CEC MASSBIKE E-BIKE PROGRAM FINAL REPORT

EXECUTIVE SUMMARY

Background: In 2022, MassBike launched an income-eligible e-bike incentive program in Worcester, MA, with funding from the Massachusetts Clean Energy Center's (MassCEC) first round of the Accelerating Clean Transportation for All (ACT4All) Program. The Program distributed e-bikes to participants from environmental justice communities in Worcester and 10 neighboring towns. The primary goals of the program were to measure the impact on greenhouse gas emissions due to mode-shift, encourage the use of e-bikes as a cleaner, more sustainable transportation option compared to traditional vehicles, and to pilot new e-bike program models. The program also aimed to encourage riders to use the e-bike safely via instruction and on-bike training, and to build a culture of bicycle advocacy in an area of the state that was not known for being bicycle friendly.

Program design: The program consisted of two phases: Phase 1 started in April 2022 and ended in May 2024. Phase 2 started in May 2024 and ended in May 2025. Phase 1 provided all e-bikes to low-income participants free of charge, Phase 2 provided some free e-bikes and also provided some vouchers for the purchase of an e-bike to individuals at slightly higher income levels.

Both phases included the design and implementation of an application, a participant selection process that guaranteed e-bikes would be deployed to income-eligible individuals, and a deployment process that assured every participant was equipped with the necessary bike accessories and hands-on safety training that would allow them to navigate the complexities of riding in an industrialized city like Worcester.

In exchange for the e-bikes, participants were required to provide weekly riding data for a set number of months, participate in at least one community ride, complete a mid-program survey, and fill out an exit survey at the end of the program. The quantitative and qualitative data collected during both phases was shared with the City

of Worcester Department of Transportation and Mobility and the Central Massachusetts Regional Planning Commission in hopes of guiding their mobility and transportation priorities.

Program results: In total across both program phases, the e-bike program yielded 203 participants that reported 20,546 e-bike trips totalling 92,353 miles of environmentally friendly transit. On average, the chart below shows the number of trips and miles that participants rode per year. Please note that in 2022, the data was collected for five months (Aug-Dec). In 2025, the data was also collected for five months (Jan-May)

			Per Participant	
YEAR	TRIPS	MILES	TRIPS	MILES
2022	5,502	21,091	97	370
2023	8,406	38,431	175	801
2024	4,956	26,369	108	573
2025	1,682	6,462	76	294
TOTAL	**20,546**	**92,353**	**114**	**409**

Based on the number of e-bike miles participants reported for trips to work, school, and shopping, the program achieved a total of 49,869 lbs of avoided C02 This is equivalent to avoiding the use of 2,545 gallons of gasoline or the amount of greenhouse gas emissions avoided if 1,923 trash bags of waste were recycled instead of landfilled. Sharing these equivalences with the riders helped them realize the positive impact they made when they chose to ride their e-bikes.

Lessons learned: Among the lessons learned, three in particular are important to mention here:

1) The events that were organized during the life of the program kept people engaged in the program and increased ridership-- and hopefully increased people's confidence and safe riding practices. It's worth mentioning that the participation of the e-riders was challenging at times due to their life-altering situations, such as health issues, family matters, lack of safe bike storage, and housing instability. The weather also played a role in their participation. During the winter months, their riding decreased by 2/3 of what it was in prior months.

2) Participants reported several physical and mental health benefits**.** They reported engaging in a total of 10,884 minutes of exercise across both phases, with an average of 54 minutes per active participant per month. Note that during the riding season (May-Nov) the average increased to 433 minutes per participant per month. Participants described that riding the e-bike was therapeutic, joyful, and a stress reliever. E-Bikers also stated that their quality of life improved; the e-bike gave them the opportunity to get outside more, enjoy nature and feel more engaged. Some mentioned that it reduced their transportation costs and increased their independence. Participants also mentioned that, thanks to participating in group rides and events, they developed a sense of community and social connection. Several of the program participants also went on to become regular volunteers with us. In particular, two of them shared their knowledge with e-bikers during the second phase deployments. They also are regular attendees at community events, along with a few others who lend a hand when needed.

3) Through the process of launching and running this e-bike program, MassBike was able to help build a culture of bicycling. We organized or collaborated with eight program partners in 68 events throughout the program, which represented an average of two events per month. The interaction with them grew as the program developed. As a result, it's become the norm that they collaborate with events on a regular basis. MassBike's participation in community meetings (City Council meetings, Public Hearings, Election Forums and Debates, Transportation and Mobility events) added value and visibility to the results that MassBike and its Worcester E-Bike Program achieved. Additionally, participation in public transportation hearings was an effective way to elevate the bicycle conversation to the city and/or state level. MassBike is now one of the members of working groups and advisory committees that deal with transportation and mobility issues locally and regionally.

Future work: In April 2025, the Massachusetts Clean Energy Center launched the statewide Massachusetts E-Bike Voucher Program. The lessons learned during both phases were key in the development of the Statewide version of the E-Bike Program. MassCEC hosted the celebratory launch event for the statewide program at Landry's Bicycles in Worcester, citing the deep impact MassBike's program had on the development of the statewide program. Due to our commitment to safety and a people-oriented approach, MassBike was selected to help with community outreach for the statewide program, which is underway as of the closing of this report.

BACKGROUND

In 2022, MassBike launched an income-eligible e-bike incentive program with funding from the MassCEC ACT4All program. MassBike is the statewide, not-for-profit advocacy and educational organization whose mission is to promote better bicycling through improved infrastructure, access, and safety, for all people throughout Massachusetts.

The primary goal of the MassBike E-Bike program was: To distribute e-bikes to participants from environmental justice communities in Worcester and 10 additional neighboring towns and track their usage for a specific period of time while measuring the impact on greenhouse gas emissions due to mode-shift. The program also had two other goals: Encourage riders to use the e-bike safely via instruction and on-bike training, and fostering a cycling community through events, which built a culture of advocacy in an area of the state that was not not known for being bicycle friendly.

Timeline: The following chart contains the timeline of Phase 1 and 2 of the E-Bike Program. The first phase of the program started in April 2022 and ended in May 2024. The second phase started in May 2024 and ended in May 2025. The activities per phase are explained in the following paragraphs.

Exhibit 1: MassBike e-Bike program timeline

	2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1																
Model and application design	X															
Program manager hiring	X															
Promotion & outreach	X	X														
Procurement of e-bikes	X	X														
Program application launch		X														
Participant selection			X	X												
E-bike deployment			X	X												
Data collection and reporting			X	X	X	X	X	X	X	X						
Phase 2																
Model and application design									X							
Promotion and outreach									X							
Program application launch									X							
Participant selection									X	X	X	X	X			
E-bike deployment									X	X	X	X	X			
Data collection and reporting									X	X	X	X	X	X		

Phase 1

Model and Application Design

The first phase of the program consisted of the distribution of 100 free e-bikes and accessories among applicants from environmental justice communities[1] in the city of Worcester. To participate in the program, selected applicants were asked to provide MassBike with information about their e-bike use for 18 months, including number of trips, estimated miles ridden, and reason for their trip. Phase 1 started in February 2022 with the design of the application, which was a collaborative effort between MassBike staff and the program partners, who were selected due to their engagement with environmental justice communities in the greater Worcester community.

In March 2022, the Program Manager was hired and one of her first tasks was to finalize and promote the application that would be shared widely amongst the general public (see Appendix A for application). This involved a robust promotion and outreach plan that included a combination of in-person meetings with community organizations and businesses around the area such as public libraries, radio stations, restaurants, and places of worship. The program partners were also asked to disseminate the program information with their contacts. Simultaneously, the application was translated in seven languages commonly spoken in Worcester (Akan kasa/Twi, Albanian, Arabic, Brazilian Portuguese, Nepali, Spanish and Vietnamese), to guarantee the reaching of applicants in the environmental justice communities, which was the goal of the program. For applicants who did not have access to a computer, printed applications were distributed at public libraries, businesses and community organizations. The outcome of this promotion meant that nearly 1200 people applied to the program, exceeding expectations and demonstrating the demand for this type of program designed to provide sustainable personal transportation for income-eligible individuals

The procurement of the e-bikes was the responsibility of Landry's Bicycles, whose personnel assembled the e-bikes between February and May 2022. Landry's Bicycles is the largest bicycle retailer in New England, and has also been nationally recognized as National Bicycle Dealer of the Year for supporting bicycle advocacy. All the deployments were at Landry's Bicycles in Worcester. This took place at the tail end of COVID, which meant the industry was facing bicycle shortages and supply chain limitations. So partnering with Landry's meant we'd have the purchasing power of a prominent independent bicycle dealer.

The online version of the application was launched in May 2022 and was available until June 30, 2022. During this time, the program received 1,181 applications from people of all walks of life, which included: people with disabilities, veterans, parents with children, seniors, low-income workers and college students.

The program requirements included filling out the application in full, being at least 18 years old, living and/or working in the City of Worcester, having health insurance, an

[1] https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts

income up to $50,000, knowing how to ride a bike, having adequate storage for the e-bike and being willing to provide 18 months of data in exchange for the free e-bike.

After several meetings between MassBike staff and CEC staff, the scoring of the applications focused on the questions related to storage (40% of the total), bike experience in Worcester (20% of the total), transportation options (20%) and health (20% of the total). 100 applications with the highest scores were chosen using the Excel Simple Random Feature, creating an unbiased selection system. A determined number of e-bikes were assigned to each age and diversity group, which was designed to match the demographic data of the city of Worcester of a recent census. In case applicants did not follow through with the program requirements, a predetermined number of applicants were chosen from each group.

The purpose of selecting applicants to match the general population allowed the program to show how average citizens who otherwise did not ride a bicycle on a daily basis would utilize their e-bikes through this pilot. By sharing that data with the City of Worcester and the Central Massachusetts Regional Planning Commission, as well as community groups, we hoped to better inform policies, programs, and decisions about how to support better bicycling in the region.

Participant Selection

Randomly chosen eligible applicants were interviewed via phone for approximately 15 minutes by MassBike staff and were asked a predetermined set of questions (see appendix). This step was used to make sure that the applicants understood the program requirements and that they were in fact a good fit for the program. It was also used to collect information on the candidate's age and height, information that, if the participant was selected, was communicated to Landry's so they could match them with the proper e-bike. This step also proved to be effective in screening out non-responsive applicants who did not answer the call or email that was sent to schedule the interview.

After the initial phone call, applicants who were a good fit received a follow-up email asking them to provide proof of household income (they needed to produce one of the documents from a pre-determined list -see Appendix B for Documentation for Income Verification) within three days of receiving the email. The Program Manager verified that the documentation reflected the household income information that was provided in the application. After this step was confirmed, the selected applicants received an email that contained the Safety Training and E-Bike Battery Care training videos that they were expected to watch prior their deployment date. They also received confirmation of the day and time they were expected to be at Landry's Bicycles to receive their one-on-one training and their e-bike.

If an applicant did not produce the income verification document, they were reminded to do so via email and phone twice within a week. If they did not return the call or email,

another candidate was chosen from the alternate group for the phone interview and the selection process continued as stated previously.

E-Bike Deployment

Once a participant was confirmed to be eligible and a good fit for the program, the Program Manager relayed this information to Landry's Bicycles so they could prepare the e-bike that matched the participants' height. The day before deployment, selected participants were reminded via email to be at Landry's for their time slot. There was a second reminder via text the day of the deployment. This proved to be an effective method for everyone to show up on time.

On deployment days, the Program Manager welcomed the participants at the bicycle shop and was in charge of explaining the responsibilities of the participants and the reporting requirements. All participants were required to show their ID. Then, Landry's staff were in charge of explaining the e-bike technology, its components, and how to charge the bike safely to participants. MassBike personnel were in charge of explaining the use of the accessories. All participants received a lock, lights (if the bike didn't have them), lube (for basic maintenance), a floor pump, and a high-visibility safety vest along with the e-bike. MassBike personnel also provided on-bike safety training and helped participants with their test rides. If participants needed some adjustments or additional equipment, Landry's was able to assist with those needs.

The program used this individualized one-on-one approach for every selected participant. Along with making sure every participant received safety training related to the complexities and dangers of riding in an industrialized city like Worcester, this had the added benefit of developing a personal connection amongst the participants and program staff, meaning that every rider got to know the Program Manager, who would be following up on a weekly basis to ask them for their data, and inviting them to community events and group bicycle rides.

It took between 30-45 minutes to deploy an e-bike, depending on the participant's biking abilities. No more than three participants were scheduled per hour.

The program distributed 98 e-bikes and accessories during 15 distributions that occurred between August and December of 2022. There was a pause during the winter months and then deployments resumed in April 2023 and finished in June 2023.

The selection of bicycle models and brands during the various phases of deployment changed, depending on the availability of e-bikes from Landry's, as well as lessons learned during the initial deployments. For instance, during the first phase, we offered a choice between two types of bicycles: a commuter-style bike that was heavier and had the rider more upright, and a mountain-style bike with wider tires and shocks meant to handle tougher terrain. Upon receiving feedback from participants, we learned that a few people who chose the mountain-style bike opted to return the bike to swap for the commuter bike, as these bikes were being used for daily trips and therefore needed the

ability to have racks to carry bags, fenders to keep the rider clean in the rain, and a less "aggressive" geometry for simply riding a bike for errands, commuting, or low-stress recreation. After the initial deployments, the project team and Landry's decided to offer more practical commuter style bikes, which incidentally were also less expensive to purchase.

We also recognized that just giving a bicycle was not sufficient, as participants likely also needed tools for basic maintenance such as an air pump and chain lubrication, and safety gear such as a helmet, bicycle lights, a good lock, and a reflective vest. As part of the deployment process, along with introducing people to their bike, the project team and staff at Landry's Bicycles also helped participants understand how the accessories functioned.

During the life of the program, ten e-bikes were returned for various reasons, for example: the participant moved out of Worcester, they realized they couldn't fulfill the requirements, they didn't have adequate storage anymore, etc. In those cases, MassBike worked to find a replacement participant from the alternate list, going through the same applicant screening and deployment process for each replacement. Ten e-bikes were returned and reissued during Phase I, which means that the E-Bike program completed 108 bicycle deployments in total, up from the initial 98 selected participants.

Data Collection

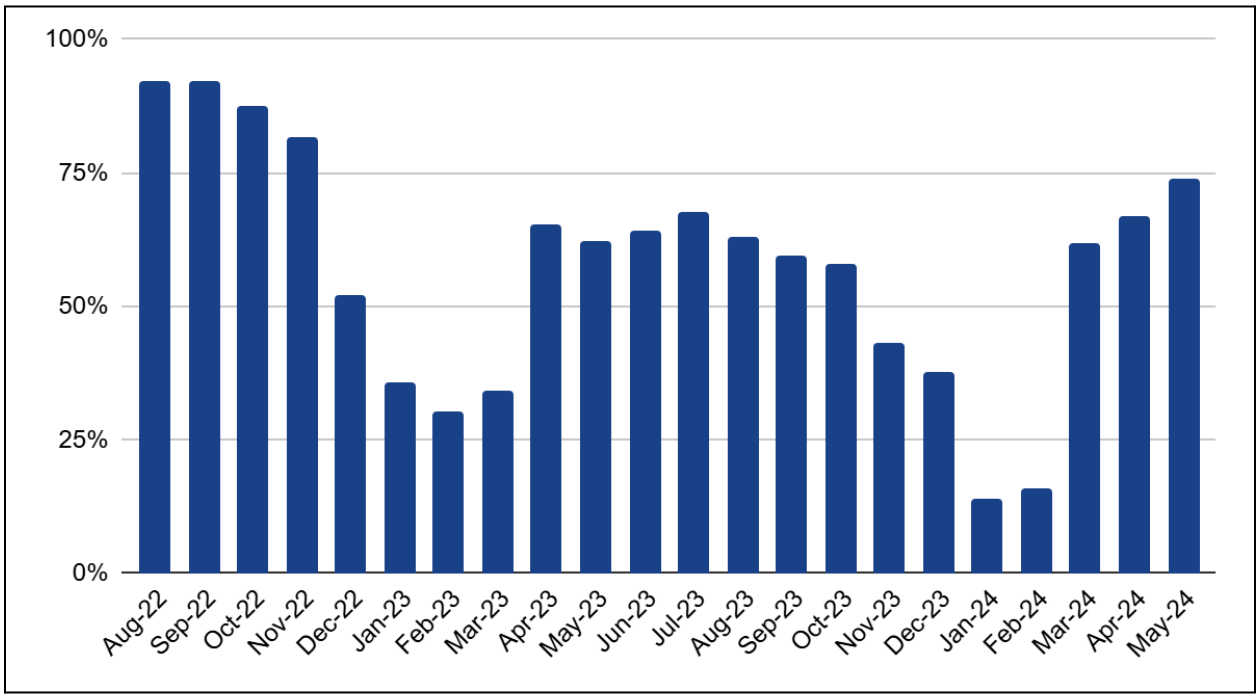
The E-bike program collected two main types of program data: participant-reported E-bike use tracking miles, trips, and types of use, and subjective participant experience data, collected with mid-program and exit surveys.

E-Bike use: The riding data collection started after the first group of e-bikes was deployed in the first week of August 2022 for eighteen months. Because of the riding pause during the winter months, participants were asked to continue reporting until May 2024, which some of them agreed to do. The reporting process started with a weekly email reminder sent by the Program Manager, in which participants were asked to report the number of trips and miles ridden in the last week across five categories: work, school, shopping, recreation and other. Participants were expected to report weekly by email, phone or via text message. All reporting was voluntary, and there were no punitive measures taken for non-reporting. Besides the weekly reminders, there were additional follow-ups when participants did not report for a month. All the participants' riding data was entered into a spreadsheet template tailored for the program. Every month, the riding data was compiled and made publicly available online. This data was then compiled quarterly for CEC reporting and included calculations of estimated gas emissions, maximum, minimum and average number of trips and miles per month, and health benefits. In order to encourage reporting, fully-compliant participants were offered a $30 gift card every quarter.

Riding data follow-up demanded time and effort, with an average of 20 minutes spent per participant who did not report weekly. Due to the volume and varied forms of data collection, the riding data entry had to be done every two to three days.

The first phase of the program finished collecting data at the end of May 2024. The riding data shows that the average participation rate (comparison between the number of participants selected vs the number of participants reporting) was 57% with a maximum reporting rate of 92% and a minimum reporting rate of 14%.

Exhibit 2: Phase 1 participant riding data reporting rate by month



Mid-Program and Exit Survey: Participants were asked to fill out two surveys during their time with the program.

A mid-program survey measured their satisfaction level with the program, their accomplishments and challenges since joining the program, bike and safety related workshops that participants would be interested in, preferred schedule that would allow participants to engage in workshops and rides, accessories and gear that would allow them to ride more, and any suggestions of what the participants would like to see more/less of for the remainder of the program (see Appendix B).

The exit interview survey included similar questions to the ones included in the program application (see Appendix C). This helped us find out if there had been any changes since participants applied for the program. It included questions that measured self-reported bicycling level; bicycling frequency; average number of trips by bicycle per week; weekly amount of money spent on all transportation; physical and mental health

status; quality of life; feelings of isolation; number of days of moderate physical activity; perception of how the MassBike e-bike program has affected physical health, mental health, quality of life and/or feelings of isolation; advice to future participants, and suggestions for program changes. The information collected in these surveys was shared with the City of Worcester Department of Transportation and Mobility and the Central Massachusetts Regional Planning Commission. Our hope is that this information will support and influence their work.

Phase 2

Model and Application Design

This phase sought to distribute bikes in two ways: a free e-bike model as was used in Phase 1, and new voucher models that would pay $1200-1500 towards the cost of an e-bike for applicants at slightly higher income levels, with the rest of the costs to be covered by the participant. For this second phase, the distribution of the 105 e-bikes was extended to nine other neighboring towns and Westborough instead of just focusing on the city of Worcester. This allowed us to reach a broader audience with the expectation of understanding different riding and tracking habits based on income level, and also to reach suburban and rural communities. This was also done to help influence a potential expansion of the program statewide.

The outreach and promotion were in-person (at public libraries, community centers, small businesses) and via social media, similar to the first phase. This time, the outreach and promotion also covered businesses and organizations located in neighboring towns, including: Leicester, Holden, West Boylston, Boylston, Paxton, Millbury, Auburn, Shrewsbury and Westborough. The program Partners helped in disseminating the application among their contacts.

The Phase 2 application was launched at the end of February 2024 and remained open until March 31, 2024. 558 people applied, which included college students, veterans, parents with children, older adults and people with disabilities. We received fewer applications in Phase 2 compared to Phase 1. This might have been because the application process was open four weeks in Phase 2 vs six weeks in Phase 1. However, we received applications from every town and city targeted in this phase.

For this phase, there were three models:

- **Grant model**: The program covered 100% of the cost of the e-bike and accessories for applicants with income up to 40% of the 2024 Massachusetts state median income (SMI).
- **$1,500 voucher model**: For applicants with a household income between 40.1% and 60% SMI. The program covered $1,500 towards an e-bike, $200 for accessories and $100 for tune-up/maintenance.

- **$1,200 voucher model**: For applicants with a household income between 60.1% and 80% SMI. The program covered $1,200 towards an e-bike, $200 for accessories and $100 for tune-up/maintenance.

The requirements for this phase were: To be 18+ years old, live and/or work in one of the following towns: Auburn, Millbury, Grafton, Shrewsbury, Boylston, West Boylston, Holden, Paxton, Leicester, Westborough or Worcester, qualify for any of the models that were based on a maximum income and the number of people living in the household (see chart below), know how to ride a bike, have adequate storage for the e-bike and be willing to provide six months of data.

Exhibit 3: Phase 2 income eligibility limits

Household size	**Grant model** (up to 40% SMI)	**$1500 voucher model** (between 40.1%-60% SMI)	**$1200 voucher model** (between 60.1%-80% SMI)
1	Less than $30,261	$30,262 to 45,392	$45,393 to $60,523
2	Less than $39,573	$39,574 to $59,359	$59,360 to $79,145
3	Less than $48,884	$48,885 to $73,326	$73,327 to $97,768
4	Less than $58,196	$58,197 to $87,294	$87,295 to $116,392
5	Less than $67,507	$67,508 to $101,261	$101,262 to $135,015
6	Less than $76,819	$76,820 to $115,228	$115,229 to $153,637
7	Less than $78,564	$78,565 to $117,846	$117,847 to $157,128
8+	Less than $80,310	$80,311 to $120,465	$120,466 to $160,620

SMI = Massachusetts state median income in 2024

Based on those requirements, 378 of the applications were eligible, which included applications from Worcester and all 10 additional towns. All the eligible applications were arranged per model and then randomly organized within each city/town using a spreadsheet developed for this purpose. The Program Manager chose applicants to schedule interviews within the random order they were listed in the application eligibility determination spreadsheet tool.

The number of e-bikes to be distributed per city/town was based on their population, with a total 105 e-bikes, as shown below.

Exhibit 4: Phase participant distribution by city/town and program model

City/town	Population	% of total	# Grant Model participants	# Voucher Model participants
Auburn	12,798	5%	2	3
Millbury	10,967	4%	2	2
Grafton	14,479	5%	2	3
Shrewsbury	28,183	10%	4	6
Boylston	3,713	1%	1	1
West Boylston	6,519	2%	1	1
Holden	14,355	5%	2	3
Paxton	3,731	1%	1	1
Leicester	8,317	3%	1	2
Westborough	16,130	6%	2	4
Worcester	165,076	58%	25	36
Total	**284,268**	**100%**	**43**	**62**

Participant Selection

The interview and selection process were similar to the first phase of the program for the free model e-bike, in which randomly chosen eligible applicants were interviewed via phone and asked a predetermined set of questions. Applicants who were a good fit received a follow-up email asking them to provide proof of household income within three days of receiving the email. The Program Manager verified that the documentation reflected the household income information that was provided in the application. After this step was confirmed, the selected applicants received an email that contained the online safety and battery care training videos that they were expected to watch prior to their deployment date. They also received confirmation of the day and time they were expected to be at Landry's Bicycles to receive their training and their e-bike.

If an applicant did not produce the income verification document, they were reminded to do so via email and phone twice within a week. If they did not return the call or email, another candidate was chosen from the alternate group for the phone interview and the selection process continued as stated previously.

For the voucher model, the interview phone call with the candidates took between 30-45 minutes, as compared to the free model calls that took about 15 minutes. These longer phone calls provided candidates with the opportunity to learn how the voucher program worked and also to ask questions that would allow them to decide if the program was a right fit for them. After the call, participants received a follow-up email with a summary of

the program's information (see Appendix E). In this email, they were asked to provide information such as proof of income, the bike shop where they were planning to use the vouchers, the expiration date that they preferred on the vouchers: either 60 day or 90 day expiration date. They were also asked to agree in writing with the liability waiver terms, which were attached to the email.

After receiving their information, the Program Manager reviewed their income documentation. Approved participants received a confirmation email (see appendix section) with the information needed to use their vouchers. The store personnel were also copied in the email so they were aware of the confirmed participant. All their information was also logged in the spreadsheet shared with them, according to the Standard Operating Procedure written for that purpose (see below).

E-Bike Deployment

The implementation of the voucher program required several meetings between MassBike and the staff of three bike shops to conduct e-bike deployments: Barney's Bicycles in Worcester, Landry's Bicycles in Worcester and in Westborough. As a result of these meetings, the program established a Standard Operating Procedure (SOP) that was implemented successfully. The SOP (see Appendix F) included the use of a spreadsheet that contained the information of the confirmed participants. Every time a participant showed up at the bike shop to claim their vouchers, the bike shop personnel confirmed their information using the spreadsheet.

40 class 1 e-bikes and accessories were to be distributed under the free e-bike model and 65 e-bikes using the voucher model with a rebate between $1,500 and $1,200 towards an e-bike of either class 1 or class 2, a $200 accessories voucher and a $100 tune-up voucher. Participants under the voucher model were given the option of choosing from any model that the store carried either under class 1 or class 2. They were also able to use the accessories voucher for any item that the store carried.

All 40 of the e-bikes under the free e-bike model were distributed between May and October of 2024, while 61 e-bikes were distributed under the voucher model between August and December of 2024, among the three bike shops. There was a pause during the winter months. Four remaining vouchers (participants who were originally selected didn't show up to use them) were reassigned in March 2025.

For this model, the participants made arrangements directly with the stores to use the vouchers for the e-bike and accessories. The bike shop personnel were in charge of explaining the use of the accessories, the safety training and the test ride. MassBike presence was less hands-on during this phase so that the bike shops could work on their abilities to engage newer riders in their communities in preparation for the statewide program.

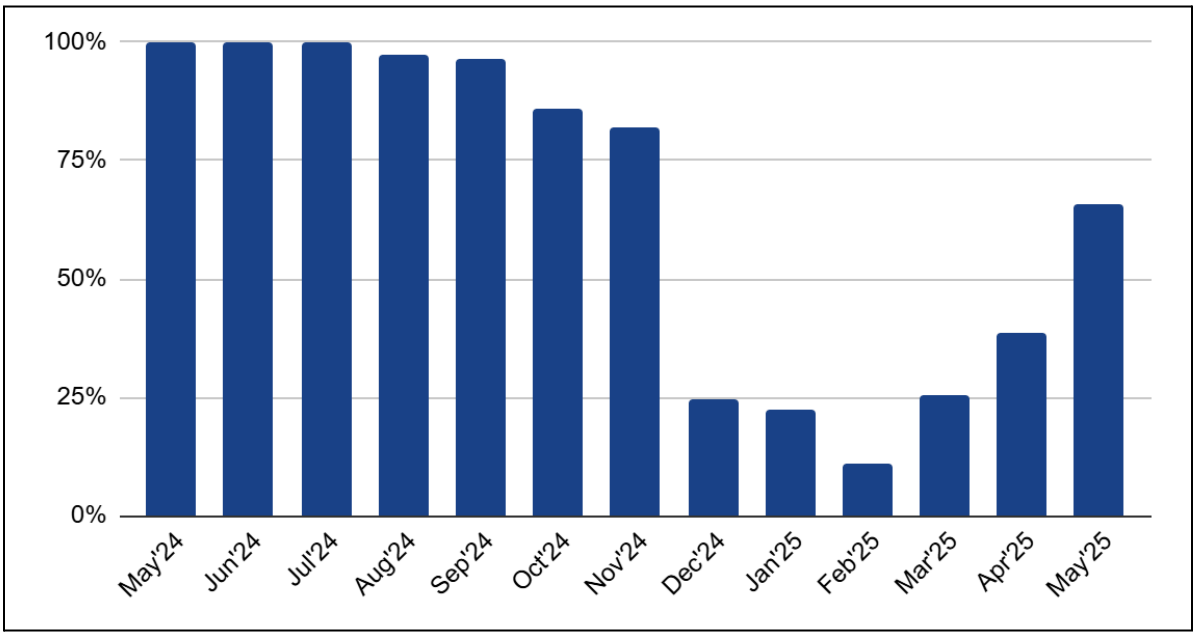
Data collection

E-Bike use: The riding data followed the same guidelines from the first phase. This time, a spreadsheet was customized by Mathematica in which the data was recorded by model. With the use of formulas, other calculations such as estimated gas emissions and health benefits were also available as the data was logged in.

The second phase of the program finished collecting data at the end of May 2025. The riding data shows that the average participation rate was 65%, with a maximum reporting rate of 100% and a minimum reporting rate of 11%.

Compared to Phase One, the reporting rate increased in Phase Two by 8% (from 57% to 65%, respectively).

Exhibit 5: Phase 2 participant riding data reporting rate by month



Mid-Program and Exit Survey: In order to measure any changes over time**,** for the second phase, similar mid-program and exit surveys were used as in Phase 1. It included questions that measured the participants' primary mode of transportation, other modes of transportation used on a regular basis, number of miles travelled weekly via car and via public transit, weekly amount of money spent on all transportation modes, biking experience level, frequency of bike usage, frequency of moderate physical activities, physical and mental health status; perception of how the MassBike e-bike program has affected physical health, mental health, quality of life and/or feelings of isolation; advice to future participants; and suggestions for program changes.

In the mid-program survey, participants were asked if they had joined any of the program rides and if they did, what they enjoyed the most. They were also asked what would help them to ride more often during the rest of the program.

In the exit survey, participants were also asked what would help them to ride their bicycles more after the program was over and any other experience(s) that they would like to share about their program experience.

PROGRAM RESULTS

Participant demographics

The following table summarizes the participants' demographics from the first and second phase of the program.

Exhibit 6: Participant demographics by phase and program model

Participant characteristic	Phase 1	Phase 2		Total (n=203)
	Grant model (n=98)	Grant model (n=40)	Voucher model (n=65)	
Gender				
Female	50% (49)	45% (18)	43% (28)	47% (95)
Male	47% (46)	55% (22)	54% (35	51% (103)
Self-described	3% (3)	0% (0)	3% (2)	2% (5)
Race				
White	48% (47)	68% (27)	66% (43)	58% (117)
Hispanic or Latino	22% (22)	10% (4)	9% (6)	16% (32)
African American or Black	12% (12)	5% (2)	2% (1)	7% (15)
Asian	6% (6)	3% (1)	5% (3)	5% (10)
Native American or Alaskan Native	1% (1)	0% (0)	0% (0)	0% (1)
Native Hawaiian or Pacific Islander	0% (0)	0% (0)	0% (0)	0% (0)
Multiracial	4% (4)	3% (1)	9% (6)	5% (11)
Other or prefer not to answer	6% (6)	13% (5)	9% (6)	8% (17)
Age				
18-25	19% (19)	15% (6)	9% (6)	15% (31)
26-39	31% (30)	33% (13)	25% (16)	29% (59)
40-54	23% (23)	23% (9)	34% (22)	27% (54)
Over 55	27% (25)	30% (12)	32% (21)	29% (59)
Income				
Less than $20,000	45% (44)	45% (18)	2% (1)	31% (63)

Participant characteristic	Phase 1	Phase 2		Total (n=203)
	Grant model (n=98)	Grant model (n=40)	Voucher model (n=65)	
$20,000-50,000	52% (51)	43% (17)	32% (21)	44% (89)
$50,000-80,000	3% (3)	13% (5)	46% (30)	19% (38)
Over $80,000	0% (0)	0% (0)	20% (13)	6% (13)
Education level				
Less than high school	8% (8)	8% (3)	0% (0)	5% (11)
High school diploma or GED	22% (22)	25% (10)	17% (11)	21% (43)
Associates or vocational degree	13% (13)	10% (4)	14% (9)	13% (26)
Some college	18% (18)	20% (8)	12% (8)	17% (34)
Bachelor's degree	27% (26)	28% (11)	31% (20)	28% (57)
Graduate degree	11% (11)	10% (4)	22% (4)	16% (32)
Home ownership status				
Rent	72% (71)	53% (21)	51% (33)	62% (125)
Own	26% (25)	40% (16)	45% (29)	34% (70)
Temporary housing (living in a hotel, motel or shelter)	2% (2)	5% (2)	3% (2)	3% (6)
Unhoused (have no place to live or living on the street)	0% (0)	3% (1)	2% (1)	1% (2)
Primary spoken language				
English	93% (91)	93% (37)	89% (58)	92% (186)
Spanish	5% (5)	5% (2)	6% (4)	5% (11)
Other	2% (2)	3% (1)	5% (3)	3% (6)
Employment status				
Working	63% (62)	58% (23)	80% (52)	67% (135)
Not working	37% (36)	43% (17)	20% (13)	33% (66)

Key findings:

- **Gender**: Our program attracted an average of 48% female in the free model programs versus 47%, overall.
- **Race**: The program served a racially diverse group of participants, with 42% of all participants identifying as non-white.
- **Age**: The program had broad appeal across different age groups, regardless of which specific model (a program for all ages and stages of adult life).
- **Income**:45% of participants in the free model programs and 31% of all participants had an income of less than $20,000 a year.
- **Education level**: The program participants had a wide variety of educational backgrounds.
- **Homeownership status:** Most of the participants reported that they rented their homes, overall.

- **Primary spoken language**: Overall, the majority of the participants reported English as their primary spoken language.
- **Employment status:** Overall, about two thirds of the participants were currently working, one third were not. The voucher model participants were more likely to be currently employed than the voucher model participants in phase 2.

E-bike ridership

The following charts illustrate the number of trips and miles travelled by the MassBike E-Bike participants overall. The first phase collected data from August 2022 through May 2024. Participants were required to provide 18 months of riding data on a weekly basis. The second phase collected data from May 2024 through May 2025. Participants were required to provide six months of riding data on a weekly basis. It is important to keep in mind the data collection time period when comparing phase 1 results versus phase 2 results, since phase 1 participants reported three times as much data as phase 2 participants did. Additionally, during the second phase, most of the data collected for the grant model included the summer months, which are ideal for biking activities. For the voucher model, a lot of the data was collected in the winter months, during which the riding decreased considerably. See Appendix G for additional e-bike ridership program data.

Exhibit 7: Number of participant bike trips by phase and program model

	Phase 1 (22 months of data)		Phase 2 (6 months of data)				Total (n=203)	
	Grant model (n=98)		Grant model (n=40)		Voucher model (n=65)			
Types of bike trip	**Trips**	**%**	**Trips**	**%**	**Trips**	**%**	**Trips**	**%**
Work	4,805	32%	677	18%	120	7%	5,602	27%
School	577	4%	123	3%	231	14%	931	5%
Shopping	2,954	20%	840	22%	553	33%	4,347	21%
Recreation	4,786	32%	1,807	47%	417	25%	7,010	34%
Other	1,895	13%	400	10%	361	21%	2,656	13%
Total	**15,017**	**100%**	**3,847**	**100%**	**1,682**	**100%**	**20,546**	**100%**

Exhibit 8: Number of miles travelled by phase and program model

	Phase 1 (22 months of data)		Phase 1 (6 months of data)				Total (n=203)	
	Grant model (n=98)		Grant model (n=40)		Voucher model (n=65)			
Types of bike trip	**Miles**	**%**	**Miles**	**%**	**Miles**	**%**	**Miles**	**%**
Work	17,916	28%	6,035	28%	487	8%	24,438	26%
School	1797	3%	430	2%	633	10%	2860	3%
Shopping	12,654	20%	3,447	16%	1,860	29%	17,961	19%
Recreation	24,077	38%	10,222	47%	1,963	30%	36,262	39%
Other	7,550	12%	1,764	8%	1,519	24%	10,833	12%
Total	**63,993**	**100%**	**21,898**	**100%**	**6,462**	**100%**	**92,353**	**100%**

Exhibit 9: Number of trips and miles ridden and bikes deployed per quarter

	PHASE 1								PHASE 2			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Trips	843	4,134	1,259	2,069	3,009	2,319	485	994	1,287	2,230	351	1,566
Miles traveled	3,758	15,582	4,292	8,395	15,295	10,947	2,051	3,673	7,427	13,744	1,063	6,126
Total e-bikes deployed	51	88	89	95	98	98	98	98	38	40	40	40
Total vouchers claimed	-	-	-	-	-	-	-	-	2	57	61	65
Total e-bikes & vouchers claimed	**51**	**88**	**89**	**95**	**98**	**98**	**98**	**98**	**40**	**97**	**101**	**105**

Note that this chart reflects only the number of participants who reported.

Key findings:

- **Trips:** The average number of trips travelled per participant was 153 in the first phase, 53 in the second phase, and 101, overall.
- Overall, the largest percentage of trips was observed for the *Recreation* category, with 34% of the total. *Work* was the second largest category, with 27%.
- The *Work* category represented the largest percentage of trips in the first phase, with 32% of the total. The *Recreation* category was the largest in the second phase, representing 43% of the total.
- For the second phase, 18% of the participants under the Grant Model reported riding their e-bikes for *Work* purposes while 8% of them did so under the Voucher model.
- Regarding the grant model for both phases, the number of trips travelled per participant was 153 for the first phase and 96 for the second phase.
- **Miles:** The average number of miles travelled per participant was 653 during the first phase, 270 in the second phase, and 455, overall.

- Regarding the grant model for both phases, 28% of the participants reported to ride for *Work* purposes.
- Overall, the number of miles per trip was 4.5 miles.

Environmental impact

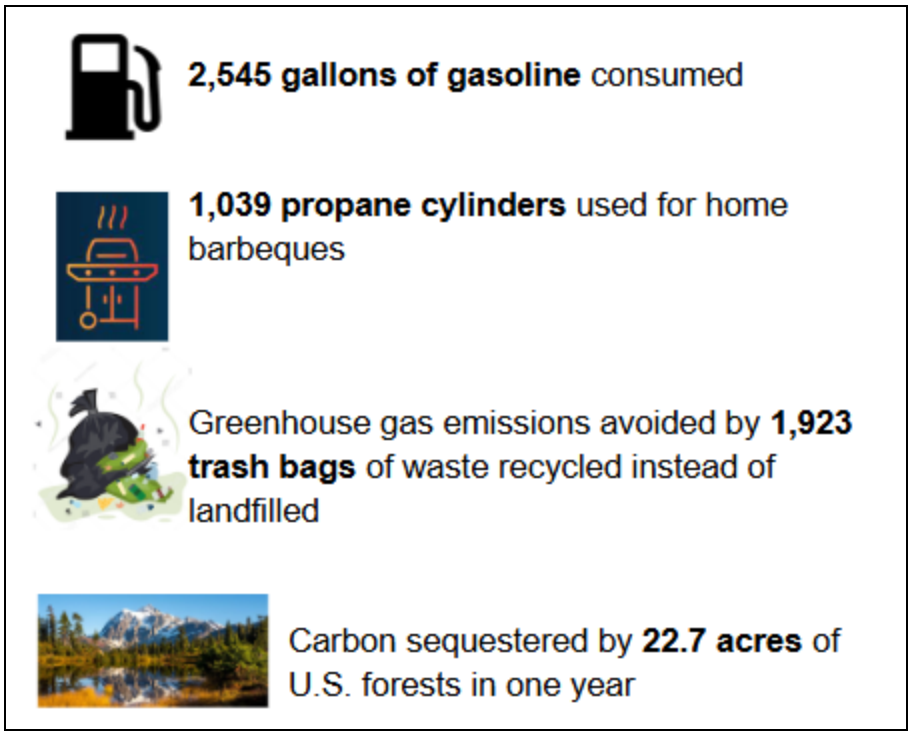
The ultimate goal of the program was to encourage the use of e-bikes as a cleaner, more sustainable transportation option compared to traditional vehicles. To that end, the number of miles participants reported riding for work, school, and shopping was used to estimate the emissions savings achieved by the program. Recreational miles were not included in this calculation.[2]

Exhibit 10: Estimated emissions savings generated by MassBike E-Bike Program by phase and program model

	Phase 1 (22 months)	Phase 2 (6 months)		Total (n=203)
	Grant model (n=98)	Grant model (n=40)	Voucher model (n=65)	
Estimated Emissions Savings (lbs)				
Total Avoided C02	35,557	10,414	3,898	49,869
Average per trip	3.48	4.69	2.66	n/a
Average per user	33.66	39.28	26.29	n/a

- The average of avoided C02 per participant during the first phase was 362 lbs, while during the second phase it was 135 lbs. Overall, it was 245 lbs.
- The total of avoided C02 (**49,869 lbs**) for both phases is equivalent[3] to:

[2] The Estimated Emissions Savings was calculated using the EPA formula for a typical passenger vehicle. This equates to CO2 emissions per mile of 8,887/22 = 404 grams. A typical car averages about 22 miles per gallon; every gallon of gasoline creates about 8,887 grams of CO2 when burned. Grant requirements also included the calculation of estimated emissions savings per trip and per user.
[3] Avoided CO2 equivalencies calculated using the following EPA tool: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results



The program shared these equivalences of C02 monthly with the participants. This helped the participants connect the dots and see the real-world impact that they make when they choose to ride their bikes. The more they rode, the more impact they made. Also, by reducing emissions, noise, and reliance on fossil fuels, e-bikes contribute to a healthier environment and can be a valuable tool for promoting sustainable urban mobility.

Participant experience

In addition to the estimated emissions savings generated by the program, participants reported several personal benefits from participating in the MassBike E-Bike program:

- **Physical health benefits:** Many participants reported increased physical activity, weight loss, and improved fitness. Some mentioned the e-bike made biking accessible again despite physical limitations (e.g., knee issues). Participants reported engaging in a total of 10,884 minutes of exercise across both phases, with an average of 54 minutes per active participant per month.[4]

[4] Number of minutes of exercise was calculated by multiplying the average of miles that active participants traveled per month by the average # of miles that class 1 e-bikes can travel/hour (@ 12 miles/hour). This is based on a study by the Transportation Research and Education Center, Portland State University.

Exhibit 11: Average amount of time participants spent riding their e-bikes

	Phase 1 (22 months)	Phase 2 (6 months)		Total (n=203)
Participants' Health Benefits (minutes spent riding their bikes)	Grant model (n=98)	Grant model (n=40)	Voucher model (n=65)	
Total	6,924	3,009	951	10,884
Average minutes per month	315	376	190	320
Average minutes per participant per month	71	75	15	54

- **Mental health and emotional well-being:** Riding the e-bike was described as therapeutic, joyful, and a stress reliever. Several participants said it made them feel like a kid again or gave them a sense of freedom.
- **Improved quality of life:** The program helped participants get outside more, enjoy nature, and feel more energized. Some noted reduced transportation costs and increased independence.
- **Community and social connection:** Group rides and events helped reduce feelings of isolation and fostered new friendships. Participants appreciated being part of a biking community.

Quotes from participants

Improved my well-being and helped me stay active and in my community, not home alone'.

'Positive effect on physical and mental health. I bike more often and ride more miles because of the program.'

Building a culture of bicycling

MassBike organized or collaborated with eight program partners in an average of two events per month for a total of 68 events throughout the program.

- 2022: 7 events
- 2023: 20 events
- 2024: 22 events
- 2025 (through May): 19 events

From partnering with AARP, to working with Worcester Earn-A-Bike and WalkBike Worcester, community events became essential in MassBike's efforts to strengthen the

bicycle culture in the city and beyond. They also helped build relationships with the program partners, bikers, city and state officials and the community, as a whole. For example, tabling at Farmers Markets was a big commitment, but a great way to understand/build a bicycle community.

The interaction with program partners grew as the program developed. As a result, it's become the norm that they collaborate on events on a regular basis.

Quotes from Partners

'Helping at deployments allowed my organization to learn first-hand what fears/hopes the new participants were expecting when they started to ride their e-bikes'.

'Thanks to attending MassBike events and tabling with them, I've been able to connect with the Worcester community on a more regular basis'.

Group rides with AARP seniors, longer rides around a Worcester reservoir with Seven Hills Wheelmen, the annual George Street Challenge with The Major Taylor Association, the Halloween ride with 508 BikeLife, among others, were the most effective way for partners and participants to build camaraderie, get to know each other and stay engaged. It is worth noting that every time there was a group ride, participants spent quite a bit of time socializing before, during and after the ride. Some of them shared that the program has allowed them to find a riding buddy, who encouraged them to ride more.

Several of the program participants also went on to become regular volunteers with MassBike. In particular, two of them shared their knowledge with e-bikers during the second phase deployments. They also are regular attendees at community events, along with a few others who lend a hand when needed.

MassBike's participation in community meetings (City Council meetings, Public Hearings, Election Forums and Debates, Transportation and Mobility events) added value and visibility to the results that MassBike and its Worcester E-Bike Program achieved. Additionally, participation in transportation public hearings was an effective way to elevate the bicycle conversation to the city and/or state level. MassBike is now one of the members of Worcester's Mobility Action Plan Working Group and of the Central Massachusetts Metropolitan Planning Organization Advisory Committee.

One event that is worth highlighting at the end of Phase 1 was the **Worcester Bay State Bike Month Celebration** on Saturday, May 18th, 2024, at Stearns Tavern

(located at 140 Mill St), when we celebrated our first cohort of riders as they officially finished their participation in the Worcester E-Bike Program, and Bay State Bike Month. Snacks, raffles and free bike lights were provided. The event was the perfect opportunity to acknowledge the work of the eight official partners of the program, and the City's Department of Transportation and Mobility. District Five City Councilor, Etel Haxhiaj, was in attendance and offered remarks in which she highlighted the importance of programs like ours, as they contribute to building community by bringing people together. The State Representative from Worcester's 17th District, David Leboeuf, attended the event, as well.

The highlight of the event was the remarks of two of the program participants, who represented the 98 bikers who received bikes and accessories and a two-year maintenance plan in exchange for their data for 18 months. A summary of their remarks is below:

- ***Andrea L****,* who attended the event with her son, spoke about his experience since he joined the program in August, 2022: *'As a single woman, my e-bike gave me the confidence to take up solo bicycling, exploring dozens of rail trail miles in the region'.*
- ***Juan S,*** who attended the event with his wife and daughter, joined the program in April 2023. He spoke in Spanish about the positive impact of the program in his life*: 'Being part of the program was a transformative experience," Not only about learning how to ride a bike, but I also learned confidence, freedom and a sense of community."*

The event was finalized with a bike ride on Mill Street that, in spite of the pouring rain, was possible thanks to parking-protected bike lanes put in place at the end of 2023. The bike lanes allowed a group of 12 riders with various biking abilities to ride together safely in inclement weather conditions.

The ride raised awareness that better/separated biking infrastructure tends to get riders out in less-than-ideal weather, encouraging mode-shift. The safer the infrastructure, the more climate-resilient riders tend to become. It's important to mention that Mill Street parking protected bike lanes are the first ones (and the only ones, so far) around the city and have become a biking training ground for people of all ages and abilities.

The celebration was featured in an article published by Patch the day after the event. Below are some photos of the celebration and the ride:

CONCLUSION

Over the course of a little over three years, the MassBike E-Bike program deployed 203 e-bikes, collected ridership data for 34 months, collaborated with eight community partners to host 68 events for the e-bike participants, had a positive impact on participants' health and quality of life, and contributed to an estimated emissions

savings of nearly 50,000 lbs. of CO2. Despite these important successes, the program also experienced a number of challenges.

Program administration challenges

- A Google Group for the program participants was created for the first phase participants to encourage interaction and camaraderie with each other. Unfortunately, it wasn't regularly used.
- Scheduling screening phone calls with applicants was challenging due to changes in their contact info (phone numbers and email addresses).
- Due to the volume and varied forms of data collection, the riding data needed to be done every two to three days.
- Organizing events, attending community events, and managing the program was a balancing act throughout the program.
- The vouchers that were not claimed were not able to be reassigned until the expiration date elapsed, delaying their reassignment between 60-90 days.

Infrastructure, environmental, and participant-related challenges

- Lack of bike parking and lots of debris (mostly glass) around the city became a common issue for several participants, especially in terms of flat tires.
- During the winter months, the riding mileage decreased by 2/3 of what it was in prior months, mostly due to weather concerns.
- Participants' life-altering situations affected their program engagement, such as health issues, family matters, lack of safe bike storage, and housing instability.
- There were four e-bikes stolen during the program (two during each phase). These became opportunities to remind everyone to lock their e-bikes properly when parking in public places. Participants were also reminded that reporting the stolen e-bike to the police increased their chances to recover the bike.

In addition to the high-level achievements of the MassBike E-Bike program, we also experienced a number of other successes during the course of the program.

- A video of the e-bike program was prepared at the end of 2022 and included some of the participants' insights. It may have helped to increase awareness about the program.
- We received additional funding from the Barr Foundation in December 2022. These funds allowed us to do additional outreach activities with program partners and other organizations that helped us understand the challenges and opportunities of the growing biking community in Worcester.
- The program kept most of the participants during the first phase (67% of the total) engaged by weekly data reminders sent by email, which also included articles related to transportation and riding events that were happening in the area.

- The most effective way to encourage reporting was by individual follow-ups (mostly by phone), The frequency of the reporting (weekly) doesn't seem to be a concern. Instead, health constraints seemed to be the #1 issue, followed by work and life issues.
- Based on the participants' feedback, the program provided additional accessories (vests, bike pump, gloves, and lube) at Landry's. It also granted requests for baskets and racks, which encouraged participants to ride their bike when going shopping, attending doctor's appointments, running errands, etc.
- The first parking-protected bike lanes located on Mill Street were opened at the end of 2023. MassBike took an active role in City Council meetings in support of the change. They became an ideal place to organize bike rides, as they provide safety and comfort for riders of all ages and biking abilities.
- Thanks to CEC's additional funding, the second iteration of the program began in February 2024 with the design of a hybrid model, which added a voucher-incentive program and the participation of neighboring towns. The help of Mathematica was key in the second phase.
- Collaboration with local program partners (CMRPC, WalkBike Worcester, SevenHills Wheelmen and Worcester Earn-A-Bike) allowed the program to increase the number of events held as well as their promotion across multiple networks. This also increased the community's participation and contributed directly to furthering the development of the city's bicycle culture.
- The majority of deployments of the second round of e-bikes for the grant model occurred during the summer months, which helped participants take advantage of the nicer weather and ride more.
- The voucher program provided the opportunity to work with other bike shops, which helped support local businesses.
- The implementation of the voucher program was very time-intensive, but the results were worth the investment. The time spent on the phone with each potential participant gave them opportunities to fully learn how the program was organized and to ask any questions. This contributed to the smooth rolling out of the program and mitigated confusion or miscommunication.
- The reporting rate for this second phase was steady, with an average of 88% compliance. This might have been because of shorter reporting data requirements.
- Keeping track of the data reported by the voucher model participants and the free e-bike model participants was easier, thanks to the spreadsheet developed by Mathematica. However, logging in their trips and miles was very time-intensive, especially as the number of participants increased.

Best practices

Based on the challenges and successes the program experienced, we developed the following best practices for others that are considering conducting an e-bike program of their own.

Planning stage: Connect with partners across different sectors with complementary expertise, such as those involved in bicycling education, data collection, media relations management, and transportation policy and infrastructure decisions in your community.

Outreach, application design: Plan ahead for subsequent stages of the process by defining all the parameters of your participant selection criteria before designing and launching your application. Make your application accessible to as much of your target population as possible by making it short, using clear language that is easy to understand, and making the application available in the languages used by the community you want to reach.

Participant selection and bike deployment: Set aside enough time to interview applicants and select an ample number of backup eligible applicants; during our process only one out of every three interviews resulted in a confirmed participant. Give bike shop personnel enough time to prepare the e-bikes for the participants by scheduling no more than 2-3 deployments per hour and sharing participants' height, gender, and age ahead of time so the shop can make sure they have enough staff and suitable bikes available.

Data collection: Work with a data collection professional to design a data collection strategy that works for participants and program staff; it can take some iterating to find a process that is not overly burdensome for everyone. Share program data with participants on a regular basis to help keep participants motivated to ride. Mid-program surveys are an excellent way to receive feedback from the participants and make changes, as needed. Exit surveys are used to learn participants' experience with the program. This knowledge can be used for future similar initiatives. If your budget allows it, provide incentives (such as gift cards) to encourage participants to report regularly and to complete surveys.

Rider motivation: Do regular check-ins with participants via phone to learn of any challenges or successes they are experiencing. Asking participants to report on their bike riding every week will also help remind and motivate them to ride. During the colder months, organize online events to stay connected with participants. Explain to participants the connection between their riding and reducing carbon emissions by using the Greenhouse Gas Equivalencies Calculator created by the Environmental Protection Agency.

Community engagement: Work to make participants feel like they are part of the e-bike program cohort or part of the local bicycling community by organizing rides and other events where participants can interact and learn from each other. When organizing rides, utilize the bicycling infrastructure in your community: rides using parking-protected bike lanes increased participation and encouraged attendees to bring their friends and family. Theme rides and offering a raffle at each event also encouraged riders to participate more frequently.

Future work

On April 14, 2025, the Massachusetts Clean Energy Center launched the statewide Massachusetts E-Bike Voucher Program. They hosted the celebratory launch event at Landry's Worcester, citing the deep impact MassBike's program had on the development of the statewide program. Our Worcester Program Manager, Alex, Landry's staffer, Greg, and one of our E-Bike Program participants, Julie, were all invited to speak at the event. Due to our success, MassBike was also selected to help with community outreach for the statewide program.

Acknowledgments

This program would not be possible without the generous funding provided by the Massachusetts Clean Energy Center. We are proud to be one of the four pilot programs whose data was used to roll out a statewide e-bike rebate program for those most in need of reliable, green transportation.

We credit much of our success to our dedicated local partners who supported our riders and our many community-oriented events throughout the program:

- Central Massachusetts Regional Planning Commission
- City of Worcester Department of Transportation & Mobility
- Landry's Bicycles
- Mathematica Inc (*)
- Mayor Taylor Association Worcester Chamber of Commerce
- WalkBike Worcester
- Worcester Earn-A-Bike

(*) Our special gratitude to Brianna Sullivan from Mathematica Inc, whose mentorship and guidance during both phases of the program made a meaningful difference.

APPENDICES

Appendix A: Phase 1 application

WORCESTER E-BIKE RIDER PROGRAM APPLICATION

Please Note: This program is only for people who live and/or work in the City of Worcester.

By completing this application, you are expressing your interest in being considered to receive a free electric bicycle, bicycle lock, rain cover, bicycle helmet, and bicycle lights from the Massachusetts Bicycle Coalition (MassBike). If selected, you agree to ride the e-bicycle in the Worcester area as often as possible, and to assist this new program, funded by the Massachusetts Clean Energy Center, designed to offset carbon emissions produced by cars, trucks, and buses. You agree to participate in trainings, provide weekly updates on your use of the e-bike, and join group rides hosted by MassBike and its partners.

Training will begin July 2022 and you must use the bike through Spring 2024. All participants are required to attend three classes, which introduce the electric bicycle, provide instruction on safe riding around Worcester, and teach basic daily maintenance needed to keep the bicycle in safe and working condition.

Bicycle maintenance will be provided by Landry's Bicycles Worcester at no cost during the program. At the end of the program, you will own the e-bicycle and will be responsible for ongoing maintenance.

The program will give priority preference to low income-qualified applicants who live or work in Worcester (documentation may be requested).

Your responses to these application questions are confidential and no identifiable information about you will ever be shared outside of the program administrators. By taking part in the program, you are agreeing to also participate in a study about this program.

If you have questions at any time about the application or the program, you may contact Alex Salcedo by email at alex@massbike.org

Thank you very much for your time and support.

Please start with the application now by clicking on the **Start** button below.

First Name

Middle Initial

Last Name

Residential Address Street

City

State

Zipcode

Mailing Address if different

What is your preferred phone number?

What type of phone number is this?

- o Cell
- o Work phone
- o Home phone

What is your email address?

What is your preferred method of contact?

- o Phone call
- o Text message
- o Email
- o Mailed letter

How old will you be on June 1, 2022?

_____

What is your gender?

- o Female
- o Male
- o Other (prefer to self-describe) _____

What is the highest level of education you have?

- o Did not finish High School
- o High School Diploma or GED
- o Associates Degree (2-year degree)
- o Vocational Degree
- o Some College
- o Bachelor's Degree (4-year degree)
- o Graduate Degree (Masters, Ph.D, JD, MD, etc.)
- o Other (Please specify) _____

What is your race/ethnicity? Check **all that apply**.

- o White
- o African American or Black
- o Hispanic or Latino (any race)
- o Asian
- o Native Hawaiian or Pacific Islander
- o Native American or Alaskan Native
- o Other (Please specify): _____
- o Prefer not to answer

What language are you most comfortable speaking?

- o English
- o Akan kasa (Twi)
- o Albanian
- o Arab
- o Nepali
- o Portuguese
- o Spanish
- o Vietnamese
- o Other (Please specify) _____

Will you need translation to participate in the e-bike program?

- o Yes
- o No

Do you have health insurance coverage? (Please include health insurance obtained through employment or purchased directly as well as government programs like Medicare, MassHealth, and the Children's Health Insurance Program that provide medical care or help pay medical bills.)

- o Yes
- o No

To qualify for the program, please tell us what your **annual household income** is.

- o Less than $20,000
- o Between $20,000 - $50,000
- o Between $50,000 - $80,000
- o More than $80,000

Did your household participate in any of the following assistance programs in the past 12 months? Please check **all that apply**.

- o Supplemental Nutrition Assistance Program (SNAP/Food Stamps)
- o Supplemental Security Income (SSI)/ Social Security Disability Income (SSDI)
- o Medicaid/MassHealth
- o Section 8
- o Public Housing
- o Other _____
- o Not applicable

Are you currently employed?

- o Yes
- o No
- o In-between jobs

In what city are you employed?

What type of residence do you live in?

- o I own my home
- o I rent
- o Temporary housing, such as living in a hotel, motel, or shelter
- o Unhoused/Have no place to live or living on the street

How many trips do you take per week that are **10 miles or less** by (count for all reasons, ie: work, school, medical appointment, shopping, etc.)

- _____Personal vehicle
- _____Car-share (Zipcar, Turo, etc.)
- _____Ride-share (Uber, Lyft)
- _____Public Transit (bus or train)
- _____Bicycle
- _____Walk
- _____Other

What is the average number of miles you travel per week **via car**?

What is the average number of miles you travel per week **via public transit**?

Are you interested in an e-bike for a single rider or a cargo bike to also transport children?

- o Single
- o Cargo

Describe your experience level in biking in Worcester.

- o I have never bicycled
- o I am new to bicycling
- o I am a confident bicyclist
- o I am an expert bicyclist

If you already bike, what is your **average # of trips** taken by bike per week?

Do you have access to a secure location to store your e-bike? (You will need access to electricity to charge the battery with a standard 3-prong outlet).

- o Inside
- o Inside but up a flight of stairs
- o Outside, uncovered
- o Outside in covered, locked storage
- o I do not know where I would store the e-bike

Would you say that in general your health is:

- o Excellent
- o Very good
- o Good
- o Fair
- o Poor

During the last 7 days, how many days did you do moderate physical activities (activities that you did for at least 10 minutes at a time, such as: carrying light loads, bicycling at a regular pace, or yoga)? Do not include walking.

- _____ of days
- o I did not do any moderate physical activities

Thank you very much for your participation!

For applicants **who apply by mail**, please mail the completed form to:

MASSBIKE
RE: Worcester E-Bike Program
50 Milk St, 16th Floor
Boston, MA 02109

For applicants **who apply online**, please visit: https://www.massbike.org/ebikeworcester

Appendix B: Documentation for Income Verification

As part of your application, we ask that you provide the following documentation:

If you are currently working:

Proof of your income status by **ONE** of the following means for each employer you may have:

● Your two most recent pay stubs if working an hourly or salaried position.

● Your four most recent pay distributions if working a gig economy position.

If working both hourly/salaried position and a gig economy position, please provide both your two most recent pay stubs from your hourly/salaried position and your four most recent pay distributions from your gig economy position.

If you are retired:

· A document stating that you are retired. A W-2 reporting 2023's income is acceptable.

Alternately, you may provide proof (**one document**) that you qualify, including:

● Temporary Aid to Needy Families (TANF)

● Supplemental Security Income (SSI)

● Social Security Disability (SSDI)

● Supplemental Nutrition Assistance Program (SNAP)

● Title IV or Title XVI of the Social Security Act.

● Low Income Heating Energy Assistance Program (LEAP)

● Weatherization Assistance Program (WAP)

● Proof that you qualify for Medicaid/MassHealth

● Section 8

● Public Housing

● Zero Income Affidavit, if needed.

Appendix C: Participant mid-year program survey

PARTICIPANT MID-YEAR PROGRAM SURVEY
First Name
Last Name
Email Address

What is your primary mode of transportation? Select one only.

- Personal vehicle
- Car-share (Zipcar, Turo, etc.)
- Ride-share (Uber, Lyft)
- Public Transit (bus or train)
- Bicycle
- Walk
- Scooter or Moped
- Other _____

What other modes of transportation do you use on a regular basis? Select all that apply.

- Personal vehicle
- Car-share (Zipcar, Turo, etc.)
- Ride-share (Uber, Lyft)
- Public Transit (bus or train)
- Bicycle
- Walk
- Scooter or Moped
- Other _____

What is the average number of miles you travel via car per week? (helpful tip: 1 mile = 20 blocks on average)

What is the average number of miles you travel via public transit per week? (helpful tip: 1 mile = 20 blocks on average)

Approximately how much money do you spend on transportation in an average week? (car payments, car insurance, fuel, MBTA passes, car-share, ride-share, taxi fares, bus fares, etc.)

1. Less than $25
2. $25 - $49
3. $50 - $99
4. $100 - $149
5. $150 - $249
6. $250 - $349
7. $350 - $499
8. $500 or above

Describe your biking experience level:

1.
2. I am new to bicycling
3. I am familiar with bicycling
4. I am a confident bicyclist
5. I am an expert bicyclist

How frequently do you ride a bicycle?

1. Every day
2. A few times a week

3. Only on weekends
4. A few times a month
5. Rarely

Would you say that in general, your physical health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Would you say that in general, your mental health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

How often do you feel isolated from others?

1. Hardly ever
2. Some of the time
3. Often

During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or yoga?

1. 0 days
2. 1-2 days
3. 3-4 days
4. 5-6 days
5. 7 days

Have you attended one of our Worcester Community Bike Rides yet?

1. No
2. Yes

IF YES: What is one thing you enjoyed about the Worcester Community Bike Ride event(s) you attended?

What would help you ride your bike more often during the rest of the program?

Is there anything else you would like to share about your experience in the program so far?

Thank you!

Appendix D: Participant exit survey

2024 E-BIKE PROGRAM EXIT SURVEY
First Name:
Last Name:
Email Address:

What is your primary mode of transportation? Select one only.

1. Personal vehicle
2. Car-share (Zipcar, Turo, etc.)
3. Ride-share (Uber, Lyft)
4. Public Transit (bus or train)
5. Bicycle
6. Walk
7. Scooter or Moped
8. Other _____

What other modes of transportation do you use on a regular basis? Select all that apply.

1. Personal vehicle
2. Car-share (Zipcar, Turo, etc.)
3. Ride-share (Uber, Lyft)
4. Public Transit (bus or train)
5. Bicycle
6. Walk
7. Scooter or Moped
8. Other _____

What is the average number of miles you travel via car per week? (helpful tip: 1 mile = 20 blocks on average)

What is the average number of miles you travel via public transit per week? (helpful tip: 1 mile = 20 blocks on average)

Approximately how much money do you spend on transportation in an average week? (car payments, car insurance, fuel, MBTA passes, car-share, ride-share, taxi fares, bus fares, etc.)

1. Less than $25
2. $25 - $49
3. $50 - $99
4. $100 - $149
5. $150 - $249
6. $250 -$349
7. $350 - $499
8. $500 or above

Describe your biking experience level?

1. I am new to bicycling
2. I am familiar with bicycling
3. I am a confident bicyclist
4. I am an expert bicyclist

How frequently do you ride a bicycle?

1. Every day
2. A few times a week
3. Only on weekends
4. A few times a month
5. Rarely

During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or yoga?

1. 0 days
2. 1-2 days
3. 3-4 days
4. 5-6 days
5. 7 days

Would you say that in general, your physical health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Would you say that in general, your mental health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

How often do you feel isolated from others?

1. Hardly ever
2. Some of the time
3. Often

How do you think participating in the MassBike E-Bike program has affected your physical health, mental health, and/or feelings of isolation, if at all?

What would help you ride your bike more often after the program is over?

Is there anything you would like to share about your experience in the program?

Appendix E: Phase 2 Application

MASSBIKE E-BIKE PROGRAM APPLICATION

Please Note: This Program is only for people who are 18+ years old who live and/or work in one of the following towns: Auburn, Millbury, Grafton, Shrewsbury, Boylston, West Boylston, Holden, Paxton, Leicester, Westborough & Worcester. The Massachusetts Bicycle Coalition (MassBike) is launching an Income-eligible E-Bike Incentive Program that will begin in Spring 2024.

There are two models available, based on your household income with a maximum of $60,523 (for a household of one). See chart with details below: 60-75% model: The program will cover between 60-75% of the cost of the bike and accessories or up to $1,500, whichever is less.100% model: The program will cover 100% of the cost of the e-bike and accessories.

The Program will give priority preference to income-qualified applicants (documentation of income status will be required). You will be required to provide bike usage data for six months and participate in at least one group bike ride. You will own the e-bike and accessories, if these requirements are met, once the Program has concluded.

The cost for basic bike maintenance and one annual tune-up will be provided by the Program, at no cost to you. At the end of the Program, you will own the e-bicycle and will be responsible for ongoing maintenance. Your responses to these application questions are confidential and no identifiable information about you will ever be shared outside of the Program administrators. By being a part of the Program, you are agreeing to participate in a study about this program.

To be eligible to participate in either E-Bike Incentive Program (100% of costs covered or 60-75% of costs covered), your gross annual household income must be less than 80% of the State Median Household Income, as listed below: The application includes a few questions about your current physical and mental health. This will help the Program explore the effects of biking on physical and mental health. If you have questions at any time about the application or the program, you may contact Alex Salcedo by email at alex@massbike.org. Thank you very much for your time and support. Please start with the application now by clicking on the Start button below.

Please tell us what your annual gross household income is. Note that, if you are selected for the program, documentation will be required to verify your household income information (do not use any special characters, such as commas).

How many adults and children are in your household (including yourself)?

First Name

Last Name

Phone

Email Address

Residential Address Street

City

State

Zipcode

How old will you be on June 1, 2024?

What is your gender?

1. Female
2. Male
3. Other (prefer to self-describe) _____

What is the highest level of education you have?

1. Did not finish High School
2. High School Diploma or GED
3. Associates Degree (2-year degree)
4. Vocational Degree
5. Some College
6. Bachelor's Degree (4-year degree)
7. Graduate Degree (Masters, Ph.D, JD, MD, etc.)
8. Other (Please specify) _____

What is your race/ethnicity? Select all that apply.

1. White
2. African American or Black
3. Hispanic or Latino (any race)
4. Asian

5. Native Hawaiian or Pacific Islander
6. Native American or Alaskan Native
7. Other (Please specify) _____
8. Prefer not to answer

What language are you most comfortable speaking?

1. English
2. Albanian
3. Arab
4. Nepali
5. Portuguese
6. Spanish
7. Swahili
8. Vietnamese
9. Other (Please specify) _____

Will you need translation to participate in the e-bike program?

1. Yes
2. No

In what language?

Do you have health insurance coverage? (Please include health insurance obtained through employment or purchased directly as well as government programs like Medicare, MassHealth, and the Children's Health Insurance Program that provide medical care or help pay medical bills.)

1. Yes
2. No

Did your household participate in any of the following assistance programs in the past 12 months? Select all that apply.

1. Supplemental Nutrition Assistance Program (SNAP/Food Stamps)
2. Supplemental Security Income (SSI)/ Social Security Disability Income (SSDI)
3. MassHealth/Medicaid
4. Section 8
5. Public Housing
6. Other _____
7. No, my household did not participate in any of these assistance programs in the past 12 months

Are you currently employed?

1. Yes
2. No

In what city are you employed?

What type of residence do you live in?

1. I own my home
2. I rent

3. Temporary housing, such as living in a hotel, motel, or shelter
4. Unhoused/Have no place to live or living on the street

What is your primary mode of transportation? Select one only.

1. Personal vehicle
2. Car-share (Zipcar, Turo, etc.)
3. Ride-share (Uber, Lyft)
4. Public Transit (bus or train)
5. Bicycle
6. Walk
7. Scooter or Moped
8. Other _____

What other modes of transportation do you use on a regular basis? Select all that apply.

1. Personal vehicle
2. Car-share (Zipcar, Turo, etc.)
3. Ride-share (Uber, Lyft)
4. Public Transit (bus or train)
5. Bicycle
6. Walk
7. Scooter or Moped
8. Other _____

What is the average number of miles you travel via car per week ? (helpful tip: 1 mile = 20 blocks on average)

What is the average number of miles you travel via public transit per week ? (helpful tip: 1 mile = 20 blocks on average)

Approximately how much money do you spend on transportation in an average week? (car payments, car insurance, fuel, MBTA passes, car-share, ride-share, taxi fares, bus fares, etc.)

1. Less than $25
2. $25 - $49
3. $50 - $99
4. $100 - $149
5. $150 - $249
6. $250 - $349
7. $350 - $499
8. $500 or above

Describe your biking experience level:

1. I have never bicycled
2. I am new to bicycling
3. I am familiar with bicycling
4. I am a confident bicyclist
5. I am an expert bicyclist

How frequently do you ride a bicycle?

1. Every day
2. A few times a week

3. Only on weekends
4. A few times a month
5. Rarely
6. I don't ride a bicycle

If you already bike, what is your average number of trips taken by bicycle per week?

Do you have access to a secure location to store your e-bike? (You will need access to electricity to charge the battery with a standard 3-prong outlet).

1. Yes, inside
2. Yes, inside but up a flight of stairs
3. Yes, outside in covered, locked storage
4. Yes, outside but not covered
5. No, I do not know where I would store the e-bike

Would you say that in general, your physical health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Would you say that in general, your mental health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Would you say that in general, your quality of life is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

How often do you feel isolated from others?

1. Hardly ever
2. Some of the time
3. Often

During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or yoga?

What suggestions/ideas would you like to share with us after filling out this application?

Appendix F: Voucher Program Follow-up Email Sample

Hi Muntasir,

Thanks so much for our conversation today.

As mentioned, this email is a follow-up to our phone conversation. The following bullet points summarize what we discussed:

- Provide income eligibility documentation (the list of acceptable documentation is attached). Upon review, we'll confirm the voucher amount, which can be used towards the e-bike, the accessories, and the tune-up. Please keep in mind that **the voucher does not cover state tax**.
- The voucher can only be used towards e-bikes class 1 and 2. You can read more about MA e-bike classification here.
- The voucher can be issued with a **90-day or 60-day expiration date**.
- The participating bike shops for the voucher program are **Barney's Bicycles** (582 Park Ave, Worcester, MA 01603), **Landry's Bicycles Worcester** (20 Jolma Rd, Worcester, MA 01604) and **Landry's Bicycles Westborough** (78 Turnpike Rd, Westborough, MA 01581). **All three vouchers must be used at the same bike shop**. In case it's helpful, other participants have checked the stores out before making a decision.
- **Participants will be required to provide weekly riding data for six months** (from the date they receive their e-bikes). **They will also be required to fill out a mid-program survey and an exit survey** (they each will take @ 5-10 minutes to complete). BTW, this is what I forgot to mention during our chat.
- **Liability Waiver**: Please read the liability waiver attached to this email and confirm that you accept the terms.

Please reply to this email providing the following information:

- Documentation (one document suffices) that confirms your income eligibility.
- The bike shop where you are planning to use the vouchers.
- The expiration date that you'd prefer on the vouchers: either 60 day or 90 expiration date.
- Confirm via email that you accept the terms of the liability waiver attached.

If you agree to participate in this program, **please respond to this email by this Monday, Sep 16, by 5pm**. Let me know if you have any additional questions/concerns.

Thank you again.

Appendix G: Standard Operating Procedure (SOP) for Voucher Model

How will the bike shops participate in the program?

Participating bike shops will fill out an online form and return to MassBike by April 14, 2024

How will the vouchers be issued?

Participants eligible for the voucher model will be selected according to the E-Bike Income Eligibility Criteria.

Once the participant is selected, the Program Manager will email a communication asking the participant to provide proof of income. Once the documentation is confirmed, the Manager will proceed to issue vouchers for e-bike, accessories, and annual tune-up. These vouchers will be emailed to the participant in a second communication stating that they have been accepted to the Program

Once the participant acknowledges receipt of the vouchers, their name will be entered in the E-Bike Program Voucher Verification Sheet for Bike Shops Use.

How will the E-bike Customer Voucher work?

When the Massachusetts Bicycle Coalition (MassBike) approves a Qualified Customer for the program, the Qualified Customer will be issued an E-bike Customer Voucher. The Qualified Customer will then bring the E-bike Customer Voucher to a Participating Bike Shop to purchase a Class 1 e-bike. The voucher will cover up to a maximum of $1,500.

Example: A selected participant qualifies for a **$1,500 voucher** (their income is between 40-60% SMI) and the price of the E-Bike is **$2,000.00.** They also qualify for a $200 voucher for accessories (lights, lock, rack/basket, gloves, pump, lube, helmet) and for a $100 voucher for an annual tune-up+labor

Price of the e-bike	**$ 2,000.00**
E-bike sales tax (6.25%)	$ 125.00
Total purchase	$ 2,125.00
(-)Voucher value	$ 1,500.00
Final cost of the e-bike for the participant:	**$ 625.00**
Price of the accessories (estimate)	
Lights	$ 40.00
Lock	$ 50.00
Rack/basket	$ 50.00
Gloves	$ 25.00
Pump	$ 25.00
Lube	$ 10.00
Helmet	$ -
Total accessories	$ 200.00
Sales Tax (6.25%)	$ 12.50
Total accessories purchase:	$ 212.50
(-) Voucher accessories value	$ 200.00
Final cost of the accessories for the participant:	**$ 12.50**
Annual tune-up + labor	$ 100.00
(-) Voucher tune-up+labor	$ 100.00
Final price that the participant will have to pay the bike shop:	**$ 737.50**
The Bike shop will bill MassBike for the total vouchers value (e-bike and accessories)	**$ 1,700.00**

How will vouchers be verified?

Before accepting an E-Bike Customer Voucher from a Qualified Customer, the participating Bike Shop must verify and redeem said voucher by verifying the customer name and voucher number using a Google sheet with all qualified candidates. If the E-Bike Customer Voucher is not on the spreadsheet, Participating Bike Shop shall not accept said voucher. The vouchers will have a 90-day expiration date from the date it was issued.

How will bike shops be reimbursed?

Bike shops will be reimbursed by MassBike when they submit the completed E-bike Customer Vouchers and their associated receipts to MassBike as outlined in the Participating Bike Shop Program Terms and Conditions. Bike shops can invoice MassBike monthly or at more frequent intervals.

We've created a **checklist** that summarizes the content of this SOP.

Appendix H: Additional program data tables and figures