Yukon and large indigenous population present a need for larger electric vehicles

20 people at energy branch - everything from writing policy to distributing rebates

Set up chargers and basic infrastructure within the Yukon

Run rebate pilot programs for heat pump and all electric vehicles

E-bike program has been running for about 3 or 4 years

65 rebates last quarter

40,000 total pop

Biggest limiting factor is infrastructure

Not faster or cheaper to ride a bike in Yukon

30,000 person town

Federal act about importation and safety standards of import

Territorial act more about safety in riding and wearing helmets etc

Program born out of high-level review of addressing climate change - federal goals - report from Yukon government that eventually ended up with goals/actions/indicators - 225 different indicators that they were tasked to accomplish

E-bike program born out of that

Rates for lots of things - heating/appliances/vehicles, etc

as long as electric or reduces fossil fuels - insulation

Low carbon economy fund - federal funding

Territory also supports with some funding

City is more concerned with where the bikes are going

Energy branch Yukon manages the program - front desk and everyone takes rotating shifts

People must physically purchase bicycle, with receipt

Once that is received - application, then goes through

Territorial Finance Department

Everybody takes turns at the front window for each rebate so each person gets to interface with each rebate/client

Everything they rebate generally must meet some safety standard

Icbc adopted income qualification - they've discussed income qualified higher rebates

They didn't see advantage to doing so

There is a bit of bias in the distribution of these clean energy rebates

Higher-income people will take advantage of solar panel rebates more for example

Local bike shops sell higher-end products

Hub motors are more problematic

Pedal assist/direct drive motors are better but harder to limit speeds - brings up the speed issue again

## City of Madison BCycle Community Pass - Interview with Tana

**Tana is the Marketing manager for MPL - oversee marketing portion of the program**

<https://www.madisonpubliclibrary.org/bcycle>

### Overview

*Bcycle has 47 local systems operating in cities across the United States. However, in several cities it operates under a name other than BCycle*

*Madison BCycle is subsidiary of Trek - trek is HQ in wisconsin*

*Madison is one of many programs all owned by Trek - each has it's own GM*

*BCycle funding model looks for people to sponsor stations - in 2014 the central madison library got a Bcycle station New branch library on the east side of madison - bcycle asked the library to 'sponsor' the station - about \$4,000 paid by the library for initial setup costs New branch on west side just got a new station as well 70/80 stations around madison - 3 next to libraries Foundation funded the community passes - 1st or 2nd in the country to do this*

*Library paid bcycle for the passes - they then loan them out with a library card*

*They also purchased helmets to loan out along with the passes*

*Pass allows unlimited trips on a BCycle over 1 week*

*If no CC, they could use the pass - nothing required to take a bike from the station except the pass*

*Reality is that people use it as a testing almost as much as low-income or people without CC/smartphone access use the program*

*BCycle is a Membership-based program so it expands depending on the number members*

*Majority of stations along the portion of land in between the two lakes (ismiss)*

*This program is the 'low-income' tool perhaps*

*Patron information is all private - those who use the community pass is all anonymous*

*CC and smartphones are not required to take out the bicycles if you have the community pass*

### Participation?

*Each library has 2 passes*

*9 libraries*

*About 1,500 check-outs of the passes over the last year*

*Largest complaint is that many libraries are not close to bcycle stations*

### Does the library Pay for passes?

*One-time fee for each pass*

*Rely on Library foundation for the funding to buy the passes*

*Maybe someone from bcycle was on the library board - so they came to the library foundation with the idea for the*

*program*

*In 2022 they switched all the bcycle bikes to e-bikes*

*if people take the pass and do not return the pass or helmet, they just pay for a new pass but if they take the bike, then the library will have to pay for the bike*

*- the liability for the lost bike is on the library foundation*

*In addition to checking out the pass, customers must be 18 or older*

*They also have to sign the BCycle waiver form - injury liability*

## City of Nelson E-Bike Loan Program - Interview with Avi

*Low-interest financing program for purchase of commuter bikes*

*Includes e-bikes, conversion kits, accessories related to commuting  
Clothing not included*

*Loan is applied to monthly bill on homeowner's Nelson Hydro account*

*Max loan of \$8,000  
Amortization of 2 or 5 years  
3.5% interest rate*

*Must be homeowner*

### **Why loan program instead of POS or post-purchase rebate?**

*Small municipality - instead of handing out money, at least getting the money out to help purchase bicycles - goal is to just get people on bicycles and out of cars - pay back the money eventually and Nelson is too small a municipality to just have funding for subsidies*

*Similar program for energy retrofits*

*Pay back on electric bill - same model as ebike*

*Homeowners only because equity needed to borrow loan against*

### **How long in operation? How many participants? What types of bikes?**

*Operational since 2020*

*Any bike is available - and accessories - anything commuter related*

*About 170 participants thus far*

*Encourage purchase from local stores, but includes bikes online*

### **Drawbacks?**

*Nelson owns its own utility so (generates own power and owns utilities) so all aspects are handled by Nelson - processing of loans are Nelson hydro accounting clerk*

*Program focuses on commuting by bike and eliminating driving*

*Not really an equity lens, more of a 'get out of your car' lens*

*Similar to YUKON lens, interesting to see how rural towns are approaching these programs*

## City of Berkeley E-Bike Access - Interview with Neil from Waterslide Workshop

Income-qualified residents can loan e-bikes through Waterside Workshop  
Program housed under the Pilot Climate Equity Fund 2021 (City of Berkeley initiative)  
"cut greenhouse gas emissions and reduce the impact of climate change on low-income residents"

Selected participants get e-bike for 1 year

Qualifications:  
Berkeley residents, over 18  
Income must be less than 80% AMI for Alameda County OR a participant in income-qualified program like SNAP, PG&E CARE, Medicaid, etc

50 people are selected through a lottery of approved applicants  
\$100 deposit required to receive the bike  
Must share monthly odometer readings  
Must bring e-bike to Waterside Workshop for inspection/maintenance every 3 months  
Must complete 4 surveys over 1 year  
Must participate in 1 e-bike safety class (specifically regarding E-Bike safety)  
4 hours of volunteer work in lieu of the \$100 deposit is available to a limited number of participants - addresses payment barrier

Applications open in waves

### Funding source?

city of berkeley - climate equity fund pilot program  
also from UC Berkeley  
Money meant to confer climate benefits - lower income berkeley residents  
Eligibility - household income 80% or less AMI for alameda county

50 bikes - mixture of cargo bikes and commuter bikes and folding - ebikes

Giveaway program - nonprofit hosting bike giveaways

Selected by lottery of over 600 applicants - 50 individuals  
Requirements:

Place to safely secure them, other requirements  
Everyone goes through safety training course  
Keep it for one year  
Quarterly surveys - maintenance checks - monthly odometer readings  
If completed then the participants get to keep the bicycles at the end of the program

The org does the work themselves - all in house (repairs, distribution, etc, etc)  
Berkeley contracts org - but effectively it's a partnership because they applied for the grant  
Waterside applied to be contractor - but the whole thing is kind of run like a grant program

### Any deliverables?

50 e-bikes distribution

Approx 50 residents

Waterside also offers Bike mechanic training programs  
Try to expand training programs to include ebikes

Bikes mostly from aventon - they are an aventon dealer - also some from rad power

Proof of residency is required (makes sense)

Using alameda county AMI as metric for income qualification  
Since berkeley has high income, the AMI is pretty high so not really many low-income or unhoused etc participants (noted)

### feedback/pushback?

yeah of course from anyone who didn't make it into the program but other than that it's been running smoothly

## City of Oakland Electric Bike Library - Interview with Kerby & Michael

Michael Randolph - city of oakland, lending library, transportation planner  
Kerby Olson - mobility management team at OAKDOT  
\$1 million grant

**Kerby** - Grant Progress & program inception  
Idea born out of 2019 bike plan  
Discussions around bikeshare - bikeshare not really working for a lot of people  
Limitations of time, bike types - people wanted to use for longer and wanted different kinds of bikes  
Community specifically called out library type model  
Feedback turned into grant application  
Grid alternative partner - bay area org  
\$1 million clean mobility options  
Awarded contract to GRID  
GRID now finalizing contracts with local partners - storefront program partners  
Idea is - customer will interface with a local org or bikeshop to look at bikes and complete transactions  
At least 1 week, up to 3 weeks bike borrowing  
At the end of time, quick checks, bike must be brought back to same place as pickup  
Originally wanted to get bike shops on board  
GRID not able to convince bikeshops to get on board - more workload for them?  
Partners - The Crucible and The East Oakland Collective  
Both partners have been trying to build out bicycle/mobility arms - but have originally not really been doing work related to bicycles  
Tough to get ahold of bike shops or CBO's -  
Figuring out best payment system moving forward  
How to balance equity - different types of payment systems  
CMO must be sustainable for up to five years  
Theft deterrents - some type of deposit  
Navigation with contractor and subcontractors regarding these barriers  
MOUs and partners have taken time to figure everything out  
GRID has not purchased bicycles yet - identified vendor but nailing down payment system first before ordering bikes  
Everything so interconnected - cannot really move forward without finalizing everything (payment system)  
Around 100 bikes from two different vendors  
Ideally a few adaptable bikes for differently abled peoples  
Hoping to launch by end of May

Ideally, people charge bikes at their homes (all ebikes in the program)  
\$1 million from grant - total cost changed because of inflation  
Originally wanted 500 bikes but has been reduced to 100 due to inflation and rising costs  
Insurance big issue  
Extra \$500K  
Struggle to make the numbers work  
Uncertainty in the program rollout  
Paying community partners - revenue share - money made off the program can be go back into those organizations  
Every bikeshop is unique and different and has their own

fee structures, etc - so each contract will be a little different depending on their pricing etc  
Orgs that they wanted to work with ended up closing down or simply not being able to work with them - inability to be a partner due to a variety of reasons, unforeseen circumstances  
Lots of up front onboarding - insurance and CMO grants requires a lot of "paperwork" like use surveys, etc  
Training requirements, etc

### drawbacks of Pacoima Beautiful Electro-Bici

"Cohorts" - people need to join a training session with limited participation slots - training sessions take like 3 months to finalize etc - no one has time for all that  
Only 12 bikes out after 6 months  
Can't charge the JUMP bikes at home because of charging ports - need to bring to community hub to charge it  
An issue for anyone not living in the housing project where the project it housed  
Funding from LADWP  
PB wants to bring on 6 different community partners maybe they should simply charge something just for accountability - never will generate enough revenue from the program to match the grant funding

**Michael** - thinking same thing regarding small charges as simply a theft deterrent  
Maybe participants have to just sign a waiver?  
Ideally these are more commercially-available e-bikes that are more familiar to participants

### Who is accountable for bike theft, or something where the participants is not really at fault?

Onboarding education piece - how to properly lock bicycles etc  
Insurance component is a large part of this  
No classes - classes are sort of a barrier/deterrent

**Kerby** - anti-theft features on the bike  
locking QRs/axles

One of the vendors - if you purchase their lock and the bike is stolen with their lock, they will replace the bike once  
A lot of lock companies will do the same  
Admin burden for individuals - but as a large ORG, getting 100 locks in bulk is easier  
More difficult thing is participants stealing the bikes - will have trackers on bikes  
Bike recovery is challenging - even if we know where the bike is, recovering it is difficult cause cops don't care and we can't expect city employees to recover the bikes  
Oakland used to lend out laptops, but all 200 were stolen - so we need to use accountability mechanisms like credit card info, other info, etc  
Returning something in a 'state of good repair'

### How long will the program operate?

**Michael** - five years operating budget  
\$1 million and they need to apply for \$500k additional  
Need to apply for it but admin process only - seems like it's secured (the 500k)

## City of Oakland Electric Bike Library - Interview with Kerby & Michael (continued)

**How many CBO's?** - east oakland collective - the crucible  
- a number of bike shop partners for maintenance only,  
just paying bike shops for the service - contract with  
reservation partners (EOC and Crucible)  
Bike storage - ideally storing as few as possible with  
reservation partners - looking for other secure storage  
(GRID)

### **AFTER 5 YEARS - who owns the bikes?**

After the program is finished, the orgs get the bikes  
Granter had no requirements for what happens to the bikes

### **Kerby**

really what they're trying to do is demonstrate a model -  
long term vision is for the Oakland Public Library to take it  
on as a permanent model

### **Signing people up for prepaid cards and using that as their deposit?**

#### **Another way to get their info?**

**Kerby** - value of bikes is \$2000-\$6000 and value of UBM  
cards is like \$200/\$300 cards and they are free - not a  
good candidate for this program  
\$5/week and \$25/week for low-income and general public,  
respectively

They would want to put a deposit for at least half the value  
of the bike (at least \$1000)

CBO's might have incentive to make the bikes come back  
- but wouldn't want to be saddled for liability for certain  
participants who don't have credit cards, etc

**Michael** - Balance affordability and want the bikes to come  
back as well

Maybe deposits could be a temporary donation?

Because of delays - settled launch deadline september -  
pushed back from may?

### **Question about leasing vs lending/library terminology**

Library carries with it a lot of meaning - community-based

**Michael** - library means free to a lot of people, so they have  
experienced some pushback regarding any payment and  
the fact that it's not attached to the literal library

Reservation CBO partners could take more ownership  
and attach it to their name instead of using the Library  
terminology

### **Who purchases the bikes?**

CMO will purchase bikes through their third-party system

Technically the grantor is paying for the bikes

City of Oakland will be the official owner of the bicycles

city attorney says city-owned bikes might not be able to  
just be given to non-profits unless the MOU or contract  
states no liability issues if bikes are just given away and  
something happens later-on (regarding LADOT program)



## City of Denver E-Bike Rebate - Interview with Natasha

*Natasha - master's student working part time with city of denver*

*Sustainable transportation team  
Involved with e-bike incentive subsidies pilot project in 2021 for essential workers*

*E-bike rebates are a part of the program, but the overarching program also includes subsidies for heat pumps solar chargers, etc - umbrella program Climate Protection Fund - CASR*

### Denver Micromobility Notes

*Peak trip times are between 3-6pm, highest ridership on Saturday evenings  
Weekday mornings are small percentage of trips  
Less likely to be used for 9-5 weekday hour jobs  
Average distance for shared micromobility (scooters) 1.5 miles - 13mins average duration  
Compared to Ride App for ebike program (ebikes), average distance 3.26 miles - 20min average duration*

### Program Funding & Distribution

*\$250,000 was initially allocated to fund this program through CPF - due to initial popularity, CASR had to expand the budget (twice I think)*

*Funding drawn from the Climate Protection Fund - ballot measure in 2020 - \$0.25 sales tax  
\$3 million over 3 years was allocated  
First year was a 'pilot' launch meant to work out any kinks  
Half of the 1st year's total budget was spent in the first month due to program popularity (unexpected)  
Program had to be shutdown and "reimagined" - solution was to reallocate money from the tax to this program*

*Release cadence - certain amount of vouchers are released each month (separate amounts for each income qualified and standard vouchers)*

*If the full year budget was released all at once, it would overwhelm the bike shops and the system, etc  
Voucher redemption rate is inconsistent*

*People apply then get the voucher THEN use it to purchase an e-bike, but not everyone who receives the voucher uses it to purchase*

*Vouchers expire after 60 days*

*Seemingly random amount of voucher redemptions - no way to determine how many people will use the voucher, apparently it changes every allocation and very difficult to predict who will use it, etc*

*If vouchers go unused (expire), the allocated money just returns to the 'pot' and rolls into the next round of vouchers - no money is ever lost on unused vouchers*

*After the first 9 months the city spent \$4.7million for 4,734 participants*

*Demand significantly higher than supply - last round of vouchers gone in 3 minutes after portal launched  
First-come, first-serve basis once the portal opens*

*There are two 'portal lines' for both income qualified and non-income qualified streams*

*Certain funding amounts are set aside for each stream  
600 vouchers - 400 standard & 200 income-qualified  
The Attorney office won't let them use a random lottery system due to some liability thing because the City cannot collect personal information without giving respondents something in return - fuzzy on legal details - provision of compensation for personal information?*

### Participant Eligibility

*Income-qualifying metrics are based on standardized metrics used by other City and State programs, such as Medicaid, SNAP, Old Age Pension, other State-funded program metrics  
This was an effort to simplify the process and increase consistency across programming*

### Bicycle Shop Eligibility & Qualifying Bicycles

*must be a brick-and-mortar shop within 5 miles of Denver city boundary  
5 mile expansion helps to include a few 'good' shops that are located outside the city limits, and accommodate residents on the periphery*

*Must sell qualifying e-bikes*

*Full-suspension E-mountain bikes are not eligible for purchase through this program*

*Denver has a large recreational cycling community - this program is targeting commuters and emission-reducing alternatives to driving (CASR), so commuter focused = no full suspension e-mountain bikes*

*Seems like hardtail e-mountain bikes are fine since they can be used to commute and the line between a commuter bike with front suspension and a hardtail e-mountain bike can get a little blurry*

*E-bikes must meet the State of Colorado's E-bike definition  
Source*

*3 different classes:*

*Class I*

*pedal assist with maximum of 20 mph electric assist*

*Class II*

*bikes that provide electric power whether or not the rider is pedaling, but stops providing power when the speed reaches 20 mph*

*Class III*

*bikes that continue providing electrical power up to 28 mph*

*Must be age 16 or older to operate a Class III e-bike*

*Motors cannot exceed 750w*

*Helmets are required for Class III only*

*Additional requirements:*

*lamp on the front emitting a white light visible from a distance of at least five hundred feet to the front  
red reflector, which shall be visible for six hundred feet to the rear when directly in front of lawful lower beams of head lamps on a motor vehicle.*

*equipped with reflective material of sufficient size and reflectivity to be visible from both sides for six hundred feet when directly in front of lawful lower beams of head lamps on a motor vehicle or, instead of reflective material, with a lighted lamp visible from both sides from a distance of at least five hundred feet.*

## City of Denver E-Bike Rebate - Interview with Natasha (continued)

### *Cargo bikes*

*\$500 additional amount for cargo bikes*

*Has to have extended frame - extended frame must have cargo load carrying capacity of at least 100 lbs*

*Have entered a stasis moment - generally agree*

*48% of bikes purchased were e-cargo bikes*

*Vast majority is a RAD Wagon (example of a disruptor within programs like this - cheaper than most e-bikes but is considered a cargo e-bike)*

*People actually spending less on standard e-bikes because RAD Wagon is cheaper option - people buying this over a standard e-bike*

*2023, since lowering cargo-rebate to \$200, now 51% bought cargo bikes*

*RAD has some proprietary parts that can only be fixed by RAD*

*RAD is a great example of company with controlling market share and create issues for service*

*RAD opened a brick-and-mortar shop in Denver to qualify for the subsidy program - take advantage of popularity of program and trying to get in on the jump in sales*

*The program is attempting to keep some semblance of quality control over the e-bikes purchased through program*

*Trying to eliminate 'cheap' e-bikes that won't work for participants, inexpensive unregulated batteries may cause hazards in the future, inexpensive bikes can break-down/ stop working within a year or two*

*This will also lessen any headache for local shops - if they are familiar with the bicycles purchased through the program, we can guarantee the sourcing of parts and repair knowledge*

*Unregulated e-bikes that do not conform to larger cycling industry standards often cause issues with proprietary hardware/components - cheaper components will also succumb to wear & tear quickly - most streamline process is just to use bicycles that shops have already 'vetted' by choosing to sell them in their store*

### **Create relationships with bike shops**

*Ideally money is circulating back into denver economy, so the program requires purchase from brick-and-mortar shops only, no online sales*

*Start of program - talking to a couple shops, had good relationships with them, then program staff reached out to every local bike-shop they could find - trying to start the program with whoever would be willing to participate*

*Staff were asking shops to contribute their needs and ideas to the program as well*

*POS rebate must be acceptable - easiest solution for bike shops*

*There are now 35 participating shops in the program*

### **Are bikes actually replacing car trips?**

*Data among survey respondents (about 1/3 of surveys that*

*were sent out received a response)*

*On average, 3.5 rides per week are replacing car trips*

*About 70% of people are using their car less often*

*~21% of respondents did not ride a regular pedal bike before purchasing an E-bike*

### **Geography of denver?**

*Flat city*

*Some cycling infrastructure ~~~ Sort of mid?*

### **Reimbursement Process & Liability?**

*Reimbursement process is managed by a subcontractor - APTIM (subcontractor logistical management)*

*APTIM operates the online portal, processes vouchers, reimburses bike shops*

*Bike shops sign terms and conditions document to participate in program*

*This states that money will be returned within a month (consistently happens within two weeks usually)*

*Bike shop needs to check IDs - important for income-qualification tier*

*If fake IDs, fraud, etc - No liability falls on the bikeshops*

*Responsibility is all on APTIM to check qualifying documents, etc*

*Outlines qualifying bikes - cargo bikes*

*RFP selection process for APTIM*

*Also hired to run a statewide program?*

*Roughly (nov/dec 2021 - feb 2022) a few months*

*Had like 4 or 5 bids roughly*

*Bike shops ARE liable if they sell a bike that doesn't count in the program*

*For example, some cargo bikes don't count - a little bit of confusion between what does qualify and what doesn't - some e-bikes fall into a grey area with "cargo" designation*

*Bikeshop submits form to denver rebate admin for reimbursement*

*10-digit voucher code, which the resident then shares with the cashier when purchasing their e-bike at a participating shop*

### **Challenges with shops?**

*Pushback from shops on who else is allowed in the program - there have been some online-only retailers who have decided to open brick-and-mortar shops in Denver in order to qualify their e-bikes for the program and local shops don't love this*

*Tricky to find a balance between keeping the local shops happy and still accommodating all e-bikes - even from those ecommerce retailers who have opened shops, etc - getting too involved and introducing new enforcement gets messy*

*'Craft' shops not that excited about new, cheaper, bikes in the program sold by other shops*

*How to enforce sales of low-end ebikes or selling low-end ebikes to take advantage of the program? - Marking up sales of bikes for example*

*Bike shop visits are part of the program - still working through best way to do this*

## City of Denver E-Bike Rebate - Interview with Natasha (continued)

*A couple resident complaints on bike shop service etc - not to get involved in customer service issues is the position of City of Denver - will quickly get complicated if they were to do this  
People can return the bike and get another one under the program*

### **Program Concerns with larger/State-led programs**

*Bad bikes that will break within a year & also concerns with price fixing - companies may raise their prices to match the rebate amount  
Also worries about fraud with larger programs*

*E-bike libraries may be a solution to the above problems?*

*Denver ebike libraries  
3 public libraries  
Run by small local nonprofit  
Strategically located  
Like one is near a tiny-home village  
Temporary housing/transitional housing for people experiencing houselessness  
Low income, under-resourced neighbourhoods are targeted*

*6 libraries run by denver housing authority  
Only available in denver city affordable housing structures  
Provide a half-way step for folks to need short term solution to transportation  
Same funding source for e-bike libraries (climate protection fund)*

### **Equity barrier solutions**

*working with non profit orgs to refer people to the program  
Ebike library operator - directly refer someone to the rebate program instead of this person having to compete with all the applicants*

*State of colorado - wants to launch program based off of denver program  
Still waiting to hear about it's launch  
Should 'happen at any time' - only one staff member working on it?  
Big challenges at larger levels is Quality Control because the State can't limit purchases to brick and mortar stores only  
- Need to be able to accommodate rural communities where their only option is online orders*

*E-bike subsidy program and E-bike library program are all complimentary programs with slightly different goals but all providing the same type of transportation*

*Different funding with some overlap - demand for all programs, just need to figure out how to spend the money  
Denver has large pot of money and not a lot of oversight*

*Denver removed all docked shared bikes in 2020  
Highly used  
City issues permits  
Docked bike share left in 2020 because they didn't get a permit*

*Programs Denver used as a basis for their own:  
Austin, TX  
Burlington, VT  
Yukon Territory*

## City of Tampa E-Bike Voucher Program - Meeting with Austin

Austin parking/planning coordinator - under parking department

Tampa Bike share - 2 operators - lime ebikes and spin ebikes

Tampa holds the contract - they each have bikes and stations throughout tampa

Scooters - razor and lime and maybe a third

### Program Origins?

Began around august/sept/oct 2022 - took a few months to get the program sorted

Tampa is experiencing a population increase, and with it increased vehicle reliance - people moving to tampa with personal vehicles

In response to this in-migration, the city of tampa looked to denver e-bike voucher program for solutions on how to promote car-alternative modes of travel

Bike share in tampa only used for recreational rides mostly, so they needed other opportunities to implement car-alternate transportation

Idea behind the program was to promote essential trip replacement (jobs/work/school/healthcare - also transport for recreational activities) with e-bikes

Looked into a few programs - looked primarily to denver though

Wanted voucher-based program instead of a rebate program

Up front discount at the time of sale will make it easier for participants

Most tampa residents are low income - up front discount helps to break down barrier to purchase for low income families - don't have out of pocket money to make purchases then wait for rebate

Rebates go to bike shops instead of people

### Bike Shops?

Googling local shops and cold calling them and asking them if they wanted to participate

Termination conditions are from legal team

Trying to keep vouchers away from amazon, walmart, dicks, online orders - want local smaller bike shops to work with

Requirements for participating shops - provide helmets - safety push from the city

State of florida bikes can be ridden anywhere - not a lot of cycling education regarding safety and laws

### Other projects Austin is working on include:

Bike Safe - safe biking locations throughout the city that austin working on

Public city owned garages have bike racks - parking security and security cameras for 24/7 surveillance

Micromobility safety campaign - bike are a part of the safety component - inviting voucher recipients to join

Safety rides, tours, etc - how to share roadway with cars

Before school starts again in the fall he wants to get biking and bus safety program running

### Funding Structure?

Total Funding was \$170,000 for first round of program (2022-2023) from internal funding sources - Austin reached out to various internal departments and asked for excess funds that they could spare from their funding pools

He could sell the program as something that was tailored to each department because the program has a ton of cross-over with existing programs/projects/etc that other departments need to meet requirements for to distribute funding

Extra project funding from all teams that austin reached out to

For example: Sustainability and Resilience department were able to tie this program into their work for obvious reasons, so they could fulfill some requirements and distribute funding from another project to this one

Spin to make it fit every team's goals so they could distribute funding

Future funding - PPP Austin wants to pursue for future funding

Thinking tampa bay lightning or something for partnership opportunities (he had some funny tag lines about being the lightning or something in regards to electric bikes etc)

Several CRAs with huge budgets in tampa but their money can only be spent within their district - so difficult to distribute funding across the program

Austin hoping that CRAs will partner in the future, allowing the program to distribute their funding within their boundaries and then have a separate fund for the general population - would be a large expansion of the program

Additional benefit for low income residents

4 different types of vouchers

Standard voucher for e-bike - \$500

E-cargo bike - \$1000

2 Low income - used AMI for city of tampa to define low-income

Double the value of standard value

\$1000 for standard and \$2000 for cargo

### Application Process?

No reliable internet access among residents - so the application process needs to be different from denvers

Lottery selection process for program - application window open for 2 weeks (March 31- April 14)

During two weeks, applicants have the time to apply freely In person paper application assistance sessions were also made available

Had a couple adjacent events where paper applications were brought to help people apply - sort of a pop-up paper application event

180 vouchers total available - 60 for standard ebike - 50 for cargo - 50 for income e-bike - 20 for income cargo

Final application component is a consultation with bike shop 6 bike shops participating

Determine inventory available - e-bike or e-cargo bike

What type they want, the price, the maintenance, etc

## **City of Tampa E-Bike Voucher Program - Meeting with Austin (continued)**

*Once they have the voucher they will know exactly what bike they want*

*Applicants must identify which shop they will purchase from - helps to organize with bike shops - so they know how many applicants will be purchasing bikes and they can have inventory ready*

*About 1000 applicants once window closed*

*Lots of media coverage and Lots of outreach on social media as well all helped to spread the word*

*Shops also helped word of mouth*

*Took Austin about two weeks to process applications - reselection process involved as well - applicants must be vetted prior to drawing names for recipients*

*Lottery numbers were issued once all applicants were vetted and passed all documentation requirements etc etc Did a live lottery drawing - first 5 or 10 drawn live on social media livestream*

*All applicants should be in process of redeeming or getting ready to redeem*

*After July 9th all vouchers are voided - money goes back into another round, or into a pool to select more applicants form first round to select more applicants*