Breakout Session 1 – Managing Travel Demand

Moderators: Asia Yeary (US EPA), Josh Miller (ICCT)

Rapporteur: Margaret Larson (DBEDT)

Hawaii Clean Energy Initiative
Transportation Charrette
November 13, 2014

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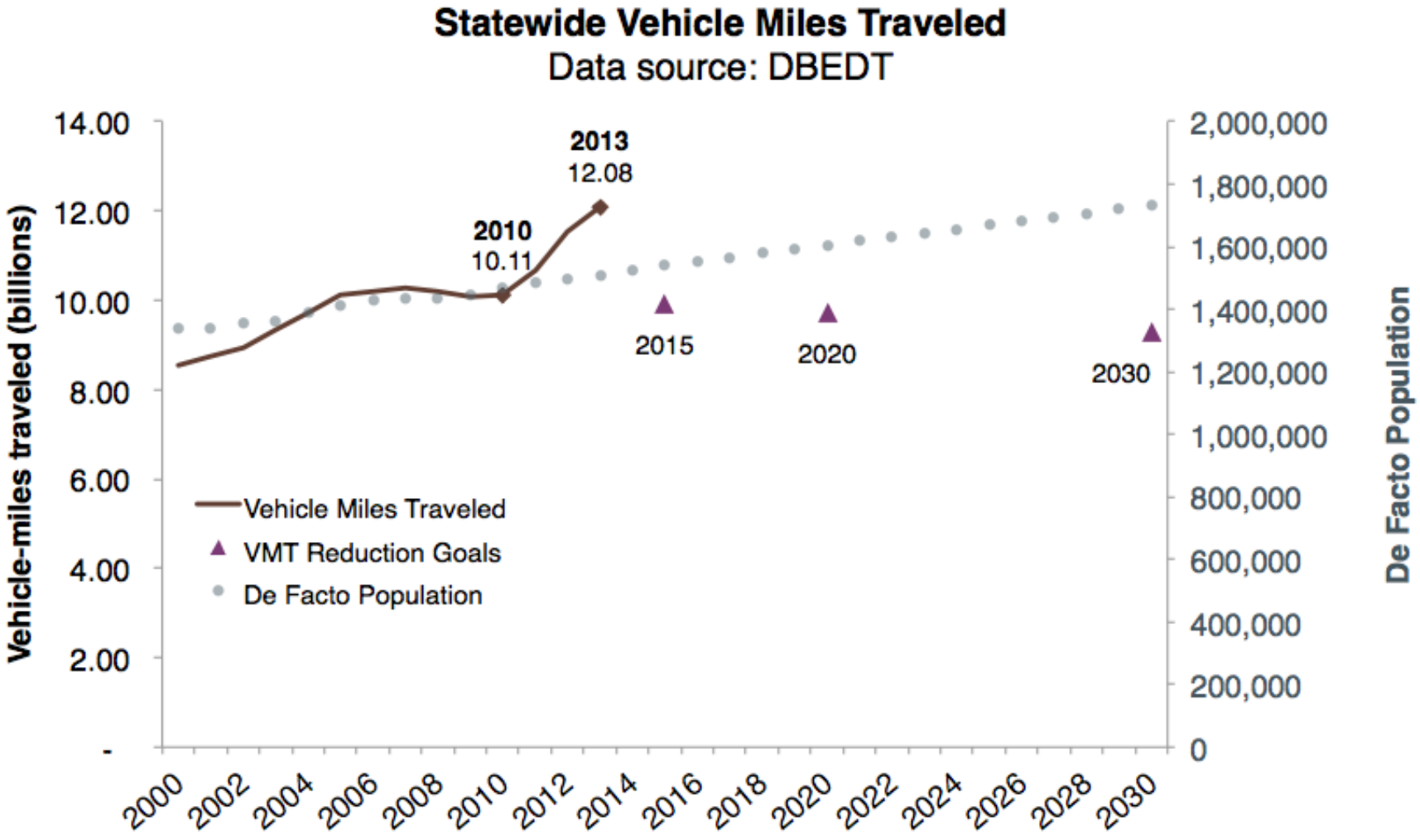
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

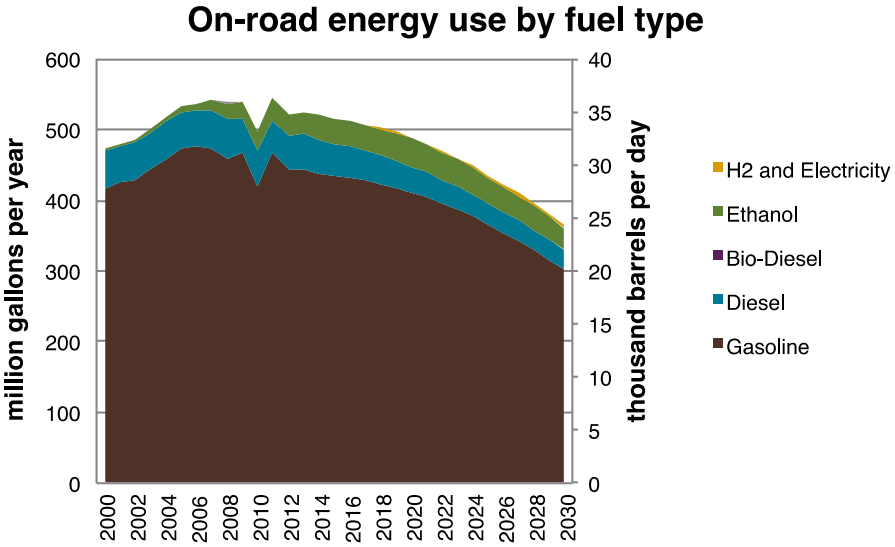
Next steps in transportation energy analysis

- Continued stakeholder engagement
  - Workshop on Electric drive vehicles: mid-December
  - Web-meetings on vehicle efficiency, aviation and marine tactics: Late December/early January
- Narrow down strategies and tactics (December/January)
- Qualitative and quantitative evaluation of tactics (January/February)
- Assess complementarity with existing Hawaii policies/plans and budgets (February/March)
- Charrette to seek consensus, plan implementation (May/June)

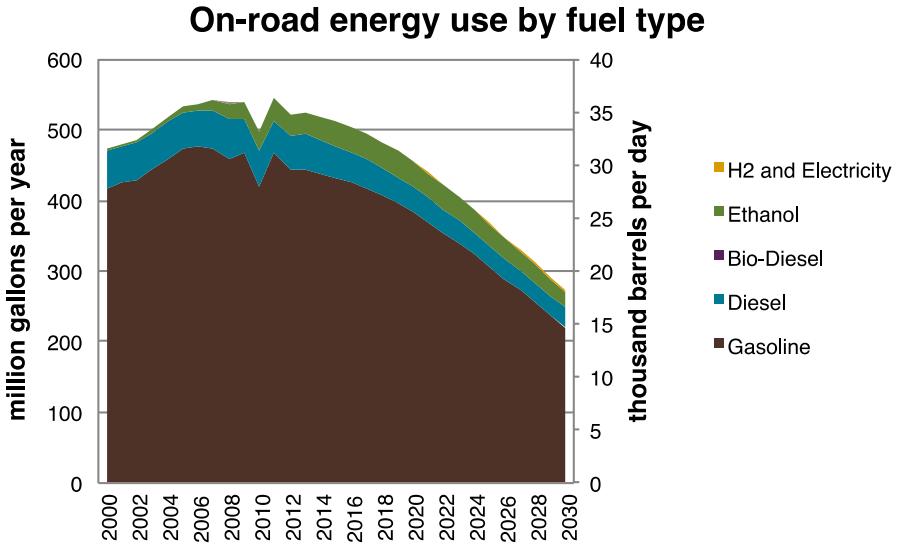
Managing travel demand in HCEI (2011)



Hawaii on-road transportation energy demand projection based on potential policies



2030 fuel economy standards for LDV and HDV
40% BEV, 40% PHEV, 20% sales by 2030 (15% total EV)
Vehicle stock and total VMT grow 15% (at a 1:1 ratio with population) from 2013-2030.



2030 fuel economy standards for LDV and HDV
40% BEV, 40% PHEV, 20% sales by 2030 (15% total EV)
8% VMT reduction target met by 2030

Process for breakout session

Measure	Feasibility	Agency with authority	Funding availability	Cost effective	Magnitude of VMT benefit	Co-benefits relative to VMT benefit
Please feel free to fill this out during the discussion of VMT tactics. If you'd like a copy for your records, write your name and we'll send you a scanned copy after the workshop.	1 - High 2 - Medium 3 - Low	List agency with authority to implement. If multiple, rank in order of likelihood.	1 - Fully 2 - Partially 3 - Not funded X - Not needed	1 - Yes 2 - No X - No cost	1 - High 2 - Medium 3 - Low	1 - Greater 2 - Similar 3 - Less
Traffic operations and management						
Support an interdepartmental group to coordinate seamless, safe connections between transit stations, bus stops, streets, sidewalks, and major activity nodes.						
Statewide policy to promote roundabouts.	1	HI DOT	2	2	3	1
Bus priority lanes to improve travel times.						
Carsharing						
Explore carsharing options for public fleets.	1	HI SPO	1	1	2	2
Allow dedicated parking for carsharing.						

- List of tactics compiled from stakeholder conversations
- Collect feedback to select and prioritize for a revised HCEI
- Template provides list of tactics and criteria for ranking

Traffic operations and management

Interdepartmental group to coordinate connections between transit, walking, bicycling facilities

"Create an interdepartmental group to promote coordination and cooperation on seamless, safe connections between transit stations, bus stops, streets and sidewalks, and major activity nodes."

– Identified as a best practice in the TOD Planning Framework, City & County of Honolulu (2013)

- Is there a mechanism for the State to support interagency collaboration to improve connections between transit modes?

Statewide policy to promote roundabouts

- could improve bus service and lower fuel use
- less potential for serious crashes
- lower travel speeds
- improved traffic flow
- lower hardware and maintenance costs

Illustration of safety benefits with roundabouts
Credit: Nevada DOT

Bus priority lanes to improve travel times

"Specifically, create a policy for an Express Lane during commuting hours (e.g., 7-9am & 5-7pm) on major roads (e.g., King, University, Beretania). It wouldn't require any construction, but it would simply be an ordinance that would only allow busses and EVs/BFVs to drive longer than a half block in a right hand lane. All cars could use the lane to make a right hand turn, but they could not use it for longer than a half block. It would create an Express Lane and an incentive to use the bus and non-fossil fuel vehicles."

– Response to the transportation stakeholder survey

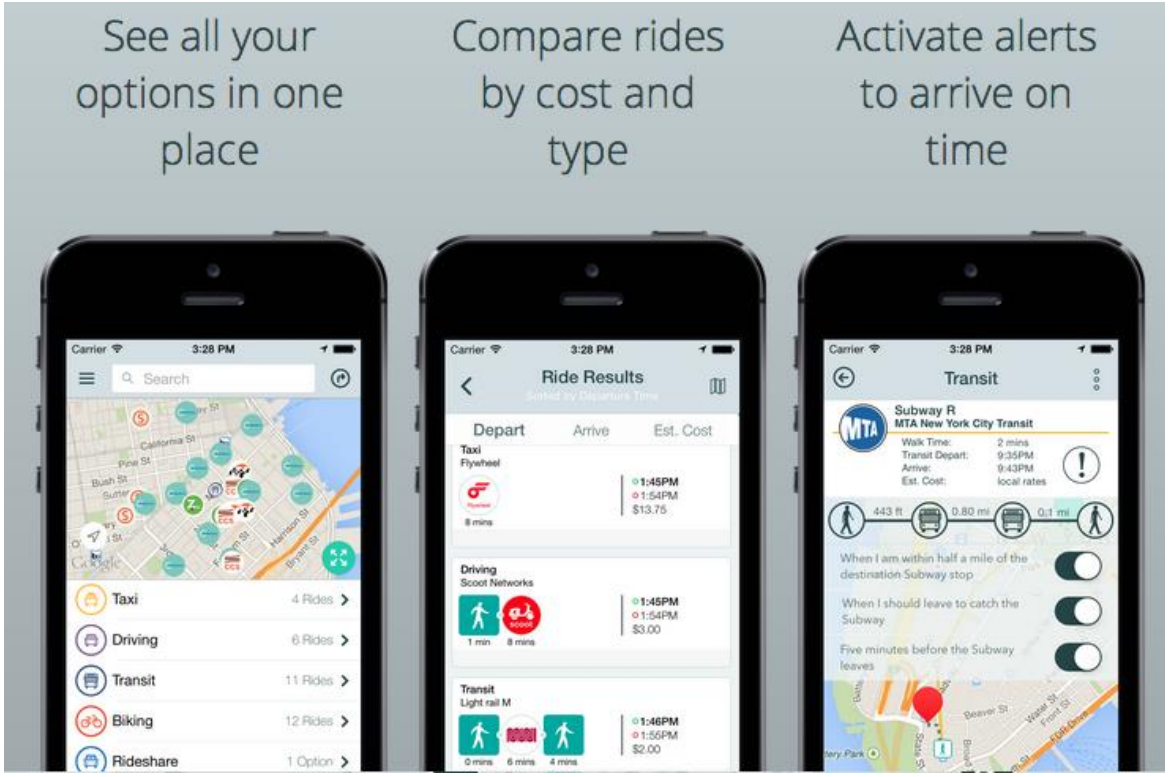
Example of a Bus on Shoulder System (BOSS)
Photo credit: Regional Transportation Alliance

- Increase transit time reliability in congested corridors
- US: MN, VA, MD, WA, NJ, GA, DE, FL, CA
- Currently in Hawaii: temporary shoulder use on H1 during morning peak

Partner with private sector to pilot intelligent transportation systems

"Make Hawaii a testbed for innovative transportation technologies. This should include a city-state-private sector collaboration to identify corridors where new transportation technologies can be piloted and tested. Not just technologies with traditional support like hydrogen, but transportation apps, innovative bikeshare approaches, multi-modal IT, connected car, congestion solutions, etc."

– Response to the transportation stakeholder survey



Example of RideScout platform as an innovative transportation technology
Photo credit: RideScout

Carsharing

Explore carsharing options for public fleets

U.S. General Services Administration Selects Zipcar for Car Sharing Program in Boston, Chicago, New York City and Washington, D.C.

Zipcar Now Offering Car Sharing Services to U.S. Federal Government Employees

City of Chicago introduced carsharing into its public fleet in 2011:

- Carsharing allowing it to reduce fleet size from 1,000 to 650 vehicles
- Savings estimated at $7 million since 2011

Federal agencies considering carsharing for public fleets, as well as other cities including San Francisco.

Cultural change may be needed:
"Some departments were reluctant to give up their pods of vehicles. ... But for the most part, it's part of the culture now." – Kevin Campbell, manager of fleet services, City of Chicago

Photo credit: Flickr user Daniel X. O'Neil

Allow dedicated parking for carsharing

- *"Every car-share vehicle in the program could remove approximately 10 cars off the road. This program will allow the city to continue to grow while still giving people access to a car when they need it." – Paul Rose, SFTMA*

Source: Jerold Chinn, SF Bay

Photo credit: Yusuke Kawasaki/Flickr

- San Francisco pilot project to reserve up to 900 spaces for car-sharing companies
- Other examples: Zipcar in US, Canada, UK, Spain, Austria

Prioritizing transportation projects

Consider multimodal and safety impacts of projects instead of vehicle flow alone

"Level of Service (LOS) has been the standard by which the state measures the transportation impacts of major developments and changes to roads. Level of Service is basically a measurement of how many cars can be pushed through an intersection in a given time. If a project reduced a road's Level of Service it was considered bad — no matter how many other benefits the project might create." – Newton and Curry, StreetsBlog LA

- Using LOS alone can be a significant barrier to bicycling, pedestrian, and transit projects
- CA recently replaced LOS with VMT, now favoring projects that reduce VMT in line with the State's goals

Incorporate health sector active transportation goals into state and county-level planning decisions

Physical Activity

Objective 2: Designate and allocate a minimum of 10% of federal and state highway transportation funds to implement complete streets, bicycle and pedestrian plans, greenbelt and trail systems, and Safe Routes to School programs.

Objective 3: Implement state and county-level "complete streets" policies.

Objective 4: Develop and implement processes at the state and by every county to include physical activity priorities when determining building design and location, land-use planning, and transportation decisions (e.g., revise, disseminate, and utilize the Healthy Community Design Assessment/Checklist).

Objective 5: Increase by 10% the percentage of people who use active transportation to commute to work or school by expanding opportunities for active transportation (e.g., bike share programs, public transit, transit-oriented development, Safe Routes to School, Work and Recreation).

– Objectives established in the Hawaii Department of Health's *Hawaii Physical Activity and Nutrition Plan 2013-2020*

- How can these goals be better connected to state and county-level transportation planning?

Secure resources to implement existing plans

Statewide Pedestrian Master Plan

- *"Just because something is a walkable distance doesn't mean it's walkable."* – A local stakeholder
- *"HDOT's Pedestrian Master Plan provides a comprehensive approach to improving pedestrian safety, evaluates ways to enhance mobility for pedestrians, and helps build a more multi-modal transportation system across Hawaii. HDOT's plan also prioritizes various pedestrian projects for improvement, identifies and promotes the Complete Streets vision for Hawaii, and meets federal requirements for multimodal planning."* – State Smart Transportation Initiative
- *"Because funding is scarce and funding sources are complex, it is important to be strategic in seeking to implement the prioritized project list."* – Statewide Pedestrian Master Plan (2013)

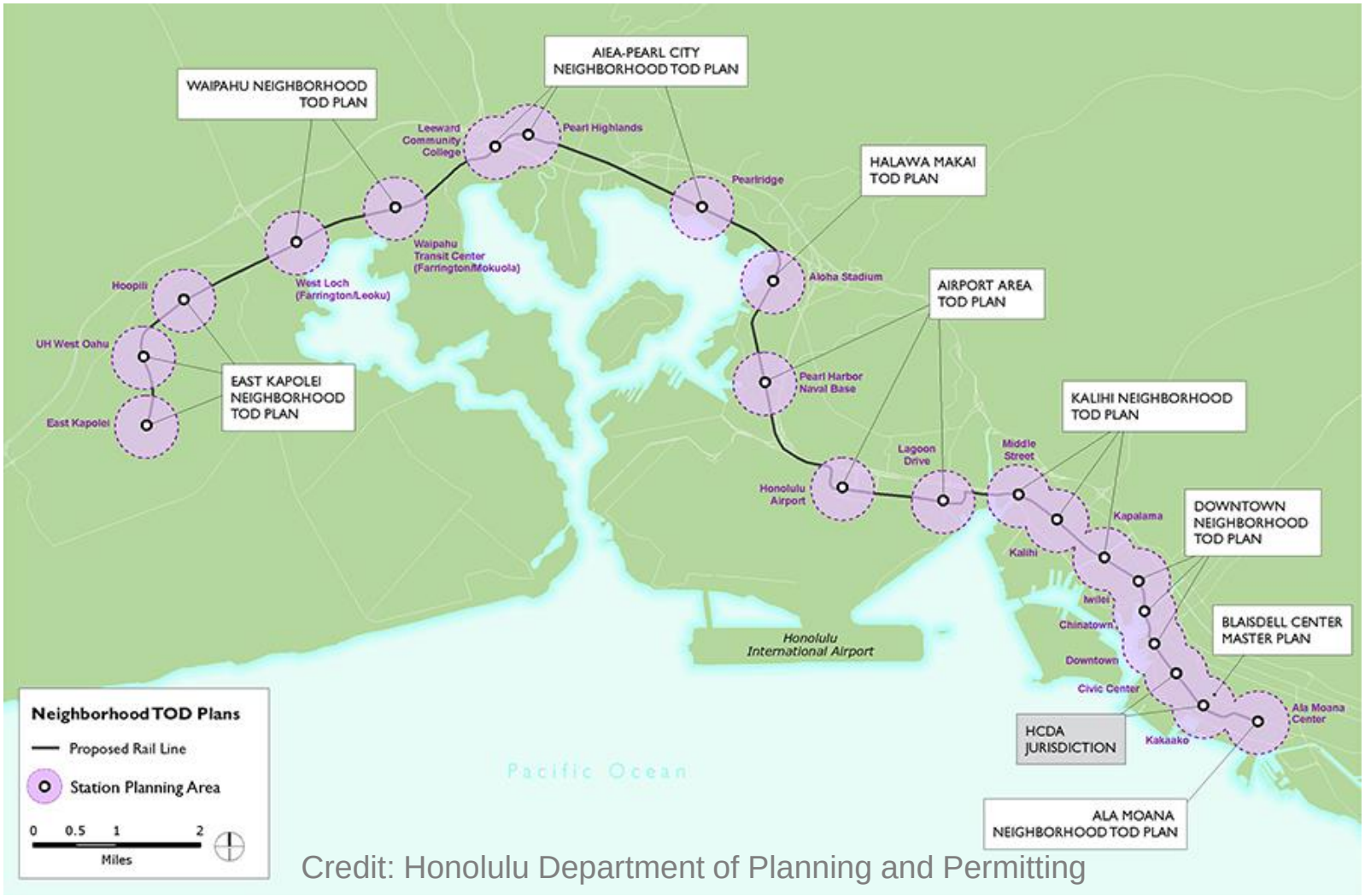
Statewide Bicycling Master Plan – requires coordination with counties and public involvement

- *"The purpose of this master plan is to identify ways in which bicycling facilities—and the environment for bicycling, more generally—can be improved, thereby giving people more meaningful modal choices. To achieve the objectives contained in this plan will require long-term, incremental changes that go beyond the process of creating the plan itself. Implementation will depend on continued work within HDOT, coordination with County governments, and sustained public involvement."* – Chapter 8, Statewide Bicycling Master Plan

County and MPO multimodal, pedestrian, and bicycling plans – require coordination with HDOT

"Implementation of The Oʻahu Bike Plan depends on the funding and actions of a variety of responsible parties and stakeholders. They include DTS (primary proponent of City roadway facilities and Oʻahu Bike Plan policies and programs), DFM (responsible for ongoing maintenance of City facilities), DDC (responsible for major City road resurfacing projects), City Council (adopts the City's operating and capital budgets), State DOT (responsible for State roadways improvements), and private developers, among other entities." – Chapter 6, Oahu Bike Plan (2012)

County neighborhood TOD plans



Credit: Honolulu Department of Planning and Permitting

Other travel demand management (TDM)

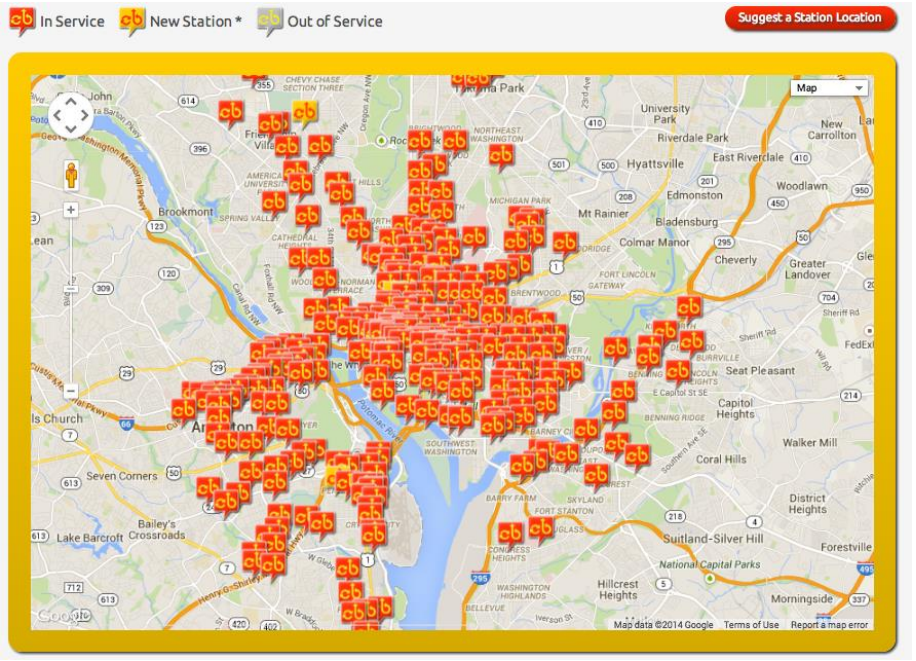
Public education campaign to improve safety and compliance of drivers and bicyclists

- Lead shifts in public behavior to reduce number of traffic-related accidents
- Strategies include community events, school activities, and neighborhood initiatives
- Address issues such as speeding, running reds and stop signs, distracted driving, bicyclist violations, crosswalk compliance

Source: Street Smart Marin

Secure state support and funding of bikeshare programs

Computer-generated image of a Citi bike station in NY
Photo credit: Bloomberg



Station map of bikeshare stations in Washington, DC
Photo credit: Capital Bikeshare

- US: New York City, San Francisco, DC, MN
- Bikeshare Hawaii: newly formed nonprofit, initial roll-out in urban Honolulu, vision for statewide bikeshare

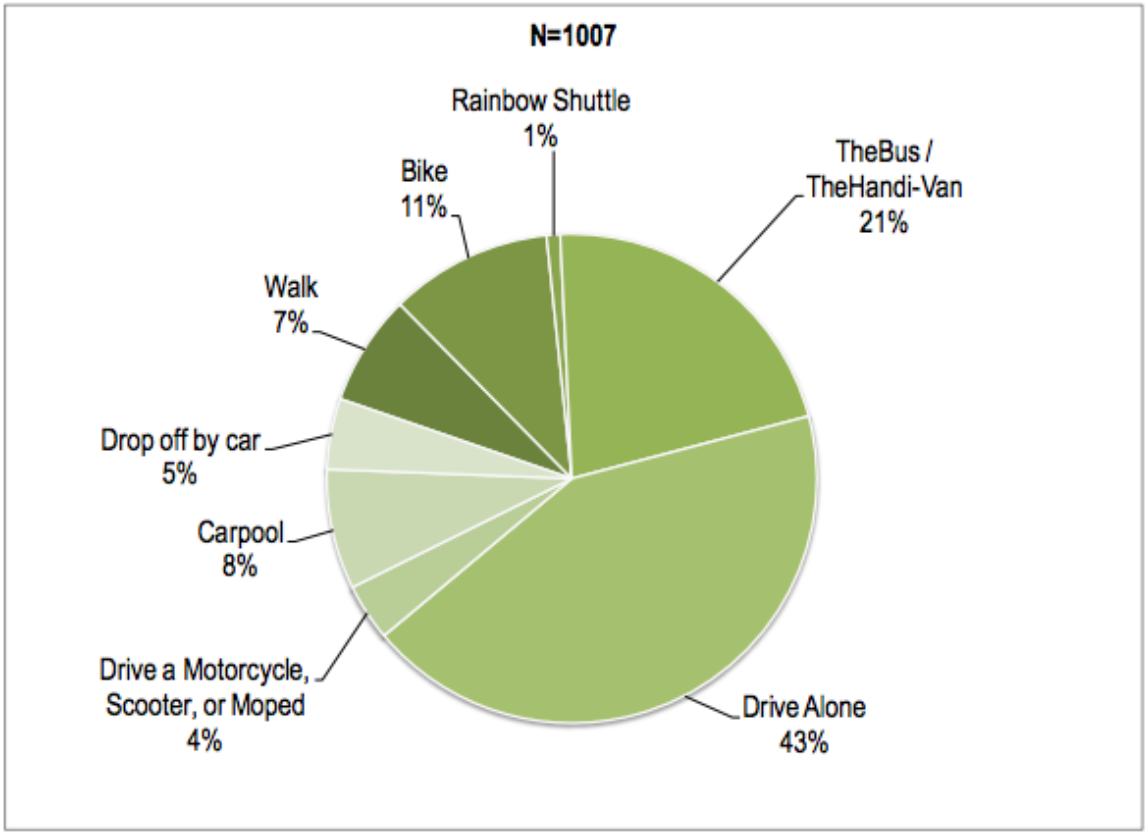
Commuter benefit program to encourage employers to promote transportation alternatives

- California's SB 1339 (2012) uses federal tax code to promote alternative commute modes
- *"The Bay Area Commuter Benefits Program gives employers the flexibility to offer one or more of the following commuter benefit options to their employees:*
- *Option 1: Pre-Tax Benefit - Allow employees to exclude up to $130 of their transit or vanpooling expenses each month from taxable income.*
- *Option 2: Employer-Provided Subsidy - Provide a subsidy to reduce or cover employees' monthly transit or vanpool costs, up to $75 per month.*
- *Option 3: Employer-Provided Transit - Provide a free or low-cost transit service for employees, such as a bus, shuttle or vanpool service.*
- *Option 4: Alternative Commuter Benefit - Provide an alternative commuter benefit that is as effective in reducing single-occupancy commute trips as Options 1, 2 or 3."* – Metropolitan Transportation Commission, CA

Increase government support of TDM programs at University of Hawaii campuses

- Improved connectivity with surrounding areas
- Regular data collection to monitor program performance
- Focused initiative for far-flung commutes
- More-reliable transportation funding sources

Campus Mode Share for Off-Campus Affiliates
Source: UH Manoa Campus TDM Plan



Source: UH Manoa Campus Transportation Survey (2011)

Lead by example to encourage telecommuting among state and local employees

In the HCEI Roadmap (2011):

- *"Promote commute reduction options (e.g., telecommuting, car/van pooling)"* – identified as an important action by 2015
- *"Evaluate 4 day work week options"* – identified as a critical action to support HCEI strategies

- **Are these still feasible?**

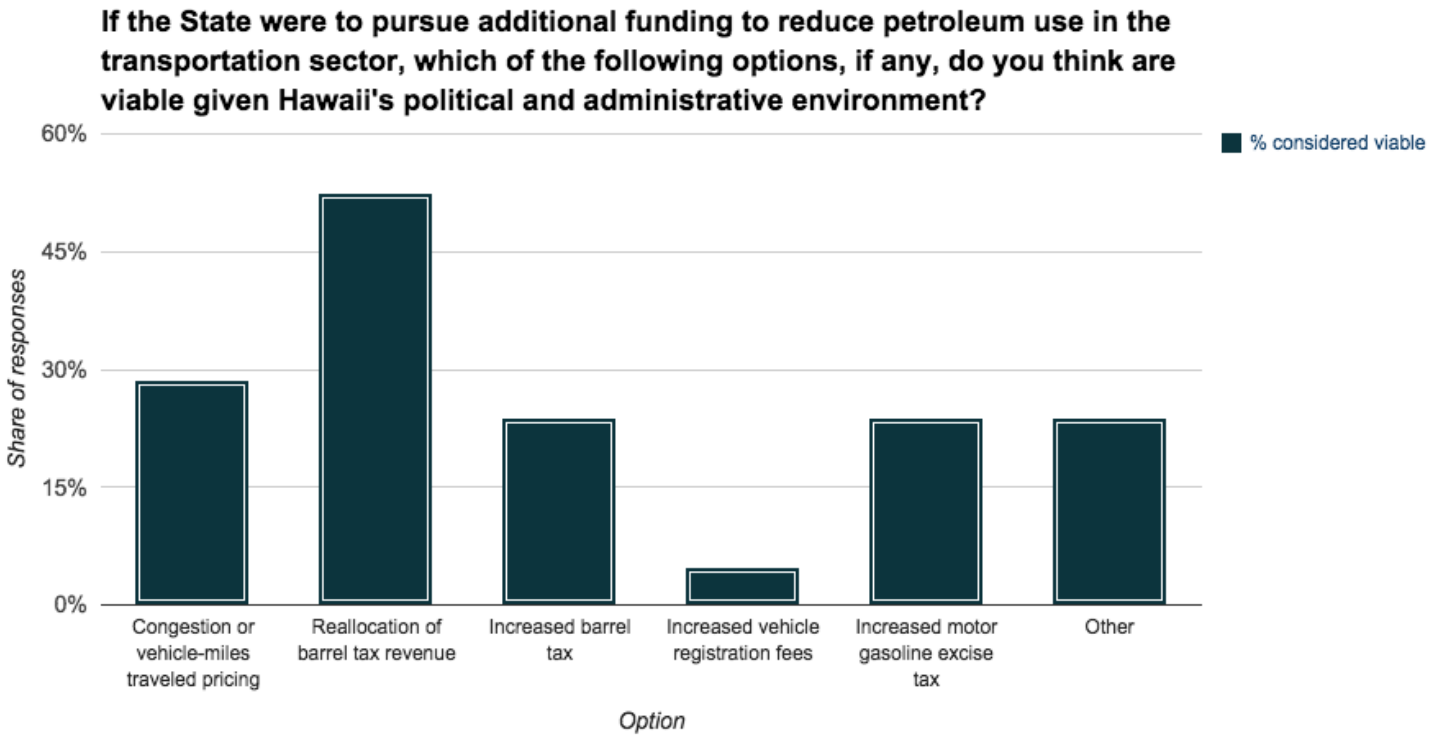
Transportation financing

“Improvements to alternative transportation (transit, walking, and biking) will be best accomplished through high levels of support from all levels of government, this will translate into prioritization and funding. This of course requires public support.” – Response to the transportation charrette survey

Execute a competitive application process for the Transportation Alternatives Program (TAP)

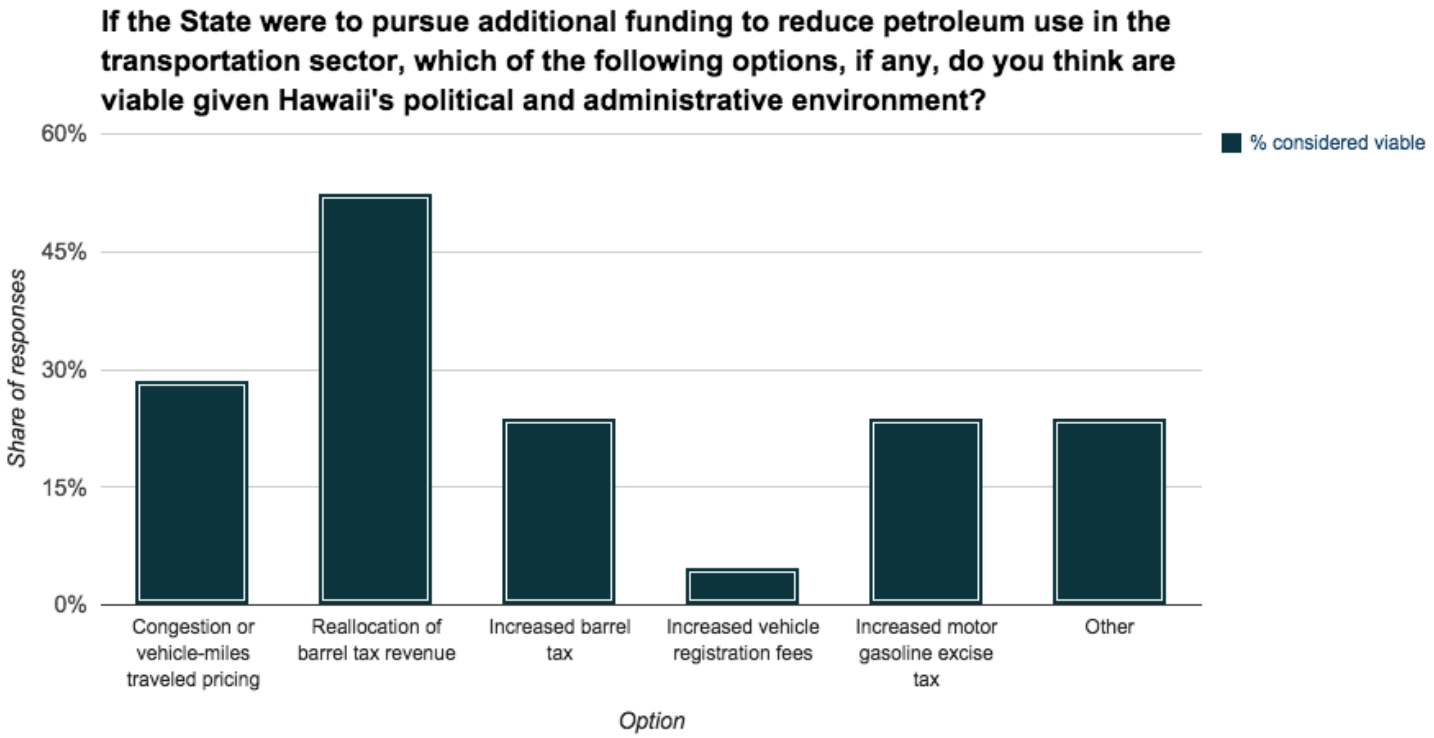
- Under MAP-21, 2% of Highway Trust Fund for Federal-aid highways is set aside for transportation alternatives
- Requires competitive application process
- *"Ensuring HDOT and OMPO set up a Transportation Alternatives Program to support multi-modal/sustainable transportation options"* was identified as a key TDM tactic in the stakeholder survey

Increase motor gasoline excise tax and dedicate funding for transportation alternatives



- Decreasing fuel demand translates to decreasing revenues in absence of rate increase
- Responses from transportation charrette survey indicate feasibility comparable with increasing barrel tax

Reallocate vehicle registration fees and taxes to fund transportation alternatives



- Increasing vehicle registration fees ranked as the least viable option
- **Is there any potential to reallocate these revenues to better align with energy and VMT goals?**

Congestion charging

Photo credit: Transport for London & Google Maps

Photo credit: Transport for London

- Applied in London; considered in San Francisco, New York
- Manage congestion within a specified zone or corridor
- Allows automated, online payment/enforcement
- Allows discounts/exemptions for residents, HOVs, etc.
- Transportation charette survey: ranked more viable than other options

Price annual vehicle-miles traveled

- Oregon's road usage charge pilot program now in its third phase
- Lessons learned:
  - Allow consumers to choose from a range of reporting options
  - Allow private sector to provide administrative and account management services
  - Lower administrative costs with bundled billings, etc.

Elements of ODOT's 2013 program (Source: Craig Honeyman, National League of Cities)

- A 1.5 cents per mile road usage charge for travel on public roads (determined to be the equivalent of Oregon's state gas tax).
- Inclusion of up to 5,000 volunteer vehicles registered in Oregon, subject to the following restrictions:
  - No more than 1,500 vehicles with a fuel efficiency rating of less than 17 miles per gallon (mpg)
  - No more than 1,500 vehicles with a fuel efficiency rating of between 17 and 22 mpg
- A refund/credit of the state gas tax to those motorists who sign up for the VMT program.
- A refund/credit for travel on private roads in Oregon.
- ODOT-developed methods by which VMT vehicles will measure and report mileage.
- Options for VMT participants as to how their mileage will be collected and reported that includes at least one method not utilizing GPS technology.
- Establishment of an integrated open-systems technology architecture.
- Use of private sector partners to provide options to VMT volunteers in lieu of the DOT system.
- Requirements for the protection of personal information.
- Enforcement standards including penalties for false statements, non-payment and tampering with in-vehicle technology.

Increase parking fees and expand use of smart parking programs

- Example: SF Park

SF*park* pioneered the world's most advanced parking management system. New meters, sensors, and demand-responsive pricing made it easier to find parking in the City. Increased parking availability benefits drivers, Muni riders, bicyclists, pedestrians, visitors, residents, merchants and more.

- Demand-responsive pricing
- Information available on the web, 511 phone system, free mobile apps
- Open data and source code encourage research and innovation
- Deployed in 14 of 20 public parking garages
- Meters accept coins, credit/debit, and parking cards, PayByPhone
- Wireless sensors detect availability in realtime

Source: SFMTA

Strengthen capacity of State and local agencies to apply for federal funding (HUD-DOT-EPA, TIGER).

- Many agencies increasingly rely on federal funding to implement core projects
- Several stakeholders indicated Hawaii is under-represented among applications for federal funding
- Some issues noted:
  - Insufficient staff capacity to apply for funds
  - Barriers related to procurement

- **How might State and local agencies collaborate to increase applications for federal funding?**

Transit-oriented development (TOD)

Clarify legality of using tax increment financing for infrastructure projects under the State Constitution

- "Tax Increment Financing could well be the most practical tool we possess for creating incentives for increasing density in urban Honolulu, build transit-oriented development and fixing our aging infrastructure." – Donovan Dela Cruz, 2010
- Four years ago, City legislation was introduced to clarify legality of using TIFs for infrastructure projects in Honolulu
- In 2014, multiple stakeholders indicated that unclear language in the State Constitution remains a barrier to expanding the use of TIFs

Is State action needed to resolve this? Are there other options to achieve the same objectives?

Use EPA SRFs to improve existing infrastructure and capacity along with consent decree plans

- EPA provides State Revolving Fund (SRF) programs finance water quality protection projects
- Some stakeholders suggested adding in supplementary funding to augment the scope of projects that need to be undertaken under EPA consent decree plans

Are there any barriers to utilization of existing SRFs? Is there a need for additional revenue streams?

Formulate TOD plans to meet existing and planned bus and rail capacity

- Example: Honolulu Rail Transit
  - Politically charged, costly
  - Some regard estimated system benefits are “extremely conservative” compared to system capacity
  - TOD plans formulated to meet system capacity could increase return on investment
- Example: Kauai’s Multimodal Transportation Plan
  - Targets 1000% increase in bus service through 2035
  - Financial uncertainty impedes cross-sector planning

State and local government collaborate to identify and develop state lands near rail stations

- TOD neighborhood plans initially target 2000 feet around stations, but longer distances are feasible
- In Honolulu, some areas include:
  - UH West Oahu
  - Community colleges
  - Airport

Are there specific actions that could be taken to improve collaboration on development of land near rail stations?

Consider residential density and distance to work as key determinants of transport activity

- Travel demand a function of activities, destinations, distances, preferences
- California's Sustainable Communities Act supports coordinated transportation and land use planning:
- *"Each of California's MPOs must prepare a sustainable communities strategy (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region."* – California ARB
- **Is there potential in Hawaii to better coordinate energy, GHG and travel demand goals?**

Metropolitan Planning Organizations (MPOs)

Modify Oahu MPO charter to give Policy Committee final decision-making authority for TIPs

- Numerous stakeholders indicated that Oahu MPO's legal authority is not in compliance with federal law
- This seems to have occurred as a result of federal laws changing and the State law regarding MPOs not keeping pace
- The necessary legal change seems to be to give MPO Policy Committees final decision-making authority for transportation improvement programs

Does this require a legislative fix, or a revised agreement between the State, County, and MPO?

Improve State DOT and MPO capacity to ensure compliance with environmental regulations

- Compliance with environmental regulations a key component to successful transportation planning
- An integrated approach between the State and MPOs could improve and potentially reduce the costs of compliance with federal environmental regulations
- “Although the SIP is produced by the state environmental agency (not the MPO) to monitor, control, maintain, and enforce compliance with the NAAQS, it must also be taken into account in the transportation planning process.” – US DOT

Establish Maui MPO in accordance with federal law

- Draft agreement yet to be finalized between State, County, and MPO
- MPO presence significantly improves capacity to secure federal transportation funding

Are there any barriers that the State could address?

Goals

Legislative target to reduce statewide VMT

- Five states have adopted binding legislative targets to reduce statewide vehicle-miles traveled
- Could improve infrastructure planning decisions and avoid induced demand, or “project and provide” problem
- Could cut road maintenance costs in environment of fiscal austerity
- New York, Massachusetts, Oregon, and Washington

Example: *Washington’s HB 2815, Climate Action & Green Jobs*

“Signed in 2008, Washington’s Climate Action and Green Jobs bill (HB 2815) requires the Department of Transportation to adopt broad statewide goals to reduce annual per capita VMT by 2050. The bill requires the department of transportation to develop strategies to decrease the annual per capita VMT by eighteen percent by 2020, thirty percent by 2035 and fifty percent by 2050.” – Smart Growth America

Island-specific goals for bicycling, walking, and transit mode share

- International application: Charter of Brussels
  - In 2009, signed by 36 European cities
  - Undersigned cities commit to target at least 15% share of cycling for trips in the year 2020
- Mode share goals could be set locally and include minimums for bicycling, walking, transit
- Such goals could promote performance-tracking, data collection, interagency coordination

Establish performance metrics for planning agencies to measure and report progress

- Key aim of the Transportation Charrette is to generate recommendations that are actionable and allow for progress tracking
- Options could include:
  - VMT statewide and by county
  - Mode share of bicycling, walking, transit, cars
  - Action on specific recommendations (e.g. policy adoption)

- **Which metrics could work for the HCEI process?**
- **Could similar metrics apply across agencies?**

Managing Travel Demand Summary

MAJOR HIGHLIGHTS

- Legislatively binding statewide VMT reduction target
    - Could require better interagency coordination
    - Provide a consistent objective at all levels of government
    - Supported with island-specific mode shift targets (share of bicycling, walking, transit)
- HDOT is a critical stakeholder and must be engaged
- Need for innovative transportation financing
    - VMT or congestion-pricing options should be seriously considered
    - Excise tax with dedicated revenue for transit and multimodal transport
- Key tactics
    - Replace Level of Service measurement of vehicle flow with VMT for multimodal planning
    - State, county support of TDM programs in government and for large employers
    - Upcoming legislation to take advantage of commuter benefits under federal tax code
    - Explore carsharing of public fleets, dedicated parking for car sharing

Breakout Session 1 – Managing Travel Demand

Moderators: Asia Yeary (US EPA) and Josh Miller (ICCT) *Name:*
Rapporteur: Margaret Larson (DBEDT) *Organization:*

As identified in an analysis of transportation sector energy trends, meeting Hawaii's clean energy goals for transportation would require progress on several fronts, including vehicle efficiency, alternative fuels, and management of travel demand. In Hawaii, an average of one gallon of gasoline is saved for every 23 miles not driven. This session will explore barriers and opportunities for reducing travel demand. The following list of tactics has been compiled based on conversations with several dozen transportation experts in Hawaii. This list will serve as a template for discussion of the feasibility and potential impacts of possible intervention tactics.

Disclaimer: Inclusion of a tactic on this list does not constitute endorsement by the Hawaii State Energy Office or by the ICCT.

Measure	**Feasibility**	**Agency with authority**	**Funding availability**	**Cost effective**	**Magnitude of VMT benefit**	**Co-benefits relative to VMT benefit**
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Traffic operations and management						
Support an interdepartmental group to coordinate connections between transit, walking, and bicycling facilities.						
Statewide policy to promote roundabouts.						
Bus priority lanes to improve travel times.						
Partner with private sector to pilot intelligent transportation systems.						
Carsharing						
Explore carsharing options for public fleets.						
Allow dedicated parking for carsharing.						
Prioritizing transportation projects						
Consider multimodal and safety impacts of projects instead of vehicle flow alone.						
Incorporate health sector active transportation goals into local planning decisions.						
Secure resources to fully implement existing plans						
Statewide Pedestrian Master Plan.						
Statewide Bicycling Master Plan.						
County and MPO multimodal, pedestrian, and bicycling plans.						
County neighborhood TOD plans.						
Other travel demand management (TDM)						
Public education campaign to improve safety and compliance of drivers and bicyclists.						
Secure state support, funding of bikesharing.						
Commuter benefit program to encourage transportation alternatives.						
Increase government support of TDM programs at University of Hawaii campuses.						
Lead by example to encourage telecommuting among state and local employees.						

Measure (continued)	Feasibility	Agency with authority	Funding availability	Cost effective	Magnitude of VMT benefit	Co-benefits relative to VMT benefit
Transportation financing						
Designate administrator(s) and execute a competitive application process for the Transportation Alternatives Program (TAP).						
Increase motor gasoline excise tax and dedicate funding for transportation alternatives.						
Reallocate vehicle registration fees and taxes to fund transportation alternatives.						
Price congested highways during peak hours.						
Price annual vehicle-miles traveled.						
Increase parking fees and expand use of smart parking programs.						
Strengthen capacity of State and local agencies to apply for federal funding (e.g. HUD-DOT-EPA, and TIGER).						
Transit-oriented development (TOD)						
Clarify legality of using tax increment financing for infrastructure projects under the State Constitution.						
Utilize EPA drinking water and wastewater state revolving loan funds (SRFs) to improve existing infrastructure and capacity in conjunction with EPA consent decree plans.						
Estimate maximum rail system capacity and formulate TOD plans to meet capacity.						
State and local government collaborate to identify and develop state lands near rail stations.						
Consider residential density and distance to work as key determinants of transport activity.						
Metropolitan Planning Organizations (MPOs)						
Modify Oahu MPO charter to give Policy Committee final decision-making authority for Transportation Improvement Plans.						
Improve State DOT and MPO capacity to ensure compliance with environmental regulations.						
Establish Maui MPO in accordance with federal law.						
Goals						
Legislative target to reduce statewide VMT.						
Island-specific goals for bicycling, walking, and transit mode share.						
Establish performance metrics for planning agencies to measure and report progress.						

Hawaii Transportation Energy: Alternative Fuels

Anup Bandivadekar
Stephanie Searle

13 November, 2014,
Honolulu, HI

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ICCT mission and activities

The mission of ICCT is to dramatically improve the environmental performance and efficiency of cars, trucks, buses and transportation systems in order to protect and improve public health, the environment, and quality of life.

- Non-profit research Institute
- Air Pollution and Climate Impacts
- Focus on regulatory policies and fiscal incentives
- Activity across modes including aviation and marine
- Global outreach, with special focus on largest markets

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Promote use of alternatives to petroleum

- Biofuels
  - Domestic production of cellulosic biofuel
  - Domestic production of sugarcane ethanol
  - Domestic biodiesel from used cooking oil and other waste fats
  - Continued imports of bioethanol
- Encourage use of CNG/LNG in commercial vehicle/bus as well as marine operations
  - Support LNG terminal facility to receive bulk shipments from LNG tankers or barges

Biofuels Review

Current biofuel status in Hawaii

	Production	Consumption
Ethanol	0	52 MGY
Biodiesel	1.6 MGY	~ 0 MGY

- Current policy incentives:
  - Ethanol production incentive (income tax credit up to 30% until 2017)
  - Ethanol fuel blend standard (E10)
  - Energy feedstock program
- Although several projects are planned, current production of biofuels in Hawaii is low
- HCEI 2020 target of 50 MGY will be met through imports

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HCEI 1.0 goal of 150 MGY biofuel in road-transportation extremely ambitious

Invest heavily in domestic production of drop-in biofuels and in facility construction

OR

Mandate or subsidize flex-fuel vehicles

AND

Subsidize E85

AND

Mandate or subsidize B10

AND

Subsidize E85 fueling station conversions

Domestic Production of cellulosic biofuels

- 24 million gallons per year could be produced
  - Multiple end-use products possible; e.g. ethanol, drop-in renewable gasoline or diesel, butanol.
  - Ethanol tends to be most cost-effective among these.
- 72 thousand acres of current pasture and idle land converted to energy crop production
- ~5% reduction in fuel carbon intensity possible

Domestic Production of cellulosic biofuels requires a range of policy support from the state

(a) Providing feedstock price support to incentivize livestock farmers and holders of idle land to switch to energy crop production

(b) Direct investment in the construction of cellulosic biofuel facilities through grants or loan guarantees, likely at least $200 million needed;

(c) Effective policy support for production of cellulosic biofuel through a refundable tax credit, grants, or other direct financial support of $1 per gallon or more

(d) Investment in energy crop establishment and support for long-term off-take agreements between farmers and biorefineries;

(e) Support for long-term off-take agreements for renewable fuel supplied by Hawaii biorefineries (through e.g. DOD use).

(f) Increase local fuel transport and storage capacity, as well as to facilitate issues with land rights and permitting.

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Domestic Production of Sugarcane biofuels

- 49 million gallons per year could be produced
- 72 thousand acres of current pasture and idle land converted to energy crop production
    - Note that this is the same land discussed under the cellulosic pathway
- ~ 2% reduction in fuel carbon intensity possible

Domestic Production of sugarcane biofuels also requires a range of policy support from the state

(a) Providing sugar price support to incentivize livestock farmers and holders of idle land to switch to sugarcane production;

(b) Investment in sugarcane establishment, including repairing irrigation infrastructure and sugar terminals, and support for long-term off-take agreements between farmers and biorefineries;

(c) Grants, loan guarantees, or other direct financial support for the construction of ethanol facilities;

(d) Price support for biofuel production, such as extending or increasing the existing ethanol producer's tax credit or increased blending mandates;

(e) Support for long-term off-take agreements for renewable fuel supplied by Hawaii biorefineries (through e.g. military use).

(f) Increase local fuel transport and storage capacity.

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Renewable jet fuels

- Drop-in jet fuel requires more complicated processing technology compared to biodiesel and ethanol
- Estimated production costs of biodiesel are $2.00-$2.50/gallon, compared to $4.00-$6.00/gallon for renewable jet fuel from conventional and cellulosic feedstocks, and $17.00/gallon for renewable jet fuel from algae
- What is the strategic value of investing in aviation biofuels?

Cost considerations for biofuels pathways

Option	Domestic Production (Imports)	Cost Effectiveness	Additional considerations
1	**24** MGY cellulosic from energy crops **4** MGY cellulosic from MSW **3** MGY biodiesel from waste fats	Data on production costs not available	Increased agricultural impacts: water use, fertilizer runoff, soil nutrient depletion, etc. in Hawaii
2	**49** MGY sugarcane ethanol **3** MGY biodiesel from waste fats	Sugarcane ethanol cost premium of $2.64 per gallon compared to imported ethanol and $3.24 per gallon compared to gasoline (E10)	Increased agricultural impacts: water use, fertilizer runoff, soil nutrient depletion, etc. in Hawaii
3	**3** MGY biodiesel from waste fats	Premium of $2.34 per diesel equivalent gallon, compared to regular diesel	
4	(Imported ethanol)	Premium of $0.60 per gallon gasoline equivalent	

Preliminary assessment of the CNG/LNG Situation

Current use of natural gas in Hawaii

- Mainly used for power
  - Hawaii Gas produces synthetic natural gas from naptha that is produced at Hawaii's refineries or imported, and has started to import ISO containers of LNG from California as backup
  - Natural gas used in commercial, industrial, and residential sectors
- Use in transportation very limited
  - <0.01% of all transportation fuel used in Hawaii
  - No consumption in road vehicles in recent years
  - Currently no publicly available CNG or LNG fueling stations for vehicles in Hawaii
- Little policy incentive for natural gas use in transportation
  - One of many alternative fuel choices for state and county acquisition requirements

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Current price of natural gas in Hawaii

- Natural gas is currently more expensive than other options in Hawaii
  - 1.4x more expensive than gasoline for vehicle drivers
  - Slightly more expensive (1.1x) than diesel for electric utilities
  - 2.5x more expensive than bunker (marine) fuel

$/MMBTU	CONSUMER VEHICLES	ELECTRIC UTILITIES	MARINE FUEL
Conventional fuel	31.28	22.79	17.41
Natural gas	42.78	25.05	42.78

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Bulk shipments of natural gas could be cheaper

- A 2012 report prepared for the HNEI by FGE projected cost savings of importing bulk LNG to Hawaii via large tankers
  - LNG cost $13.62/MMBTU - fuel savings of up to 49% compared to low sulfur and ultra low sulfur fuel in 2020 if sourced from the US West Coast
  - Projected cost of natural gas delivered by ISO containers is similar to current prices in Hawaii
- Slightly higher projected costs from 2014 Hawaii Electric plan submitted to Public Utilities Commission
  - $16.31/MMBTU for bulk LNG in 2020, but still cheaper than oil
- Importing LNG from US mainland or Alaska would require Jones Act waiver – political uncertainty
  - Importing LNG from international sources (no waiver required) would reduce or eliminate projected fuel savings
- For both studies, results dependent on assumptions and future oil price
- For use in transportation: additional costs
  - $250,000-700,000 for CNG fueling equipment per station
  - Transport costs from terminal to fueling stations
  - CNG/LNG vehicles are generally more expensive than conventional

Plans for expanding natural gas in Hawaii

- HECO RFP to purchase up to 800,000 bpd LNG in ISO (standard shipping) containers
  - Commencement by mid-2017, delivery for up to 15 years
  - Intention for use as primary fuel at HECO electric utilities
- Consortium (including HECO and Hawaii Gas) seeking establishment of a LNG terminal facility to receive bulk shipments from LNG tankers or barges
  - Expected to be available 2021/2022
  - **Could potentially increase availability of natural gas as transport fuel in Hawaii**
    - Can be consumed as LNG (in trucks and buses) or easily converted to CNG (trucks, buses, passenger vehicles)
    - No significant demand for LNG/CNG in transportation at present
- Concerns about increasing natural gas imports
  - Increase traffic at congested Hawaiian harbors
  - Jones Act waiver may be needed
  - Accelerate refinery closures

Potential refinery impacts of CNG/LNG

- Imported LNG could replace all SNG supplied by Hawaii gas
  - Hawaiian refineries may find other uses for naptha or would need to export to other markets
    - Blending component of gasoline, chemical solvent, fuel for camp stoves, etc.
  - Hawaii gas uses a relatively small fraction of all Hawaiian naphtha
- Larger risk to refineries if LNG/CNG significantly displace petroleum consumption
  - LNG/CNG use by electric utilities would force refineries to export residual fuel oil to other markets (likely Asia) at a substantial revenue loss
  - LNG/CNG use by utilities **and** vehicles would force refineries to reduce total production
- If one or both refineries close, Hawaii may have to import refined fuel
  - Would be short on diesel and especially jet fuel
  - Need another Jones Act waiver or import foreign fuel at higher expense

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Climate risks with LNG/CNG

- Using natural gas instead of petroleum reduces lifecycle greenhouse gas emissions **only if gas leakage is minimal**
  - Un-combusted methane (main component of natural gas) has a global warming potential 25x that of CO_2 over 100yr timeframe
  - Some studies estimate CNG vehicles have a higher GHG footprint than gasoline and diesel vehicles on average over short timeframes due to leakage (Alvarez et al., 2012, PNAS)
  - Leakage must be kept under 1.6% from well to wheel for immediate climate benefits (same study)
- Steps must be taken to ensure low-leakage transport and usage of CNG/LNG to and within Hawaii

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Strategies and Tactics under consideration

Fuels Session worksheet…

	Description of tactic	Key venue or actor or agency	Outcome/impact: 3-5 year 7-10 year	Risk	Risk mitigation strategy
Public-private partnership					
State Executive Support					
Legislative Tactic					
Other (Federal support, private sector operation…)					

Alternative Fuels Breakout Session

MAJOR HIGHLIGHTS

- ICCT requests additional data and information from stakeholders for accurate assessment
- Other market barriers also need to be included in assessment of policy options
- What is the value proposition of domestic, renewable fuels? What are we going to achieve? Are we looking at better ways to use better fuels or at renewable transportation? What are the order or operations and what is the potential for fuel paths?
- Consider possible biofuel pathways for aviation and marine sectors
- Biogas Pathway has potential
    - Quantify statewide potential for renewable biogas
    - Identify specific projects
- Hydrogen discussed as an alternative fuel – December follow up. HNEI will present an infrastructure roadmap.
- CNG in transportation would start with fleets first (i.e. buses, trucks)
    - Needs biogas production tax credit
    - Simplified permitting pathways for biogas/CNG projects
- Biodiesel mandate – B5 mandate
    - Fuel distributors need to put in place infrastructure
    - Tax credit/purchase biodiesel state fleet to use

DBEDT HAWAII STATE Energy Office

Hawaii Clean Energy Initiative: Transportation Charrette

The purpose of this survey is to gather initial feedback from participants in the Transportation Charrette to support the development of a revised transportation plan under the Hawaii Clean Energy Initiative, which aims to achieve deep reductions in petroleum use in the State of Hawaii. Aggregated results of this survey will be presented at the first stakeholder meeting, held on November 13, 2014. Your personal responses to the survey will be kept confidential.

Background

The Hawaii State Energy Office has contracted The International Council on Clean Transportation (ICCT) to assist in conducting a Hawaii Transportation Industry Analysis. The objective of this project is to provide assessments, analysis, and recommendations in order to develop a clean transportation plan under a revised Hawaii Clean Energy Initiative ("HCEI 2.0"). ICCT is analyzing the progress to date on the transportation section of the HCEI Roadmap 2011 Edition, and assessing what can realistically be achieved in terms of gasoline and diesel reductions by 2030 under the current plan. As part of the Transportation Charrette, ICCT will offer for consideration a new set of transportation options, goals and timeline to reduce petroleum-based fuels in the transportation sector including aviation, ground and marine transportation.

* Required

About you

We are asking you to fill in this survey as you have been identified as a key expert on Hawaii transportation issues. Your personal responses to the survey will not be disclosed, and will not be considered as official views of your department or organization. We ask that you provide us with a bit of information about yourself for the purposes of transparency and follow-up.

Name *

Organization *

One transportation-related measure for consideration in HCEI 2.0

1. What is one specific transportation-related measure that you would like to see considered in a revised HCEI? *

Please choose one measure you'd like to elaborate on. There will be opportunity to suggest multiple measures during the Charrette.

2. Which of the following actions could help overcome the barriers associated with implementing this measure? *

Please rank actions in order of importance, selecting the rightmost option if not an issue. 1 = most important; 8 = least important.

	1	2	3	4	5	6	7	8	Not an issue
Support from Federal Government	○	○	○	○	○	○	○	○	○
Support from the Public	○	○	○	○	○	○	○	○	○
Support from Local Government	○	○	○	○	○	○	○	○	○
Dedicated Funding	○	○	○	○	○	○	○	○	○
Support from State Government	○	○	○	○	○	○	○	○	○
Improved Procurement Policies	○	○	○	○	○	○	○	○	○
Institutional Cooperation	○	○	○	○	○	○	○	○	○
Other	○	○	○	○	○	○	○	○	○

3. Please elaborate on one action that you assigned a rank of high importance to overcoming barriers to implementation.

If the identified transportation measure would benefit from support of a specific agency within government, please indicate. There will be opportunity to discuss additional actions and measures during the Charrette.

Funding to reduce petroleum use in the transportation sector

4. If the State were to pursue additional funding to reduce petroleum use in the transportation sector, which of the following options, if any, do you think are viable given Hawaii's political and administrative environment?

We're interested in your personal view about the feasibility of each option. Responses will not be considered as official views of your department or organization.

- [ ] Increased motor gasoline excise tax
- [ ] Congestion or vehicle-miles traveled pricing
- [ ] Increased barrel tax
- [ ] Increased vehicle registration fees
- [ ] Reallocation of barrel tax revenue
- [ ] Other:

Please feel free to add any clarifications or comments that you would like us to consider.

Answering this question is entirely optional.

Submit

Never submit passwords through Google Forms.