



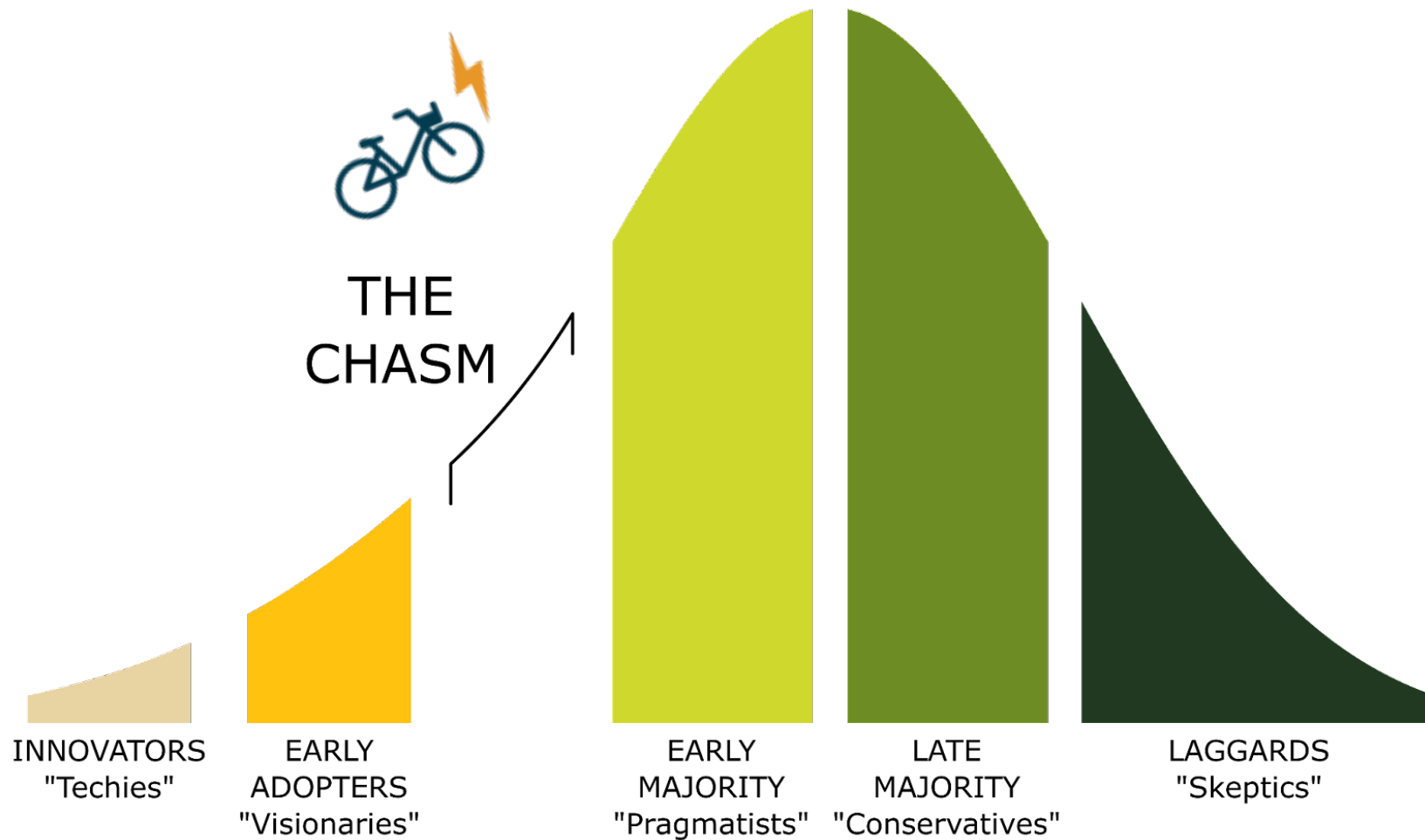
Moving the Market for E-bikes

TNJ Institute webinar: E-bikes in New Jersey
December 14, 2023

John MacArthur
Portland State University



Is 2023 the Year of the E-bike?

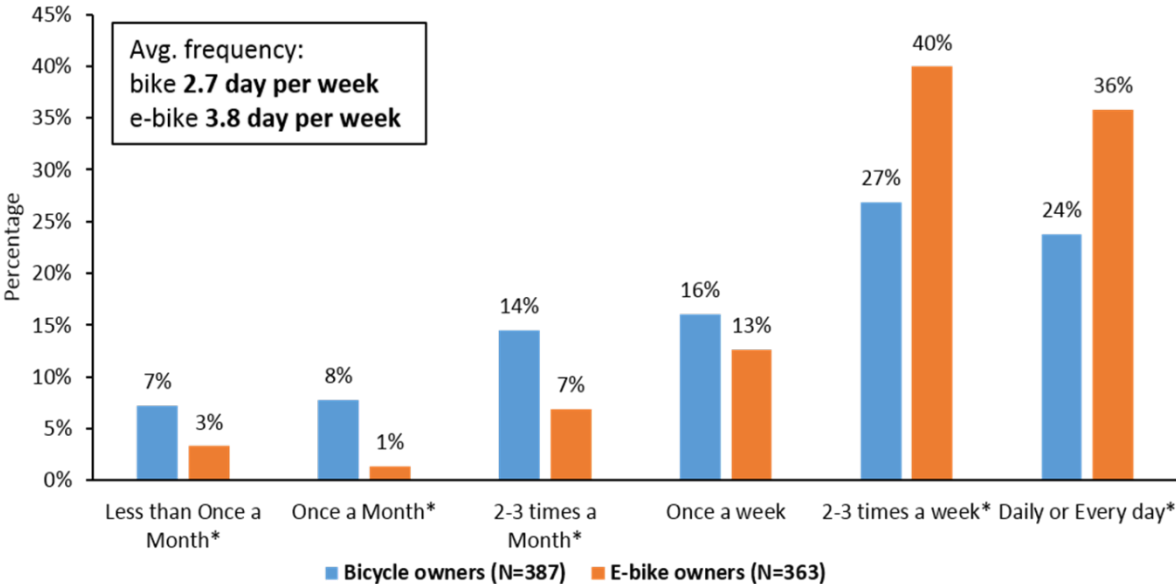


E-bikes are getting more people biking and replacing VMT

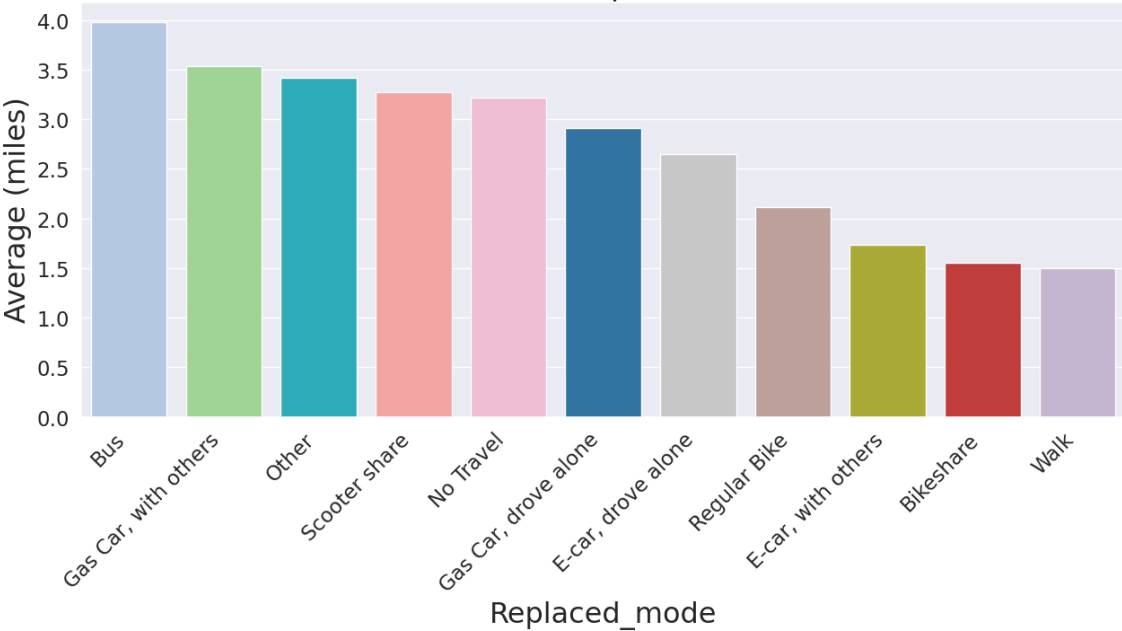
From nationwide surveys & studies:

- E-bikes diminishes terrain and distance
- E-bike riders travel farther than bicycle riders
 - For bicycle riders 55% ride daily or weekly; after e-bike purchase, 94% ride daily or weekly.
 - 73% of e-bike riders tend to ride to more diverse destinations.
- E-bikes result in more car-substitution & VMT reduction.

During the time of year you ride, how often do you ride?



Average Miles for each replaced mode with > 3 entries
'Other' represents trips with a non-standard or missing replacement
Based on 3261 confirmed e-bike trips from 61 users
of 11584 total confirmed trips from 62 users (28.15%)



NREL: <https://ccebikes-openpath.nrel.gov/public/>

How Do Get More People Riding and Riding More Often?

- **Increase Awareness**

- Lending libraries
- Outreach
- E-bike share

- **Sell More E-bikes**

- Incentives
- More types of e-bikes at different price points
- Equity-focused programs

- **Create More Safe Places to Ride to More Locations**

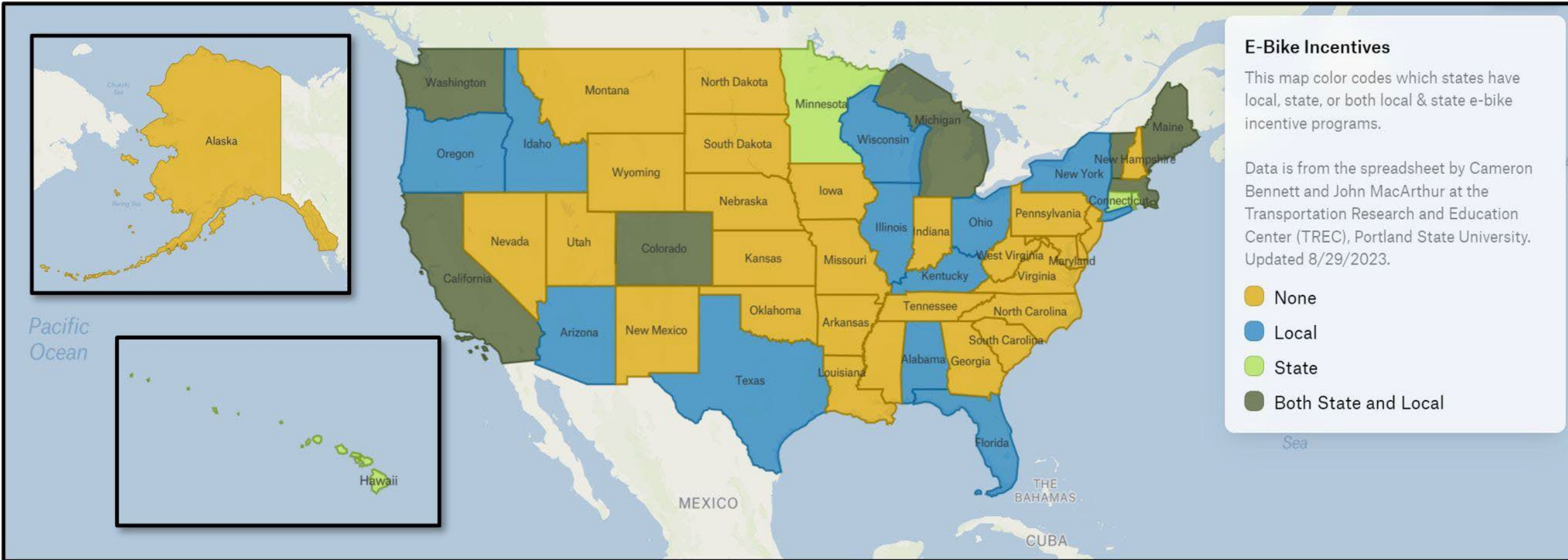
E-bike Libraries

What is the purpose of the library program?

- Ride to Purchase
- Community Resource
 - Open - Anyone
 - Closed – e.g., retirement communities, employees, affordable housing locations, colleges
- Lending programs – short term (weekly – monthly)



E-bike Incentives Programs in the US



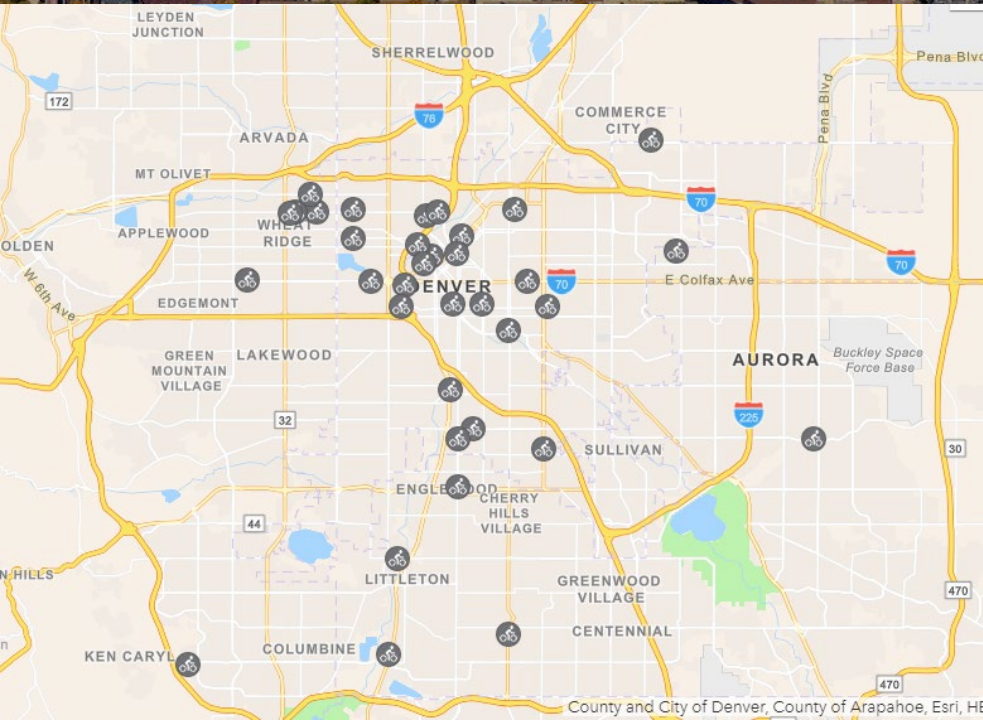
“e-Bike Incentives are Booming in the US”, Anthony Cherolis, September 19, 2023, <https://ctnewsjunkie.com>

E-bike Incentive Tracker: <https://trec.pdx.edu/e-bike-research>

States with E-bike Incentive Programs

State	Status
California	Active (soft launching)
Colorado	Active
Connecticut	Active
Hawaii	Active
Maine	Approved
Massachusetts	Approved
Minnesota	Approved
Rhode Island	Active
Vermont	Active
Washington	Approved

Denver, CO



Point-of-sale discount with application

- ~~\$400~~ **\$300** available to the general public
 - \$1,200 low-income subsidy
 - Additional ~~\$500~~ **\$200** for cargo bikes
 - **Adaptive e-bike rebate program: \$1,400**
-
- Full-suspension mountain bikes or conversion kits are not covered.
 - all 30 + participating bike shops have a brick and mortar location
 - State of Colorado launched an income-qualified e-bike rebate program. However, one can not use both rebates to purchase the same e-bike.
 - **6,697 e-bike vouchers have been redeemed in Denver (as of September, 2023)**
 - Program estimates 100,000 VMT is replaced every week, 1,450 metric ton/year (or 312 cars)

What is a cargo bike?



Denver's definition:

- E-cargo bicycles must have an extended frame designed to carry additional people or cargo. E-cargo bikes are designed to carry:
 - One or more passengers in addition to the rider OR
 - Heavier or bulkier loads than a traditional bicycle can carry
- The bike has an extended frame (long tail, long john, Bakfiet or box bike)
- The bike's extended frame has a published cargo load carrying capacity of at least 100 lbs.

Impacts of E-bike Ownership on Travel Behavior: Evidence from three Northern California rebate programs

- An increase in bicycle use after acquiring an e-bike.
- Recipients replaced driving with their e-bikes “1–3 times per week” or “1–3 times per month.”
- More than 50% of reported recent e-bike trips were for recreation.
- GHG reductions were estimated to be 12–44 kilograms (kg) of CO2 equivalent (CO2e) per rebate participant per month.
- E-bike rebate program requirements were successful at targeting those with low incomes, though these requirements did not seem to result in representative participation from people of color.

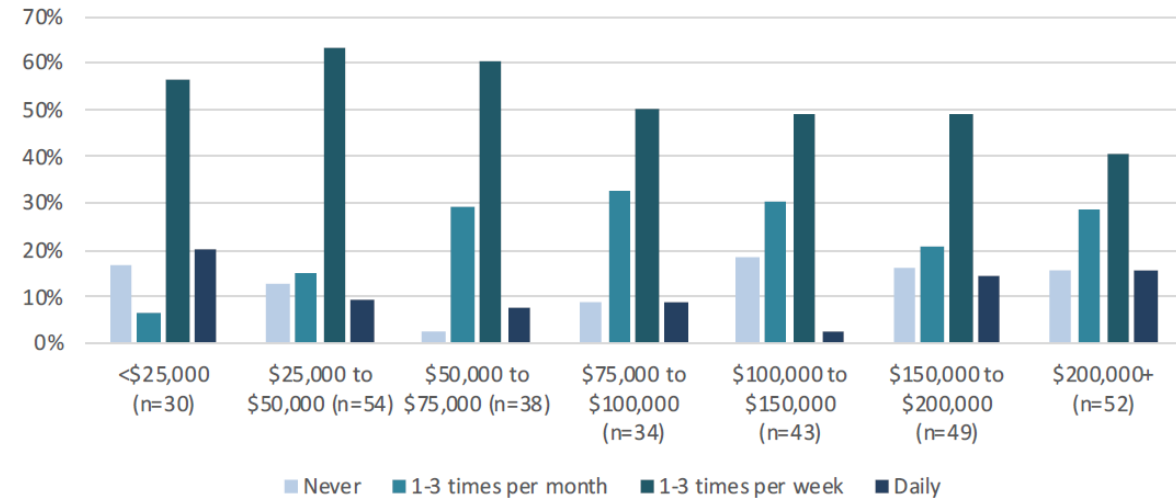
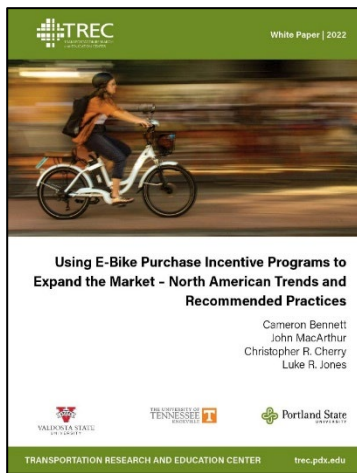
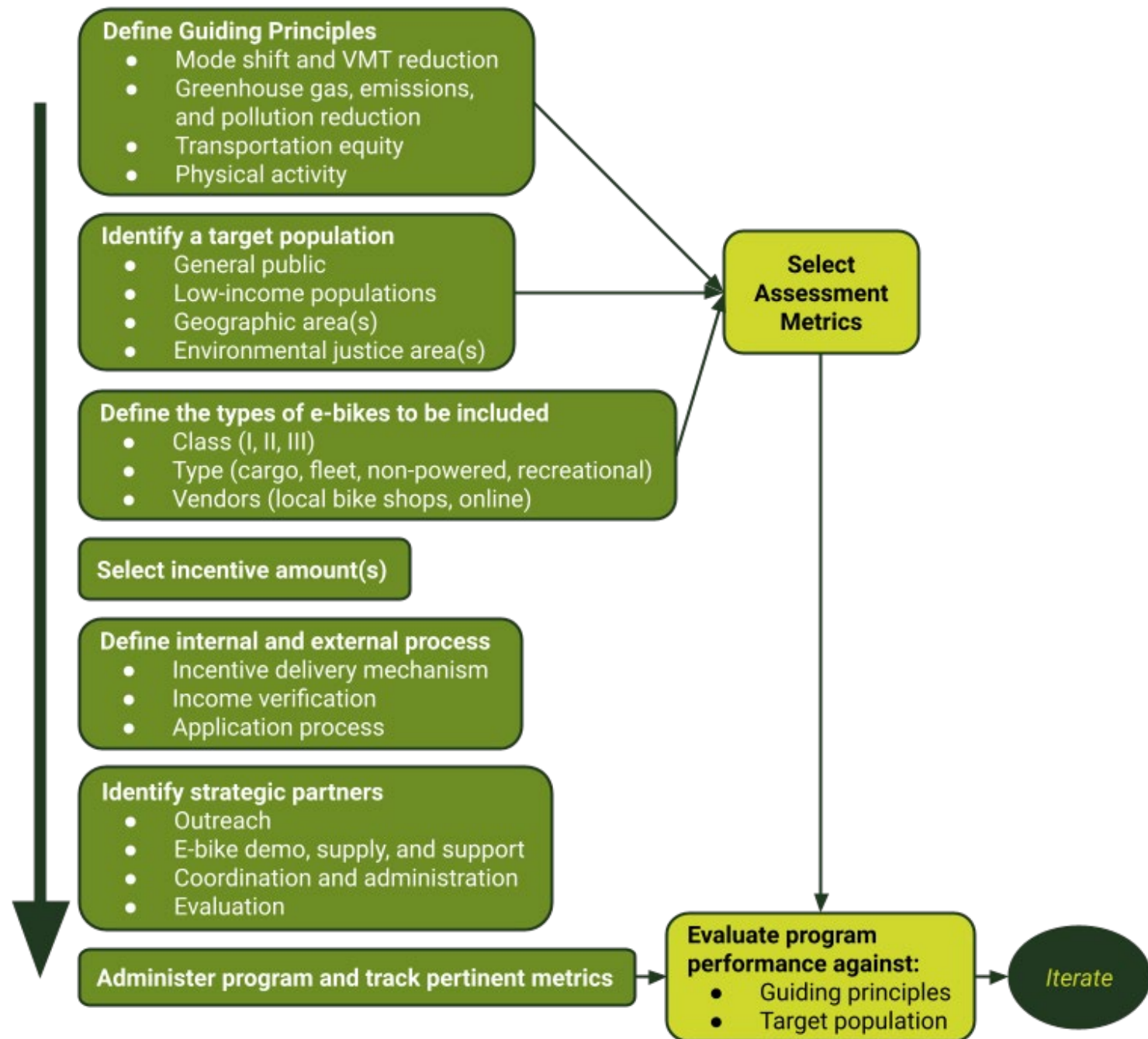


Figure 9. Frequency of replacing car trips with e-bike by income category. (short-term: n =

Recommended Program Design Framework



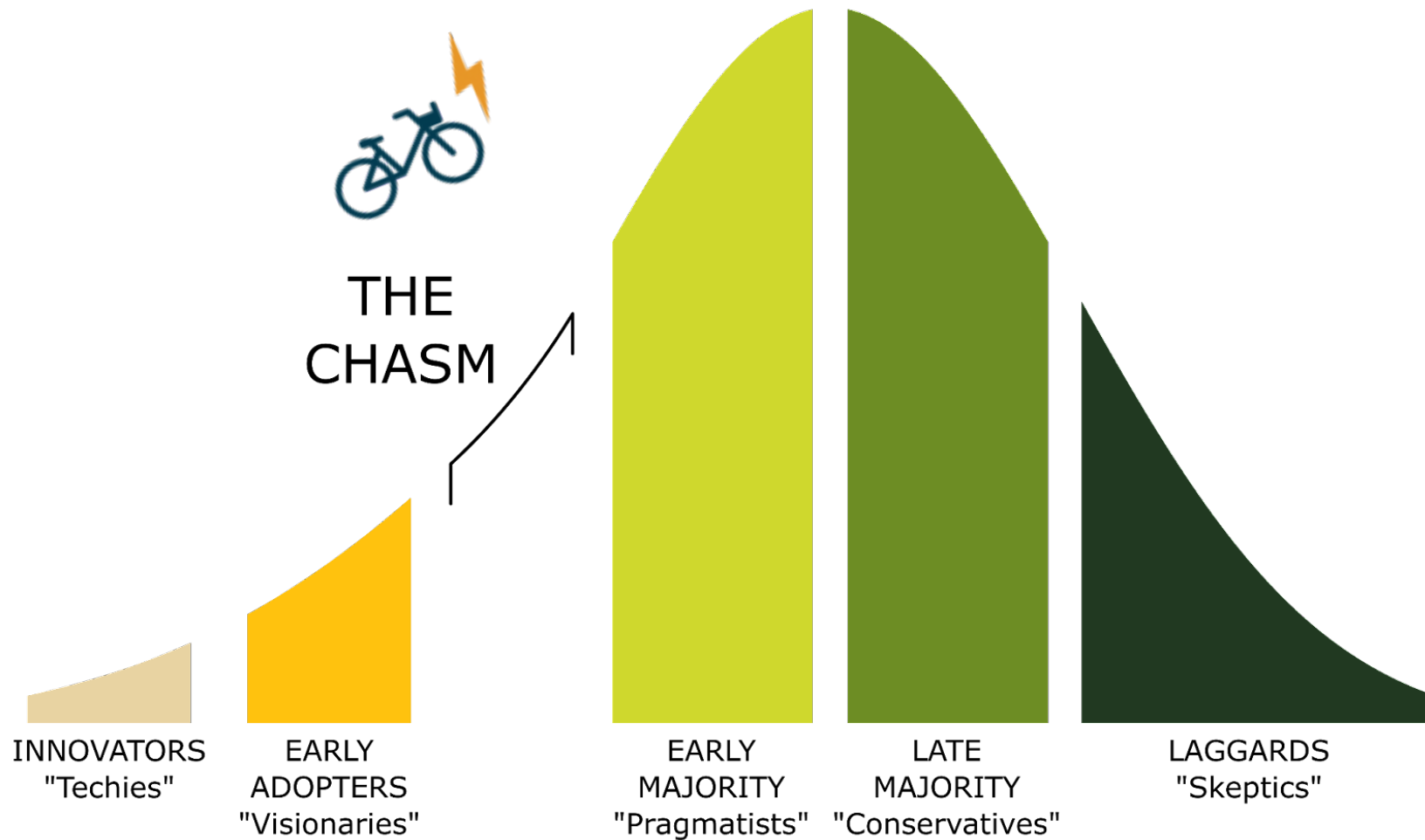
Bennett, MacArthur, Cherry and Jones. "Using E-Bike Incentive Programs to Expand the Market – Trends and Best Practices" (2022). https://pms.trec.pdx.edu/media/project_files/E-bike_Incentive_White_Paper_5_6_2022.pdf



More Information is Needed

- Evaluation of programs on achieving outcomes
 - Decreased vehicle miles traveled/emissions
 - Improved quality of life
 - Enhanced access and mobility for underserved communities
 - Increased transportation equity
 - Increased physical activity
 - Decreased traffic congestion
 - Improved transportation safety
- Understanding the benefits of program, such as CO2 reduction, but also potential benefits include *safety, congestion mitigation, local economic development, and physical and mental health benefits* that may outweigh CO2 benefits but are more difficult to quantify.
- Explore how to streamline administrative process to minimize overhead cost
- Determine the most cost-effective incentive levels to achieve outcomes

If not 2023, 2024 will be!



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<https://trec.pdx.edu/e-bike-research>

E-Bike Purchase Incentive Tracker


E-Bike Incentive Programs of North America Tracker


This policy scan was developed by Cameron Bennett and John MacArthur from the Transportation Research and Education Center (TREC) at Portland State University.

The initial development of this list was based off of existing inventories from PeopleForBikes and Job List. More e-bike research from TREC can be found at <https://trec.pdx.edu/e-bike-research>. Additions or updates to the tracker since the 8/23/2023 update are highlighted in yellow.

By accessing and using the E-Bike Incentive Programs of North America Tracker, created and operated by the Transportation Research and Education Center (TREC) with permission and owned by Portland State University, you have read and agreed to the [Terms & Conditions](#). Copyright © 2023 Portland State University. All Rights Reserved.




Country	State	Location	Program Name	Administrator	Admin. Type	Status	Incentive Style	Discount Mechanism	Discount Rate	Minimum Purchase/Fee	Maximum Incentive	Total Earmark	Income-Qualified?	Low-Income Option?	Low-Income Threshold	Local bike shops? only	Details/Link
US	CA	Santa Cruz	Go Santa Cruz	City of Santa Cruz / Ecology Action	Local Government	Active	Partial purchase subsidy flat rate	Point-of-sale discount with application			\$400; \$800 low-income		No	Yes	Currently enrolled in a low-income assistance program (FDC, CalCare, CalFresh, MediCal, WIC, Calworks, etc)	Yes	Link
US	CA	Santa Cruz	Family Cargo Bike Loaner Program	Santa Cruz County City of Santa Monica The Bike Center	Local Government	Active	Lending Library	Lending Library							income qualified state or local program (Medicaid, WIC, NSL, SNAP, SSI, etc.)	Yes	Link
US	CA	Sonoma County South Coast Area (including LA)	Bike Electric	Sonoma Clean Power South Coast Air Quality Management District	Power district	Closed	Partial purchase subsidy flat rate	Point-of-sale discount with application			\$1,000		Yes	No		Yes	Link
US	CA		Replace Your Ride		Air quality management authority	Active	Voucher with vehicle trade-in	Voucher with vehicle trade-in					No	No		Yes	Link
US	CA	Statewide	California E-Bike Incentive Project Clean Cars 4 All (Enhanced Fleet Modernization Plus-Up Program)	California Air Resources Board (CARB)	Air quality management authority	Approved	Partial purchase subsidy flat rate	Point-of-sale discount with application			\$1,000/\$1,750 cargo low-income additional \$250	\$13 million (4.7k vouchers)	Yes	Yes	300% FPL to qualify for program, 225% FPL or living in a transportation disadvantaged community to qualify for additional incentives	Yes	Link
US	CA	Statewide		tonia Air Resources Bc	Air quality management authority	Parent Program	Parent Program	Parent Program			\$7,500		Yes				Link
US	CA	Statewide	A.B. 117		Local Government	Proposed	Partial purchase subsidy flat rate	Post-purchase rebate				\$25k (2022), \$30k (2023)	No	No		Yes	Link


White Paper | 2022



Using E-Bike Purchase Incentive Programs to Expand the Market - North American Trends and Recommended Practices

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 John MacArthur
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 Luke R. Jones

TRANSPORTATION RESEARCH AND EDUCATION CENTER trec.pdx.edu

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