Hawaii Transportation System GHG Reduction

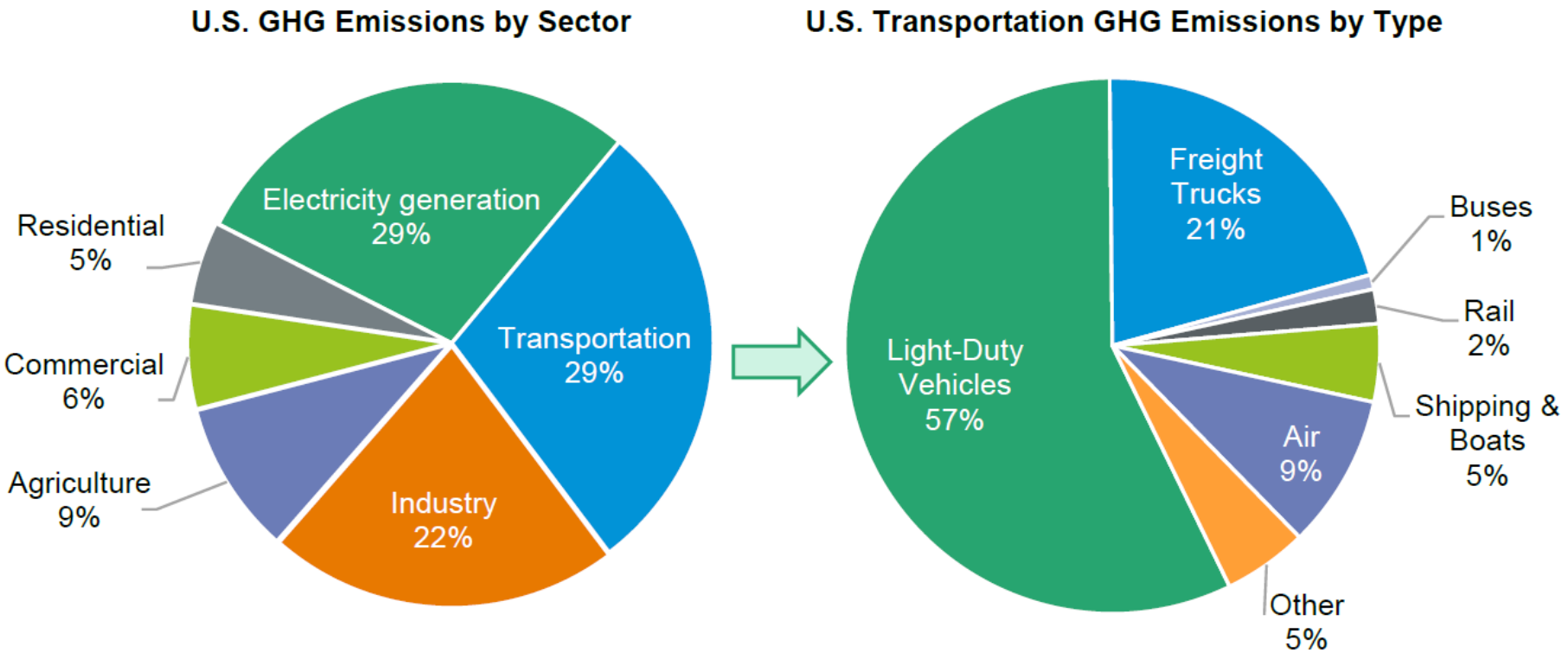
Challenges and Opportunities

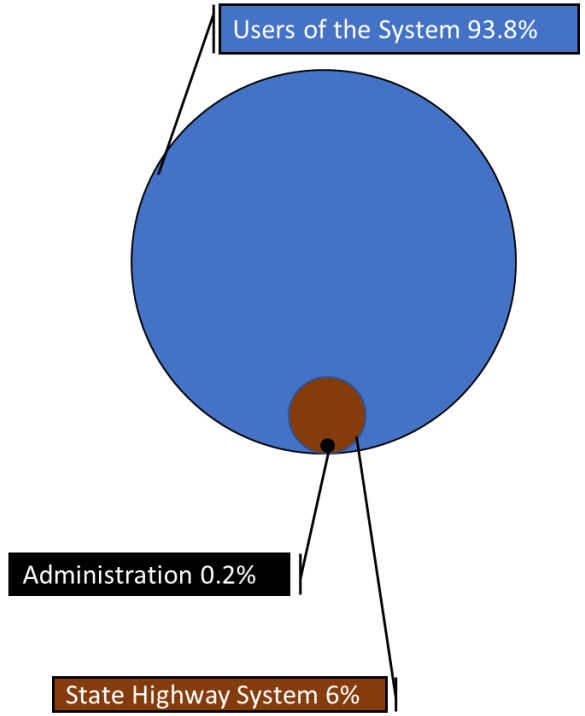
Hawaii GHG Mitigation Opportunities

Robust legal framework…

- Act 234 (2007) capped statewide emissions at 1990 levels by the year 2020. Hawaii became the second state after California to adopt legally binding greenhouse gas emissions reduction legislation.
  - 2008 Hawaii Clean Energy Initiative (HCEI)- original goal was to meet 70 percent of the state's energy needs through energy efficiency and renewable energy by 2030.
- Act 286 (2012) adopted a statewide climate adaptation policy and added said policy to the State Planning Act.
- Act 83 (2014) acknowledged climate change as the paramount challenge of this century and established what is now the State Climate Mitigation and Adaptation Commission
  - 2015 HCEI - Hawaii became the first state to adopt a 100% renewable portfolio standard (RPS), requiring electric utilities to generate all of their electricity from renewable energy sources by 2045.
- Act 32 (2017) enshrined the principles and goals of the Paris Agreement as the framework for Hawaii to pursue climate change planning.
- Act 15 (2018) set a greenhouse gas (GHG) target of carbon neutrality by 2045 -"to sequester more atmospheric carbon and GHGs than emitted"

Scale of GHG Emissions by Type





Hawaii GHG Total and Ground Transportation Emissions

Hawaii GHG Emission Projections (MMT CO_2 Eq)

2015: 21.28

2020: 20.90

2025: 17.34

Source	1990	2007	2010	2015	2020	2025
Transportation	**11.26**	**12.19**	**10.16**	**9.79**	**10.22**	**10.32**
Ground	3.4	4.97	5.28	5.64	5.84	5.73
Domestic Marine	1.82	1.79	0.91	0.39	0.39	0.39
Domestic Aviation	4.66	4.42	2.87	3.23	3.46	3.67
Military	1.38	1.02	1.1	0.53	0.53	0.53

Source: Hawaii Greenhouse Gas Emission Report for 2015, 2019

Hawaii GHG Mitigation Opportunities

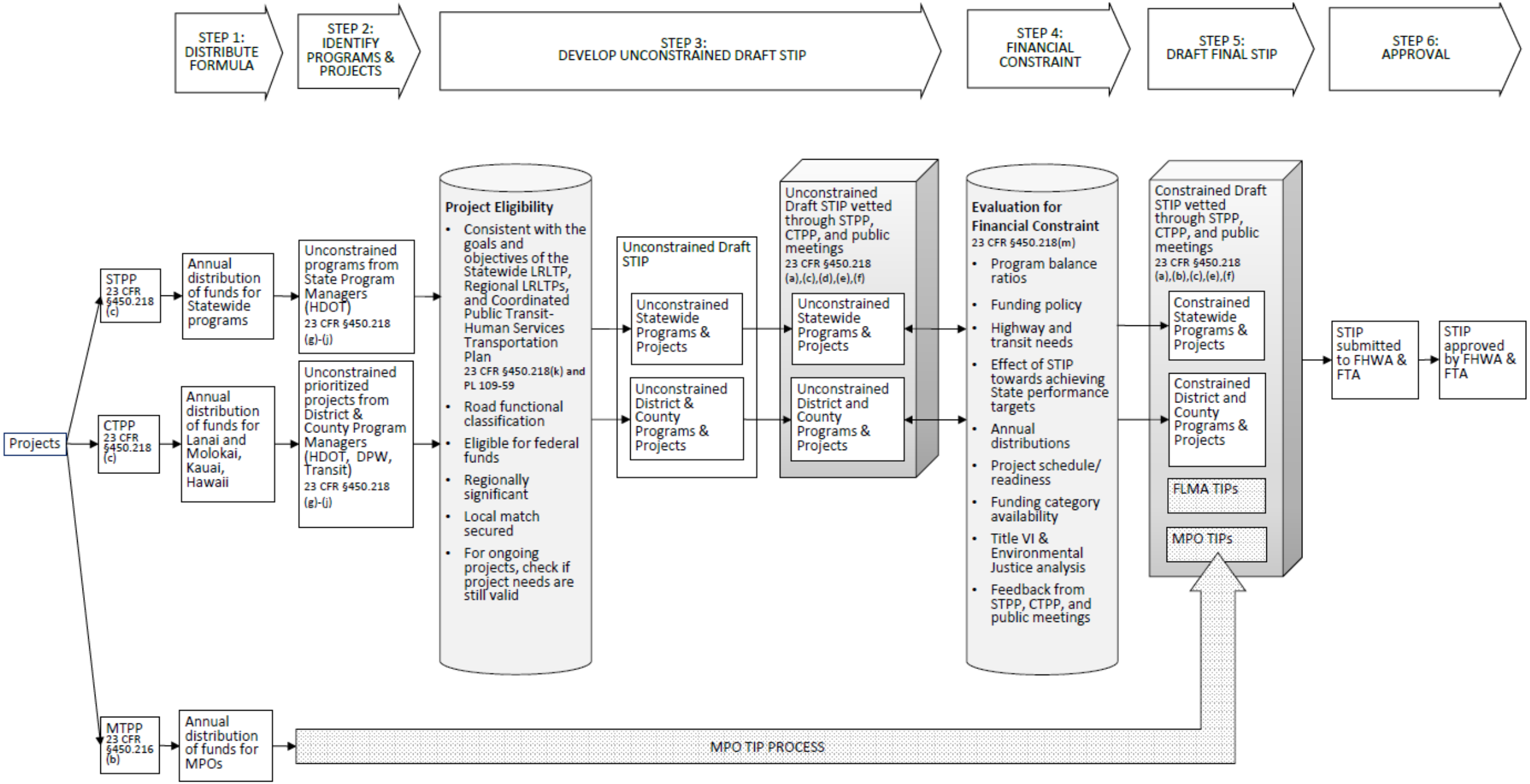
Transportation legal framework and Initiatives

- HRS 196-42: Hawaii's State Alternate Fuel Standards require 20% of highway fuel demand to be provided by alternate fuels by 2020 and 30% by 2030.
- HRS 103D-412: All state and county entities when purchasing new light-duty motor vehicles, to look for vehicles with reduced dependence on petroleum-based fuels.
- Act 168 (2012): Provided Electric Vehicle (EV) free parking at state airports and most State and County parking lots/meters & HOV lane use (repealed 06/30/20).
  - 2017: Hawaii Mayors committing to transform Hawai'i's public and private ground transportation to 100 percent renewable fuel sources by 2045.
- Act 144 (2019): Allows agencies to contract for vehicle procurement or associated capital investments in charging or fueling infrastructure similar to facility-based energy services contracts.

Clean Energy Transportation in Hawaii

- The pace of the transportation clean energy transition has been slower than in electric power.
- Federal standards have helped to keep oil consumption flat despite growth in travel demand
- The state ranks second in the nation in electric vehicles per capita
- Hawaiian Electric's Electrification of Transportation roadmap projects that 55% of cars on the road in 2045 will be electric

STIP UPDATE FLOWCHART



SmartTRAC: Smart Transportation Rank Choice

Goal Area	Points
Safety	20
System preservation	24
Access to Jobs and Necessities	16
Congestion Reduction	16
Environmental Protection	16
Project Readiness	8
Total	**100**

Access to jobs & services (12 points)
Bonus: Benefits low income community (4 points)

Objectively Variable Indicators: Tools and Processes

Reduce emissions (4 points)
Improve cultural resources (4 points)
Improves resilience (4 points)

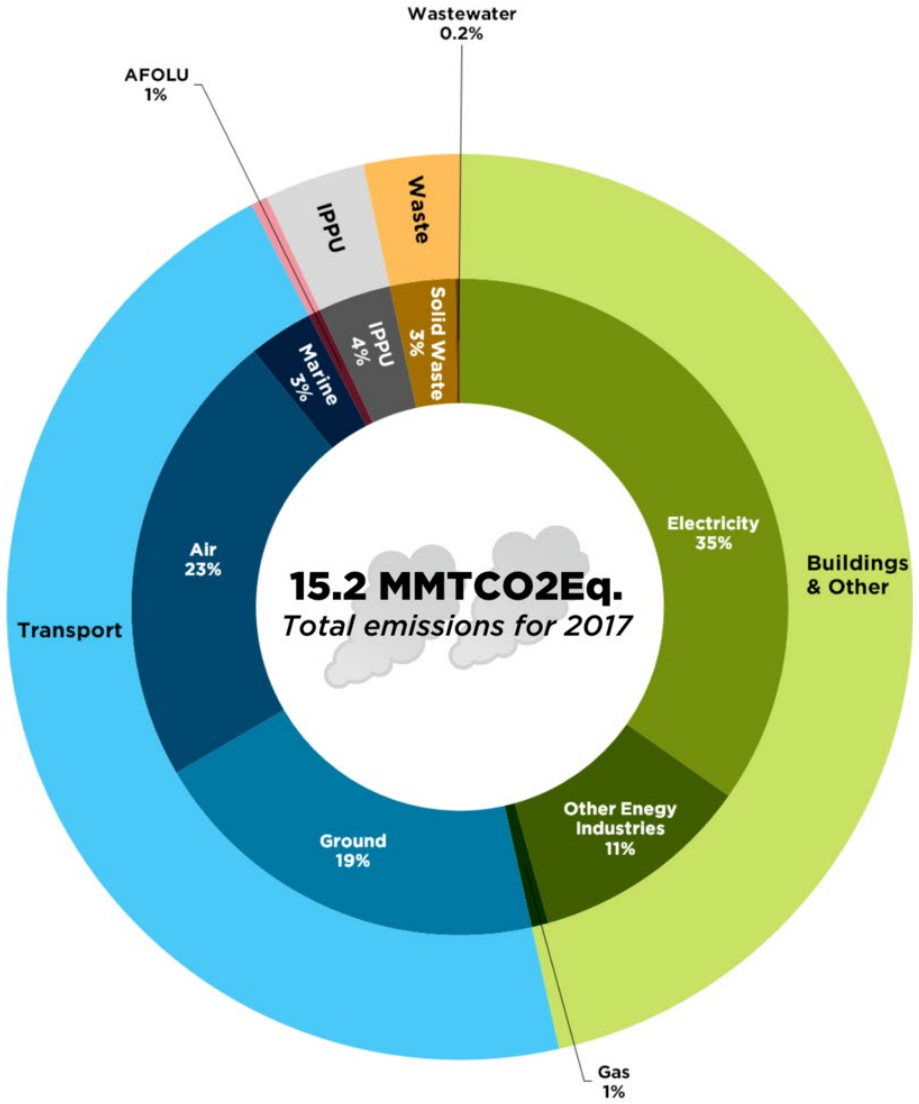
Being redefined and recalibrated as a part of mid-range planning process

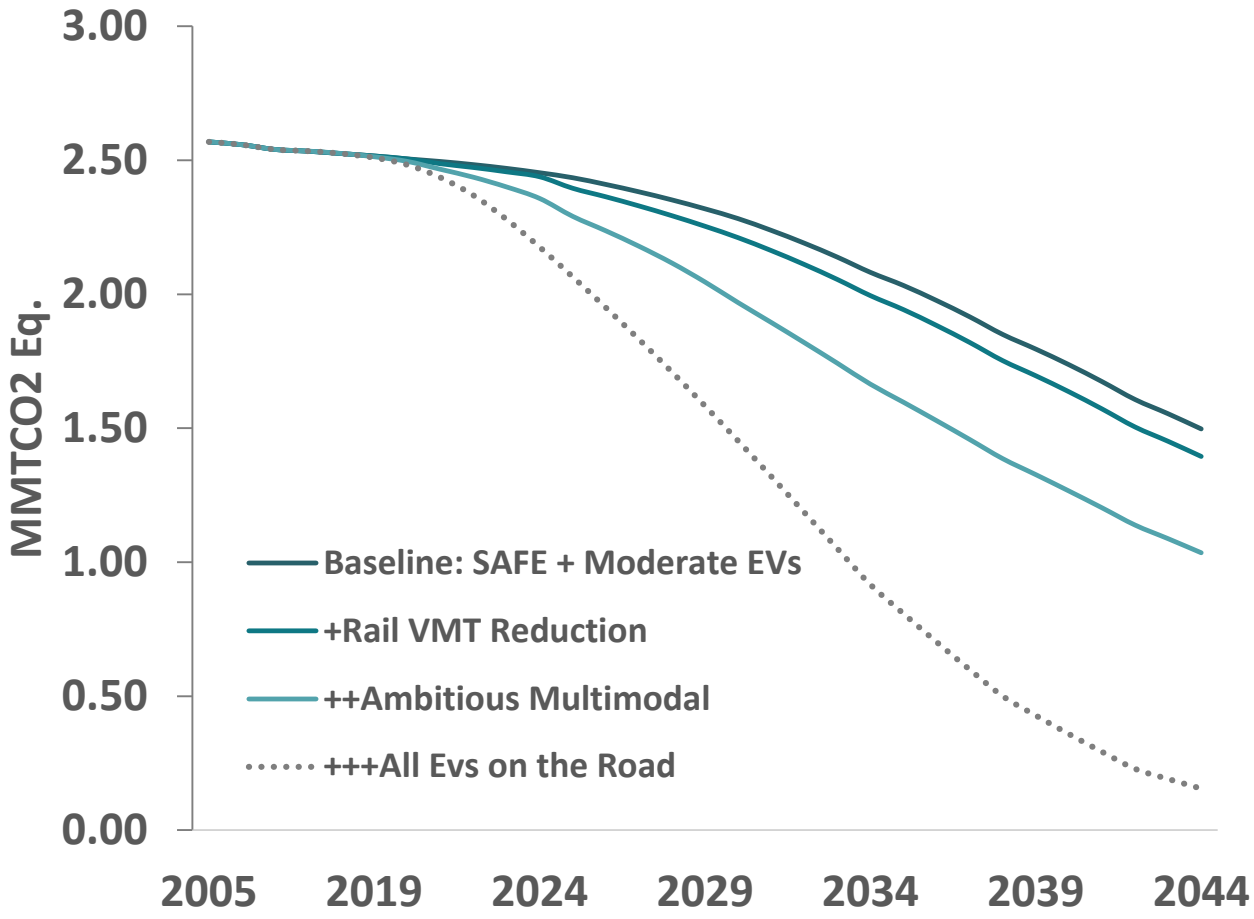
GHG Levels of Engagement

Engagement Level	Policy	Practice: Internal	Practice: System	Technology
Level 1	New to the topic; few or no formal actions to address GHG.			
Level 2	Has established general policies, goals, and/or objectives related to GHG.	Agency emissions considered.	No formal consideration of transportation system emission reduction.	No or limited/partial GHG inventory.
Level 3	Has established specific policies, goals, and/or objectives related to GHG.	Applies quantitative project or program evaluation criteria to agency emissions.	Qualitative project or program evaluation criteria.	Has developed GHG inventory and/or forecast.
Level 4	Serious multiagency effort.	Strategic planning: has evaluated GHG reduction strategies, linked strategies to plans and programs, and conducted quantitative assessment.	Strategic planning: has evaluated GHG reduction strategies, linked strategies to plans and programs, and conducted quantitative assessment.	Has developed inventory, forecast, specific data and measurement methods, and established a range of specific policies, goals, and/or objectives related to targeted GHG reductions.

Source: Draft NCHRP 25-56: Methods for State DOTs to Reduce Greenhouse Gas Emissions from the Transportation Sector Guidebook

C&CH Climate Action Plan
GHG Emissions Pathways for Passenger Cars and Trucks

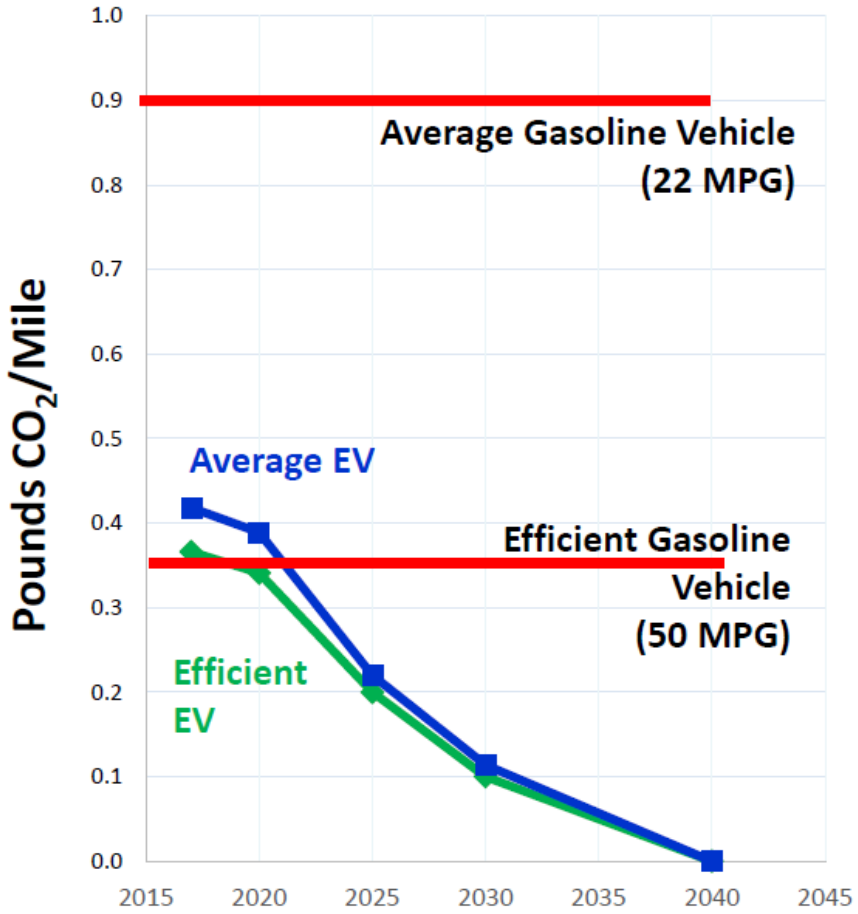




Carbon Emission and EV

Gasoline vehicles only convert about 17%–21% of the energy stored in gasoline to power at the wheels.

EVs convert over 77% of the electrical energy from the grid to power at the wheels.

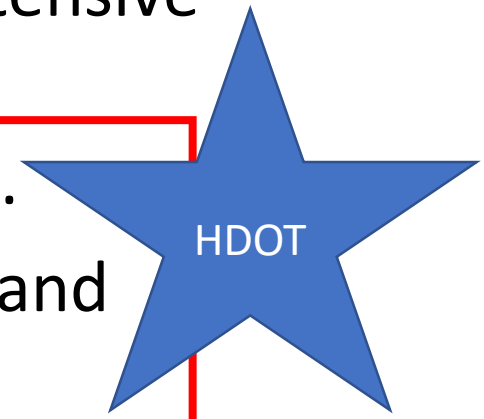


- As the electric grids become cleaner … so do the EVs powered by those electric grids.
- In 2018, even on Oahu, EVs surpassed even the most efficient (50 MPG) gas-powered vehicles.

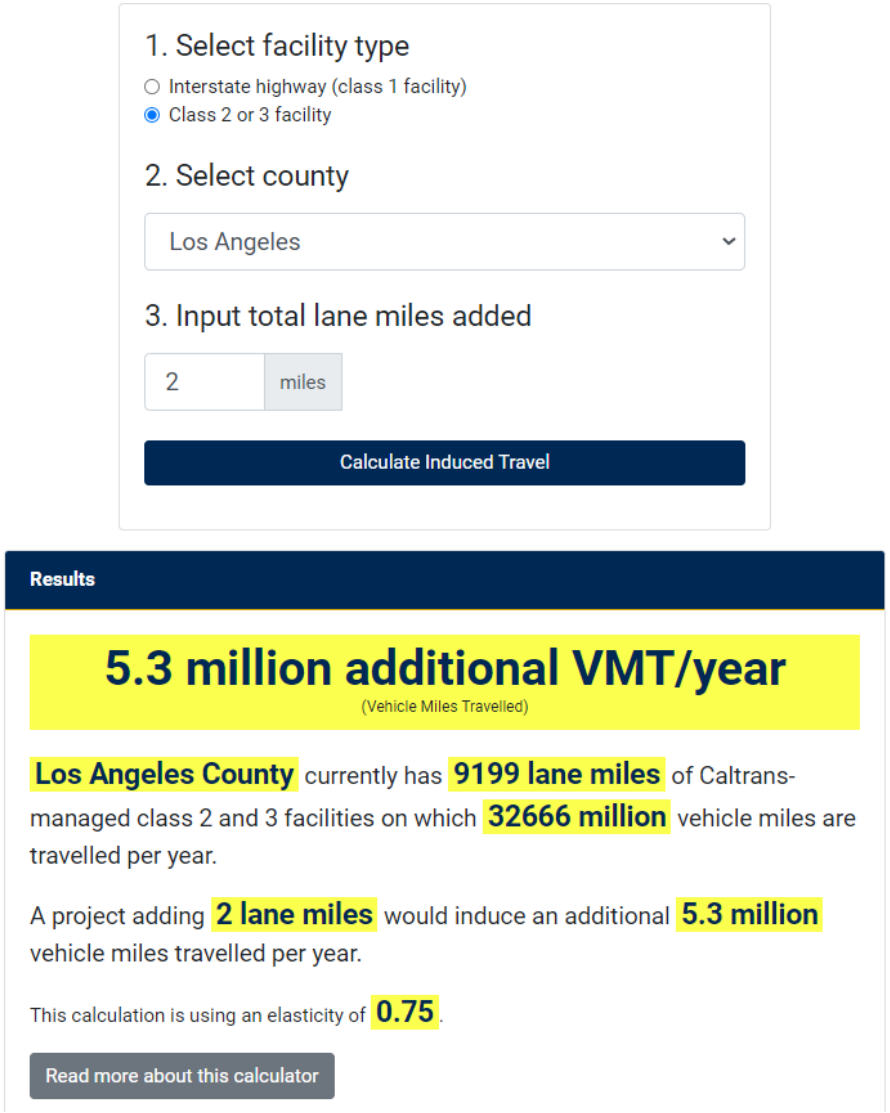
Adapted from Blue Planet Foundation, with the utility's best case projected RPS goals for 47% by 2030, and optimistically 100% by 2040

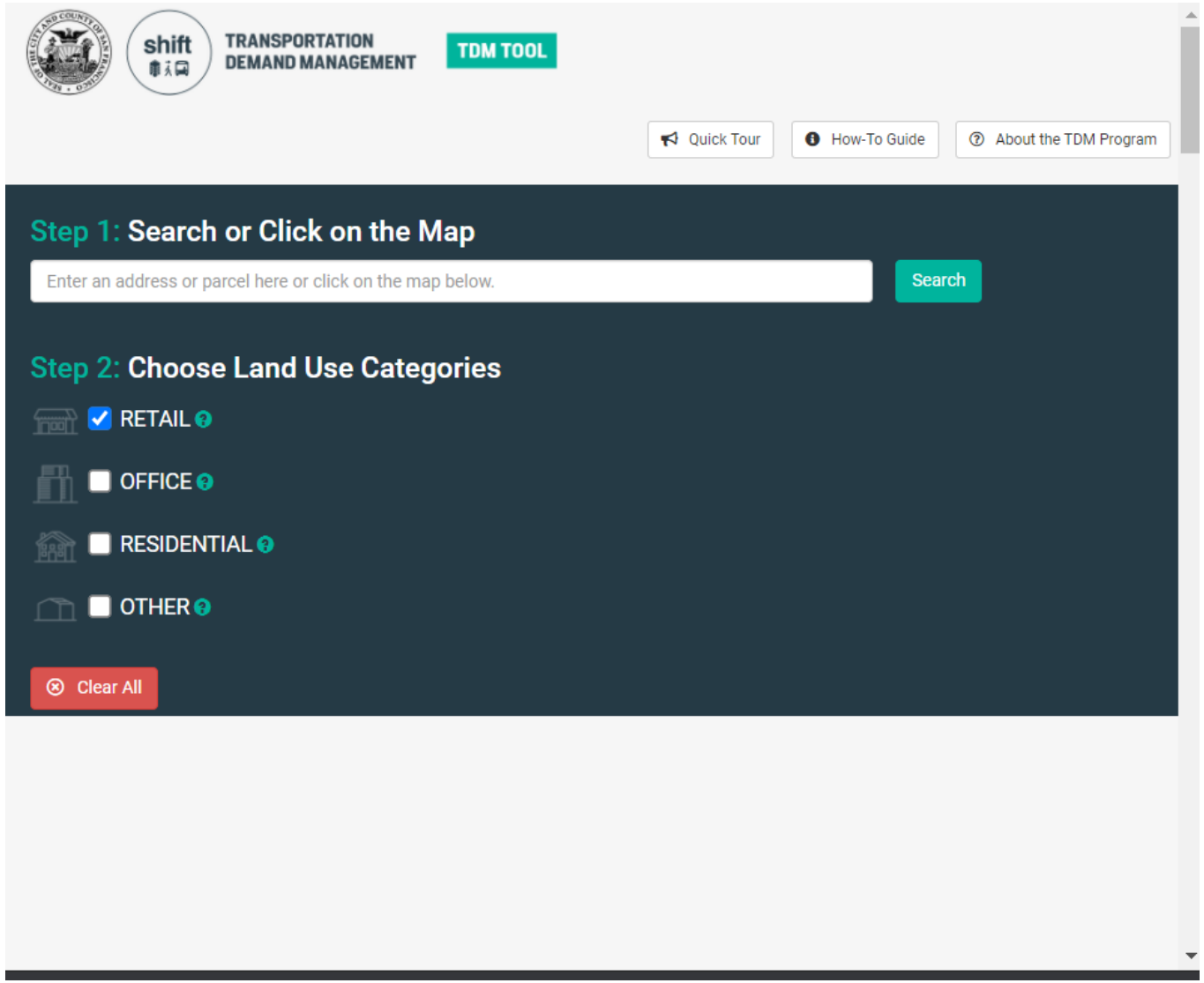
Transportation GHG Reduction Strategies

- Reducing the carbon intensity of fuels.
- Making vehicles more fuel efficient.
- Offsetting carbon emissions.
- Reducing the amount of travel or shifting it to less carbon-intensive modes.
- Improving the efficiency of transportation system operations.
- Reducing emissions from material production, construction, and maintenance of the transportation system.



Induced VMT Travel and TDM Calculators





Cleaning Transportation and Tackling Demand in Hawaii

- Adopt Zero Emission Vehicle standards.
- Follow through and build on clean transportation commitments.
- Revise state and county land use and transportation policies to incentivize multimodal mobility and disincentive car ownership.
- Price the full cost of parking and driving.
- Design public streets for everyone.