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

U.S. GHG Emissions by Sector
- Electricity generation: 29%
- Transportation: 29%
- Industry: 22%
- Agriculture: 9%
- Commercial: 6%
- Residential: 5%

U.S. Transportation GHG Emissions by Type
- Light-Duty Vehicles: 57%
- Freight Trucks: 21%
- Buses: 1%
- Rail: 2%
- Shipping & Boats: 5%
- Air: 9%
- Other: 5%
- State Highway System: 6%
- Administration: 0.2%
- Users of the System: 93.8%
### Hawaii GHG Total and Ground Transportation Emissions

#### Hawaii GHG Emission Projections (MMT CO₂ Eq)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Transportation</th>
<th>Ground</th>
<th>Domestic Marine</th>
<th>Domestic Aviation</th>
<th>Military</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>21.28</td>
<td>11.26</td>
<td>3.4</td>
<td>1.82</td>
<td>4.66</td>
<td>1.38</td>
</tr>
<tr>
<td>2020</td>
<td>20.90</td>
<td>12.19</td>
<td>4.97</td>
<td>1.79</td>
<td>4.42</td>
<td>1.02</td>
</tr>
<tr>
<td>2025</td>
<td>17.34</td>
<td>10.16</td>
<td>5.28</td>
<td>0.91</td>
<td>2.87</td>
<td>1.1</td>
</tr>
</tbody>
</table>

#### Source

*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

STEP 1: Distribute Formula
- STPP 23 CFR 450.218 (c)
- CTPP 23 CFR 450.218 (c)
- MTPP 23 CFR 450.218 (c)

STEP 2: Identify Programs & Projects
- Annual distribution of funds for Statewide programs (HDOH, DPW, Transit)
- Unconstrained programs from State Program Managers (HDOH, DPW, Transit)
- Unconstrained prioritized projects from District & County Program Managers (HDOH, DPW, Transit)
- Road functional classification
- Eligible for federal funds
- Regionally significant
- Local match secured
- For ongoing projects, check if project needs are still valid

STEP 3: Develop Unconstrained Draft STIP
- Project Eligibility:
  - Consistent with the goals and objectives of the Statewide LRTP, Regional LRTPs, and Coordinated Public Transit Human Services Transportation Plan (23 CFR 450.218(b) and PL 109-59)
  - Unconstrained Draft STIP
  - Unconstrained Statewide Programs & Projects
  - Unconstrained District and County Programs & Projects

STEP 4: Financial Constraint
- Evaluation for Financial Constraint:
  - 23 CFR 450.218(a)(5)
  - Program balance ratios
  - Funding policy
  - Highway and transit needs
  - Effect of STIP towards achieving State performance targets
  - Annual distributions
  - Project schedule/readiness
  - Funding category availability
  - Title VI & Environmental Justice analysis
  - Feedback from STPP, CTPP, and public meetings

STEP 5: Draft Final STIP
- Constrained Draft STIP vetted through STPP, CTPP, and public meetings
- Constrained Statewide Programs & Projects
- Constrained District and County Programs & Projects

STEP 6: Approval
- STIP submitted to FHWA & FTA
- STIP approved by FHWA & FTA

MPO TIP PROCESS
### SmartTRAC: Smart Transportation Rank Choice

<table>
<thead>
<tr>
<th>Goal Area</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>20</td>
</tr>
<tr>
<td>System preservation</td>
<td>24</td>
</tr>
<tr>
<td>Access to Jobs and Necessities</td>
<td>16</td>
</tr>
<tr>
<td>Congestion Reduction</td>
<td>16</td>
</tr>
<tr>
<td>Environmental Protection</td>
<td>16</td>
</tr>
<tr>
<td>Project Readiness</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Objectively Variable Indicators:**
- Tools and Processes

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

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

**Being redefined and recalibrated as a part of mid-range planning process**
## GHG Levels of Engagement

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

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

1. Select facility type
   - Interstate highway (class 1 facility)
   - Class 2 or 3 facility

2. Select county
   - Los Angeles

3. Input total lane miles added
   - 2 miles

Calculate Induced Travel

Results

5.3 million additional VMT/year

Los Angeles County currently has 9199 lane miles of Caltrans-managed class 2 and 3 facilities on which 32666 million vehicle miles are travelled per year.

A project adding 2 lane miles would induce an additional 5.3 million vehicle miles travelled per year.

This calculation is using an elasticity of 0.75

Read more about this calculator
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.