

HOW E-BIKE INCENTIVE PROGRAMS ARE USED TO EXPAND THE MARKET

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This project will deliver an update to the 2019 white paper published by McQueen et al. under the same title.

Background

- There is a desire to promote the purchase of electric bicycles (e-bikes) in order to meet emissions, vehicle miles traveled (VMT), and/or mode share objectives.
- Purchase incentive programs** have emerged as a popular technique.
 - There are **more than 50** active, lapsed, or proposed programs in the US and Canada.



Program Context

- E-bikes are shifting from a novelty or recreational vehicle to a **viable mode** enriching the transportation network.
 - E-bike sales increased 64% between 2020 and 2021 (Bicycle Retailer).
 - E-bikes are a viable low-carbon substitute to many auto trips (MacArthur 2020).
 - They provide associated emissions, VMT, and quality of life benefits.
- Due to pedal assistance, e-bikes are more accessible for a wider range of demographics and use cases than conventional “acoustic” bicycles.

Study Questions

- How can price be used as an instrument to bridge the “chasm” of e-bikes’ technology adoption curve?
- What are the current trends in e-bike incentive programs?
- What are the best practices administering in e-bike incentive programs?

Project Goals

- Summarize** the incentive programs’ design philosophies, structures, and techniques.
- Provide best practices** for the development of future e-bike purchase incentive programs.

Methods

- Policy scan** of existing programs
 - Google search, Google Alerts
 - Program web pages and application materials
- Program manager interviews**
- Literature review for existing incentive philosophies

Results

- 55 e-bike purchase incentive programs** were identified in the U.S. and Canada.
 - 28 are active; 6 are in a pilot phase; 2 are approved by legislators but are awaiting implementation; 9 are proposed; and 8 have closed or are on hiatus (the remaining 2 programs are “parent” programs).
- Existing programs are predominantly structured as either post-purchase rebates (43% of programs) or point-of-sale discounts (24% of programs).
- Rebate amounts range \$100 to \$1,200 for flat-rate rebates, and 10% to 80% for rebates based on purchase price.
- 15 of the 42 (36%) active, pilot, or closed programs include additional benefits for low-income populations.

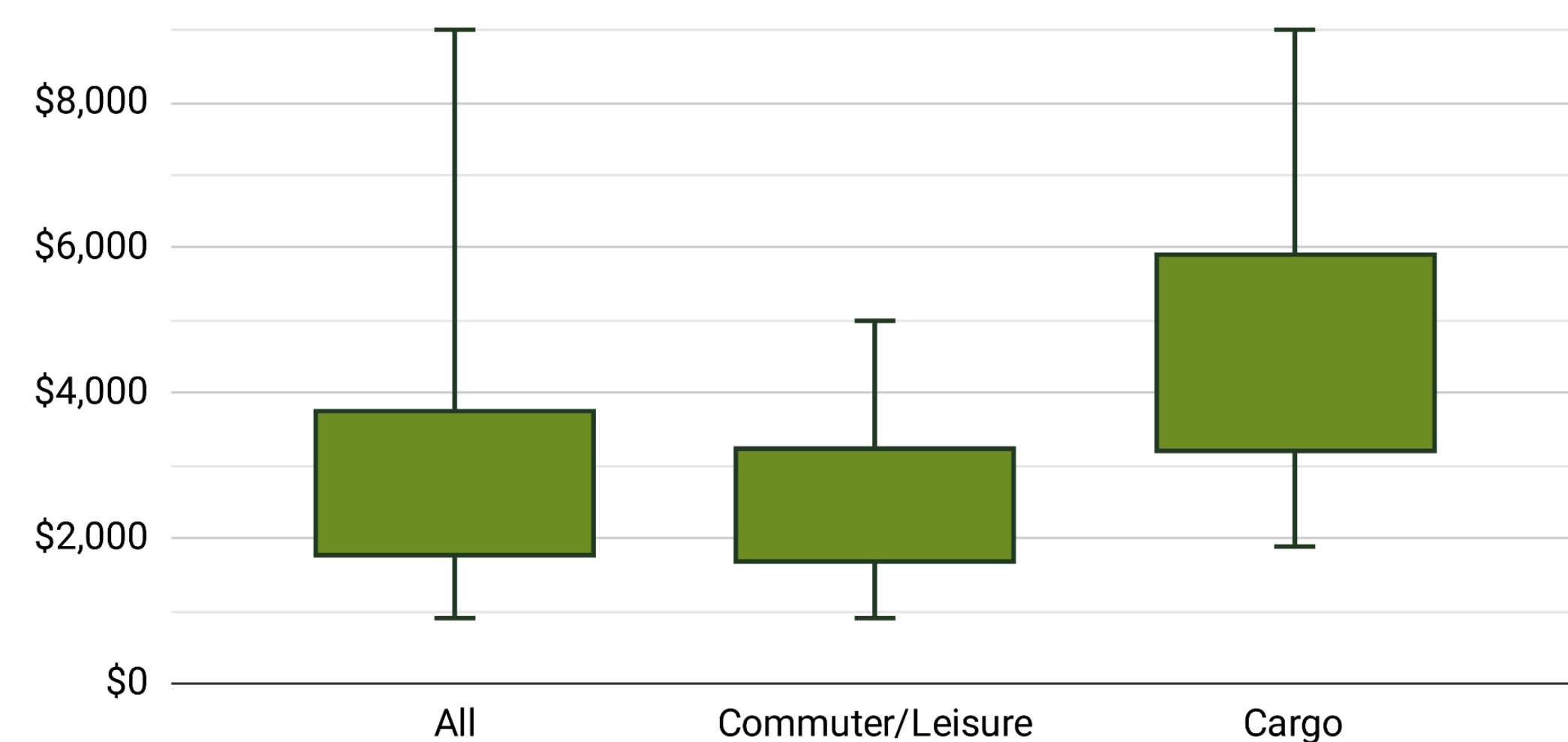
What is an E-Bike?

- Electric motor (typically less than 750W)
- Pedals (i.e. can be ridden with human power)
- May or may not have a throttle allowing them to be ridden without pedaling
- Generally described and regulated using a 3-class system

	Max. Speed (mph)	Throttle
Class 1	20	×
Class 2	20	✓
Class 3	28	×

Retail Price – Commuter/Lesirure and Cargo E-Bike Models for 13 Major Brands

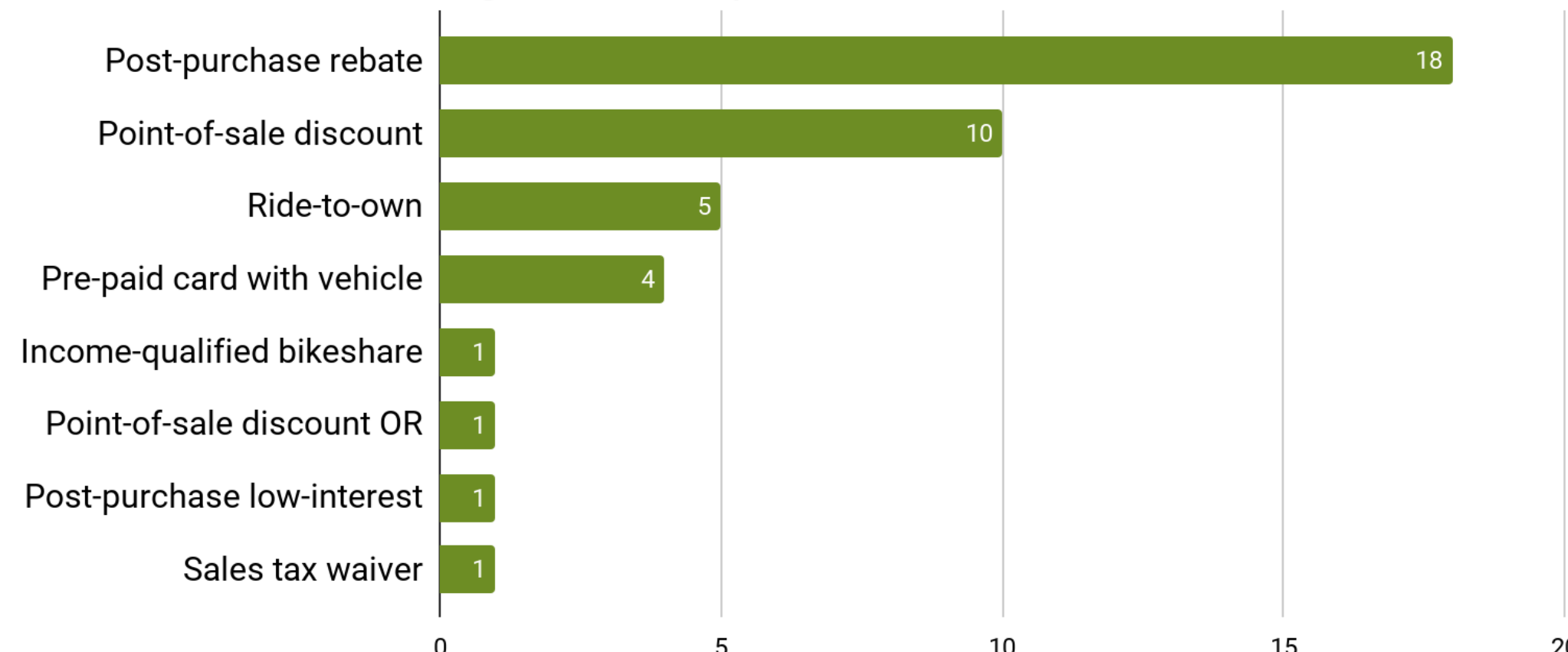
Giant, izip, Lectric, LeMond, Pedego, Propella, Rad, Specialized, Tern, Trek, VanMoof, X-Treme, Yamaha



Program Structures

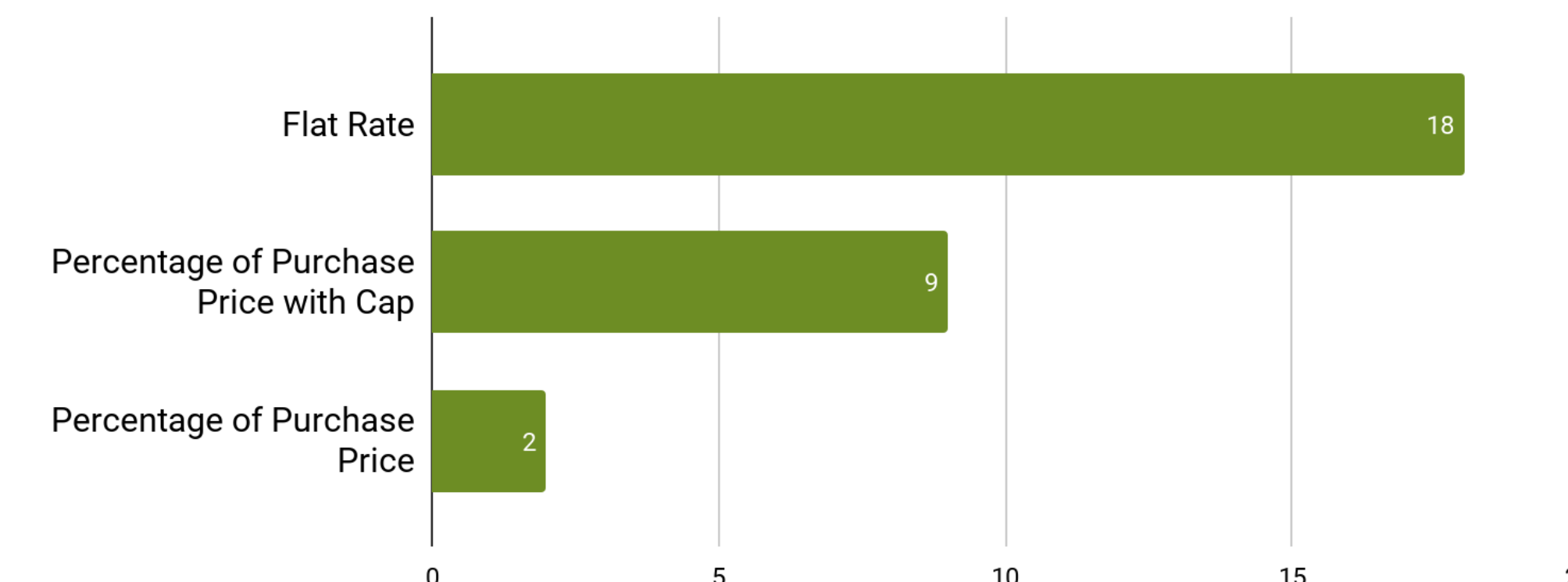
Discount Mechanism

How does the incentive get to the recipient?

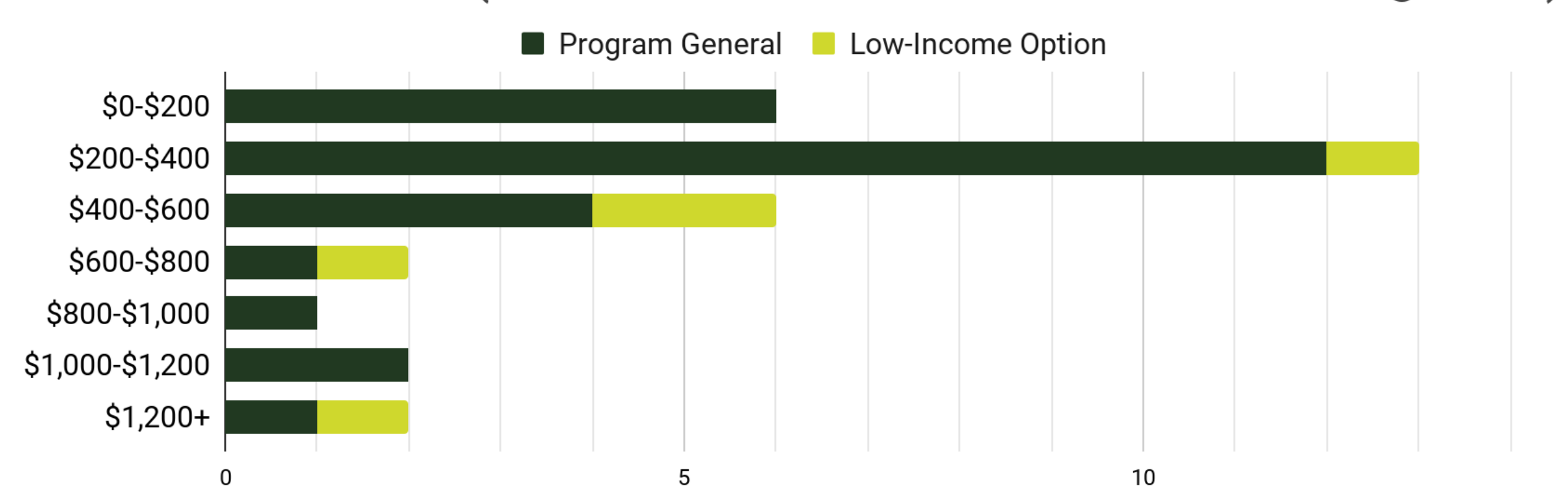


Incentive Amount For Post-Purchase and Point-of-Sale Rebates

How is the dollar value of the incentive determined?



Incentive Amount (Maximum Incentive for %-Based Programs)



Funding Sources

- State/Local Governments
- Utility Providers
- Air Quality Management Authorities
- Environmental funds
- Bike manufacturers
- Local bike shops
- Federal Government? – See H.R. 5376

Approaches to Determining Incentive Levels

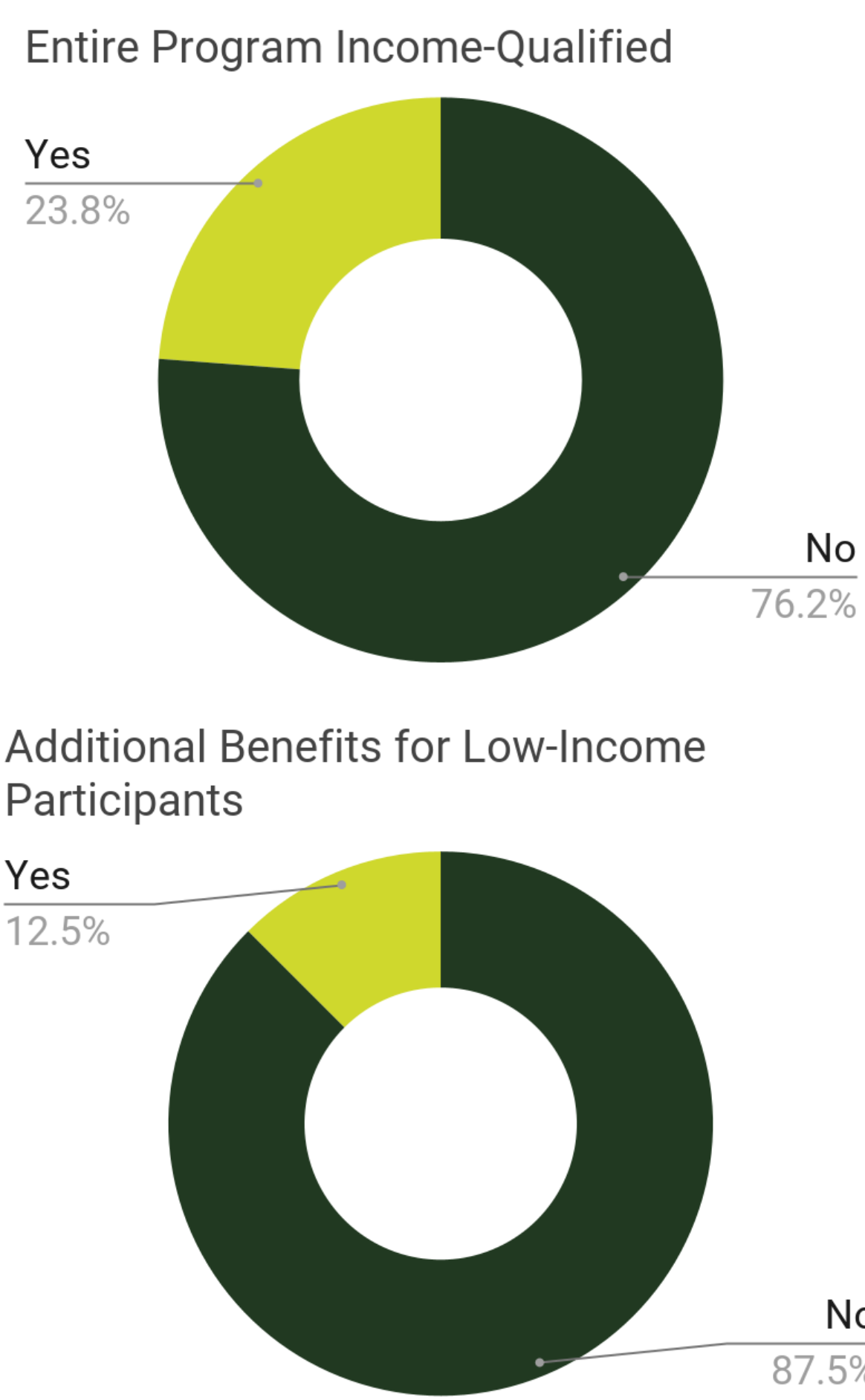
- Function of funding and desired number of recipients**
 - Program funding ÷ total number of rebates
 - Can include consideration for additional incentives for target groups (low-income, essential workers, etc.)
 - Model used by most programs
- Greenhouse Gas (GHG) Equivalents**
 - Fuel savings for vehicle replacement → avoided penalty for emissions standards (est. \$300 per e-bike lifetime) → pass proportion of savings to consumer (\$200/incentive)
 - Model used by Burlington, Vermont’s program
 - One of the earliest programs – this \$200 figure became a default for many others
- Price Sensitivity Survey**
 - Survey to define price target population would be willing to pay – incentive provides difference to retail price
 - Lack of large-scale survey for understanding of e-bike price elasticity – See *Knowledge Gaps and Future Work*
 - Model used by Corvallis/Benton County, Oregon’s program
- Econometric Analysis**
 - Based on modeling price sensitivity across groups vs. number of desired purchases, target groups, etc.
 - See Bigazzi & Berjisian 2020 for a model for this type of analysis
 - Model used by Saanich, British Columbia’s program

Equity Considerations

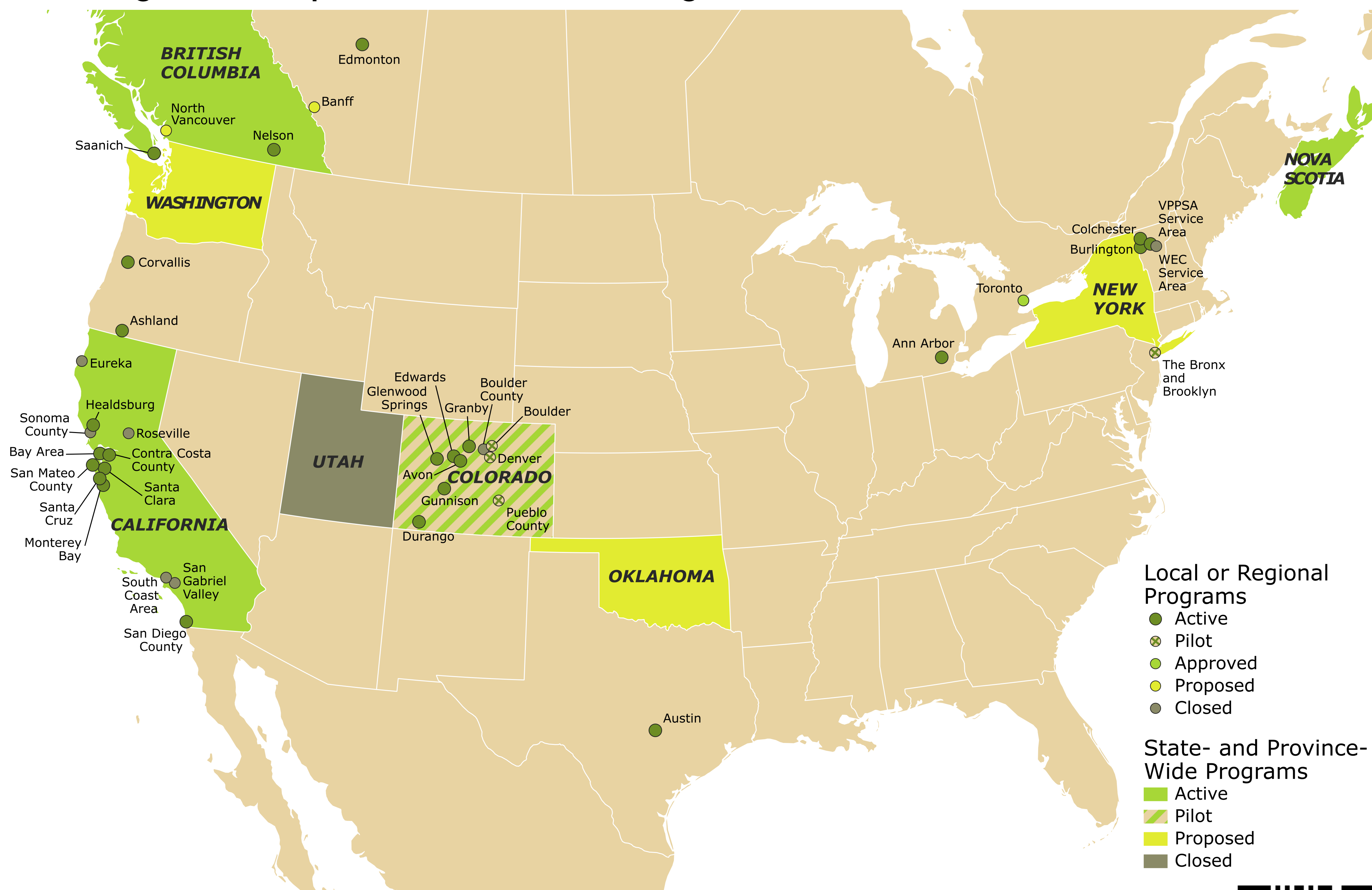
Because of the high retail price of e-bikes, many consumers, particularly those in low income brackets, may be priced out of the market despite the presence of financial incentives. Many existing programs address this issue through income-qualification or tiered benefits for lower income levels.

Best Practices

- Use a “**targeted universalism**” approach to support target groups.
 - High-incentive programs see higher rates of participation because they **induce new purchases**, especially when set aside for low-income groups.
 - Low-value incentives tend to go to less price-sensitive consumers.
 - Higher-value incentive support people otherwise priced out of the market.
- Partner with academic institutions for tracking, survey, data collection.
- Partner with local organizations to identify and connect with participants.
- Partner with local bike shops for outreach, access to service, and ability to demo bikes.
- Make the application process simple – online is best for tracking and simplicity.



Existing and Proposed Incentive Programs



Scan here to see our live inventory of existing and proposed e-bike incentive programs in the US and Canada, the 2019 edition of this report, and other e-bike related research from TREC, or visit <https://trec.pdx.edu/e-bike-research>



Common Challenges in Program Administration

- Product pipeline issues** – programs requiring that e-bikes be purchased from local dealers may run into supply issues, especially among popular or low-price models, reflecting a current industry-wide trend.
- Difficult paperwork** – more complex qualification for participants leads to higher administrative costs and lower rates of program satisfaction.
- High administrative costs** – partnering with existing programs for outreach and/or income verification can help to minimize administrative overhead.

Knowledge Gaps and Future Work

- The effects of rebate method, incentive amount, and external cultural or environmental factors on participation rate in an incentive program, especially across different demographic groups, are not well understood.
- No formal study has been completed on **e-bike price elasticity**, just conventional bicycles and electric vehicles.
- These dynamics will be investigated in a national **stated preference survey** by the authors of this paper.*

All interpretations, conclusions, and errors are those of the authors alone.

This project is funded by the National Institute of Transportation and Communities (NITC), a U.S. DOT University Transportation Center. PeopleForBikes is providing funding and technical support for the project and developed the seed list for this policy scan. The Federal Highway Administration (FHWA) has provided support through the Dwight David Eisenhower Transportation Fellowship Program (DDETFP).

A number of e-bike purchase incentive program managers gave their time as interviewees in this project: Alan Romero (Monterey Bay Air Resources District, Monterey Bay, CA), Glenys Verhulst (Saanich, BC), Kathryn Duvall (Corvallis- Benton County Economic Development Office, OR), Mary Medeiros McEnroe (Silicon Valley Power, Santa Clara, CA), Sandee Cirian (Community Cycles, Boulder, CO), Simi Barr (Ann Arbor, MI).

